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**Technical Brief I**

# RURAL WATER SERVICES

## USAID Water and Development

TECHNICAL SERIES

### INTRODUCTION

The purpose of this guidance note is to provide an overview of the important factors to consider when designing a rural water activity and information on the strengths and weaknesses of various possible service delivery models. It concludes with guidance for putting this into practice in the context of a United States Agency for International Development (USAID) activity, to be used in conjunction with Agency guidance on programming.<sup>1</sup>

#### KEY TAKEAWAYS

- Take into account that self-supply and community-based management generally fail to deliver sustained services without professionalized maintenance support.
- Think beyond the community level – service authorities and national government play an important role in the sustained delivery of rural water services.
- Design interventions to build capacity of community organizations, government, and other service providers for ongoing service delivery beyond first-time access to drinking water.

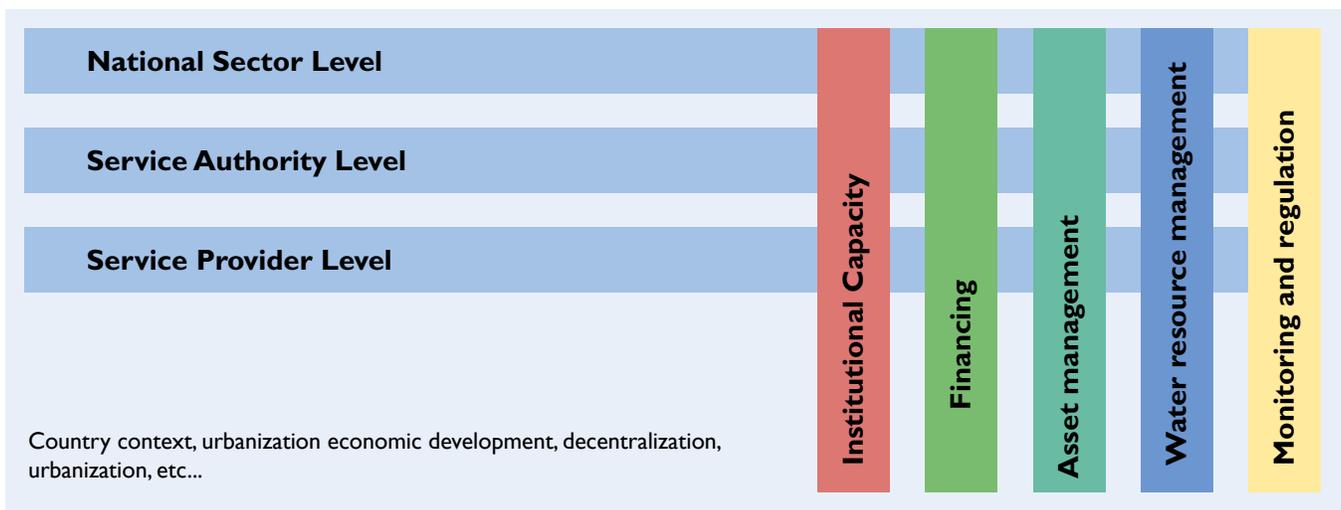
### FRAMEWORK FOR BUILDING SUSTAINABLE RURAL WATER SERVICES

The sector now recognizes the need to view water supply as an ongoing service that needs to be effectively managed over the life of the physical infrastructure. This emerging emphasis on a service delivery approach recognizes the importance of wider systems of governance and the enabling environment, political economy, life cycle costs, and the role of local institutions. The delivery of sustainable rural water services continues to be a complex challenge due to this variety of interacting factors. The World Bank's analytic framework<sup>2</sup> for examining the sustainability of rural water services provides one tool for assessing the status of services and designing interventions to address weaknesses (Figure 1). This framework recognizes that there are three key institutional levels that must be considered:

- **National Level:** legislation, policy, and the establishment of national authorities
- **Service Authority Level:** planning, contracting, monitoring, and post-construction support, often local governments
- **Service Provision Level:** day-to-day operation, administration, and maintenance

<sup>1</sup> USAID ADS Chapter 201 Program Cycle Operational Policy.

<sup>2</sup> Sustainability Assessment of Rural Water Service Delivery Models, World Bank Global Water Practice August 2017.



**FIGURE I: ANALYTIC FRAMEWORK FOR SUSTAINABILITY OF RURAL WATER**

*Adapted from Sustainability Assessment of Rural Water Service Delivery Models, World Bank Global Water Practice, August 2017*

The framework centers on five key “building blocks” that should be considered for each of the three institutional levels:

- **Institutional Capacity:** policies, strategies, and delineation of roles, functions and effective coordination, and ability of service authorities to organize effective technical, administrative, and institutional support to service providers.
- **Financing:** funding for initial capital investments, operation, and maintenance costs, as well as indirect support costs, and ensuring tariffs and fees are affordable to the most vulnerable.
- **Asset Management:**<sup>3</sup> good design, appropriate planning for expansion, and quality assurance during construction and clearly defined asset ownership –includes whether the technical know-how is in place and the extent to which systems and tools for asset management have been developed and implemented.
- **Water Resource Management:** planning and design of infrastructure that considers current and future potential water demands and resource availability, as well as institutional linkages between those entities that manage watersheds – the service authorities and service providers.
- **Monitoring and Regulation:** monitoring systems that routinely collate relevant data about the quality of services and performance of service providers – used to inform service delivery. Regulatory oversight is exercised to protect the interests of consumers, and ensure authorities have appropriate contracting power.

## SERVICE PROVIDER MANAGEMENT MODELS

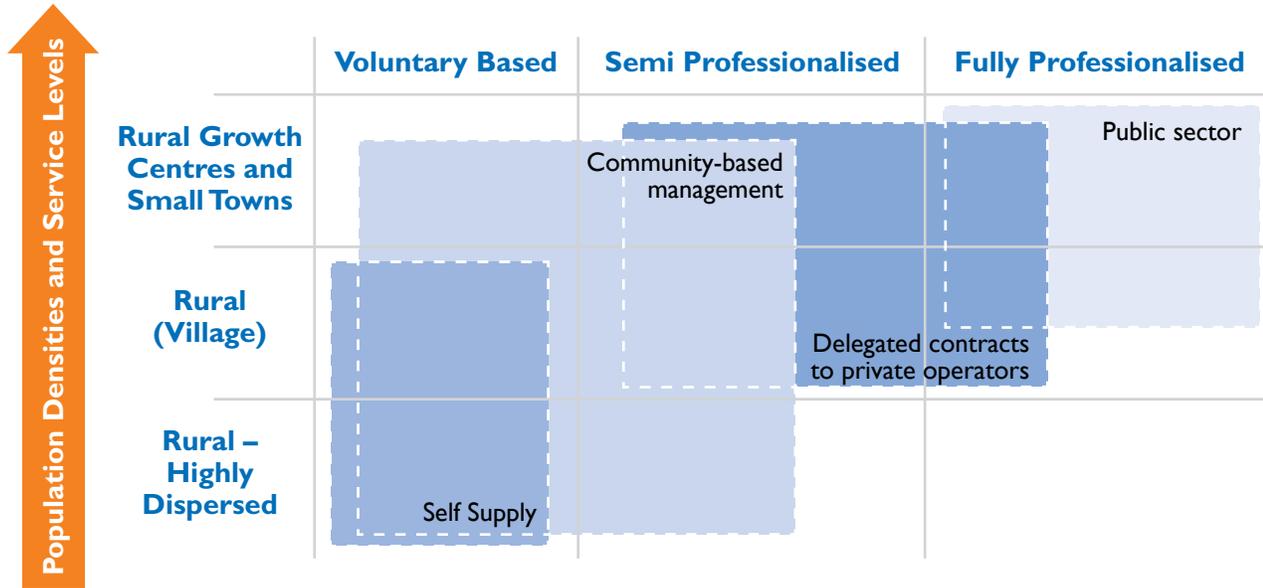
How services are delivered to end-users is highly dependent on the local context – including population density, national policies, and the capacity of service authorities and other relevant institutions. As we aim to reach more people with progressively higher quality services, self-supply and community-based management models often fail to provide reliable, sustained services,<sup>4</sup> and must be supported or professionalized.<sup>5</sup> Professionalizing may mean moving away from a reliance on volunteers by hiring professional staff or outsourcing functions to the private sector, but it can also refer to actions taken to operate with more transparency, accountability and efficiency.

<sup>3</sup> In the water sector, assets refer to the physical components of water schemes (e.g., pipes, pumps, meters, generators, storage tanks, valves), while their management refers to the processes that ensure services are maintained to ensure performance at the lowest possible cost. ([Infrastructure asset management for rural water supply Briefing Note, 2015, Boulouaour & Schweitzer](#))

<sup>4</sup> Rural Water Supply Network (RWSN) (2009). “Myths of the Rural Water Supply Sector.” St. Gallen, Switzerland: RWSN.

<sup>5</sup> Lockwood, H., and Gouais, A.L. (2015). “Professionalizing community-based management for rural water services.”

Below we discuss a few management models for service providers and the strengths and weaknesses of each. Different management models are likely to be more appropriate based on the population density of the area and the level of professionalization available (See Figure 2). The management models below and in the figure are not strict categories. In reality, there are variations on these core concepts. Ultimately improving water service provision requires addressing weaknesses of the management models in place or seeking reform toward those more responsive to the context.



**FIGURE 2: SERVICE DELIVERY MODELS AND TYPES OF SETTLEMENT**

Source: Lockwood and Smith, 2011. [Supporting Rural Water Supply](#)

### SELF-SUPPLY

Self-supply is an approach where households construct and maintain individual water systems at household level, typically wells or rainwater harvesting systems, which may supply water for both domestic and productive needs. Self-supply is a dominant approach in highly dispersed populations where water services are poor or non-existent. Under this approach, users choose the technology and service level they want and select their own provider for these services based on options available in their local market. This means that water services are not planned at central, regional, or municipal levels. Subsidies are generally not a major part of self-supply interventions, which rely on households to contribute their own funds, but may be used for activities such as promotion of products or linking private vendors to customers, known as “market facilitation.”<sup>6</sup>

- **Strengths**
  - Self-supply can help increase coverage in areas where it is not feasible or cost-effective to develop communal supplies. Few countries have reached 100% coverage of water services without it.<sup>7</sup>
  - Self supply **can help fill part of the public funding gap** for rural water supply by leveraging household investments and shrinking the number of households to be served via other approaches.
- **Weaknesses:**
  - There is a risk that the government will abdicate responsibility for providing services when they have **low institutional capacity**.
  - There is little or **no systematic monitoring of self-supply**.
  - **Asset management systems do not typically capture self-supply infrastructure**, leading to incomplete knowledge of water services by government authorities.

<sup>6</sup> Market facilitation is a type of market intervention that works to *stimulate* markets while still remaining outside of the market themselves.

<sup>7</sup> In the U.S., more than 14% of the rural population supplied its own water for domestic use in 2005. (USGS 2009)

- There is **little or no regulation** of self-supplied services, including a lack of monitoring water quality over time against standards, no monitoring of groundwater abstraction, and no accreditation systems for product suppliers.
- Self-supply may not address the needs of the very poor, since households need access to some capital to construct their own water supply.

## MOVING FORWARD: SUPPORTED SELF-SUPPLY

There is consensus that promoting self-supply without providing support to address its weaknesses is likely to fail, while allowing authorities to avoid responsibility for ensuring universal services. Many in the water, sanitation, and hygiene (WASH) sector are therefore moving towards a “supported self-supply” approach for rural, highly dispersed areas. Under this type of approach, national and local governments play a role in standardization, monitoring, regulation, and technical assistance. They may also offer targeted subsidies, market facilitation, or other support for the provision of services. However, services are still chiefly financed and managed by the users, with products delivered by the local private sector.

## SUPPORTED COMMUNITY-BASED MANAGEMENT

Historically, a common approach to the management and maintenance of rural water services is based on Community-Based Management (CBM) where communities take on the burden of maintenance themselves, with limited, if any, support from external agencies or local government. Traditionally, there is external support (either from government or donors) for initial capital expenditure, with community participation in the planning and design of infrastructure. A voluntary water committee is formed and trained, with an assumption that this committee will manage the collection of payments, system operations, and small repairs. This approach is frequently codified as the preferred approach for provision of rural water services in national policies and strategies.

Evidence has shown that the traditional, voluntary, **CBM model has struggled to ensure that rural water supply infrastructure is adequately maintained**,<sup>8</sup> with most communities waiting until infrastructure breaks before attempting any maintenance due to a lack of resources, knowledge, or expertise among volunteer committee members. This results in long periods without water services, higher costs, and ultimately a lack of reliable, sustainable services for rural populations. In response to the documented challenges with CBM, most development partners are now promoting what is termed “**supported community based management**,” which has the potential to dramatically improve functionality rates for rural water services.<sup>9</sup>

A key component of these supported CBM approaches is to professionalize the provision of both preventative and corrective maintenance services. The typical approaches for providing these types of maintenance services to community-managed systems are:

1. **Ad Hoc Reactive Approach:** Maintenance or repair services that cannot be undertaken directly by the community are provided by an external entity (such as a local government authority or private maintenance provider) upon request or identification of the problem. Communities may or may not pay for these services, depending on the service provider and specific arrangement.

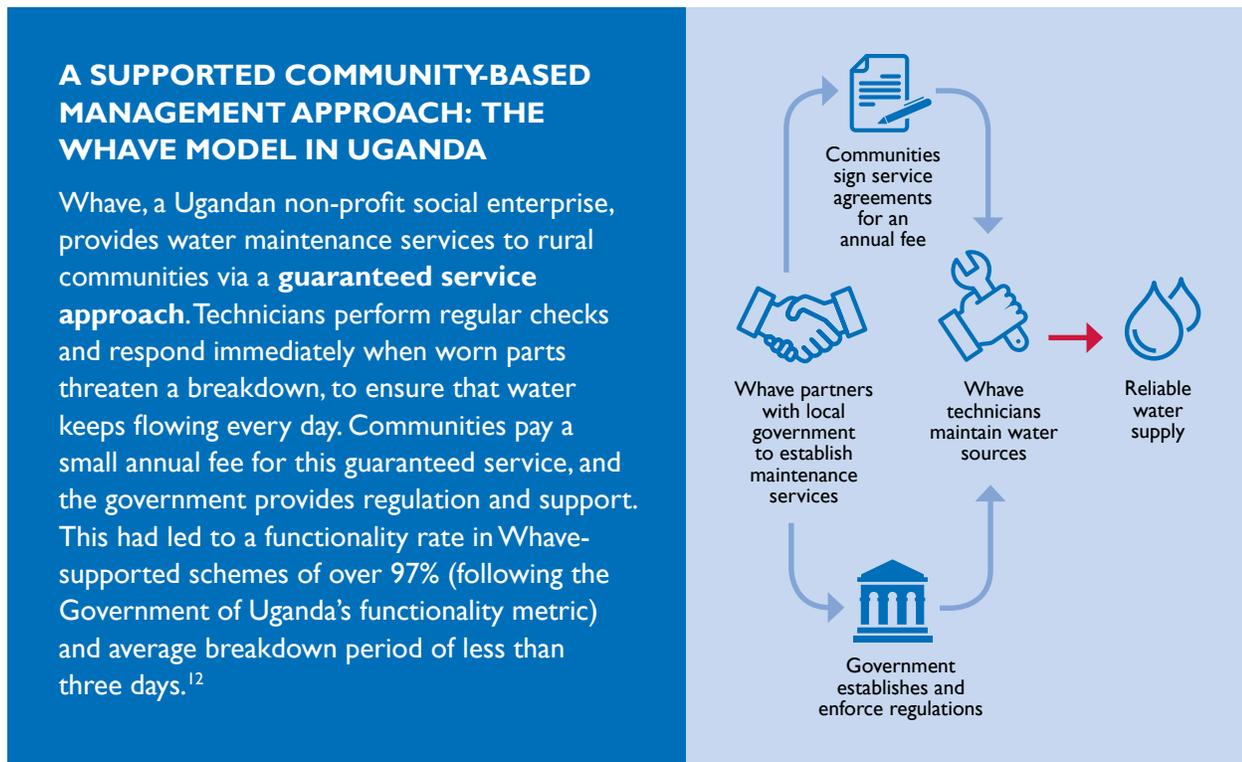
<sup>8</sup> Sustainability Assessment of Rural Water Service Delivery Models, World Bank Global Water Practice August 2017.

<sup>9</sup> McNicholl, D., et al. (2019). Performance-based funding for reliable rural water services in Africa. Uptime consortium, Working Paper 1.

2. **Structured Proactive Approach:** Maintenance services are provided on a structured basis, with an agreed frequency (i.e., quarterly visits), and including both preventive<sup>10</sup> and corrective tasks. Communities usually pay for these services, unless provided by the local government or other publicly funded organization.
3. **Guaranteed Service Approach:** Communities pay a flat fee on a monthly or annual basis, which covers all costs for any repairs and maintenance, and services are guaranteed by contract, with performance targets such as repair response time and functionality rates specified.

These community structures might be supported via:<sup>11</sup>

- **Associations:** Groupings of committees or local mechanics to pool resources and expertise. Associations can help professionalize services by ensuring members are experienced and trained, monitoring and regulating members (e.g., to avoid overpricing), and creating a clear link between members, committees, and local governments.
- **Private Sector:** Community delegates day-to-day operations or maintenance services to a private operator. Community management committees may sign a contract with a private entity (or non-governmental organization) that defines the community's role in day-to-day operations and tariff collection and sets out payments for provision of maintenance services.
- **Government Support:** Local government supplies materials or maintenance services to community committees. Committees retain the primary responsibility for day-to-day operation and minor maintenance and administration, but can call upon local government authorities for assistance with repairs.



**FIGURE 3: WHAVE'S GUARANTEED MAINTENANCE SERVICE APPROACH** Source: Whave

<sup>10</sup> World Health Organization (WHO). "Preventive Maintenance of Rural Water Supplies." 1984.

<sup>11</sup> Lockwood, H. *Sustaining Rural Water: A Comparative Study of Maintenance Models for Community-Managed Schemes*, Sustainable WASH Systems Learning Partnership, 2019.

<sup>12</sup> University of Colorado Boulder, Whave. "Emerging Lessons on Sustaining Rural Water Services in Uganda: A Case Study of Whave's Preventative Maintenance Model" Sustainable WASH Systems Learning Partnership, 2019.

- **Strengths**
  - Supported CBM has the potential to increase community ownership, participation, and control of water services by the users who rely on them.
  - Professionalized maintenance service providers can take on roles related to operations and maintenance that community volunteers are not well suited for.
  - Contractual agreements between committees and service providers can **create accountability** by specifying the services to be provided and **performance metrics for monitoring**.
  - Supported CBM allows service authorities to focus on overall planning for **asset management and regulation**, rather than directly providing ad-hoc repairs.
- **Weaknesses:**
  - Community **volunteer committees typically lack capacity** for financial management and contract management with maintenance service providers, and there is often high turnover among members.
  - Community committees **struggle to collect sufficient revenue** to fund maintenance and repairs, and even more so to cover capital costs of water schemes.
  - Informal CBM structures may not be legally recognized, limiting their ability to negotiate for or manage contracts with entities providing maintenance services.
  - Depends on service authorities to ensure effective monitoring and regulation.

## PRIVATE SERVICE PROVIDERS

In private sector approaches, private operators either own water assets and manage the services, or have been delegated responsibility for operation and management of publicly owned water systems through public-private partnership (PPP) arrangements. Increasingly, governments or service authorities manage contracts with these private operators, who then receive revenue through the sale of water.

- **Strengths**
  - Private operators are used to operating on commercial principles and generally do well at collecting revenue.
  - Delegated management contracts with private operators can create accountability for delivering high quality services by creating a financial incentive to focus on **key performance indicators**.
  - Service **authorities can focus on monitoring and regulation**, without the responsibility for delivering maintenance services directly.
- **Weaknesses:**
  - Private operators are only willing to work in areas where services are commercially viable, creating a **risk that the poorest or hard to reach communities will be neglected**.
  - Private operators require a long enough duration contract to be financially viable, and authorities must have the ability to issue contracts of appropriate duration
  - In some contexts, there are no private operators with the required capacity (such as technical skills, financial capital, or business management skills) to deliver maintenance services.
  - Private operators **require accurate and validated asset inventories** to limit financial risk, which are often not available.
  - Government authorities must have the **capacity to monitor and regulate** these private providers to ensure quality and timeliness of service.

## PUBLIC-PRIVATE PARTNERSHIPS FOR RURAL WATER SERVICES IN BENIN

In Benin, municipalities (decentralized local government authorities) are responsible for providing water services in rural areas. Since the early 2000s, they have taken the approach of setting up affermage contracts to provide these services, with support from the World Bank. In an affermage contract, the municipality retains ownership of the assets, while a private operator is responsible for operating the water service, in accordance with the contract's specifications. The operator receives revenues from the sale of water on the basis of tariffs agreed upon with the municipality and is responsible for operations and maintenance-related expenses. The operator pays fees to the municipality to cover the cost of service monitoring and invest in asset renewals and extensions. The municipalities are responsible for investing in asset renewal, regulating services, and setting tariffs.

By 2014, around 1.6 million people were served by 269 privately-operated systems supplying piped water in rural areas and small towns. To further leverage private sector resources and improve service delivery in these areas, the Government of Benin, through the World Bank Group's IFC and Global Water Security and Sanitation Partnership, developed eight-year concession agreements, thereby transferring more responsibilities to the private sector, including design, engineering, partial financing, rehabilitation of equipment, and pipe network extension.

**Source:** World Bank Water and Sanitation Program. *Benin – Innovative public private partnerships for rural water services sustainability – A Case Study.*

## PUBLIC SERVICE PROVISION

Under this approach, the government authority directly provides water services to rural areas within its geographic jurisdiction. These services are not made independent from other services and responsibilities of the local government, and water services are operated out of the general budget – not “ring-fenced” – that is, separated from other funds.

- **Strengths**
  - Local governments maintain responsibility for service provision, **potentially simplifying overall planning and asset management** and ensuring that those in areas that are not commercially viable are not neglected.
  - Local governments may have stronger technical skills than can be found at the community-level.
  - This model can be used as an interim solution towards creating a regulated rural public utility, which is more likely to show professional management of water assets, be staffed with qualified personnel, and have better financial capacity and access to funding.
- **Weaknesses:**
  - Often low levels of financing at local government levels and the lack of ring-fenced funds creates **financial constraints for repairs and maintenance.**
  - Local governments struggle to operate on commercial, cost-recovery, principles and face **political challenges to setting tariffs** at cost recovery levels.
  - Many local governments **lack institutional capacity**, especially in monitoring, regulation, and asset management.

## PUTTING IT INTO PRACTICE – CONSIDERATIONS FOR ACTIVITY DESIGN AND IMPLEMENTATION

Activity designs will be highly dependent on context, but should always consider the five building blocks and the three institutional levels involved in service delivery. Four critical steps in this process are:

1. **Understand the Rural Water Sub-Sector:** When designing the appropriate mix of interventions for a rural water activity, it is important to understand the overall context and enabling environment, including key government policies for rural water services, the roles and responsibilities of institutions, and financial flows. Sector maturity and target populations are also important considerations at this stage of activity design.

Generally, an analysis of this type should be done initially at the national scale and used to inform either project or activity design (depending on the level of detail in the project design). The results of this assessment can inform the background section of either a Project Appraisal Document (PAD), Program Description (PD), or Statement of Work (SOW). There are many options for doing this kind of assessment including political economy analysis (PEA),<sup>13</sup> systems mapping,<sup>14</sup> and participatory model building,<sup>15</sup> among other methods. The World Bank's Sustainability Assessment Framework introduced above can also be used to guide this type of analysis.

### SAMPLE QUESTIONS FOR ASSESSMENT USING WORLD BANK FRAMEWORK

#### **General Context**

- What is the population density, geography, topography, transport, and connectivity within the target area(s)?
- What are other donors primarily investing in?

#### **Institutional Capacity**

- What is the national policy on rural water services?
- What roles and responsibilities are assigned to different institutions?

#### **Financing**

- What are the main sources of financing for the rural water sub-sector?
- Are there policies related to tariffs?
- What is the willingness to pay for services?

#### **Asset Management**

- Who legally owns rural water assets?
- Are the roles and responsibilities of operators and service authorities defined?

#### **Water Resources Management**

- Is there a lead institution designated for managing water resources? Are there national, basin, and catchment level institutions for managing water resources?
- Are there policies and regulations in place for water abstraction? Are these followed?

#### **Monitoring and Regulation**

- Is there a monitoring system in place that tracks the functionality of rural water systems?
- Are there water quality regulations that are enforced?

<sup>13</sup> See [WaterAid's Political Economy Toolkit](#) for detailed guidance on how to perform a PEA.

<sup>14</sup> See [USAID Local Systems Framework](#).

<sup>15</sup> See [Sustainable WASH Systems Learning Partnership](#) on factor mapping.

- 2. Understand Locally Relevant Service Delivery Models:** After this initial national level landscaping, a deeper dive into the local conditions for service delivery is necessary. This should include further understanding of who owns assets and has responsibility for maintenance, whether responsibilities can be delegated, and what the sources of financing are. At this point, it is also important to understand what service delivery models are in use throughout the target region and how they are performing.

Once the target geographic areas and specific populations we are aiming to reach are known, apply the framework again to understand local capacity and appropriateness of the different management models for the target areas or populations. For example, in highly dispersed settings, communal water supply systems may not be feasible. In addition, the governing policies and level of local capacity will drive selection of what management model makes the most sense. In order to provide external maintenance support services to community managed systems or delegate management entirely, there must be a strong enough monitoring and regulatory system in place to ensure that quality of services are maintained. If this is not already in place, support to these systems should be considered as part of the intervention design.

It is important to always consider the strengths and weaknesses of different rural water service delivery models and work to develop and strengthen models that are responsive to the local context. This type of analysis might be done during activity design, or jointly with an implementing partner as part of activity start-up and should inform work plans.

- 3. Design Interventions to Address Gaps at All Institutional Levels:** The selected interventions should target the appropriate institutions and actors to ensure that there are capacities and authorities to provide sustained services after an activity ends.

The analysis done in Steps 1 and 2 to understand existing capacities and gaps in rural water services is critical to designing interventions. Appropriate interventions will vary based on the target population and on how well the sector is performing towards delivering sustained services (see Figure 4). Interventions targeting highly dispersed population areas might focus on developing policies for supported self-supply, allocating public funding for monitoring, or developing appropriate maintenance systems. In denser areas, activities might focus on professionalizing service providers, registering assets, or instituting tariff policies

At a basic level, activities might focus on the initial development of policies for the sector, developing an understanding of what assets are in place, ensuring that regulatory and management responsibilities are clear, and increasing finance to the sector. At a more advanced level of sector development, interventions might focus on institutionalizing monitoring systems, increasing access to commercial or blended finance, or introducing new types of service contracts. A set of illustrative interventions across the building blocks are provided in Figure 4. Note that all of these interventions may not be applicable across all populations.

Note that other development partners may also be undertaking interventions to support the rural water sector. A single activity should not need to do everything, and must coordinate with other partners, especially the local government, to ensure all gaps are addressed.

	Institutional Capacity	Financing	Asset Management	Water Resource Management	Monitoring and Regulation
National Sector	<ul style="list-style-type: none"> <li>Develop policies for rural water services management</li> <li>Define institutional arrangements and functions of service authorities &amp; providers</li> </ul>	<ul style="list-style-type: none"> <li>Increase access to public funding for rural water</li> <li>Adopt a financing policy and implement tariff guidelines</li> </ul>	<ul style="list-style-type: none"> <li>Formalize asset ownership through legal frameworks</li> </ul>	<ul style="list-style-type: none"> <li>Develop policies for water resource allocation that consider the needs of multiple users</li> </ul>	<ul style="list-style-type: none"> <li>Establish regulatory oversight and tariff policies</li> <li>Develop and fund a comprehensive monitoring system</li> </ul>
Service Authority	<ul style="list-style-type: none"> <li>Develop local Systems for back-up support to operators</li> <li>Provide support in project preparation, tendering, and contract management</li> </ul>	<ul style="list-style-type: none"> <li>Allocate public funding for maintenance support</li> </ul>	<ul style="list-style-type: none"> <li>Conduct asset inventories</li> <li>Register and legally recognize service providers, with clear asset ownership</li> </ul>	<ul style="list-style-type: none"> <li>Strengthen representation of rural drinking water users' interests in local water management platforms</li> </ul>	<ul style="list-style-type: none"> <li>Develop monitoring system for functionality and gradually expand to cover all providers</li> </ul>
Service Provider	<ul style="list-style-type: none"> <li>Improve customer orientation</li> <li>Implement business and performance improvement plans</li> </ul>	<ul style="list-style-type: none"> <li>Understand full life cycle costs of providing services</li> <li>Increase access to commercial financing (where feasible)</li> </ul>	<ul style="list-style-type: none"> <li>Support providers to feed updated information into asset management systems</li> </ul>	<ul style="list-style-type: none"> <li>Support service provider to engage in catchment Protection and water safety planning</li> </ul>	<ul style="list-style-type: none"> <li>Initiate service provider performance benchmarking</li> </ul>

**FIGURE 4: ILLUSTRATIVE INTERVENTIONS FOR RURAL WATER ACTIVITIES.**  
Based on [Sustainability Assessment of Rural Water Service Delivery Models](#).

- 4. Define Metrics of Success:** Finally, it is important to select standard and custom indicators that measure how the activity is working. These should go beyond tracking the number of people reached to capture both near-term and long-term impacts that will ensure sustainability. While there is no single indicator that can predict long-term sustainability, a mix of custom indicators that measure aspects of the five building blocks is often most appropriate for ensuring that an activity is not only providing services, but also putting into place the right institutions, processes, and capacities to continue delivering services in the long run.

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## MEASURING SUCCESS FOR RURAL WATER ACTIVITIES

USAID has standard indicators for WASH, which focus on first-time access and service quality improvements, as well as tracking improvements in institutional capacity:

- HL.8.1-1: Number of people gaining access to a basic drinking water source
- HL.8.1-2: Number of people gaining access to a safely managed drinking water source
- HL.8.1-3: Number of people receiving improved service quality from an existing basic or safely

USAID has standard indicators for WASH, which focus on first-time access and service quality improvements, as well as tracking improvements in institutional capacity:

### ***Institutional Capacity***

- National policy, standards, and guidelines for sustainable rural water services in place
- Roles and responsibilities of sector institutions are clearly defined

### ***Financing***

- Percent improvement in operating ratio (revenue divided by operational costs) of water service providers
- Percent of national or sub-national budget dedicated to rural water services

### ***Asset Management***

- Asset management system is in place
- Percent of assets registered and accounted for in service authority monitoring systems

### ***Monitoring and Regulation***

- National monitoring system in place with sub-national data feeding in
- Number of districts with monitoring information systems in place and used
- Regulation of rural water service quality and reliability in place and enforced

### ***Water Resources Management***

- Percent of target service providers with representation in water resource management planning bodies

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## SELECTED RESOURCES

1. IRC (2017). *Agenda for Change: A District Level Roadmap for Universal Access to Sustainable WASH Services*.
2. Lockwood, H., and Smits, S. (2011). "Supporting Rural Water Supply: Moving Towards a Service Delivery Approach." Rugby: Practical Action Publishing.
3. Lockwood, H. (2019) *Sustaining Rural Water: A Comparative Study of Maintenance Models for Community-Managed Schemes*, Sustainable WASH Systems Learning Partnership.
4. Olschewski and Sutton (2016). *Supported Self-Supply – Learning from 15 years of Experiences*. 7th RWSN Forum "Water for Everyone"
5. World Bank Global Water Practice, August 2017. *Sustainability Assessment of Rural Water Service Delivery Models*.