Research Report

Sustainable WASH Systems Learning Partnership

A LOCAL SYSTEMS ANALYSIS FOR RURAL WATER SERVICES DELIVERY IN SOUTH ARI AND MILE, ETHIOPIA

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SUSTAINABLE WASH SYSTEMS
A LEARNING PARTNERSHIP

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About the Sustainable WASH Systems Learning Partnership: The Sustainable WASH Systems Learning Partnership is a global United States Agency for International Development (USAID) cooperative agreement to identify locally-driven solutions to the challenge of developing robust local systems capable of sustaining water, sanitation, and hygiene (WASH) service delivery. This report is made possible by the generous support of the American people through USAID under the terms of the Cooperative Agreement AID-OAA-A-16-00075. The contents are the responsibility of the Sustainable WASH Systems Learning Partnership and do not necessarily reflect the views of USAID or the United States Government. For more information, visit www.globalwaters.org/SWS, or contact Elizabeth Jordan (EJordan@usaid.gov) or IRC Ethiopia (ethiopia@ircwash.org).

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Acronyms

AfDB	African Development Bank
CapEx	Capital expenditure
CapManEx	Capital maintenance expenditure
EFY	Ethiopian fiscal year
ETB	Ethiopian Birr
GTP	Growth and Transformation Plan (Ethiopia)
JMP	Joint Monitoring Programme (WHO/UNICEF)
LCCA	Life-cycle cost analysis
lpcd	Liters per capita per day
MoWIE	Ministry of Water, Irrigation, and Energy
O&M	Operations and maintenance
ONA	Organizational network analysis
SDG	Sustainable Development Goal
SNNPR	Southern Nations, Nationalities and Peoples Region (Ethiopia)
SWS	Sustainable WASH Systems Learning Partnership
UCB	University of Colorado at Boulder
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WASH	Water, sanitation, and hygiene
WASHCo	Water supply and hygiene committee
WUA	Water users' association

Executive Summary

Understanding local systems to find solutions to poor sustainability

The United States Agency for International Development (USAID)-funded Sustainable WASH Systems Learning Partnership (SWS) seeks new ways to improve the sustainability of water, sanitation, and hygiene (WASH) services by drawing upon a systems approach and promoting innovation to strengthen service delivery systems through improved local partnerships. In Ethiopia and Uganda, SWS is focusing on rural water services and urban sanitation services. This baseline assessment report considers rural water services in Ethiopia.

The report provides a synthesis of various studies and systems analyses undertaken in two rural *woredas* (districts) in Ethiopia: South Ari, in the Southern Nations, Nationalities, and Peoples Region (SNNPR), and Mile, in the Afar Region. All rural water assessments were undertaken with the involvement of representatives from local government, and most were done with the USAID Lowland WASH Activity, which is implementing a broad WASH intervention in both woredas. The baseline studies undertaken include an asset inventory, service delivery assessment, life-cycle cost analysis (LCCA), sustainability check, organizational network analysis (ONA), and factor mapping.

Following a structure based on nine building blocks for the delivery of WASH services (institutions, legislation, finance, planning, infrastructure management and development, monitoring, regulation, learning and adaptation, and water resources management) (See Figure 1), this report summarizes the strengths of the decentralized local systems that deliver services in these locations, describing key actors, factors, and interactions. It then identifies recommendations for systems-strengthening activities to improve service delivery. Related reports provide full details of the results from each of the baseline assessments.

Different local contexts to test systems approaches

South Ari and Mile have very different contexts. The hills of South Ari receive substantial year-round rainfall (around 1,300 millimeters [mm] per year) with peaks in April and October. The average temperature is 21°C. Shallow groundwater can be tapped across much of the district. Domestic water supplies come from hand-dug wells and shallow-drilled boreholes or springs that emerge along the hillsides. A total of 245 schemes serve a population of almost 280,000, but actual access to these improved sources is low.

Mile is a flat and arid landscape in the lower Awash River basin, with very low average annual rainfall (about 200 mm) and high temperatures that average 28°C. Although the river passes through Mile on its way from the highlands around Addis Ababa before drying out in the salt flats toward Djibouti, most of the woreda has high water scarcity, even with the Mile dam. Many members of the population (106,000) are pastoralists, moving with their livestock in search of pasture and water. There are only 29 water supply schemes: shallow boreholes with hand pumps, shallow and deep wells with motorized pumps and typically small distribution systems, and a few stand posts for people and livestock.

Poor services and high risks to sustainability

Despite the different contexts, in both districts, rural and small town water services are provided through a mix of community- and utility-management models. In both districts, access to services, and the quality of service provided, is low.

In South Ari, official estimates and analysis based on asset inventory data show that coverage (i.e., access to improved water schemes) is 26 percent. However, less than half (48 percent) of the users of public water services spend 30 minutes or less round-trip to fetch water, and only 13 percent have access to basic water services, according to WHO/UNICEF Joint Monitoring Programme (JMP) definitions of basic water services. This includes the 0.6 percent of the population with piped water supply on premises. The proportion of the population with access to water services that meet national norms, as set out in the country's first and second Growth and Transformation Plans (GTP-1 and GTP-2), is also very low when key parameters are measured. Functionality and reliability of community-managed schemes are far from optimal, with scheme functionality rates of 69 percent and reliability rates (providing non-seasonal water services at least 85 percent of the time during the last month) of only 56 percent. Functionality and reliability rates of public taps connected to springs and deep wells are even lower, 41 percent and 23 percent, respectively. Water quality is also an issue: only 40 percent of community-managed schemes provide water of adequate quality (E. coli < 10 mpn/100ml) (Adank et al., 2018). The level of water services provided by the utility-managed scheme in Gazer is also very low.

In Mile, official water supply coverage was 35 percent in 2017. However, based on updated asset inventory data and allowing for different calculation assumptions, IRC estimates coverage to be somewhere between 15 and 21 percent. More than half (55 percent) of users of public water points reported spending 30 minutes or less round-trip to fetch water, and 13 percent had access to basic services, according to JMP definitions. This includes the estimated 6 percent of the population with access to piped water supply on premises. However, such supplies are not always available when needed, and the proportion of people with access to safely-managed water is effectively 0 percent. The proportion of the population with access to water services that meet GTP-1 and GTP-2 national norms is also very low. The functionality and reliability of community-managed schemes are considerably higher in Mile than in South Ari, although there are fewer schemes. Nevertheless, 23 percent of schemes were non-functional at the time of the asset inventory survey.

Weak systems for WASH service delivery

IRC and partners have identified nine building blocks as critical components of a strong system for delivering WASH services. In South Ari and Mile, the analyses revealed gaps and weaknesses in all the building blocks but particularly financing, infrastructure development and management, monitoring, regulation, learning and adaptation, and water resources management. In each woreda, official structures and capacities for institutions, legislation, and planning are in place to some degree—providing a basis for systems strengthening—but capacities are low.

Finance is a major constraint in both woredas, with huge financing gaps for investment in new services to reach the unserved, as well as for maintenance, rehabilitation, and direct and indirect support to service providers.

A critical problem that affects sustainability is that local and national priorities are largely geared toward extending services to the remaining unserved, rather than raising or even maintaining service levels. Investments in infrastructure are not well managed. In both South Ari and Mile, attention to rehabilitation has recently increased, but the baseline assessment found almost no preventive or minor maintenance—an important cause of high failure rates for both simple hand pumps and more complex schemes involving generators, motors, and submersible pumps.

Recommendations for interventions to strengthen systems

Innovations to address gaps in the system and find ways to improve sustainability are being sought through a stakeholder-driven approach. Learning alliances—a facilitated network of local actors interested in WASH and sustainability—are undertaking experiments and pilot programs.

The overall objective identified by SWS and learning alliance partners, including representatives from local government and the USAID Lowland WASH Activity, is to shift the focus toward operations and Maintenance (O&M). This is expected to lead to higher functionality and service levels while helping the woredas use strong asset performance to justify increased financial investments (e.g., from the woreda cabinet) in new and extended water supplies.

Opportunities to develop capacities in both South Ari and Mile and pilots to improve mechanisms for O&M were identified through the baseline assessments and follow-up meetings with representatives from local government and other learning alliance partners. In each woreda, an integrated pilot is proposed, with a focus on asset management, including aspects related to institutional arrangements for maintenance (e.g., strengthening federations that connect WASHCos or strengthening micro and small enterprises that perform O&M), financing for maintenance, and the use of monitoring data to guide asset management.

Coordination is another critical weakness. SWS has already supported local stakeholders in establishing learning alliance platforms that seek to improve coordination, collaboration, and learning. This was an integral component of the project's theory of change and design. SWS also conducted an ONA to map and track changes in the network over the life of the project.

Other recommendations for systems-strengthening activities include capacity building, advocacy, and sector influencing activities. Stakeholders identified training in WASHCo management and basic maintenance as a necessary activity. At the same time, financing constraints emerged as a critical issue that cannot easily be solved at woreda or higher levels, but advocacy was identified as an entry point. Various changes will require policy and related actions at regional and national levels, with stakeholder engagement at these levels, to support innovations and progress at local levels.

Introduction

This analysis summarizes assessments of two local systems for rural and small town sanitation service delivery in Ethiopia. It was prepared for the Sustainable WASH Systems Learning Partnership (SWS), which is testing systems-based approaches to strengthen water, sanitation, and hygiene (WASH) service sustainability. Here, "systems" refer not to physical water supply facilities—such as wells, pumps, and pipes—but to the wider set of people, organizations, and capacities that underpin service delivery. Systems are made up of actors (stakeholders), factors (components in the system, such as infrastructure or financing), and the complex interactions and interdependencies between them.

Background: Sustainable WASH Systems Learning Partnership

SWS is a global United States Agency for International Development (USAID)-funded cooperative agreement to identify locally-driven solutions to the challenge of developing robust local systems capable of sustaining WASH service delivery. Led by the University of Colorado at Boulder (UCB), it emphasizes partnership and learning for catalytic change in the WASH sector. Coordinating and facilitating interactions among partners in four priority countries (Ethiopia, Kenya, Uganda, and Cambodia), the project works to meet the rapidly increasing needs of USAID's partner countries for sustainable WASH service delivery.

The partnership has four implementation teams. In Ethiopia, SWS is led by IRC, working with Tetra Tech and LINC to develop and test a structured approach to understanding, engaging with, and strengthening decentralized *woreda* (district) and small town systems for WASH service delivery. SWS is facilitating learning alliances that gather local stakeholders and seek to provide a safe space for innovation. Comprehensive systems analyses are expected to provide a basis for action research experiments (i.e., joint testing of potential improvements involving implementers and researchers) to find new solutions to service delivery and sustainability challenges. Emphasis is placed on strengthening the WASH service delivery system by finding a balance between competing priorities to extend, improve, and sustain services, and delivering the capacity development and communications activities that are needed at local, regional, and national levels to scale up successful innovations and outcomes.

The expected outcome is stronger service delivery systems in targeted woredas and small towns. At the regional and national level, SWS seeks to influence Ethiopia's wider WASH sector agenda with tools and approaches applied beyond the focus woredas and small towns. SWS is addressing both rural and small town water supply and urban sanitation in different parts of the country. This baseline report is limited to the rural and small town water activities, with a separate report by Tetra Tech focused on sanitation.

During Year 1, with in-country activities starting in January 2017, SWS developed a strategic partnership with the USAID Lowland WASH Activity led by AECOM and involving the International Rescue Committee and CARE as implementing partners.

The USAID Lowland WASH Activity is working in challenging lowland environments in Afar, Somali, and the Southern Nations, Nationalities, and Peoples Region (SNNPR) to develop, rehabilitate, and sustain water supplies and improve sanitation. The partnership provides an opportunity for synergies between

the implementation of a package of construction, rehabilitation, and improved maintenance for rural water supply schemes and activities focused on systems strengthening and learning under SWS.

SWS selected two rural woredas where the USAID Lowland WASH Activity operates for its rural water supply activities: South Ari, part of South Omo Zone in SNNPR in south-western Ethiopia, which relies heavily on hand pumps and springs, and Mile, in the Afar Region in north-eastern Ethiopia, where water schemes include motorized boreholes pumping deep groundwater. Community management is the primary service delivery model for both the simple and the more complex rural water supply schemes, with utility management present in some small towns.

Theory of Change

SWS has three objectives: to improve actors' understanding of local systems, to strengthen local systems, and to increase the sustainability of WASH services. These are the foundations for SWS's approach, theory of change, and main learning questions (see Methodology section).

The SWS theory of change reflects how the partnership expects to accomplish its goals, through a series of intermediate results and associated activities. The theory of change is:

Box 1: Definitions

Actor: a stakeholder with direct or indirect influence on the WASH system. An actor may be an individual (e.g., health extension worker) or an organization (e.g., water operator, water committee, NGO, government agency).

Building block: a major component of the WASH system. IRC has identified nine building blocks that support WASH service delivery: institutions, legislation, finance, planning, infrastructure management and development, monitoring, regulation, learning and adaptation, and water resources management.

Facility: the physical infrastructure that collects, treats, or distributes water or collects, transports, treats, or disposes of waste (e.g., pumps, pipes, wells, tanks).

Factor: any element, aspect, or component of the WASH system with direct or indirect influence on the system (e.g., willingness to pay, maintenance capacity).

Scheme: the combination of water supply facilities and their management. This may involve a formal structure, such as a WASHCo or town water utility.

System: the social, technical, institutional, environmental, and financial factors, actors, and interactions that influence WASH service delivery in a given context.

If actors better understand the local systems for delivering sustained WASH services and are supported to undertake interventions that aim to improve the way in which actors coordinate or address WASH factors that influence service sustainability, then these systems will be strengthened. This in turn will lead to increases in the sustainability of WASH services at the national and sub-national level.

In Ethiopia, SWS emphasizes the application of innovation to improve local systems, and works with local actors through multi-stakeholder partnerships, or learning alliances. In the learning alliances, local stakeholders develop an understanding of their WASH service delivery system and execute a shared

action and learning agenda. It is expected that locally-driven innovation will result in better solutions to challenges and changes that increase the sustainability of WASH services.

Report Objectives and Organization

This report summarizes the 2017 status of local water service systems in South Ari and Mile. It has three objectives:

- To establish a baseline for monitoring changes in systems strength and service levels;
- To synthesize information on local WASH systems to provide a basis for discussion and improving understanding; and
- To identify key weaknesses in WASH systems and possible systems-strengthening activities that SWS could support to improve services and their sustainability.

The report focuses on systems at the woreda level, which is the critical level for WASH service delivery under decentralized governance in Ethiopia. A related SWS report considered the national context for these services.

This section has described the background for the project. The Methodology section explains how the assessments were conducted. It briefly describes the nine building blocks used as the framework for analysis, plus two additional approaches, factor mapping and sustainability checks. The following two sections present findings for South Ari and Mile. The final section, Recommendations and Conclusions, suggests ways forward for strengthening the local systems.

Methodology

Learning Questions

SWS activities in Ethiopia are guided by four main learning questions:[1]

1. How can local stakeholders improve their understanding of complex WASH systems and find ways to drive changes aimed at improving the sustainability of WASH services?
2. How do selected interventions influence, improve, and/or strengthen the system?
3. How does implementation of a multi-level learning alliance approach affect proxy indicators for WASH system sustainability?

In addition, IRC seeks to ask and answer the question:

4. What are the links between strengthened WASH systems and service level outcomes?

Systems Approach

SWS looks at the WASH sector from a systems perspective. In Ethiopia, the implementation team's understanding of what constitutes the WASH system is summarized in Figure 1.

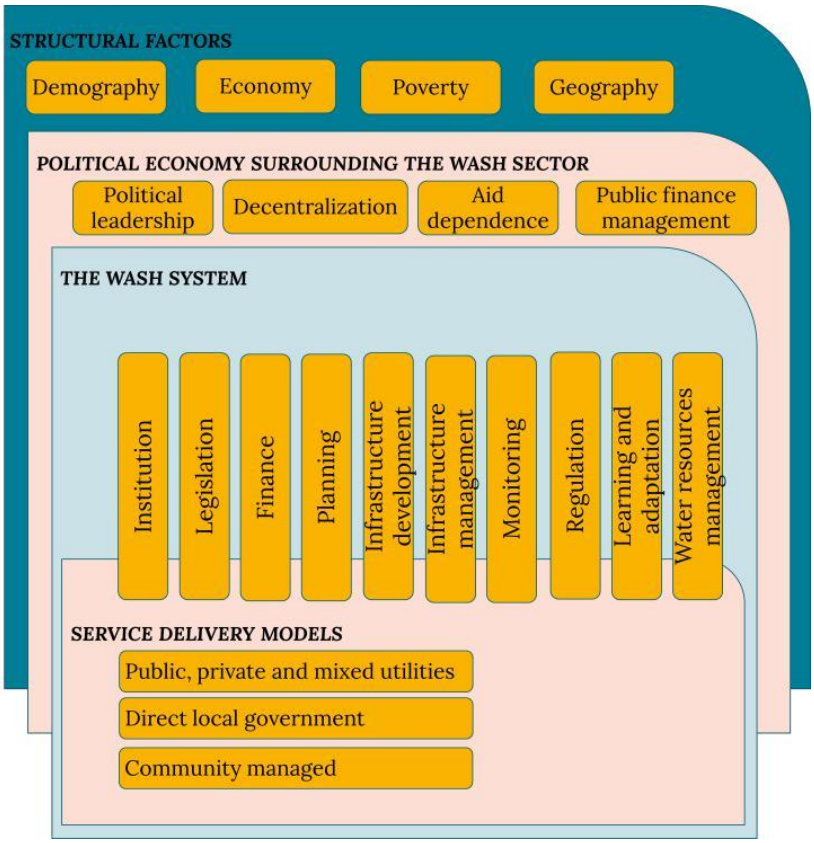

Figure 1 Generalized WASH System and Its Context

[1] These are contextualized learning questions for Ethiopia and differ slightly from the overall SWS learning questions.

WASH services can be delivered through different service delivery models, such as community or utility management. Service delivery performance depends on internal factors (i.e., the operations of each service provider itself) and the behavior of external actors, including the service authority and users of the service. Service delivery models are part of a WASH system in which other actors can be categorized according to their functions and activities. The nine building blocks are the focus of efforts to strengthen WASH services. Often, however, efforts target only one or two building blocks, ignoring or neglecting their complex interactions and interdependencies with the other building blocks. Addressing these interactions and interdependencies is a key focus of a systems approach. The WASH system is further embedded in a wider system, with the political economy determined by factors largely outside of the WASH sector and its influence. These factors include demographics, the economy, poverty, and geography.

IRC and its partners have identified nine building blocks in WASH systems:

- Institutions
- Legislation
- Finance
- Planning
- Infrastructure development and management
- Monitoring
- Regulation
- Leaning and adaptation
- Water resources management

Different agencies and authors may identify a slightly different set of building blocks for the WASH system, but ultimately the functions are the same.

To better understand the strengths and weaknesses of the WASH systems and their building blocks in the focus woredas, SWS undertook baseline assessments in 2017 (see Table 1). The methodology for these assessments and the detailed results appear in the focus area reports. The assessments served multiple purposes. First, they provided actors with insights into the current status of the water supply system. Second, they provided actors with the data and information they need to inform decisions related to water service provision—thus directly contributing to strengthening the system. Third, they provided a baseline against which SWS's progress and achievements in the woreda can be monitored.

Table 1 Baseline Assessments

Assessment	Aspects of Focus	Results	Basis for Monitoring
Asset inventory: mapping of water supply infrastructure and assigning service levels, in collaboration with service authorities (woreda water offices) (Pearce and Abera, 2018)	Monitoring and infrastructure development building blocks	Strengthening of monitoring; data used in planning for infrastructure development; potential changes in infrastructure management	Baseline data on service level parameters, such as functionality and water quality
Service delivery assessment: analysis of asset inventory data with other data sets (population, national standards for water service provision, etc.) (Adank and Hailegiorgis, 2018)	Outcomes (access to services and service levels)	Possible strengthening of planning and monitoring building blocks	Baseline data on service levels (coverage, reliability, quality, accessibility)
Life-cycle cost analysis: costs of service delivery, expenditures, sources of funding (Veenkant et al., 2018)	Financing and regulation building blocks	Possible strengthening of the financing, planning, and infrastructure management building blocks; some budgets quickly influenced by baseline results	Baseline data on financing
Sustainability checks: status of service levels, service provider, and service authority capacity and performance (Adank et al., 2018)	All building blocks; capacity of actors and interactions among building blocks	Possible strengthening of the monitoring and regulation building block	Baseline data on "likely sustainability" of WASH services
Organizational network analysis: position of actors in local systems, interactions among actors (Guttentag, 2018)	Learning and adaptation building block; interactions among actors	Possible strengthening of the learning and adaptation building block	Baseline data on strength of WASH sector actor network
Factor analysis: workshops and models on factors for WASH sustainability (Valcourt, 2018)	Stakeholders' perception of factors that influence WASH service sustainability and their interactions	Potential for new understanding by stakeholders	Baseline data on local stakeholders' level of understanding of system

The results of these assessments were used to derive a baseline of the current WASH systems in South Ari and Mile woredas. The nine building blocks constituted the framework for the analysis.

Building Block Framework

The building block assessment provides a qualitative description of a WASH system with a "traffic light" score (red, yellow, or green) for each of the nine building blocks to reflect their current status (low-, medium-, or high-functioning, respectively).

The **institutions building block** reflects the institutional set-up of the WASH system. This includes capacity and resources, staffing levels, coordination among organizations, and support to service

providers and service authorities. It also includes the existence of data on service providers' performance.

The **legislation building block** comprises the mechanisms by which a government sets out its vision for the sector and determines the legal framework for achieving it. Legislation must link to and support policy and provide a clear framework for the interaction of actors in WASH institutions. Legislation is particularly important where non-state actors (e.g., communities, the private sector) are service providers. Typically, legislation is national and regional. The assessment considers how sector policy works at the local level and how norms and by-laws for local application and enforcement are developed.

The **finance building block** deals with identifying the costs of service delivery, sources of funding, roles of different actors in providing finance, effective mechanisms for long-term financial procurement, and channels for getting the money where it is needed.

The **planning building block** is the foundation for implementation of policies to achieve universal access to sustainable services. Plans must include expected costs and sources of financing and may involve multiple phases. The strength of this building block is assessed based on the existence of a jointly developed, multi-year plan. It should be based on national targets; include costs and sources of funding for capital expenditure (CapEx), capital maintenance expenditure (CapManEx), and direct support elements; and consider equity.

The **infrastructure building block** is the essential physical component that delivers the services. It comprises not only hardware but also the mechanisms and processes for developing new infrastructure and maintaining existing facilities. Infrastructure has two components: development and management. Infrastructure development refers to capital investment for new infrastructure, with coordination of international donors, private operators, and other actors, plus support for the efficient procurement, construction, and management of assets. All infrastructure requires both ongoing routine maintenance (operation and maintenance expenditure, or OpEx) and occasional major replacement or rehabilitation (CapManEx). Infrastructure development is assessed by looking at the mechanisms that ensure due diligence and control procurement, construction quality, and adherence to construction standards. Infrastructure management assigns responsibility for these different tasks. It is assessed in terms of clarity of asset ownership, the existence of an asset inventory, and fulfilment of roles and responsibilities for asset management by service providers and authorities.

The **monitoring building block** covers the capture, management, and dissemination of the information required to effectively manage WASH services at all levels. Monitoring is the basis for information feedback loops that ensure effectiveness and allow adaptive change. Monitoring also supports both regulation and planning. The strength of the monitoring system is assessed in terms of the existence of a national system that operates at the district level, with district-wide, up-to-date data that are analyzed and used by service providers and authorities.

The **regulation building block** assesses the accountability mechanisms, regulatory framework, and capacity of the regulator. The existence of a regulatory body and the degree to which it uses monitoring data to guide regulation, enforcement, and accountability mechanisms available to citizens determine the strength of this building block.

The **learning and adaptation building block** presumes inclusive platforms for the regular sharing of information and use of data for critical analysis with participation from multiple stakeholders, including civil society. The stakeholders then respond to learning through adaptation: they alter their policies and practices and they are willing to address failure and work with others to do things differently. The learning and adaptation building block is assessed in terms of the existence of district-level institutionalized learning platforms, linked to national-level platforms, with sufficient representation by different stakeholders. The platforms' findings and reflections should be systematically taken up in local policies and strategies.

The **water resources management building block** refers to the coordination and control of water allocations to different sectors. A strong system includes methods or protocols for addressing conflicts and encouraging cooperation. Both the abstraction of fresh water and the disposal of used water should be controlled, managed, monitored, and enforced. This building block is assessed based on the existence of plans and practices related to source protection and preservation, the involvement of service providers and authorities in decision-making bodies, the degree to which infrastructure development takes into account water resources, and mechanisms for managing conflicts and synergies between water users.

Full definitions of the building blocks and guidelines on scoring them can be found in IRC's working paper (Huston and Moriarty, 2018). Briefly, to assess the strength of a system, each building block is scored using 3 to 5 key statements (see Annex I). These statements represent core elements of what may be expected in an ideal scenario for the delivery of sustainable services.

The scores for each building block are the average of the scores of the statements, which are scored 1 to 5, where 1 denotes non-existent or very weak and 5 denotes fully compliant or very strong (see Figure 2). A sixth score, "not applicable" (N/A), is possible but is not calculated as part of the average score of the building block. No individual scoring statement is defined as a minimum benchmark statement for a functional building block, and thus the building block score indicates only the relative strength and not the functionality of the building block. The scores are most meaningful when accompanied with a narrative that explains the score (see IRC, 2018).

	Score	Interpretation
	1.0–1.75	Very weak
	1.76–2.5	Weak
	2.6–3.4	Moderate
	3.5–4.25	Strong
	4.26–5.0	Very strong

Figure 2 Scoring System for Assessment of Building Blocks

SWS partners completed the scoring based on the baseline assessments and with the input of zonal and woreda experts having knowledge of the local system. The draft building block scores were discussed with stakeholders at a learning alliance meeting and revised based on feedback received.

In some cases, the assessments themselves helped strengthen elements of the building blocks. For example, undertaking an asset inventory changed the monitoring systems, and in these cases, both baseline and "post assessment" scores are estimated.

Additional Approaches

The building block analysis is based on a standard set of questions that make the tool simple to use and easy to replicate but might preclude other insights or give less weight to certain issues. The analysis lacks the scope to explicitly examine interactions among building blocks. UCB developed and undertook an additional analysis, factor mapping, as part of the baseline assessment to identify the most important factors in sustainable water service delivery from the perspective of local stakeholders (Valcourt et al., 2018). Factor mapping explicitly focuses on identifying interactions.

Sustainability checks are a mechanism to estimate the likely future sustainability of water service delivery based on service-level indicators and proxies, with a focus on capacities. Separate indicators were applied to assess whether these conditions are in place for the two service delivery models: community-managed and utility-managed water services. Community-managed schemes (i.e., WASHCos or water users' associations [WUAs]) were assessed against 10 service provider indicators, and utility-managed schemes were assessed against 12 service provider indicators covering institutional, financial, infrastructural, and water resources issues. The woreda as a whole was assessed against 12 service authority indicators related to community management (including institutional set-up and performance, finance, planning, infrastructural management, monitoring, regulation, and learning and adaptation) and six indicators related to utility management (including institutions, finance, planning, learning, and water resources).

Each indicator has a scoring table, assigning a score ranging from 0 to 100 to a certain scenario related to the indicator. The zero (0) score is assigned to a scenario in which a specific condition for sustainable service provision is not in place. The 50 score sets the benchmark and is assigned to a scenario with acceptable levels of the specific conditions for sustainable service provision. The 100 score is assigned to a scenario in which a specific condition for sustainable water provision related to the indicator is fully in place (see Annex II for the indicator list). The average scores and the proportion of benchmarks met indicate the degree to which

conditions for sustainable service provision are in place (see Adank and Hailegiorgis, 2018, for more details). All these analyses provide complementary information, as presented in this report.

Water Service System in South Ari, SNNPR

South Ari is a large woreda, covering an estimated 4,350 square kilometers (km^2) in South Omo Zone in SNNPR. It surrounds, but does not include, the zonal capital, Jinka. It includes a mix of highland, midland, and lowland terrain, but pastoralism is no longer practiced in the woreda. Its population is 279,574 (based on 2017 projections by the Central Statistical Agency), or about 64 people per km^2. There are 50 *kebeles (*a sub-woreda administrative unit*)*, of which 46 are rural and four are urban, including the woreda's capital Gazer, approximately 17 km from Jinka town.

Water Schemes and Service Delivery Models

Overall, the woreda is served by 245 schemes with (at least) 334 communal point sources (hand pumps, protected-on-spot springs, and public standpipes connected to springs or deep well–based schemes) and 334 household connections (Adank et al., 2018). The service delivery models in South Ari are community-managed schemes and, in Gazer town, a utility-managed piped scheme. Community-managed schemes are estimated to serve about 35 percent of the population (24 percent when functionality is considered). Only about 2 percent of the population is estimated to be served under the utility-managed model.

The asset inventory mapped 244 community-managed schemes, including 120 dug and shallow wells with hand pumps, 103 on-spot springs, 16 protected springs with distribution systems, and 5 deep wells with distribution systems. The springs and deep wells with distribution systems provide water to 96 public standpipes and nine household connections. WUAs consisting of members elected by and from the local community are responsible for the operation, maintenance, and day-to-day management of these schemes.[2]

Gazer is served by the woreda's only utility-managed system. The scheme is supplied by springs and has a distribution system with 23 public standpipes (seven of which were not functioning at the time of the asset inventory) and 314 household connections (Pearce and Abera, 2018). The Gazer town water utility only has six staff members: a manager, three mechanics, and two bill collectors.[3] The utility is supervised and supported by the South Ari Woreda Water Office. The Gazer utility also receives some advice and support from the nearby (grade 3) Jinka town utility (Adank and Hailegiorgis, 2018).

System Outcomes: Current Water Services

In South Ari, water service levels are very low. Official water supply coverage amounted to only 26 percent in 2017 (personal communication with South Ari Woreda Water, Mines, and Energy Office). Based on the estimated number of people served by the functional water facilities (Pearce et al., 2018), coverage is also about 26 percent.[4]

[2] SNNPR has advanced further compared to other regions in legalization of voluntary WASHCos, which are known as Water User Associations in the region.
[3] For more on the challenges that Gazer utility faces, see https://www.ircwash.org/blog/shouted-water-users-and-shouting-support.
[4] Based on the number of schemes and the maximum number of people covered by each scheme as per GTP-2 (regardless of their functionality), coverage would amount to 38 percent.

Less than half (48 percent) of users of public water points reported spending 30 minutes or less round-trip fetching water, making the total population with access to basic services (as defined by JMP; see WHO/UNICEF, 2017) only 13 percent. This includes the 0.6 percent of the population with access to piped water supply on premises.

The proportion of the population with access to water services in line with national norms (as set out in the country's first and second Growth and Transformation Plans, GTP-1 and GTP-2) is also very low. Only 4 percent of people have access to water services in line with the GTP-1 norm of at least 15 liters per capita per day (lpcd) within 1.5 km. Fewer than 1 percent have access to improved water services in line with GTP-2 of at least 25 lpcd within 1 km. In addition to low coverage, the limited amount of water is a main factor in not meeting the GTP goals (Adank et al., 2018).

Table 2 Percentage of South Ari Population with Water Services by GTP and JMP Standards

Standard	Service Level Indicator	Percentage of Population
Ethiopia Growth and Transformation Plan	Access to 15 lpcd within 1.5 km (GTP-1)	4%
	Access to 25 lpcd within 1 km (GTP-2)	0.8%
UN Joint Monitoring Programme	Safely managed communal water services (piped on premises, no contamination, available when needed)	0%
	Basic communal water services (improved within 30-minute round trip)	13%
	Limited communal water services (improved, not within 30-minute round trip)	14%
	Unserved (by communal water services)*	73%

*Self-supply was not included in this analysis

Table 3 provides an overview of the level of services in the woredas. It shows that functionality[5] and reliability[6] of community-managed schemes are far from optimal, with rates of 69 percent and 56 percent, respectively. The functionality and reliability rates of public taps connected to springs and deep wells were even lower, 41 percent and 23 percent, respectively. Water quality is also an issue, with only 40 percent of community-managed schemes providing water of adequate quality (*E. coli* < 10 mpn/100ml) (Adank et al., 2018).

The level of water services provided by the utility-managed scheme in Gazer is also very low. Reliability (continuity) of town water services is a big challenge. Although the scheme was built about 11 years ago, it is no longer able to meet the increasing demand. Water is rotated over segments of the town, with each segment receiving water once every 3 or 4 days. About 55 percent of the town's total population

[5] Defined as whether the scheme was functional at the time of visiting.
[6] Defined as the availability of non-seasonal water services at least 85 percent of the time during the most recent month (based on recall).

were found to spend 5 minutes or less fetching water, in line with the 250 meter (m) maximum distance set by GTP-2 (Adank et al., 2018). The amount of water used in the town is around 11 lpcd, which is below the 20 lpcd norm for GTP-1 and far below the 40 lpcd norm for GTP-2.

Table 3 Service Levels of Community- and Utility-Managed Schemes in South Ari

	Service Level Indicator	Community Service Provider	Utility Service Provider	Total
Functionality	Functional schemes	69%	N/A	69%
	Functional public taps	41%	70%	47%
Reliability	Reliable schemes	56%	Not reliable	56%
	Reliable public taps	23%	70%	33%
Quality	Water points with acceptable quality	40%	100%	
Accessibility	Served population within 30-minute round trip	47%	100%	48%
	Served population within GTP-1 distance norm	97%	100%	97%
	Served population within GTP-2 distance norm	85%	55%	84%
Quantity	Served population with water quantity of GTP-1 norm	15%	6%	15%
	Served population with water quantity of GTP-2 norm	3.6%	0%	3.5%

Sustainability Check

As mentioned above, the sustainability check provides an analysis of whether the conditions for sustainable water services provision are in place. Table 4 indicates the service provider and service authority scores are low for South Ari, especially for the utility-managed scheme in Gazer. Financing and asset management are key challenges for the utility and pose possible sustainability challenges. The service authority scored zero (0) related to utility-management, because Gazer has limited structures and mechanisms for ensuring a conducive and enabling environment for service provision (Adank and Hailegiorgis, 2018).

For community-managed schemes, the benchmarks were met on less than half (44 percent) of the service provider indicators and only five (42 percent) of the 11 service authority indicators.

Table 4 Sustainability Check for South Ari

Service Delivery Model	Category	Average Score	% Of Benchmarks Met
Community-managed scheme	Service provider performance	34	44%
	Service authority performance	31	42%
Utility-managed scheme	Service provider performance	19	17%
	Service authority performance	0	0%

Baseline Assessment Results by Building Block

This section presents an analysis of the strength of the local water supply system as per the building blocks. Annex 1 includes the full scoring for each building block and Table 5, at the end of this section, provides a summary.

Institutions

Overall, the institutional arrangements for rural water supply in South Ari are assessed as **moderate**. However, critical gaps were identified, especially in capacity and support.

There is a clear institutional set-up for rural water service provision in South Ari, with defined roles and responsibilities for the WUAs and Gazer utility (the service providers), the South Ari Woreda Water, Mines, and Energy Office (the service authority), and support from the zone and regional bureau. However, the South Ari Woreda Water, Mines, and Energy office is understaffed, with 61 percent of the required positions filled and only seven staff dedicated to rural water supply.

Although WUAs should be in place as water service providers for all water schemes that are not under the responsibility of the Gazer town utility, 33 percent of the water schemes do not have WUAs (Pearce and Abera, 2018). Most WUAs in South Ari were found to be well constituted with a chairperson, secretary, treasurer, and other members elected by the community. The WUAs are established as community-based organizations and registered with the regional water bureau, but very few are gender-balanced. Training of WUAs is insufficient, with most having received only limited training when the associations were first established more than 2 years ago.

The capacity of the Gazer water utility is also very low. The utility has six staff members, four of whom are on the payroll of the South Ari Woreda Water, Mines, and Energy Office. Staff are unable to perform many routine repairs or carry out essential administrative and management roles such as keeping operational and financial records.

About two-thirds of WUAs report being visited by government staff (woreda, zone, or region) at least once a month. However, when asked about the most recent visit, just over half (56 percent) of WUAs had been visited in the past month. Of these, more than half reported that the main reason for the visit was to obtain information, and 43 percent identified repairs or technical assistance as the main reason. The utility reported receiving insufficient support from the woreda office or other agencies.

Before the start of the asset inventory, information on the performance of service providers was not available. Limited performance data became available to the woreda through the asset inventory (Pearce et al., 2018), while more detailed service provider performance data came from the sustainability check (Adank and Hailegiorgis, 2018).

Legislation

SNNPR, where South Ari is located, has been a national leader in establishing the necessary proclamation and implementing the legalization policy for community-based water service providers. As a result, all WUAs in the woreda reported having by-laws describing their roles and responsibilities (Adank and Hailegiorgis, 2018). However, as noted above, about a third of rural schemes do not yet have WUAs and therefore do not have by-laws in place. The strength for legislation is assessed as **moderate**.

Finance

Given the gap between needs and expenditure for CapEx, CapManEx, and direct support, plus the poor mechanisms for ensuring equity and discussing tariffs, the finance building block in South Ari is assessed as **very weak.**

Combined water expenditure for the 2006–2008 Ethiopian fiscal year (EFY) (2013/14–2015/16) as compiled under the life-cycle cost analysis (LCCA), was approximately 2.36 million Ethiopian Birr (ETB) ($87,400) per year (see Figure 3). The South Ari woreda office expenditure in 2006–2008 EFY was roughly 0.9 million ETB ($33,500) per year. This covered only salary and operations costs (56 percent) and new water schemes and extensions (44 percent). NGOs provided roughly 0.78 million ETB ($41,000), which was allocated to new water schemes and extensions (71 percent), rehabilitation (9 percent), and WUA establishment (20 percent). The Development Association dedicated all its 0.350 million ETB (roughly $13,000) to new water schemes and extensions. In South Ari, no budget was allocated to maintenance in 2006–2008 EFY (Veenkant et al., 2018).

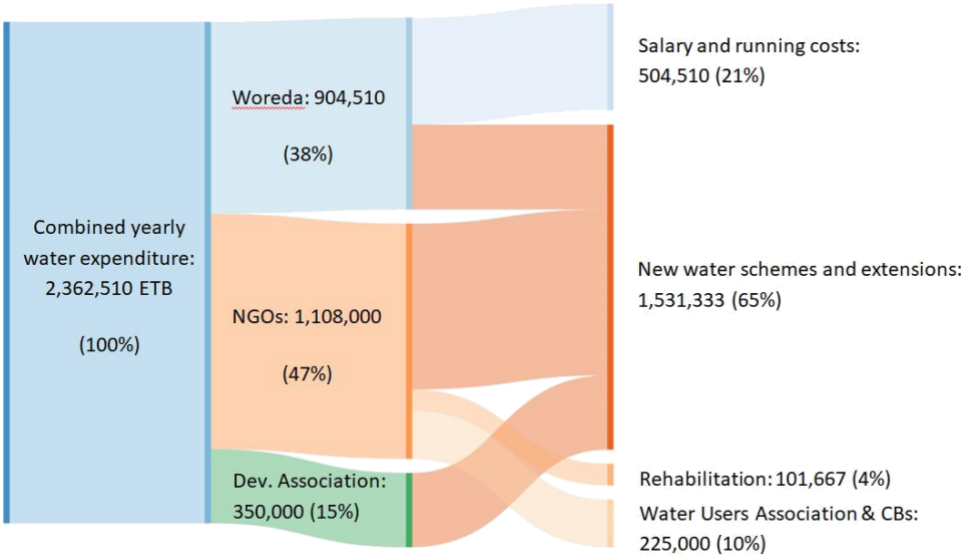

Figure 3 Sankey Diagram of Yearly Water Budget in South Ari

Source: Veenkant et al., 2018. The regional contribution to South Ari's water budget is not included.

Annual CapEx in 2006–2008 EFY was about $56,660 (including budgets from the woreda, NGOs, and other parties). The value (replacement cost) of the assets that serve 26 percent of the current population is estimated at $4.3 million (Veenkant et al., 2018). Assuming a similar mix of water supply schemes as is currently in place, a minimum estimate of the CapEx needed to serve the remaining unserved people (74 percent of the population) is $12.2 million, or 215 times the current annual expenditure. This estimate, though rough, highlights the huge financing gap between required and current CapEx, especially considering that costs could be even higher because the unserved are largely in remote, scattered communities.[7]

Expenditure on CapManEx has been very low in the woreda. Only about $3,760 per year between 2006–2008 EFY was spent on rehabilitation of existing infrastructure. At least part of CapManEx is expected to be raised by WUAs through tariffs. However, systematic, regular collection of money for operations and maintenance (O&M) is difficult for most rural schemes. Only 43 percent of water schemes have established a tariff (Pearce et al., 2018). Most WUAs (72 percent) have bank accounts and keep financial records, but the amounts collected are insufficient to cover CapManEx (Adank et al., 2018).

The utility in Gazer also struggles with financial sustainability. Because of the poor services, water sales are low, with households using water from standpipes collecting only an average of 11 lpcd (Adank and Hailegiorgis, 2018). The resulting revenue is not enough to cover even basic operational costs and spare parts, let alone the major repairs, expansion, and rehabilitation needed to raise service levels, attract

[7] Non-functional systems and population growth would make the gap even bigger.

more customers, and increase revenues (Adank et al, 2018). The gap between required and actual CapManEx is substantial.

Direct support falls under the woreda budget for salaries and running costs, roughly $19,000 per year in 2006–2008 EFY. This covers the salaries of 11 technical WASH officers who are responsible for providing direct support. They spend most of their time in the office, reporting, planning and providing ad hoc support to communities that seek help with maintenance. The woreda water office has few resources, with only one motorcycle. Experts sometimes use transport facilities from other offices or public transport paid for by communities. NGOs also provided some funds to establish WUAs in 2006–2008 EFY (about $8,000 per year), which qualifies as indirect support. Total direct support costs amount to about $27,000 per year at best. This amounts to $0.10 per capita per year, far below the recommended minimum of $2.00 to $3.00 per capita per year (McIntyre and Smits, 2015).

Box 2: Budget for Water Supply, Including Rehabilitation, 2017/2018

The South Ari Water, Mines, and Energy Office budget for 2010 EFY (2017/18) increased by almost 1.3 million ETB ($48,000) over the 2006–2008 EFY budget. This included 0.8 million ETB (about $30,000) for medium maintenance, versus no maintenance budget in 2006–2008 EFY. The allocation was in response to poor functionality levels, as revealed by the asset inventory and discussed at meetings involving the South Ari and South Omo zonal cabinets. In the 2010 EFY budgets, the biggest components were still new water schemes and extensions (50 percent, down from 65 percent), followed by salary and running costs (22 percent, up from 21 percent), but medium maintenance constituted 17 percent (up from none). Although this is a positive development, in practice the maintenance funds are allocated to rehabilitation of schemes, and not maintenance as such.

Source: Veenkant et al., 2018

Planning

Planning should include multi-year plans based on national targets; identify CapEx, CapManEx, and direct support elements and sources of funding; and consider equity. Because only some of these elements are present in South Ari, the overall the strength of the planning building block is rated as **moderate**.

The woreda reported having a multi-year WASH strategic plan and an annual plan that defines costs for both CapEx and CapManEx (including support), with sources of funding identified from the government side. However, it does not include plans from NGOs. There is no consultative process for planning with stakeholders.

Infrastructure Development and Management

Although new infrastructure development is a primary focus in South Ari, substantial gaps remain, and the poor quality of construction affects sustainability. Overall, this sub-system is considered **moderate**.

Mechanisms and capacities exist at woreda and zonal levels to ensure due diligence and control over procurement. However, the quality of work and the quality of the infrastructure development process is variable. The USAID Lowland WASH Activity and its implementing partner, the International Rescue Committee, are introducing new and higher standards that could be more widely adopted.

Box 3: Poor Quality Construction Is a Major Challenge

Although the woreda is supposed to check construction quality of all schemes, including those implemented by NGOs, a June 2017 field visit to a recently constructed scheme revealed it had broken down before it even started delivering water. It was not clear which office (woreda, zone, or region) was responsible for checking construction quality and holding the contractor to account.

Infrastructure management in South Ari is considered **weak** overall, with actors focusing on new construction and, where needed, undertaking ad hoc rehabilitation of infrastructure, rather than maintaining infrastructure and planning for asset rehabilitation and renewal. The consequence is low rates of functionality (see Figure 4).

Ownership of assets is not clear, and no systematic asset management regime is in place. The 2017 asset inventory conducted by the woreda with SWS and the USAID Lowland WASH Activity covered all water sources and water points, including their age and current physical state. However, before this intervention, no recent or detailed asset inventory data were available (Pearce et al., 2018). Having an up-to-date asset inventory could help in identifying immediate and future maintenance and rehabilitation needs but would require service providers and service authorities to assume responsibility for infrastructure management. This is still a major system gap.

Most WUAs (93 percent) in South Ari report that they undertake routine preventive maintenance on at least an annual basis, and 71 percent do so monthly. Nevertheless, breakdowns of WUA schemes are common. Moreover, not all schemes have WUAs. Most WUAs (81 percent) report being able to get spare parts for minor maintenance within 3 days, but only 25 percent can get spare parts for major maintenance within 3 days (Adank et al., 2018). The Gazer utility does not systematically practice asset management (Adank et al., 2018) and struggles to perform both minor and major repairs.

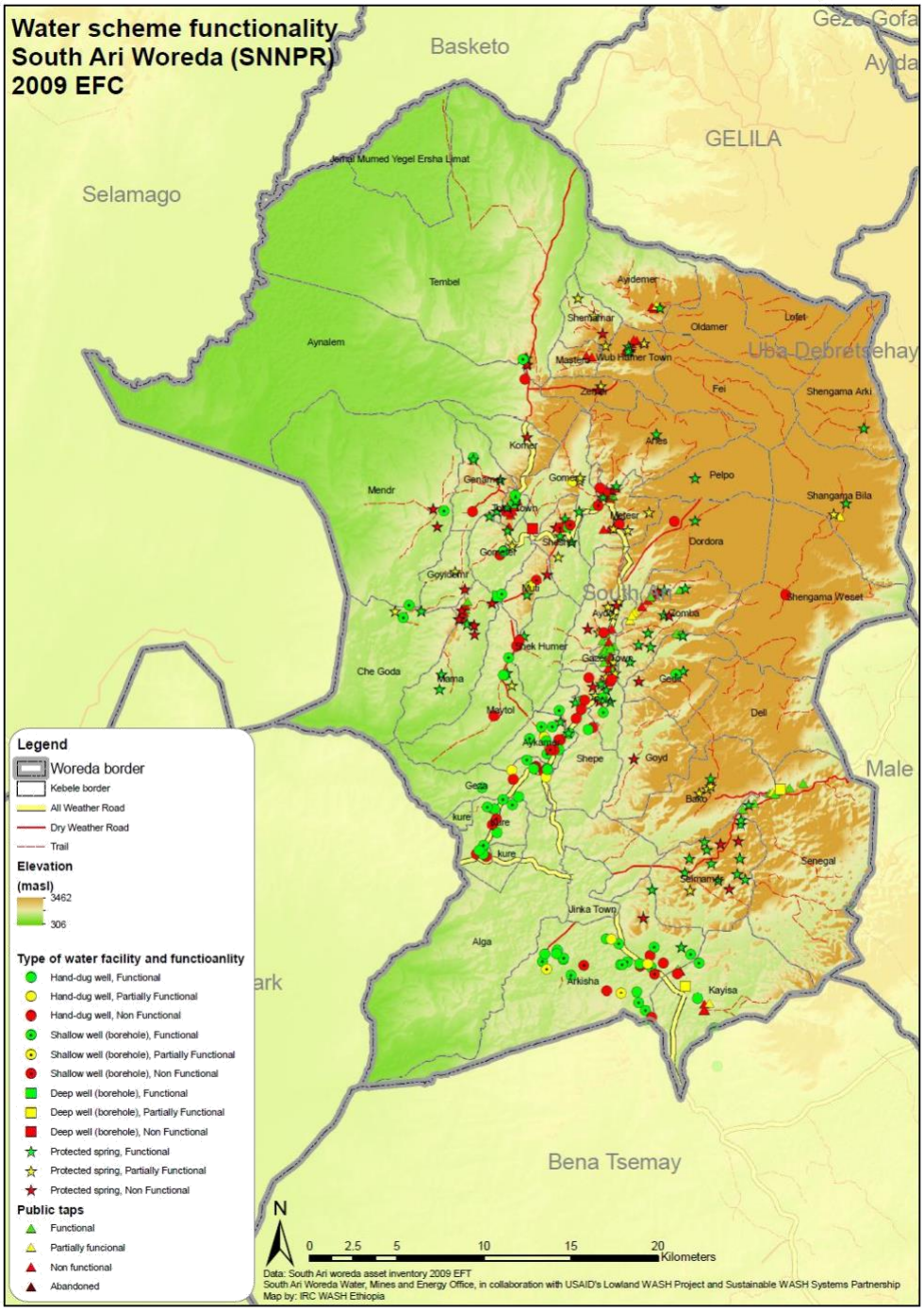

Figure 4 Water Scheme Functionality in South Ari (Source: Pearce et al., 2017)

Monitoring

A permanent national or regional monitoring system has yet to be made operational. SNNPR undertakes occasional region-wide inventories, and a national WASH inventory was undertaken in 2011. The South Ari woreda reports to the regional level on a limited number of parameters, including the number and type of schemes and their functionality.

Available data were out-of-date by 2017 when the Water, Mines, and Energy Office, SWS, and the USAID Lowland WASH Activity undertook a joint inventory of all water sources and water points. The results have been used to inform decision making (e.g., on budgeting and planning) and were subsequently updated in Excel by the South Ari Woreda Water, Mines, and Energy Office.

Monitoring of service levels and service providers is not done systematically. The asset inventory and sustainability checks have strengthened the monitoring systems at the woreda level (now assessed as **moderate** rather than **weak**) by providing data on assets, service levels, and service provider performance for the entire district. Updating needs to be institutionalized so that records can be used to track changes in performance and the data are more widely used to inform maintenance.

Regulation

The water sector in Ethiopia has no independent regulator, although this is planned by the Ministry of Water, Irrigation, and Energy (MoWIE). Initially, a regulator is likely to focus on urban water services, leaving rural services to local and other governments. The woreda water offices should in theory fulfil some regulatory functions, like tariff and service provider regulation. However, South Ari lacks the capacity (institutions), information (monitoring), funds, and logistical resources (finance) to undertake these functions. Overall, regulation in South Ari is considered **weak.**

There are no mechanisms for citizens to hold service providers to account, other than not re-electing WUA members and verbally complaining to government staff or local politicians about services. Information on the performance of service providers is not communicated to users.

Learning and adaptation

Learning and adaption in South Ari were assessed as **weak** in 2017, with no institutionalized learning platforms or regular coordination among government, NGOs, and the other stakeholders in rural water supply. WASH coordination mechanisms exist for emergencies, but there is no standing platform for WASH engagement among NGOs (Guttentag, 2018).

NGOs do coordinate their efforts with both woreda and zonal government offices, but there is very little engagement among the NGOs in the network. Information sharing, coordination, and communication in government tend to occur between offices at the same level, with woreda offices engaging with other woreda offices, and zone offices with other zone offices (see Figure 5).

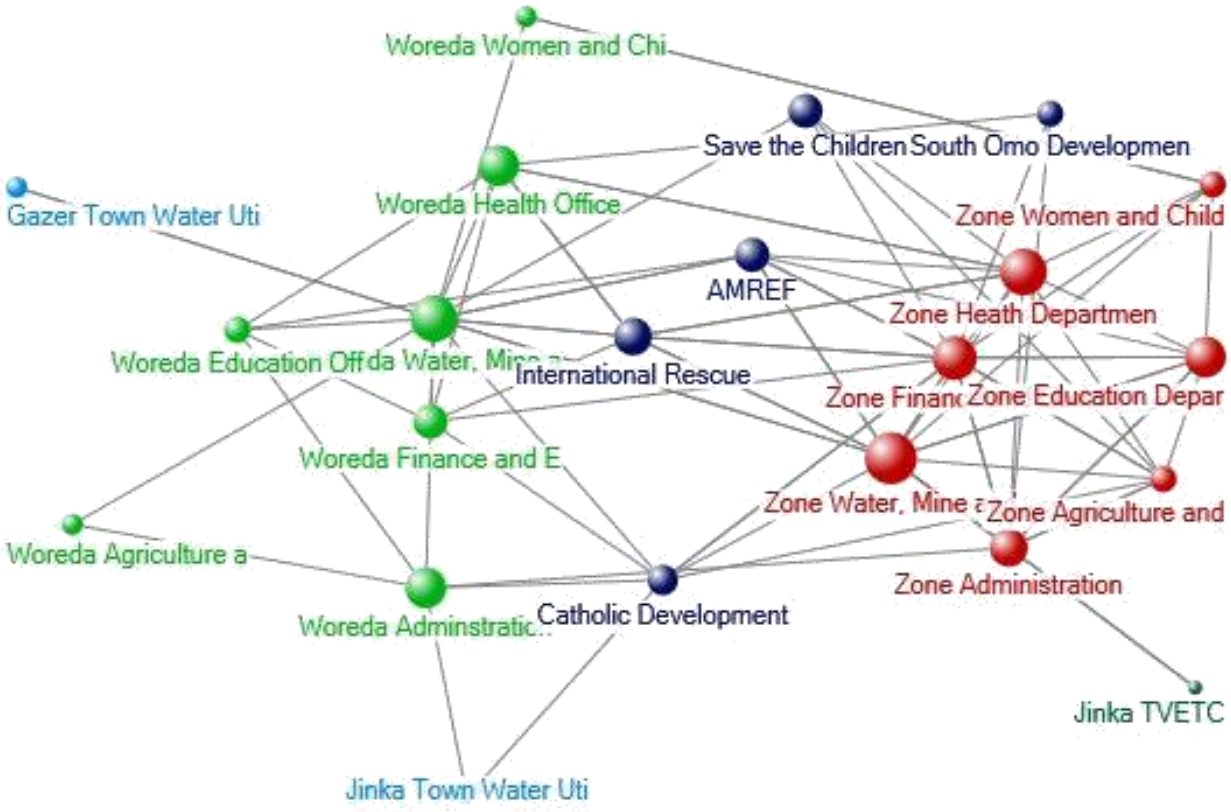

Figure 5 South Ari Coordination Network (Source: Guttentag, 2018)

The organizational network analysis (ONA) attributed low sustainability levels not to a lack of understanding among organizations about the network, but rather to a lack of mechanisms and processes for effective collaboration and coordination (Guttentag, 2018) that prohibited joint learning and adaptation. SWS intends to address this issue by supporting the development and facilitation of learning alliances in South Ari. During a kick-off meeting in November 2017, stakeholders agreed on the need for an additional platform at the zonal level that can take lessons learned from the woreda and scale them to other woredas.

Water Resources Management

Overall water resources management in South Ari is assessed as **weak**. Groundwater is the main source for improved domestic supply. The unserved rely on unprotected wells, springs, and surface water. Protection of improved sources is poor because of livestock watering and inadequate construction standards and fencing. WUAs do not have water safety plans, which would be the basis for source preservation activities. At the catchment level, there are no formal structures for making decisions about water resources or addressing conflicts over water allocations or pollution. Because the water schemes are in principle managed by the users, WUAs are expected to devise means of resolving conflicts. At the service provider level, then, a mechanism could be in place, but it tends to be informal and weak.

System Strength: Overall Status of the Local System for Rural Water Services

The assessment shows that overall, the provision of sustainable water services in South Ari is a very weak system, particularly with respect to legislation, planning, infrastructure management, monitoring, regulation, learning and adaptation, and water resources management. Official structures and capacities in institutions, legislation, and planning exist to some degree, providing a basis for strengthening the system, but the actual implementation of related processes is limited.

Table 5 South Ari Building Block Scores and Opportunities

Building Block	Score	Opportunities
Institutions	2.5	Advocate for additional WUAs. Support capacity building of WUAs and Gazer utility.
Legalization	1.7	Advocate for WUAs for all water schemes.
Finance	2.2	Advocate for increased funding to meet national and international goals.
Planning	1.6	Strengthen joint strategic and annual planning (with government and NGO stakeholders) for reaching SDGs, based on improved evidence and cost analysis.
Infrastructure Development	2.3	Advocate for improved construction standards and oversight by the woreda water office.
Infrastructure Management	1.3	Strengthen maintenance arrangements based on capacities of WUAs and the local sector and support from woredas, zone, and regional levels.
Monitoring	1.5	Promote institutionalization and strengthen capacities for ongoing monitoring. Support use of monitoring data for asset management, planning, and regulation.
Regulation	1.0	Support use of monitoring data for regulation by woreda and zone.
Learning and Adaptation	1.0	Further develop learning alliance platforms.
Water Resources Management	1.2	Advocate for wider application of water safety planning by WUAs and utility.

System Understanding: Participatory Mapping of Sustainability Factors and Interactions

A workshop using the factor mapping technique — a group model-building exercise — was held with stakeholders in South Ari to explore the factors that drive local WASH systems and their underlying connections and interdependencies. Ten factors influencing sustainable water services were identified from the ONA: local capacity, community participation and awareness, coordination, water resources, finance, monitoring and information, O&M, planning and construction, policy, and proper use of water schemes by users.

The analysis in South Ari revealed the following:

- Policy and finance are perceived by stakeholders as strong influencing factors in the system, especially on O&M.
- Finance is a perceived prerequisite for sustainable services.
- Coordination platforms need to be strengthened in the view of stakeholders and include community-level participation.
- Local government capacity is perceived as weak.

Overall, factor mapping results in South Ari confirmed findings derived through the baseline and building block analyses. Figure 6 shows a causal loop diagram for South Ari, demonstrating the interactions between these factors. Analysis of these interactions using data from the workshop indicated that there is a special connection between policy and O&M. Therefore, policy around O&M is likely to be the strongest driver of changes in sustainable water services, improving, holding constant, or diminishing functionality levels. Second to the role of policy is that of finance in all the loops. This is due to the inverse relationship that participants identified between finance and community, implying that as more financial resources are made available for water scheme operations, communities may be disincentivized to contribute their own financial resources (Valcourt et.al., 2018).

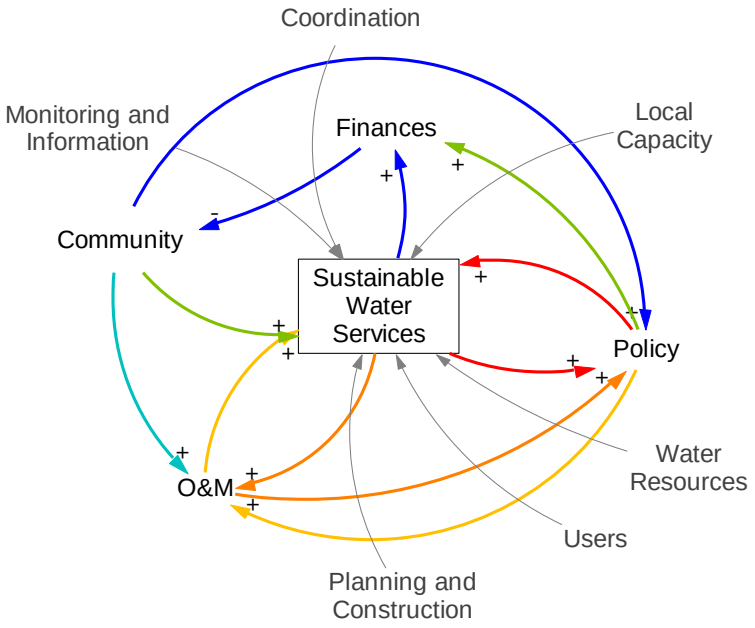

Figure 6 South Ari Causal Loop Diagram

Recommendations

There are many opportunities to strengthen rural water service provision in South Ari. SWS is a learning initiative with a strong focus on sustainability. A strategic partner, the USAID Lowland WASH Activity, focuses on implementation and has strong interest in developing capacities, the enabling environment, and sustainability of services.

Through discussions with the learning alliance—including representatives of the woreda, zonal, regional, and national governments—the following strategies have been identified for SWS in South Ari:

- Support coordination
- Support innovation and pilot programs for provision of maintenance
- Capacity building, including training of trainers, conventional training, and follow-up support
- Advocacy to leverage support from other stakeholders and partners or to raise the profile of a problem or solution
- Link to and influence regional- and national-level debates on the need to strengthen the local WASH system

Supporting Coordination

This assessment confirms the relevance of SWS's focus on strengthening coordination and learning. SWS is already supporting the development of a learning alliance platform to improve coordination, facilitate sharing of experiences, and encourage learning about rural water service delivery in South Ari. Further, at the first learning alliance meeting held in December 2017, SWS agreed to support different platforms and dialogues at the woreda and zonal levels. Each platform is expected to meet quarterly, with an agreed vision, a learning agenda that has clear terms of reference, defined membership, and strong documentation. ONA is being used to inform the development of the platforms and to track changes in the network and its performance.

Supporting Innovation and Pilot Programs

This report flags low levels of functionality, poor service levels, and a lack of investment and action related to maintenance as critical gaps in the system. Incentives for maintenance are missing: WUAs wait for problems to develop, and when a major breakdown occurs, the woreda steps in. Encouraged by a recent learning visit to Uganda, the zone developed plans to improve maintenance by engaging youth trained through the local Technical and Vocational Education and Training center and, in South Ari, hiring a new staff member focused on O&M. SWS and the USAID Lowland WASH Activity will support the development of pilots that increase maintenance capacity and systems, including organizing and financing. While monitoring and institutional arrangements for maintenance and financing were initially seen as separate areas for pilot programs, they should be integrated into a pilot on asset management. A plan is being developed for discussion at the next learning alliance meeting.

Capacity Building

The woreda and zone specifically requested training support in collecting and using data effectively. They also identified the need to raise awareness among staff on how to improve service delivery. This can draw upon the learning exchange in Uganda at the end of 2017. Other needs are: (1) effective training for WUAs in rural water scheme management, (2) training of trainers, (3) preparation of strong reports and plans, and (4) water quality testing.

Advocacy to Leverage Support

Greater advocacy at various levels is needed to move the water sector toward a greater focus on maintenance and sustainability, and one that supports strong systems that enable service delivery. This report has highlighted the low priority and limited financing of maintenance. SWS and the USAID Lowland WASH Activity both seek larger-scale changes to Ethiopia's water sector. To do this, they will advocate for: (1) replication of WUA training, building on the training of trainers; (2) linkages between the utilities and counterparts elsewhere; (3) increased levels of financing from different sources, including public finances; (4) establishment of improved construction standards and mechanisms for regulating standards; and (5) application of water safety planning to protect and preserve sources. Financing is critical to bringing about these changes and, building on LCCA findings, helping facilitate better planning and budgeting by government and NGOs for reaching the Sustainable Development Goals (SDGs) and ensuring sustainable water services to all in South Ari.

It is possible to build on progress in South Ari and influence regional and national policy and debates. This includes securing the levels of financing required to meet the SDGs and ensure sustainable water services (including asset management) and establishing regulatory entities to improve monitoring and asset management.

Water Service System in Mile, Afar Region

Mile lies along the main Addis Ababa–Djibouti highway, about 50 km south of Semera, the administrative center of the Afar Region. The woreda covers an area of about 5,345 km^2, and the estimated 2017 population of 117,960 is mainly rural (78 percent). Population density is about 22 people per km^2, far less than the Ethiopian average of 102 and slightly less than the Afar average of 25 people. The population is only partly settled (about a quarter, according to 2007 Population and Housing Survey), with many nomadic pastoralists, who live in domed tents that are packed up and moved when the livestock need fresh pasture or water. Male family members are the most mobile. The woreda includes two urban and two rural kebeles.

Water Schemes and Service Delivery Models

Mile woreda is served by a total of 31 sources: India Mark II hand pumps (16), shallow and deep wells with motorized schemes with distribution networks (7), a deep well without a distribution network (1), deep wells with solar pumped schemes (2), and motorized deep wells (5) supplying the urban piped scheme of Mile town and Adayitu and Ledi (Pearce et al., 2018). As in South Ari, the two main service delivery models in Mile are community-managed schemes, mainly found in the rural areas, and utility-managed small town piped schemes in Mile and Andale. The community-managed schemes are estimated to serve between 9 and 14 percent of the woreda's population (see Box 4).

The utility-managed scheme in Mile consists of three motorized deep boreholes that supply 17 public standpipes and 790 household connections. The utility-managed scheme of Andale has one deep and one shallow borehole, which supply four public standpipes and 650 household connections. However, public taps were not functional. They had been abandoned in favor of household connections. The asset inventory data estimates that 6,610 people are served by the utility-

Box 4: Community-Managed Schemes in Mile

National norms (FDRE, 2018) indicate the maximum number of people served by different types of schemes.[8] Accordingly, the potential number of people served in Mile is 32,350 (27 percent of the total woreda population). However, this does not consider the number of tap stands. Assuming that a tap can run 8 hours per day, takes 2 to 5 minutes to fill one jerry can, and that one jerry can serve one person per day (in line with the GTP-2 norm of 25 lpcd), the number of people served per public tap would be 96 to 240. Thus, for 2,000 people to be served by a deep well with a distribution system, 8 to 21 public taps would be needed. However, the deep wells in Mile have 2 to 5 (average, 2.8) public taps.

If they received less than half of the required 25 lpcd, 500 people could be served by one public tap. Adding the maximum number of people served by shallow wells with hand pumps (16 x 250) gives a total of about 17,000 people served by community-managed schemes. That is only 14 percent of the total population and 19 percent of the rural population of the woreda. Based on the number of households using the schemes, community-managed schemes serve only an estimated 10,592, or 9 percent of the total population and 12 percent of the rural population.

[8] Dug well with hand pump: 160; shallow well with hand pump: 250; spring at a spot: 200; shallow well with submersible pump: 1450; spring with piped scheme: 3,000; deep borehole with piped scheme: 2,000.

managed schemes, or 5.6 percent of the woreda's total population and 25 percent of its urban population. Based on the number of household connections, and assuming at least five people per household, the population served is at least 7,200 people, or 6 percent of the total population and 27 percent of the urban population. However, because household connections in these towns are often used by multiple households, actual coverage may be higher.

Based on the above, we estimate that 15 to 21 percent of the total population has water services — considerably below the official coverage figure of 35 percent in 2017 (personal communication with Mile Woreda Water Resources Office).

System Outcomes: Current Water Services

As in South Ari, the level of water service is **low**. Official water supply coverage amounted to 35 percent in 2017 (personal communication with Mile Woreda Water Resources Office). However, as mentioned above, SWS estimates coverage at 15 to 21 percent. To assess the level of service, SWS uses an estimated coverage of 21 percent.

More than half (55 percent) of users of public water points reported spending 30 minutes or less round trip fetching water, bringing the total population with access to basic services (as defined by JMP; see WHO/UNICEF, 2017) to only 15 percent. This includes the estimated 6 percent of the population with access to piped water supply on premises. However, because supply from piped water on premises is not reliable and not available when needed, the proportion of people with access to safely managed water is effectively 0 percent.

The proportion of the population with access to water services in line with national norms as set out in GTP-1 and GTP2 is very low (see Table 6). Low coverage and low quantities of water are thus a main limiting factor in missing the GTP goals (Adank et al., 2018).

Table 6 Percentage of Mile Population with Water Services by GTP and JMP Standards

Standard	Service Level Indicator	Percentage of Population
Ethiopia Growth and Transformation Plan	Access to 15 lpcd within 1.5 km (GTP-1)	5%
	Access to 25 lpcd within 1 km (GTP-w)	0.4%
UN Joint Monitoring Programme	Safely managed communal water services (piped on premises, no contamination, available when needed)	0%
	Basic communal water services (improved within 30-minute round trip)	13%
	Limited communal water services (improved, not within 30-minute round trip)	7%
	Unserved (by communal water services)	79%

Table 7 provides an overview of the level of service provided under the two main service delivery models in the woreda. It shows that functionality and reliability of community-managed schemes are considerably higher in Mile than in South Ari. The proportion of water points with acceptable water quality are also higher in Mile (Adank et al., 2018). Quantity of water is the main limiting factor.

Reliability of water services and water quantity are big challenges for Mile's utility-managed schemes. Water is rotated over segments of the town, with each segment receiving water once every 3 to 4 days. According to the system manager, the main issue is the limited storage capacity of the system, which was constructed about 20 years ago. The production of deep wells that supply the scheme is decreasing and insufficient. Main and secondary lines are old and subject to high losses from leaks. The total amount of water provided by the system is estimated at 15 lpcd, enough to serve 73 percent of the population with 20 lpcd (GTP-1 norm) or 29 percent with 50 lpcd (GTP-2 norm) (Adank and Hailegiorgis, 2018).

Table 7 Service Levels of Community- and Utility-Managed Schemes in Mile

Service Level Indicator		Community Service Provider	Utility Service Provider	Total
Functionality	Functional sources	88%	80%	87%
	Functional public taps	76%	0%	41%
Reliability	Reliable schemes	77%	Rotating service	N/A
	Reliable public taps	76%	70%	41%
Quality	Water points with acceptable quality	85%	0%	
Accessibility	Served population within 30-minute round trip	50%	N/A	55%
	Served population within GTP-1 distance norm	91%	100%	92%
	Served population within GTP-2 distance norm	85%	100%	86%
Quantity	Served population with water quantity of GTP-1 norm	21.3%	100%	23%
	Served population with water quantity of GTP-2 norm	0.9%	35%	1.2%

System Sustainability: Likelihood of Sustainability

The sustainability check indicates the extent to which conditions for sustainable service provision are in place. Table 8 presents an overview of the average scores and the proportion of benchmarks met. For a complete overview of the indicator scores, see Annex II.

Given the low scores on the service provider and service authority indicators, and the low proportion of benchmarks met on these indicators, there are serious sustainability concerns in Mile. Scores are

especially low for the community-management service provider indicators, as about half of the rural schemes do not have a WASHCo in place. Utility-managed schemes scored better in Mile than in South Ari, with slightly better scores for service level and for provider and authority performance (Adank and Hailegiorgis, 2018).

Table 8 Sustainability Check for Mile

Service Delivery Model	Category	Percent of Benchmarks Met
Community-managed scheme	Service provider performance	10%
	Service authority performance	35%
Utility-managed scheme	Service provider performance	27%
	Service authority performance	21%

Baseline Assessment Results by Building Block

This section presents an analysis of the strength of the local water supply system as per the building blocks. Annex 1 includes the full scoring for each building block and Table 9, at the end of this section, provides a summary.

Institutions

Overall, the woreda is assessed as **moderate** for institutional strength. The institutional set-up is clear about the roles and responsibilities of the service providers (rural WASHCos and the urban utility), and the service authority (Mile Woreda Water Resources Office) is supported by the regional bureau.

The Mile Woreda Water Resources Office is relatively well staffed, with 24 of its 25 positions filled. However, more than half the rural water schemes do not have a WASHCo to take up the role of service provider. The WASHCos that exist were not well constituted, with an often unclear distribution of roles and responsibilities among members. Training of WASHCos is an issue, with most having received only limited training when they were established more than 2 years ago. Very few WASHCos are gender balanced (Adank and Hailegiorgis, 2018).

Only 30 percent of WASHCos reported receiving technical support from the woreda level within 3 days when they face technical issues beyond their capacity. There were only two artisans providing repairs to water schemes at the time of the asset inventory. Recently, the woreda was selected for a pilot program to develop micro- and small-enterprise capacity for maintenance, which may increase local private sector capacity to make repairs.

Limited information about service providers' performance is available from the asset inventory. Better data is available from the sustainability check.

Legislation

None of the WASHCos reported having by-laws setting out their roles and responsibilities (Adank and Hailegiorgis, 2018). Mile is assessed as **weak** for this component.

Finance

Mile is assessed as **weak** in finance. The LCCA (Veenkant et al., 2018) found that the total combined expenditure in 2008–2009 EFY (2015/16–2016/17) was 14,579,460 ETB ($525,000). NGOs were the biggest contributors to the combined water investment. Combined expenditure came from the woreda (12 percent), regional government (24 percent), and NGOs (64 percent).[9] Most of the budget was allocated to new water schemes and extensions (88 percent), followed by salary and running costs (7 percent) and several smaller components.

The Woreda Water Resources Office expenditure in 2008–2009 EFY was roughly 1.680 million ETB ($62,000). Most of it went to salaries and running costs (58 percent). In 2006–2008 EFY, Mile allocated funds for medium maintenance (7 percent) and major maintenance (9 percent). A reported high budget for the purchase of spare parts (250,000 ETB) and construction of a warehouse (100,000 ETB) could not be verified. The regional government contributed 3.5 million ETB ($130,000) split between new water schemes and extensions (97 percent) and maintenance (3 percent). According to deputy head of the Mile Woreda Water Resources Office, the Regional Water Resources Bureau maintains motorized schemes and hand pump schemes. NGOs contributed 9.4 million ETB ($348,000) to new water schemes and extension. Figure 7 presents an overview of the annual expenditure in Mile (Veenkant et al., 2018).

[9] Three NGOs are known to have contributed in recent years in Mile: Save the Children, Care Ethiopia, and AMREF. Contributions from the Afar Pastoralist Development Association and UNICEF are excluded from this analysis because they have not recently funded programs.

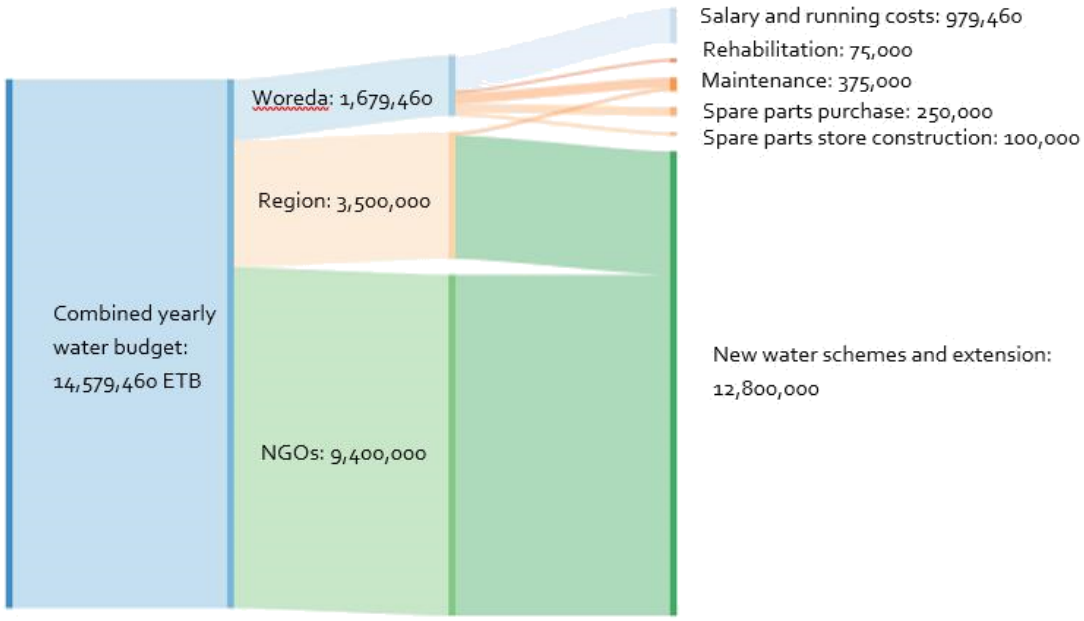

Figure 12 Sankey Diagram of Annual Water Budget in Mile

Though the Mile Woreda Water Resources Office requests budget for different activities every year (new construction, expansion, and O&M), the woreda cabinet allocates funds only for O&M. In practice, the office uses part of the O&M budget for expansion and replacement of some components.

The value of current assets is estimated at about $3.5 million. Assuming these assets are serving 35 percent of the population, and assuming a similar mix of schemes and unit costs, going to full coverage would require a minimum additional investment (CapEx) of about $6.8 million.[10] In practice, this figure would likely be higher. If the current annual expenditure on new infrastructure of $462,000 were maintained, full coverage could be achieved in 15 years — not accounting for population growth and assuming all systems are kept in service.

The WASHCos generally collect money on an ad hoc basis (e.g., to buy fuel) and thus cover only part of their operations and minor maintenance expenditures. None of the WASHCos in Mile reported having a bank account. Only one WASHCo reported keeping up-to-date records on revenue and expenditures, which had not been checked by an inspector. Therefore, CapManEx is the responsibility of the government and its partners. Expenditure on rehabilitation and major repairs has been limited — only about $2,775 annually. However, the local water office and the regional water bureau have contributed approximately $14,000 to covering minor maintenance costs.

The budget for direct support in Mile comes from the woreda budget for salaries and running costs, which amounts to roughly $36,200 per year, based on 2008–2009 EFY (Veenkant et al., 2018). Staffing consists of 11 people, mostly for supervision of rehabilitation and new infrastructure. The Mile Woreda

[10] Considering the 21 percent actual coverage, as calculated based on the assets, achieving full coverage would cost $17 million and take 37 years. This assumes a constant CapEx of $462,000 per year and does not take population growth into account.

Water Resources Office is poorly resourced, with only one motorcycle. Its experts sometimes use transport facilities from other offices or take a *bajaj* (a three-wheeled vehicle). Benefitting communities tend to pay for the cost of transport. Considering a total population of 105,840, expenditure on direct support is about $0.34 per capita per year — well below the minimum of $1.00 per capita per day and far below the minimum of $2.00–$3.00 for ensuring direct support that can contribute to sustainable water service provision.

Planning

Planning processes are **moderately** well developed in Mile. The woreda has a multi-year WASH strategic plan and a WASH annual plan, both listing costs for capital investments as well as recurrent costs (CapManEx and support costs) and identifying sources of funding. However, the plans do not include NGOs, which make major contributions, and there is no substantial consultative planning process with stakeholders.

Infrastructure Development and Management

Government mechanisms at the local and regional levels ensure due diligence and control over procurement, although capacity to effectively implement these processes and oversee the quality of work is variable. CARE, a partner of the USAID Lowland WASH Activity, is seeking to raise construction standards, which are low. Overall, infrastructure development is assessed as **weak**.

A general concern identified by the USAID Lowland WASH Activity in the region is that motorized schemes are oversized, having been designed based on high population figures and norms. In practice, the use of these schemes is limited, as indicated by relatively low fuel costs. As a result of over-design, generators and other equipment are hard to maintain.

Infrastructure management is **weak**. Both WASHCos and utilities operate schemes, and for the motorized schemes, the cost (and related logistics) of procuring diesel fuel is a major limiting factor. The electro-mechanical components of these schemes are vulnerable to breakdown. Communities cover fuel costs but do relatively little minor maintenance. Major maintenance then becomes the responsibility of the regional government. Ownership of assets, especially among communities, is unclear.

The asset inventory supported by SWS and the USAID Lowland WASH Activity collected information on the age and current state of assets and made the data available to the woreda and region in July 2017. However, before then, no such asset inventory had been completed (Pearce et al., 2018). None of the WASHCos reported conducting routine preventive maintenance. Most reported that they could get spare parts for minor maintenance within 3 days (78 percent), but none reported having obtained spare parts for major maintenance within 3 days. Maintenance of the motorized schemes is considered the responsibility of the regional water bureau.

The regional water bureau manages major maintenance, including activities that require a crane and well development, but other maintenance falls to the Mile Woreda Water Resources Office. Based on the woreda's experience, a hand pump requires maintenance 1 to 4 times per year. The woreda reports

responding to maintenance requests within 1 to 3 days, but if the repairs are beyond its capacity, response time depends on the availability of a crane (the region has three service rigs).

Some spare parts (filters for generating sets, pipes, and fittings) are available locally. Others (pistons for hand pumps) may be procured from Addis Ababa and are bought in bulk and kept in stock. The Mile Woreda Water Resources Office does not check water quality and has no expertise or test kits for water quality monitoring.

A pilot program (funded by the African Development Bank [AfDB] through MoWIE) in Mile is developing a post-construction support unit to create jobs and improve maintenance through local artisans. The woreda has identified and registered individuals with potential to provide services and materials for water supply.

Monitoring

Although **weak** initially, monitoring is now assessed as **moderate** in Mile. While a national monitoring system is not yet operational, the woreda has been reporting to the regional bureau on the number and type of schemes and functionality. The asset inventory provided an opportunity for the woreda to update its information, but the data need to be updated and fully utilized — for example, by making data more accessible for different processes, updating functionality status, and recording other changes over time.

Regulation

Regulation in Mile is **weak**. There is no independent regulator, and the regional government in Afar plays a limited and poorly developed regulatory role. Citizens have few mechanisms to hold service providers to account other than complaining to the local water office or local political representatives.

Learning and Adaptation

Learning and adaptive capacity is weak. There are no institutionalized learning platforms or mechanisms for coordination among stakeholders involved in water supply at the woreda level. The ONA (Guttentag, 2018) found that government offices in Mile are less influential in the network than NGOs and regional government offices (see Figure 8). The overall influence of NGOs and regional government offices was apparent in the composition of the core information-sharing organizations. Of this core group, all except one were NGOs and regional government offices. The woreda government offices, on the other hand, are nearly all on the periphery, with relatively few connections to the core group or even among themselves (Guttentag, 2018).

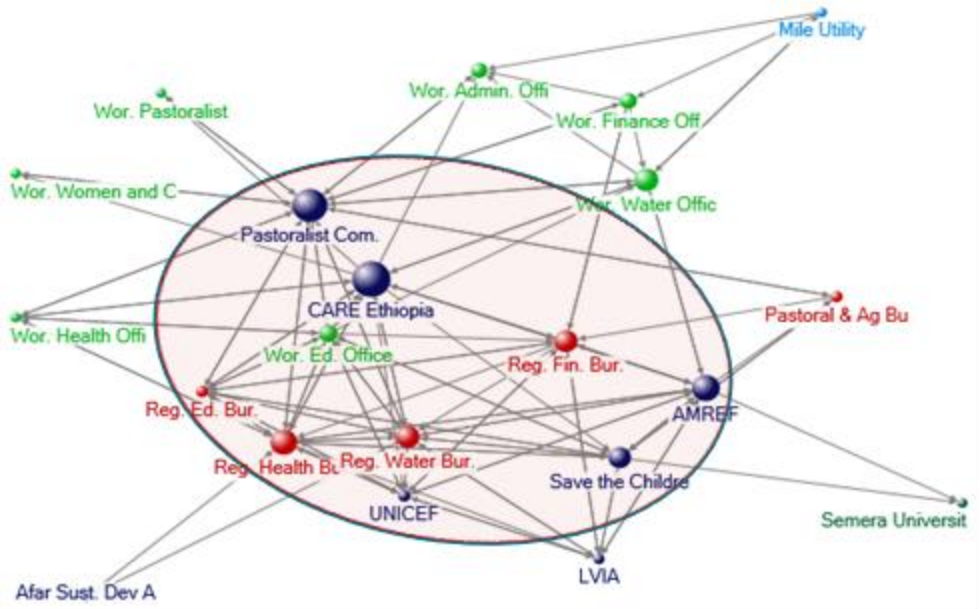

Figure 13 Mile Information-Sharing Core Network (Source: Guttentag, 2018)

Water Resources Management

Mile is in the lower Awash River basin. The river is important for irrigation and pastoralism, and the construction of Mile dam is reported to have negatively impacted the availability of pasture for some community members.

Boreholes, often located on or near dry riverbeds, are prone to flood damage. In 2017, one borehole and its pumping infrastructure were damaged. None of the WASHCos reported having a water safety plan, which could be a basis for source preservation activities. Water resources management is therefore **weak** in the woreda.

System Strength: Overall Status of the Local System for Rural Water Services

The building block assessment reveals a weak local system for the provision of sustainable water services in Mile, with weaknesses across the board. Only the institutions building block can be considered moderately strong. While structures exist for engagement and progress, capacities are low.

Table 9 Mile Building Block Scores and Opportunities

Building Block	Score	Opportunities
Institutions	2.8	Advocate for capacity building of WASHCos and Mile utility.
Legalization	1.3	Advocate for set-up and legalization of WASHCos with clear by-laws on roles and responsibilities.
Finance	2.2	Advocate for increased funding to meet national and international goals.

Planning	1.6	Strengthen joint strategic and annual planning (with government and NGO stakeholders) for reaching SDGs, based on improved evidence and cost analysis.
Infrastructure Development	2.3	Advocate for improved construction standards and oversight. Explore replacing hand pumps with solar pumping, as preferred by the woreda.
Infrastructure Management	1.0	Strengthen the capacities of WASHCos to manage maintenance, with local private sector and support from woreda and regional governments (via MoWIE-Afar Water Resources Bureau pilot supported by AfDB). Strengthen asset management, building on asset inventory and training by the USAID Lowland WASH Activity.
Monitoring	1.3	Promote institutionalization and strengthen capacities for updating inventory and routine monitoring (including water quality). Support use of monitoring data for asset management, planning, and regulation.
Regulation	1.0	Support use of monitoring data for regulation.
Learning and Adaptation	1.0	Further develop learning alliance platforms.
Water Resources Management	1.0	Advocate for flood protection of rural water installations. Advocate for wider application of water safety planning by WASHCos and utility.

System Understanding: Participatory Mapping of Sustainability Factors

Interviews and factor mapping identified the primary factors that influence sustainable water service delivery in Mile: finance, coordination, water resources and infrastructure, proper use, skilled water technicians, spare part supply, water quality, water demand, and woreda administration (Valcourt et al., 2018). These priority factors overlap with the building blocks. Figure 9 shows a causal loop diagram for Mile woreda.

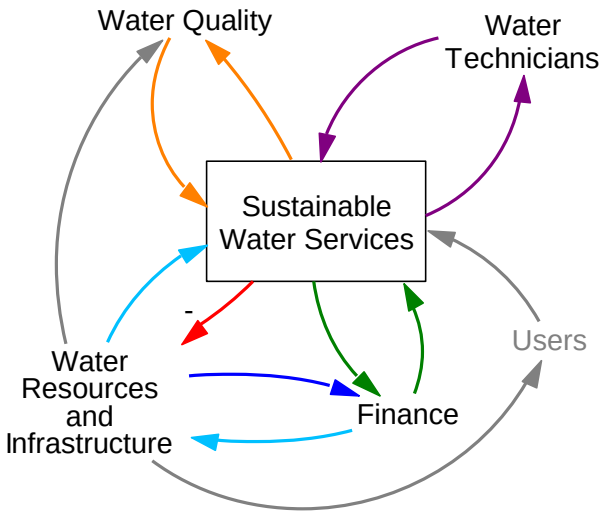

Figure 14 Mile Causal Loop Diagram

An influence map for Mile (see Figure 10) shows the outcome factor, sustainable water services, as both highly dependent on other factors and highly influential. This suggests the existing state of water services in the woreda has a feedback effect on other factors in the system overall. The influence map also identifies woreda capacity as the only clear leverage point in the system. Water technicians and water demand also appear to have the potential to leverage or influence the system, but are less influential overall than the outcome factor, sustainable water services, or finance, another highly influential factor (Valcourt et.al., 2018).

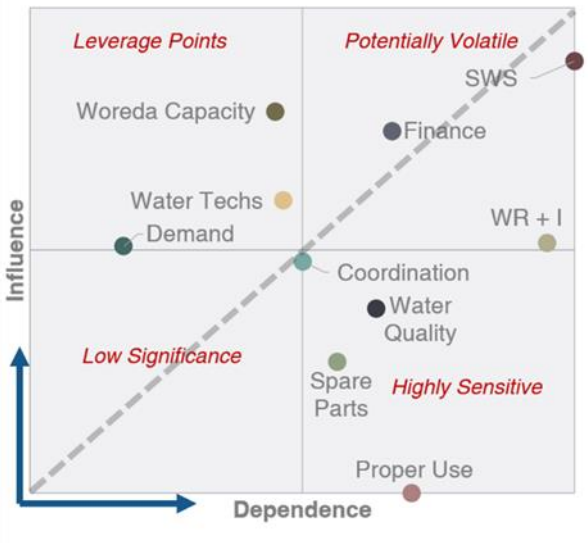

Figure 10 Mile Influence Map

Recommendations

The overall weakness of the system for delivering rural water services in Mile means there are many opportunities for improvement. SWS seeks to support innovations that will enhance sustainability. The USAID Lowland WASH Activity is more focused on infrastructure but also has strong interests in developing capacities, improving the enabling environment, and achieving sustainable services.

The following strategies have been identified for SWS in Mile:

- Supporting coordination
- Supporting innovation and pilot programs
- Capacity building, including training of trainers, conventional training, and follow-up support
- Advocacy to leverage support from other stakeholders and partners or to raise the profile of problems and solutions
- Linking to and influencing regional- and national-level debates

Supporting Coordination

SWS is already supporting the development of a learning alliance platform to improve coordination, facilitate sharing of experiences, and encourage learning about rural water service delivery in Mile. The learning alliance held its first meeting in December 2017 and is expected to meet quarterly, with an agreed vision, a learning agenda that has clear terms of reference, defined membership, and strong documentation. ONA will be used to inform the platform's development and to track changes in the network and its performance.

Supporting Innovation and Pilot Programs

Poorly performing hand pumps, under-utilized and hard to maintain motorized schemes, and new solar pumping technologies all present maintenance challenges. Maintenance is a critical area for improvement. Incentives for maintenance are missing: WASHCos and communities wait for problems to develop, and when a major breakdown occurs, the woreda or region steps in. Because Mile is part of a pilot program for the development of micro- and small-enterprises related to maintenance, SWS and the USAID Lowland WASH Activity are helping to increase capacity through activities related to monitoring, organizing, and financing maintenance. Monitoring and institutional arrangements for maintenance and financing were initially seen as subjects for separate pilots but should be integrated into a pilot on asset management. A plan is being developed for discussion at the next learning alliance meeting.

Ideally, interventions for monitoring and asset management are not focused at the woreda scale. Based on the asset inventory in Mile, SWS activities have already scaled up to the regional level. The partnership is supporting the uptake of innovations, including sensors for real-time monitoring of motorized schemes and an mWater database at the regional level. It is intended that activities supporting asset management, including monitoring, maintenance, and financing components, will continue to involve both woreda (focused on Mile) and regional activities.

Capacity Building

The woreda and the Afar Water Resources Bureau have specifically requested support for training to improve data collection and using information effectively; this is ongoing. Another need is raising awareness among staff on how service delivery can be improved, drawing upon a 2017 learning exchange in Uganda. Other gaps are: (1) effective training for WASHCos in rural water scheme management; (2) training of trainers; (3) preparation of strong reports and plans; and (4) water quality testing.

Advocacy to Leverage Support

Greater advocacy is needed at various levels to move the water sector to focus more on maintenance and sustainability, and a sector that supports strong systems that enable service delivery. SWS and the USAID Lowland WASH Activity seek larger-scale changes to Ethiopia's water sector. To do this, they will advocate for: (1) replication of WASHCo training, building on the training of trainers; (2) linkages between the utilities and counterparts elsewhere; (3) increased levels of financing from different sources, including public funds; (4) establishment of improved construction standards and mechanisms for regulation; and (5) water safety planning for ensuring source protection and preservation. Most critical is financing. Building on findings from the LCCA study is a commitment to help facilitate better

planning and budgeting by government and NGOs for reaching the SDGs and ensuring sustainable water service provision to all in Mile.

It is possible to build on progress in Mile and influence regional and national policy and debates. This includes securing the levels of financing required to meet the SDGs and ensure sustainable water service provision (including asset management) and establishing regulatory entities to improve monitoring and asset management.

Conclusion

SWS established a baseline in South Ari and Mile to measure changes in system strength, proxies related to the likelihood of sustainability, and service levels. In both woredas, rural and small town water services are provided by community- and utility-management models. Although the technology mix is different — e.g., higher technologies are required in arid Mile — access to services, and the quality of services provided, remains low in both woredas.

Assessment of the nine critical building blocks of a strong system for delivering WASH services revealed that the water delivery service systems in both woredas is weak. Official structures and capacities for institutions, legislation, and planning are in place to some degree and provide a basis for systems strengthening, but capacities are low.

Finance is a major constraint: huge financing gaps were identified for maintenance, rehabilitation, and direct and indirect support to service providers, as well as investment in new services to reach the unserved. Local and national systems are geared toward new water schemes to serve the remaining population, at the expense of raising existing service levels or sustaining current services. Infrastructure is not well managed. Attention to rehabilitation recently increased, but preventive or minor maintenance is lacking. This explains the high failure rates for both simple hand pump–based water supplies and more complex schemes involving generators, motors, and submersible pumps.

SWS is seeking innovations to address these gaps in the system and improve sustainability through a stakeholder-driven approach. SWS is convening learning alliances and involving them in experiments and pilots to find ways to strengthen different aspects of the system.

The overall objective identified by SWS and learning alliance partners, including local governments and the USAID Lowland WASH Activity, is to shift the system toward more focus on O&M. This is expected to improve functionality and service levels while also helping the woredas make a case, based on strong asset performance, for higher investments in new and extended water supplies.

SWS has identified opportunities to develop capacities and pilot improved mechanisms for O&M in both locations, through follow-up bilateral and joint meetings with local government and learning alliance partners. In each woreda, an integrated pilot is proposed with a focus on asset management as well as institutional arrangements for maintenance, financing of maintenance, and use of monitoring data to guide asset management.

Coordination is another critical weakness. SWS has already supported local stakeholders to set up learning alliance platforms to improve coordination, collaboration, and learning — an integral component of the project's theory of change and design. ONA provides a mechanism to track changes in network strength against the baseline described in this report.

Other recommendations for systems-strengthening activities include capacity building for WASHCo operations, advocacy, and influencing activities.

The building block framework sparked feedback and discussion about the system among stakeholders. It is intended to be updated regularly, performed rapidly on an annual basis and fully toward the end of the project. Additionally, it is recommended to deploy tools focused on assessing actors' behaviors in combination with the next ONA and development of network strengthening plans. Iteration of factor mapping at the same relatively high level (factors influencing sustainable services) is not expected to add much value, but participatory and group model building will be explored further within the context of sub-systems where innovation and pilots are focused.

Supporting Reports and Other References

Supporting Reports

The following reports were used to inform the overall synthesis.

Adank, M., & Hailegiorgis, B. 2018. *Baseline Assessment: Water Service Levels Report.* Sustainable WASH Systems Learning Partnership (Ethiopia) report. IRC: Addis Ababa.

Adank, M., Dimtse, D., & Hailegiorgis, B. 2018. *Baseline Assessment: Rural Water Sustainability Check Report.* Sustainable WASH Systems Learning Partnership (Ethiopia) report. IRC: Addis Ababa.

Guttentag, M. 2018. *Baseline Assessment: Organizational Network Analysis Report.* Sustainable WASH Systems Learning Partnership (Ethiopia) report. LINC.

Huston, A., & Moriarty, P.B. 2018. Understanding the WASH system and its building blocks: building strong WASH systems for the SDGs. IRC WASH working paper. Available at https://www.ircwash.org/resources/understanding-wash-system-and-its-building-blocks

Pearce, J., & Abera, M. 2018. *Baseline Assessment: Rural Water Asset Inventory Report.* Sustainable WASH Systems Learning Partnership (Ethiopia) report. IRC: Addis Ababa.

Valcourt, N. 2018. *Factor analysis* (forthcoming) Sustainable WASH Systems Learning Partnership (Ethiopia) report. Boulder: University of Colorado Boulder.

Veenkant, M., Fonseca, C. & Kebede, A. 2018. *Baseline Assessment: Rural Water Life-Cycle Costs Analysis (LCCA) Report.* Sustainable WASH Systems Learning Partnership (Ethiopia) report. IRC: Addis Ababa.

Other References

IRC. 2017. Learning visit to Uganda on rural water supply maintenance. Report of a learning visit by USAID Sustainable WASH Systems Learning Partnership, USAID Lowland WASH Activity, and the Ministry of Water, Irrigation and Electricity [online]. Available at www.ircwash.org

IRC. 2018. Baseline data (building blocks). Unpublished Excel scoring sheets.

Annex I: Assessment of Rural Water Service Delivery in South Ari and Mile by Building Block

The scoring scale is 1 (very weak) to 5 (very strong).

Building Block	South Ari	Mile
Institutions		
Required institutional set-up for different service delivery models (particularly for service authority and service provider roles) exists.	4	2
All required staff positions of service authority are filled.	2	3
Service authority receives regular back-up or support from higher levels of government.	2	2
Service authorities and service providers have formal relationships addressing accountability (contracts, performance agreements, authorizations).	2	2
Average	***2.5***	***2.8***
Legislation		
By-laws and ordinances for service delivery arrangements are in place.	2	1
National sector legislation is known by local stakeholders.	2	2
By-laws for hygiene and environmental protection are in place.	1	1
Average	***1.7***	***1.3***
Finance		
Nationally defined mechanisms for financing CapEx are in place.	1	1
There is sufficient absorption capacity for and a manageable gap between budget and disbursements to follow planning of service development.	4	3
Nationally-defined mechanisms for CapManEx and ExpDS are used.	1	1
Nationally-defined subsidy mechanisms (block tariffs, cross-subsidies between providers, other) are used.	2	3
WASH is prioritized in local planning (e.g., with earmarked budget).	3	3
Average	***2.2***	***2.2***
Planning		
District-level multi-year WASH targets link to national targets.	3	3
Plans take into account equity (access) issues.	1	1
Plans take into account capital investment, direct support, and capital maintenance to ensure sustainability of service.	2	2

Plans identify costs and sources of financing.	1	1
Consultative planning process involves key stakeholders.	1	1
Average	***1.5***	***1.5***
Infrastructure Development		
Project delivery models, procurement and implementation manuals, and procedures for capital investment projects (drinking water infrastructure) are followed.	4	4
Mechanisms for due diligence, regulation, and procurement exist.	4	4
Sufficient capacity for conducting due diligence, enforcing regulation, and following procurement and implementation manuals exists.	1	1
Average	***1***	***1***
Infrastructure Management		
Asset ownership by service authority and service providers is clearly defined, following national legal framework.	1	1
Inventory of water infrastructure assets, including age and current condition, exists.	1	1
Service authority fulfills its role in managing assets.	1	1
Service authority supports service providers in O&M.	2	2
Average	***1.3***	***1.3***
Monitoring		
Agreed national monitoring system for service delivery models is used.	1	1
Monitoring system covers entire district (all communities, all service providers).	2	2
Service provider performance data are available.	1	1
Monitoring data are regularly updated.	2	1
Average	***1.5***	***1.3***
Regulation		
Entity responsible for regulation sets (1) tariffs and tariff calculation guidelines, (2) service-level requirements, and (3) rules that protect consumers.	1	1
Entity responsible for regulation uses monitoring data to guide performance management and applies effective enforcement (incentives, penalties).	1	1
Platform (e.g., civil society organization) exists to inform and consult with citizens on service delivery issues.	1	1
Mechanism (e.g., civil society organization) exists for citizens to hold service providers to account.	1	1
Average	***1***	***1***

Learning and Adaptation		
Institutionalized learning platform (e.g., district stakeholder platform, thematic working group, resource center, coordination platform) exists at district level.	1	1
Learning platform is representative of sector stakeholders.	1	1
Deliberations of learning platform are regularly documented and made available to stakeholders.	1	1
Reflections from learning platform are taken up in local policies and strategies (e.g., through targeted actions).	1	1
District learning platform is linked to national level.	1	1
Average	***1***	***1***
Water Resources Management		
Service providers in district plan and conduct source protection and preservation activities (e.g., water safety and security plans).	1	1
Service providers and/or service authority engage with water resources management decision-making at catchment or basin level.	1	1
Service providers and/or service authority considers water resource availability, variability (including vulnerability to extreme events), and effects on receiving water bodies when developing and expanding infrastructure.	1	1
Mechanisms exist for managing conflicts and finding synergies between water uses (drinking water, irrigation, livestock) to optimize system performance.	2	1
Water resources management instruments (e.g., abstraction permits, abstraction fees, disposal license) are used.	1	1
Average	***1.2***	***1***

Annex II: Sustainability Check Framework and Results

Community-Managed Schemes: Water Service Provider Scores

	South Ari	Mile
Number of sampled schemes with WASHCos or WUAs	**29**	**12**
Percent of rural water schemes with a WASHCo or WUA	**67%**	**46%**

	Indicator	0	25	50	75	100	Average score	% schemes meeting BM	Average score	% schemes meeting BM
SP-I-1	***Well-composed and trained WASHCo or WUA***	No WASHCo or WUA or without 3 key positions filled or never meets	WASHCo or WUA with all three key positions filled	….and trained	…less than a year ago	….and meeting at least monthly	30	60%	0	0%
SP-I-2	***By-laws and legal status of the WASHCo or WUA***	No WASHCo or WUA with by-laws		WASHCO or WUA has by-laws		...and legal status (established and registered with regional water bureau)	67	67%	0	0%
SP-I-3	***Election of WASHCo or WUA by entire community***	No WASHCo or WUA with members elected by entire community				WASHCO or WUA members elected by entire community.	67	67%	46	46%
SP-I-4	***Women representation in WASHCo or WUA***	Less than 50 percent of the WASHCo or WUA members are female		At least 50 percent of the WASHCo or WUA members are female		….and there are at least two women in the three key decision-making positions (chair, treasurer, secretary)	1	2%	12	15%
SP-F-1	***User payment and tariffs***	No user payment	Ad hoc basis (when the system breaks down)	Annual fees	Monthly (or weekly) fees	Tariffs by unit of used water	33	43%	20	19%
SP-F-2	***Revenue or standard annual***	< 0.5	at least 0.5	at least 1	at least 1.25	at least 1.5	22	32%	0	0%

	expenditure balance									
SP-F-3	***Financial management of WASHCo or WUA***	No WASHCo or WUA which keeps financial records	Simple financial records	Up-to-date financial records and a dedicated account in a financial institution	….and records are shared with community on a regular basis	…. according to their by-laws	38	49%	2	0%
Sp-Inf-1	***Spare part supply***	Minor maintenance spare part supply takes more than 1 month	Minor maintenance spare part supply takes more than 3 days	Minor maintenance spare part supply within 3 days	…and major spare part supply within a week	…and major spare part supply within 3 days	40	55%	23	38%
SP-Inf-2	***Routine (preventive) maintenance***	Not done	Done, but irregularly	Done at least annually	Done at least monthly	Done at least weekly	47	62%	0	0%
SP-WR-1	***WASHCo or WUA water safety plan***	There is no water safety plan		There is a water safety plan		Water safety plan has been implemented	0	0%	0	0%
Average							**34**	**44%**	**10**	**12%**

Community-Managed Schemes: Service Authority Scores

	Indicator	0	25	50	75	100	South Ari	Mile
SA-I-1	***Woreda water office***	Woreda water office (or department) has less than 75% of required staff	Woreda water office (or department) has more than 75% of required staff	... and are sufficiently trained in WASH planning, management, and monitoring	….and receive some support from zonal or regional level	….and receive adequate support from zonal or regional level	0	75
SA-I-2	***Support to WASHCos***	None of the WASHCos or WUAs receive support and back-up from the woreda water office	Less than half of WASHCos or WUAs receive technical support within 3 days	At least half of WASHCos or WUAs receive technical support within 3 days	At least 75% of WASHCos or WUAs receive technical support within 3 days	All WASHCos or WUAs receive technical support within 3 days	50	25
SA-I-3	***Presence of WASH artisans in the woreda***	No WASH artisans or other private sector support for O&M in the woreda	WASH artisans in the woreda, but less than half of the number of kebeles	At least half of the number of the kebeles	All kebeles have at least one trained artisan	All kebeles have at least two trained artisans	25	25
SA-F-1	***Woreda water office annual recurrent budget***	Operational budget < 12.5 ETB per person per year	Operational budget 12.5-25 ETB per person per year	Operational budget 25-50 ETB per person per year	Operational budget 50-75 ETB per person per year	Operational budget > 75 ETB per person per year	0	25
SA-F-2	***Woreda water office logistics***	No motorcycles available to woreda water office	One motor bike available to woreda water office	Two motor bikes available to woreda water office	Three motor bikes available to woreda water office	More than three	25	25
SA-P-1	***Woreda-level plan***	There is no WASH strategic plan, nor a woreda annual plan	There is a WASH annual plan but no (multi-annual) strategic plan	There is a woreda (multi-annual) WASH strategic plan and a WASH annual plan	…which has been costed for both capital investments as well as recurrent costs (CapManEx and support costs)	…and sources of funding have been identified.	100	100
SA-inf-1	***Roles and responsibilities related to major maintenance***	No clarity on asset ownership	Clarity on asset ownership	…and clearly defined roles and responsibilities related to major maintenance and rehabilitation	…. with all (WASHCo, woreda, zone, region) fulfilling roles and responsibilities accordingly	….as documented in local laws and regulations	0	0
SA-inf-2	***Scheme inventory and maintenance plan***	Woreda has never done inventory of schemes	Woreda has done inventory of schemes, but more than a year ago	Woreda has conducted scheme inventory within last year	…which includes functionality status and age of all schemes	… and has developed a maintenance plan	75	100

SA-inf-3	***Checks on construction quality***	Build quality is checked for some schemes	Build quality is checked for all schemes	... and action is taken when faults are observed	…including for NGO-implemented schemes	…informed by general guidelines	50	0
SA-M-1	***Monitoring of O&M and WASHCo performance***	The woreda water office staff do not monitor rural water services on ongoing (at least annual basis)	The woreda water office monitors water services on at least an annual basis	….and uses data to inform planning and corrective action	…and monitors performance of WASHCos	…and uses data for providing targeted support to WASHCos	50	50
SA-R-1	***Tariff and performance regulation***	The woreda water office has not set tariff regulations, nor does it provide guidelines for tariff setting to the WASHCos	The woreda water office provides guidelines for tariff setting to the WASHCos but does not regulate tariffs	The woreda water office provides guidelines for tariff setting to the WASHCos and regulate set tariffs	… and has set performance benchmarks for service providers	… and enforced the service provider benchmarks	0	0
SA-L-1	***Coordination at woreda level between stakeholders (government, NGOs etc.) involved in rural water supply***	No coordination structures	Coordination structure	…. meeting on at least a quarterly basis	… with agreed actions based on meeting	….and a joint annual plan	0	0
Average service authority score							31	35
Percent of service authority BMs met							**42%**	**33%**

Utility-Managed Schemes: Water Service Provider Score

	Indicator	0	25	50	75	100	Gazer	Mile
SP-I-1	***Utility organization***	No utility	Utility in place	… with three core departments	… and signed performance agreement	… which is implemented	25	50
SP-I-2	***Town water utility staffing***	< 75% of required staff	≥ 75% of required staff	…. and all trained in WASH planning, management, and monitoring	… and equipped with required guidelines	… and perform quarterly monitoring	25	0
SP-I-3	***Staff productivity***	> 20 staff per 1,000 connections	15 to 20 staff per 1,000 connections	10 < 15 staff per 1,000 connections	7 < 10 staff per 1,000 connections	< 7 staff per 1,000 connections	25	0
SP-F-1	***Cost recovery***	Operational cost recovery not met	Operation cost recovery	…. and 20% reserve	… and fulfilling on lending agreement.	Full cost recovery	0	25
SP-F-2	***Effective financial management***	Single entry accounting but incomplete records	Single entry with complete financial records	Double entry accounting system with annual income statement	… and balance sheet	… and audited	0	0
SP-f-3	***Effective billing and collection***	No consumption-based billing	Manual billing with 60 days or more backlogs	Manual billing with less than 60 days backlog	Computerized billing with no backlog and > 80 collection rate	Computerized billing with no backlog and > 95 collection rate and < 10 percent zero reading	50	50
SP-P-1	***Urban poor get affordable water***	No public taps and no shared yard connections	Insufficient public taps and shared yard connections in the town	Sufficient public taps in the town and shared yard taps for urban poor	… and provision of credit facility for urban poor for private connections	… which are all repaid within 1 year	25	25
SP-Inf-1	***Effective asset management***	No (or incomplete or outdated) asset registry	All utility assets registered	… and accumulated depreciation calculated	… and condition identified	… and replacement plan developed	0	25
SP-infr-2	***Effective maintenance system in place***	Utility has no capacity to execute simple repairs	Utility has capacity to execute simple repairs but does not do so within 3 days	Utility can execute all repairs (except major electronic mechanical maintenance) within 3 days	… and executes periodic (preventive) maintenance	… on monthly basis	0	50
SP-infr-3	***Adequate supply of spare parts for minor maintenance (pipes, fittings, etc.)***	No spare parts available	Spare parts available but takes more than 3 days	Spare parts available within 3 days	Spare parts available within day	Store available with adequate pipe and fittings available for a month requirement or there is private sector which	75	75

						delivers within 24 hours		
SP-infr-4	***Non-revenue water***	Non-revenue water is not known	> 20%	< 20%	< 20%, action developed for reducing on non-revenue water	< 10%, and action developed for reducing on non-revenue water	0	0
SP-infr-5	***Water quality management and disinfestation***	No disinfection of reservoir(s)	Disinfection of reservoir(s) but less often than monthly	Monthly disinfection of reservoir(s) by qualified operator	... and intermittent quality check (chemical, bacteriological, physical) on network	... and periodic (at least monthly) quality check (chemical, bacteriological, physical) on network	0	25
Average service provider score							19	27
Percent of service provider BMs met							17%	33%

Utility-Managed Schemes: Water Service Authority Scores

Service authority scores		0	25	50	75	100	Gazer	Mile
SA-I-1	***Presence of water board***	No water board established by regional proclamation	Water board established by regional proclamation	… and receives regular training and support when needed	… and with guidelines	… and meeting monthly	0	25
SA-I-2	***Sufficient capacity at woreda or zonal or regional level to support town water utilities***	Woreda or zone or region has no dedicated department or section for supporting town water utilities	Woreda or zone or region has dedicated department or section for supporting town water utilities, but not adequate staff	Woreda or zone or region has dedicated department or section for supporting town water utilities, with adequate staff	… and logistics and budget	… and systems (guidelines, etc.)	0	25
SA-I-3	***Effective provision of technical support to the town water utility***	There is no technical support to the town water utility	There is some technical support to the town water utility, but it generally takes more than a week to receive	Technical support to the town water utility is generally provided within a week	Technical support to the town water utility is generally provided within 3 days	Technical support to the town water utility is generally provided within a day	0	75
SA-P-1	***Town master plan***	No annual water supply plan and no town master plan that includes water supply	Annual water supply plan	… and multi-annual town master plan that includes water supply	… which has been costed for both capital investments as well as recurrent costs (CapManEx and support costs)	… and sources of funding have been identified	0	0
SA-L-1	***Coordination at town level between stakeholders involved in town water supply***	No coordination structures	Coordination structure	… meeting on a monthly basis	… with agreed actions based on meeting	… and a joint annual plan	0	0
SA-WR-1	***Catchment management system in place***	No catchment management plan	Catchment management plan in place	… which is partially implemented	… which is fully implemented	… and regularly monitored	0	0
Average service authority score							0	21
Percent of service authority BMs met							0%	17%

To learn more about the Sustainable WASH Systems Learning Partnership, visit:
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