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SUSTAINING RURAL WATER SERVICES IN ETHIOPIA: RURAL WATER SERVICE LEVELS REPORT

USAID SUSTAINABLE WASH SYSTEMS (SWS) LEARNING PARTNERSHIP CONCEPT I (ETHIOPIA)

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SUSTAINING RURAL WATER SERVICES IN ETHIOPIA: RURAL WATER SERVICE LEVELS REPORT

Prepared by:

This baseline assessment report on rural water service levels in Mile, Afar and South Ari, SNNPR, is one of a series of reports on different baseline studies and systems analyses in Ethiopia for the Sustainable WASH Systems Learning Partnership.

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ABREVIATIONS

CSA	Central Statistical Agency
DHS	Demographic Health Survey
DW	Deep Well
ESS	Ethiopia Socio-Economic Survey
FDRE	Federal Democratic Republic of Ethiopia
GTP	Growth and Transformation Plan
HH	Household
JMP	Joint Monitoring Program of World Health Organization and UNICEF
JSI	John Snow International
Lpcd	Liter per capita per day
ml	milliliter
MoWIE	Ministry of Water, Irrigation and Electricity
mpn	Most Probable Number
OWNP	One WASH National Program
PMA2020	Performance Monitoring & Accountability 2020
PT	Public Tap
SDG	Sustainable Development Goal
SEUHP	Strengthening Ethiopia's Urban Health Program
SNNPR	Southern Nations, Nationalities and People's Region
SW	Shallow Well
SWS	Sustainable WASH Systems partnership
USAID	U.S. Agency for International Development
WASH	Water, sanitation and Hygiene
WASHCO	Water, Sanitation and Hygiene Committee
WHO	World Health Organization

EXECUTIVE SUMMARY

This report uses the data from an asset inventory (Pearce et al., 2018) to estimate the level of services provided in the urban and rural areas of the two focus woredas of Sustainable WASH Systems learning partnership in Ethiopia, South Ari (SNNPR) amd Mile (Afar). Service levels are assessed using different available approaches. These include the JMP water ladder, which differentiates between safely managed services, basic services, limited services and unserved, and using national norms and standards as set out in Ethiopia's first and second Growth and Transformation Plan (GTP-1 and GTP-2). The levels of service provided by the two main service delivery models, community-managed schemes and utility-managed schemes, are separately assessed.

Assessing the level of service provided in the two woredas based on the available data proved to be a challenge. As no household survey was conducted as part of the baseline assessments, getting good insight into the proportion of people with access to unimproved and improved services, both on (self-supply and household connections) and off (communal water supply) premise is difficult. The assessment has shown that the estimated proportion of households with access to basic water services (as per JMP definitions) is low in both Mile and South Ari, especially in the rural areas. The estimated proportion of households with water services in line with GTP-1 and especially GTP-2 norms is very low as well. This was especially due to the low levels of water use quantities. Accessibility in terms of distance was less of a challenge for people with access to improved water supply.

Focusing on community-managed water schemes shows considerably lower levels of functionality, reliability and quality in South Ari than in Mile. The proportion of population using community-managed water supply in line with GTP-2 quantity norms was very low for both woredas.

Focusing on utility-managed water supply, as found in South Ari's capital Gazer and the Mile woreda towns Mile and Andale, the proportion of households accessing water services in line with GTP quantity norms was also found to be very low. This analysis further showed low levels of reliability of water supply and non-functionality and abandonment of public taps. A bit less than a quarter of households was found to have access to piped water supply on premise in Gazer and Mile.

The report concludes that considering the current low service levels in the two woredas, going towards achieving the SDGs and ensuring the provision of at least basic water services for all in the two woredas, will require huge efforts in increasing coverage of water schemes, increasing services levels and ensuring sustainable service provision.

INTRODUCTION

This report was prepared as an input to the Sustainable WASH Systems Learning Partnership which is focused on testing approaches to strengthen WASH systems and improve WASH services delivery. In this case, systems are referred to not as the physical water supply facilities such as wells and pipes, but rather the wider enabling environments for service delivery. These cover multiple necessary conditions for sustainable services delivery from financing to infrastructure and monitoring.

The two woredas involved in the study were South Ari in the SNNP Region and Mile in the Afar Region (Figure 1). The projected populations of South Ari and Mile are approximately 280,000 and 118,000 respectively (based on CSA, 2013).Rural water services in both woredas depend on voluntary, village-based Water, Sanitation and Hygiene Committees (WASHCOs) managing facilities under a community management model. In South Ari, wells with hand pumps and springs tap into shallow groundwater, whereas in Mile, there are more complex facilities often accessing deep groundwater and reliant on motorized pumping.

Figure 1: Location of South Ari and Mile woredas.

USAID SUSTAINABLE WASH SYSTEMS LEARNING PARTNERSHIP

The SWS Learning Partnership is a global U.S. Agency for International Development (USAID) 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, it emphasises partnership and learning for catalytic change in the WASH sector. Coordinating and facilitating interactions amongst 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 'concept' teams. In Uganda and Ethiopia, Concept 1 is led by IRC, working with Tetra Tech and LINC. With other stakeholders, Concept 1 is developing and testing a structured approach to understanding, engaging with and strengthening decentralized woreda (district) and small-town systems for WASH service delivery. Learning alliances that gather local stakeholder seek to provide a safe space for innovation. Comprehensive systems analyses are expected to provide a basis for action research experiments – joint testing of potential improvements involving implementers and researchers – to find new solutions to service delivery and sustainability challenges. Emphasis is on strengthening the WASH service delivery system as a whole, 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 the targeted woredas and small towns. At regional and national levels, Concept 1 seeks to influence the country's wider WASH sector agenda with tools and approaches applied beyond the focus woredas and small towns.

Concept one in Ethiopia 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, and a separate report by Tetra Tech is focused on urban sanitation. Concept 1 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 understanding of their WASH service delivery system and execute a shared learning and action agenda. It is expected that locally driven innovation will result in better solutions to challenges and changes that increase the sustainability of WASH services.

During year one, with in-country activities starting in January 2017, a strategic partnership was developed with the USAID Lowland WASH Activity led by AECOM and involving the International Rescue Committee and CARE as implementing NGO partners. The USAID Lowland WASH Activity is working in challenging lowland environments in Afar, Somali and SNNP regions to develop, rehabilitate and sustain water supplies and improve sanitation. The partnership provides an opportunity for synergies between the systems-strengthening and learning activities of SWS, and the implementation of a package of construction, rehabilitation and improved maintenance for rural water supply schemes.

Two rural woredas where the USAID Lowland WASH Activity operates were selected for SWS rural water supply activities: South Ari, part of South Omo Zone in the Southern Nations, Nationalities and Peoples Region (SNNPR) (south-western Ethiopia), which relies heavily on hand pumps and springs, and Mile, in the Afar Region (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 only in some small towns.

THIS REPORT

The objective of this report is to present a clear picture of the current water supply realities in South Ari and Mile woredas. The report provides detailed information on service levels in the urban and rural parts of South Ari and Mile woredas with analysis against the different criteria and methods related to the global (SDG) and national goals (GTP1 and 2). Key information from this report is used in a summary report that describes the local systems for water services delivery in the woredas (Hailegiorgis et al., 2018).

METHODOLOGY

SERVICE LEVELS

There are different conceptual and methodological approaches to determine the provided and accessed level of service. The Joint Monitoring Program of WHO and UNICEF (JMP) assesses service levels by differentiating between safely-managed services (improved water services on premise, available when needed, without contamination); basic services (improved water services within 30min round trip); limited water services (improved water services which take longer than 30 min round trip to access) and unimproved water services (WHO, 2017). In order to determine service levels according to this framework, JMP applies regression analysis, mostly using data from nationally representative household surveys (e.g. the Ethiopia Socio-Economic Survey (ESS), Performance Monitoring & Accountability 2020 (PMA2020) and Demographic Health Survey (DHS)). In the absence of representative woreda-level household survey data, we use the data from a detailed asset inventory (Pearce et al., 2018) to make an approximation of the levels of service provided as per the JMP definitions.

In its Growth and Transformation Plans (GTP-1 and GTP-2), the government of Ethiopia sets norms and standards related to water service levels, differentiating between rural and urban water services, as summarized in Table 1. A key difference in GTP-2 is the raise of the minimum service level for water supply access from the level set under GTP-1. The goal of GTP-2 (2016-2020) is to ensure universal access in line with GTP-1 norms and access to services in line with GTP-2 norms for 75% of the population (FDRE, 2015).

Table 1: GTP-2 normative service levels (Source: Compiled from FDRE (2015))

Category	Population	Water quantity		Accessibility		Water quality	Reliability
		GTP1	GPT2	GTP-1	GTP2	GTP-1 and GTP2	GTP2
Rural	<2,000	15 lpcd	25 lpcd	Within 1500m	Within 1000m	In line with water quality standards of WHO, supplied by schemes labelled as "improved" by Joint Monitoring Program (JMP) of UNICEF and WHO	-
Category 5 town	2,000- 20,000	20 lpcd	40 lpcd	Within 500m	Within 250m		Uninterrupted for at least 16 hours per day
Category 4 town	20,000 - 50,000		50 lpcd				
Category 3 town	50,001 - 100,000		60 lpcd				
Category 2 town	100,001 - 1 million		80 lpcd				
Category 1 town	> 1 million		100 lpcd				

In addition to the above-mentioned indicators which are part of the JMP and GTP assessments, the assessment made of the service level of these main service delivery models includes assessment against the following indicators:

- Functionality: functionality of water points was assessed based on whether water flows from the water point at the time of checking site visit.[1]
- Reliability: GTP-2 standard sets the standard as uninterrupted services of at least 16 hours per day in urban areas. The One WASH National Program (OWNP) M&E framework mentions that all public fountains and household connections should be functioning at least 6 hours per day for at least 6 days a week (which is 85% of the days in the year)[2]. As GTP-2 does not set a reliability norm for rural water supply, this assessment uses the proportion of rural water points which are functional for at least 85% of the days in the year as an indicator for point source reliability.
- Water quality: WHO guidelines (WHO, 2004) and JMP (WHO, 2017) state that water should be free from Fecal Coliform Bacteria contamination. However, for this assessment we will regard an E. coli count of less than 10MPN per 100ml as acceptable, as this is considered to present an intermediate risk/probably safe.
- Assessing the proportion of people served

[1] The ONEWASH National Program monitoring framework differentiated between functioning, functioning but faulty, not functioning, abandoned (p10).

[2] Based on key performance indicator (KPI) from the One WASH National Program monitoring framework, town water supply should be more than 6 hours for more than 5 days per week. This implied the system should be providing water services at least 6 days a week, or 86% of the days in the year. (p68)

Different methods can be used to assess proportion of a population with access to or using water services at different levels. The easiest and most accurate method is analyzing household access to water services based on household survey of randomly selected households in an area.
In the absence of representative household survey data, an estimate can be made based on asset inventory data. If the estimated number of households served per scheme has been recorded for each scheme as part of an asset inventory, the estimated population served can be calculated by multiplying the number of households with the average household size (commonly 5 people per household). However, this requires reliable estimated on the number of households served by each scheme, which can be a challenge.
Alternatively, the population served can be assessed based on the number of schemes mapped during the asset inventory multiplied by assumed (maximum) number of people served per scheme. However, this method is only as good as the data used in deriving the estimated numbers per scheme type. Table 3 shows the variation in assumed maximum number of people per scheme.

Table 2: Number of maximum beneficiaries per scheme

Type of Scheme	ONE WASH National Programme Document (FDRE, 2013)	One WASH Programme Document phase II – National standard for GTP-1 (FDRE, 2018)	One WASH Programme Document phase II – National standard for GTP-2 (FDRE, 2018)
Dug well with Indian Mark II/Afridev Pump	270	270	160
Shallow borehole with hand pump	500	500	250
Spring at a spot	350	350	200
Shallow borehole with submersible pump	1500	1500	1450
Spring with piped scheme	4000	4000	3000
Deep Borehole with Piped Scheme	3500	3500	2000

This method is particularly unsatisfactory for piped schemes, which can vary enormously in size and numbers of water points or connections[3]. Therefore, for piped schemes this report instead assesses the estimated number of people served based on the number of access points (public taps and household connections), assuming 5 people per household connection and 500 people per public tap (in line with the maximum number of people per point source (shallow well with handpump) as indicated in the table above. To assess the (maximum) number of people served by point sources (dug wells with handpumps, shallow boreholes with handpumps, spring on spot), we have used the 2018 One WASH National Program Document GTP-2 estimates of people served per scheme.
When assessing the number of people served in an area based on the number of schemes and the (maximum) number of people served per scheme, the potential number of people served may exceed the actual number of people in an area. In order to correct for that, for South Ari, where kebele-level population data was available, the assessment was done at kebele level, with the kebele population size as the maximum number of people served and aggregated to woreda level.

URBAN – RURAL POPULATION

JMP and GTP differentiate between provided services in urban and rural areas. Urban areas are defined in Ethiopia as settlements with a population of at least 2000 people. However, the asset inventory differentiates between urban and rural based on the nature of the kebele in which schemes can be found.
According to 2017 population projection (CSA), the total population of South Ari amounts to 279,574 people, with 65,798 (24%) living in urban areas (defined as settlements with a population of at least 2000 people). However, 2017 population data obtained from the woreda, indicates the population living in the four urban kebeles amounts to only 4.6% of the total population. This could imply that some 19% of the population which is considered 'urban', is not found in the four urban kebeles, but in settlements with at least 2000 people found in rural kebeles. For this analysis, we consider the population of the four urban kebeles to be the urban

[3] For example, when assuming that 1 jerry can serves 1 person per day (in line with the GTP-2 norm of 25 lpcd), that a water point can be used continuously to fill jerry cans for 8 hours per day, and that it takes 2 to 5 minutes to fill one jerry can, the number of people served per water point can be estimated to amount to 96 to 240 people. A deep well with distribution system of 3500 therefore equates to 15 to 36 public taps, while a spring with piped scheme service 4000 people would be equivalent to 17-42 public taps. However, in reality, shallow boreholes with submersible pumps and springs with piped schemes in the two woredas has considerably fewer public taps.

population of the woreda. Similarly, the total population of Mille amounts to 117,960 people, with 26,529 (22.5%) living in urban areas.

COLLECTED DATA

The data used in this assessment was collected as part of an asset inventory, which involved mapping of all (communal) water schemes and water points in the woreda and interviews with water users at water points. However, as utility-managed taps were not functional in Mile, data was instead collected from households using yard taps. Table 3 presents an overview of the number of surveys.

Table 3: Number of users surveyed

	Community Managed schemes	Utility Managed piped schemes	Total
South Ari	1288	17	1305
Mille	230	26	156

As part of the asset inventory, user data was collected from user queueing at each water point. This user data that was used for this assessment included data on single leg travel time, queuing time, number of (20 liter) jerry cans collected per day (from the water point), and number of household members. To convert single leg travel time into distance, an average walking speed of 3km per hour was applied.

Data on functionality and reliability was collected from 302 of 319 (95%) community-managed water points (mostly hand pumps) in South Ari and from all 42 community-managed water points (mostly taps connected to motorized wells) in Mile woreda. Data on water quality was collected from 69 (22%) water points in South Ari and 11 (26%) in Mile. Data on water quantity and distance (accessibility) was collected from 1288 water users accessing community-managed point sources in South Ari and 230 water users in Mile. For more information on the asset inventory, please see Pearce and Abera, 2018.

LIMITATIONS OF THE USE OF THE ASSET INVENTORY DATA

The assessment presented in this report is based on assets inventory data. However, the focus on this source of data does present challenges, including:

- The lack of data on household water use quantity from households with access to water from household connections in Gazer;
- Water quality tests on utility-managed schemes were only done for 2 public taps in South Ari. In Mile, no quality tests were done on utility-managed schemes;
- Small sample size of water users depending on utility-managed schemes is small;
- Lack of data on household water sources and water use practices of households using improved non-piped water sources on premise (self-supply).

RESULTS

SUMMARY OF WATER SCHEMES

In South Ari, there are 120 hand pumps installed on shallow and hand-dug wells, most of which (115) can be found in the rural kebeles. In addition, there are 103 protected on-spot springs, which mostly (96) serve the rural areas. The rural kebeles are furthermore served by 12 protected springs and three deep wells with distribution systems, with a total of (at least) 53 public taps and nine household connections. These water facilities are assumed to be managed by a community-based WASH Committees (WASHCOs). The town of Gazer is served by a spring with distribution system with 23 public taps and 314 household connections. This scheme is managed by a Small-Town Utility. In addition, there are two community-managed protected on-spot springs in the town. The three other towns are served by a combination of community-managed hand pumps, protected on-spot springs and springs / deep wells with distribution systems. Overall the woreda is served by 336 communal point sources (including hand pumps, protected-on-spot springs and public taps (PTs) connected to springs or deep wells) and 334 household connections, with a total of 245 schemes. Table 4 provides overview of water schemes in South Ari Woreda.

Mile woreda is served by a mix of water supply schemes serving the rural population, tapping relatively deep groundwater in this arid context: India Mark III hand pumps (16), shallow and deep wells with motorised schemes with distribution networks (7), 1 deep well without distribution network (1), and deep wells with solar pumped schemes (2). These schemes are assumed to be managed by WASHCOs. In addition, there are 3 motorised deep wells supplying the small town (urban) piped scheme of Mile town, with its 790 household connections and 17 public taps. The town of Andale is served by one deep and one shallow well with a piped scheme supplying a total of 4 public taps and 650 household connections. These two piped schemes are managed by small town utilities. Supply in these towns mainly occurs through (joint) household connections, as the public taps are not functioning.

Overall the woreda is served by 63 communal point sources (including hand pumps and public taps) and 1440 household connections, with a total of 31 schemes. Table 5 provides overview of water supply schemes in Mile woreda.

Table 4: Overview of water supply schemes in South Ari

Type of scheme	Urban (small towns)					Total Rural	Total
	Gazer	Mestier	Tolta	Wub Hamer	Total Urban		
Hand-dug well or shallow well with hand pump		2	3		5	115	120
Protected on-spot spring	2	1	1	3	7	96	103
Protected spring with distribution	1 (in rural kebele Zomba, with 23 PTs and 314 HH connections in Gazer)	1 (with 8 PT and 1 HH connections)	2 (1 with 5 PT; 1 with at least 2 PT)	1 (with 9 SP)	5 (Total: 47 PT and 325 HH connections)	12 (10 with 2 to 4 PT; 1 with 9 PT and 2 HH connections; 1 with only institutional connections. Total: 33 PTs)	17 (80 PT, 327 HH connections)
Deep well (borehole) with distribution network		1 (with 6 PT)	1 (with 7 PT)		2 (Total: 13 PTs)	3 (1 with 5 PT in Kayisa; 1 with 7 PT and 5 HH connections in Maytol; 1 with 8 PT and 2 HH connections in Senegal. Total PT: 20; Total HH connections: 7)	5 (33 PT, 7 HH connections)
Total number of sources	**3**	**5**	**7**	**4**	**19**	**226**	**245**
Total number of point sources	**25**	**17**	**20**	**12**	**72**	**264**	**336**
Total number of household connections	**314**	**11**	**0**	**0**	**325**	**9**	**334**

Table 5: Overview of water supply schemes in Mile

Type of scheme	Urban			Rural	Total
	Mile	Andale	Total Urban		
Shallow wells with hand pump	0	0	0	16	16
Deep well point source, motorised	0	0	0	1 (Serayitu SW)	1
Shallow well with distribution system, motorised	0	1 (Andale SW with 1 PT and 430 HH connections)	1 (1 PT and 430 HH connections)	2 (Burtele SW and Aresis SW. Total: 5 PT)	3 (total: 6 PT, 430 HH connections)
Deep well with distribution network, motorised	1 scheme with 3 deep wells (4th Mile DW with 4 PT, unknown HH connections; Lay Mile DW with 4 PT and 226 HH connections; Tach Mile DW with 9 PT and 564 HH connections. Total: 17 PT and 790 HH connections)	1 (Adayitu Adele Deep Well with 3 PT and 220 HH connections)	2 (Total: 20 PT and 1010 HH connections)	5 (Total: 16 PT)	7 (36 PT and 1440 HH connections)
Deep well with distribution network, solar power	0	0	0	2 (Gesyuna leas DW and Hafelu DW. Total: 4 PT)	2 (4 PT)
Total number of sources	**3**	**2**	**5**	**26**	**31**
Total number of point sources	**17**	**4**	**21**	**42**	**63**
Total number of household connections	**790**	**650**	**1440**	**0**	**1440**

RURAL AND URBAN WATER SERVICE LEVELS

Official water supply coverage is very low in both South Ari and Mile woreda, with official coverage figures of 26% and 34% respectively (personal communication with South Ari Water, Mines and Energy Office and Mile Water Office). It was however not clear what these official figures had been based on. Applying different methods of assessing coverage, as described in the methodology, provides coverage figures as presented in table 6 for South Ari.

Table 6: South Ari water supply coverage as per different assessment methods

	Uncorrected		Corrected	
	All schemes	Functioning schemes only	All schemes	Functioning schemes only
Based on number of schemes and maximum number of beneficiaries per scheme	38%	30%	33%	27%
Based on Number of access points and max number of people per access point	27%	20%	24%	19%
Based on estimated number of households as recorded in asset inventory			34%	28%

For further calculations we use and apply the corrected estimate based on number of schemes and maximum number of beneficiaries of functional schemes.

As shown in table 7, the majority of users are within the GTP-2 distance norm and the GTP-2 distance norm. However, only about half are within the JMP norm for basic water services of improved water supply within a 30-minute round trip. The main limitation for users to access safely-managed services in the rural kebeles is the absence of water supply on premise. In urban kebeles is the lack of water supply when needed, with rotation of water supply being practiced, is the limiting factor. In both the rural as well as the urban kebeles, only few households reported to use water qualities in line with GTP-1 and GTP-2 norms.

Table 7: Population served with water supply

	South Ari			Mile		
	Urban	Rural	Total	Urban	Rural	Total
Access: max population served with improved functional (communal) water supply	81%	25%	27%	27%	19%	21%
…. within GPT-1 distance norm	63%	24%	26%	27%	17%	19%
…. within GTP-2 distance norm	46%	22%	23%	27%	16%	18%
… within 30 min round trip (JMP: basic service)	47%	12%	13%	27%	9%	13%
…. with piped on premise	13%	0%	1%	27%	0%	6%
Quality: proportion of water points with acceptable water quality	31% (n=13)	42% (n=59)	40% (n=72)	50% (n=2)	88% (n=25)	85% (n=27)
Availability: proportion of water points which provide water services at least 85% of last month	0% (rotation)	49%	49%	0% (rotation)	76%	41%
Safely managed: On premise, available when needed, free from contamination	0% (determined by availability)	0% (determined by piped on premise)	0%	0% (determined by availability)	0% (determined by piped on premise)	0%

Figure 2 presents an overview of the estimated level of water services in the two woredas based on the JMP norms. It shows a high proportion of the population in both woredas are unserved with improved water services. None of the users has access to 'safely managed' water services, as per JMP definitions.

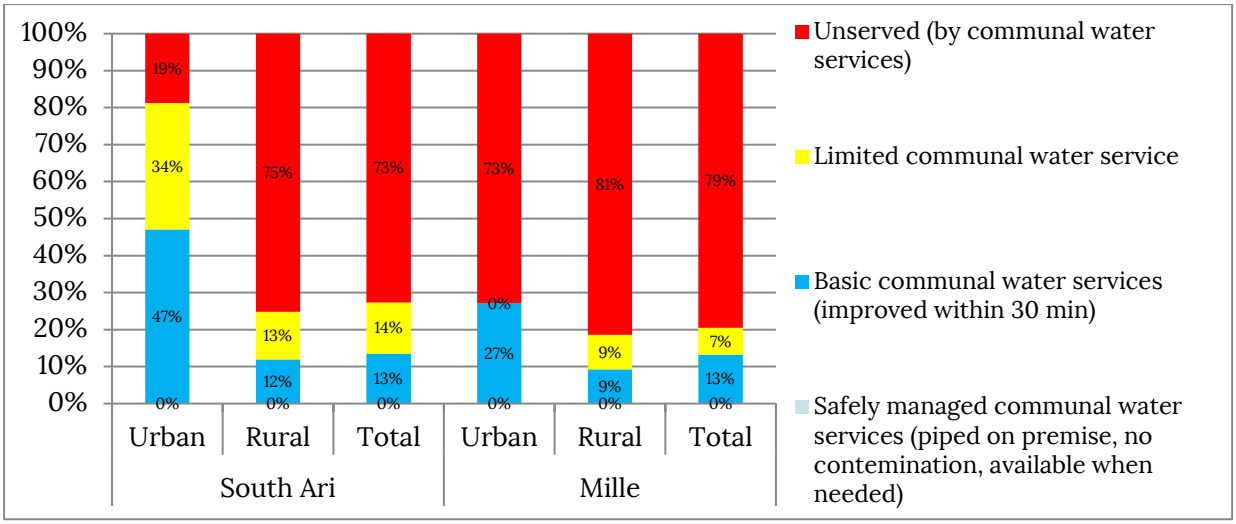

Figure 2: Service levels as per JMP

Figure 3 presents an overview of the assessment of level of service against the GTP-1 and GTP2 norms. It shows that only very few people have access to water services in line with the GTP1 norm (within 15 litres per capita per day within 1.5 km) and less than 1% of people have access to water services in line with GTP2 (25 litre per capita per day within 1 km). Especially access to sufficient water in line with quantity norms is a big challenge.

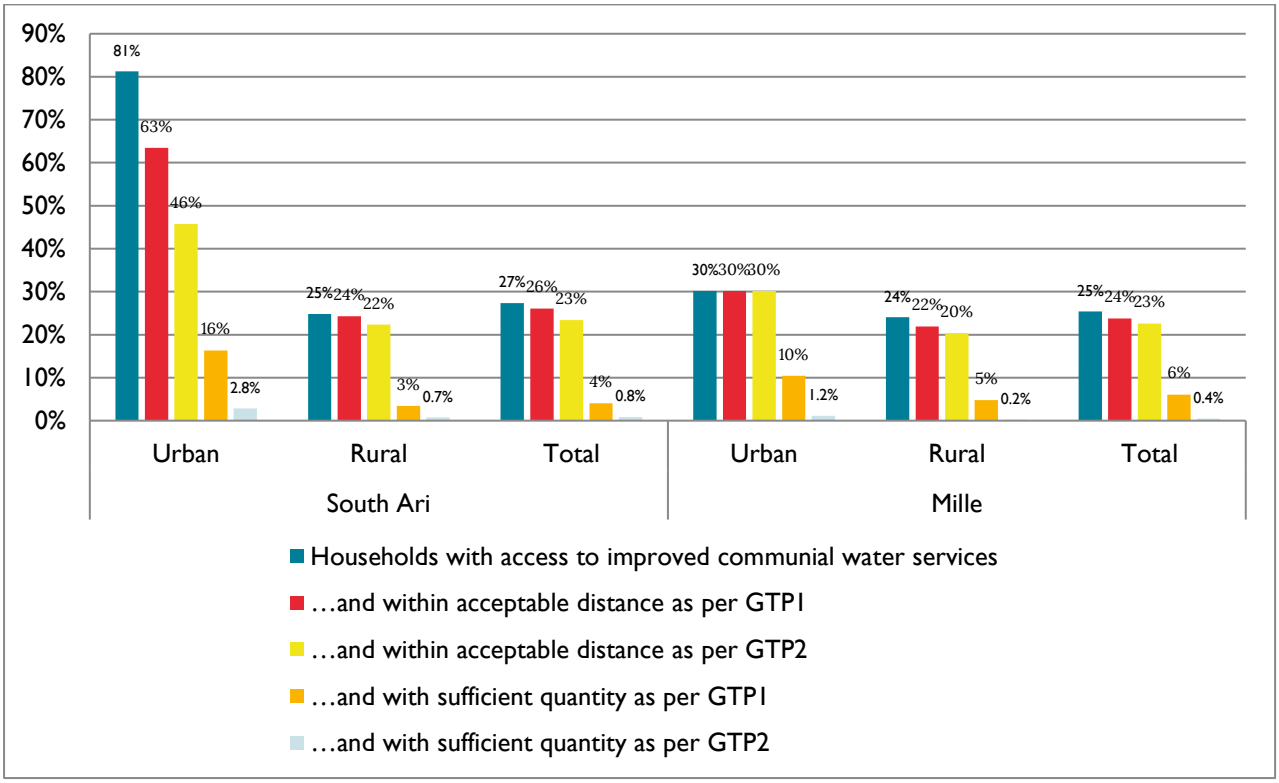

Figure 3: Service levels as per GTP1 and GTP2

COMMUNITY MANAGED SCHEMES

In this section we focus on the level of service provided by "community-managed schemes", i.e. communal water schemes which do not fall under the management of a town water utility. This covers rural, but also some urban areas, served by community-managed schemes.

Table 8 presents the results related to the service levels of the community-managed water points in Mile and in South Ari. In both woredas, the proportion of users which travel an acceptable distance (as per the GTP-2 norm of 1 km) to access the community-managed water points is high.

Functionality and reliability are both considerably higher in Mile than in South Ari. Also, the percentage of water points with acceptable quality is higher in Mille (85%) than in South Ari (40%). The main challenge remains the amount of water extracted and used, with only very few users reporting to use water from the community-managed sources in line with GTP-2 quantity norms (25 lpcd).

Table 8: Water service levels related to community-managed schemes

Service level indicator	Description	South Ari	Mille
Functionality	Functional schemes	69%	88%
	Functional public taps	41%	76%
Reliability	Reliable schemes	56%	77%
	Reliable public taps	23%	76%
Quality	Water points with acceptable quality	40%	85%
Accessibility	Served population within 30-minute round trip	47%	50%
	Served population within GTP-1 distance norm	97%	91%
	Served population within GTP-2 distance norm	85%	85%
Quantity	Served population with water quantity of GTP-1 norm	15%	21.3%
	Served population with water quantity of GTP-2 norm	3.6%	0.9%

UTILITY-MANAGED SCHEMES

This section gives an overview of the level of service provided by utility-managed schemes in South Ari and Mile woreda.

South Ari's capital is the only town in the woreda with a utility-managed piped scheme. The exact population of Gazer town is unknown. According to the asset inventory, some 1287 households reside in the town. With an average household size of 5 people, this brings the total estimated population to about 6,435. There is a grade 5 water utility, which provides water through a piped scheme serving 314 household connections 13 government connections, 6 connections to religious institutions and 23 public taps (of which 7 (30%) are not functional, mainly because of problems in the distribution network). The scheme is supplied by springs located some 5 km from the town. Assuming 5 people per household connection and 200 people per tap, the maximum proportion of people using the scheme is 96%, with 24% of the population with household connections.

In Mile woreda, two utilities managing piped schemes can be found: in Mile town and in Andale in Ledi & Adayitu kelebe. For Mile town, the exact population is not known, but is estimated to amount to about 20,000 people. The grade 4 water utility provides water through 790 household connections and 17 taps. This brings the potential proportion of people served (assuming 200 people per tap and 5 per household connection) to 36%, with 20% with household connections. However, at the time of the asset inventory, none of the public taps were functional. Main reason for this was the fact that users tend to use household connections, either from their own household or from neighbouring households.

With a total projected urban population of the woreda of 26,529, the population of Andale town is estimated to amount to about 6529 people. With 650 household connections and 3 public taps, the potential proportion of people served by the scheme is expected to amount to 59%, with 50% accessing household connections. However, at the time of the asset inventory, none of the public taps were found to be functioning.

Reliability (continuity) of water services and water quantity are big challenges in Gazer and Mile. According to the Gazer system manager, the springs provide more than enough water, but the pipe that is supposed to transport water to the town is too small with lots of leakage points, and the scheme is not adequate to provide water to the town's growing population. Although the scheme was built only about 11 years ago, it is no longer able to meet the increasing demand. Both in Gazer as well as in Mile, water is rotated over segments of the town, with each segment receiving water once every 3-4 days. According to the Mile system manager, the main issue is the limited storage capacity in the system, which was constructed some 20 years ago. The production of the deep wells which supply the scheme has been decreasing and is also insufficient. Main and secondary lines are old, which leads to leakages in the scheme.

The water **quality** sample taken from the spring supplying the Gazer scheme, proved to contain unsafe water. However, the two samples taken from the public tap stands did contain safe water. Unfortunately, no water quality samples were taken from the Mile and Andale schemes.

Accessibility of people using the scheme does not seem to be a big issue. All interviewed tap users in Gazer reported to spend 30 min or less on fetching water (return trip, including queueing and to spend 10 min or less on a single leg trip (500m), but only 41% reported spending 5 min or less (250m). In addition to the 41% of public tap users who spend less than 5 min, the estimated 24% of households with household connections on their premise also spend less than 5 minutes, bringing the total proportion of households spending 5 min or less to 55%.

In Mile, people accessing the utility-managed scheme do so through household connections, either on their own premise, or from neighbours. Travel time is thus below 30 min and the distance is smaller than 250m for 100% of the population depending on the utility-managed piped scheme.

The **amount of water used** in the towns is difficult to assess. In Gazer, people using public taps reported to use an average of 11 lpcd. This is far below the 20 lpcd norm as per the GTP-1 and the 40lpcd norm as per GTP-2. Only one of the 17 interviewed households (6%) using public taps reported to use 20 lpcd. None reported to use at least 40 lpcd. The amount of water used by people with household connections is unknown. As water services are unreliable, household with household connections do not have access to water 24/7, but rather once every 3 to 4 days (if they are lucky). Therefore, we will assume that their actual consumption not higher than, but more or less in line with the consumption of households using public taps[4].

In Mile, the total amount of water provided by the system is estimated to amount to 291,616 litre per year[5], which would amount to some 15 lpcd. The total amount would be sufficient to serve 73% of the estimated population with 20lpcd (GTP-1 norm) or 29% with 50 lpcd (GTP-2 norm). The asset inventory provides data

[4] If all water used was indeed sold, revenues would reflect actual water use and could be used to estimate water use. Annual revenues (2015-2016) amounted to 57,600 birr. Assuming this was all due to sales from household connections (at 6 birr per m3), this would mean sales of only 9,600m^3/year or 4 lpcd. This would be sufficient to supply 20 lpcd (GTP-1) to only 1315 people (20% of the town's population) or 40lpcd (GTP-2) to only 650 people or 10% of the town's population. As reported household water collection from public taps seems to amount to 11 lcpd, it seems fair to conclude that revenues do not reflect water use and hence revenue collection is far from optimal in Gazer town.

[5] This estimate is based on the fact that every day two reservoir of 140m^3 are filled. In addition. A reservoir of 80 m^3 is filled once a week.

on amount of water used by households. The proportion of households using public taps meeting the GTP-1 and GTP-2 quantity norm is 60% and 13% respectively.

Table 9: Overview of service level indicators of utility-managed schemes

Service level indicator		Gazer, South Ari	Mille
Functionality	Functional sources	NA	80%
	Functional public taps	70%	0%
Reliability	Reliable schemes	Not reliable	Rotating service
	Reliable public taps	70%	0%
Quality	Water points with acceptable quality	100%	NA
Accessibility	Served population within 30 min round trip	100%	100%
	Served population within GTP-1 distance norm	100%	100%
	Served population within GTP-2 distance norm	55%	100%
Quantity	Served population with water quantity of GTP-1 norm	6%	35%
	Served population with water quantity of GTP-2 norm	0%	3.8%

CONCLUSIONS AND RECOMMENDATIONS

Assessing the level of service provided in the two woredas against the latest JMP ladder, which include an assessment of safely managed water (which is improved, accessible, on premise and free from contamination) is a challenge. No household survey was conducted as part of the baseline assessments, which makes it difficult to get good insight into the proportion of people with access to unimproved and improved services, both on (self-supply and household connections) and off (communal water supply) premise.

The assessment using the data from the asset inventory has shown that the estimated proportion of households with access to safely managed water services (as per JMP definitions) is very low in both Mile and South Ari, especially in the rural areas. The small proportion of people with access to safely managed water supply is in the rural areas of both woredas and the urban areas of South Ari mostly due to the low proportion of people with access to (piped) water supply on premise. In the urban areas of Mile, lack of reliable water supply (availability) was the main limiting factor.

The estimated proportion of households with water services in line with GTP-1 and especially GTP-2 norms is very low as well. This was especially due to the low levels of water use quantities. Accessibility in terms of distance was less of a challenge for people with access to improved water supply. It should be noted that self-supply has not been included in this analysis.

Focusing on community-managed water schemes shows considerably lower levels of functionality, reliability and quality in South Ari than in Mile. The proportion of population using community-managed water supply in line with GTP-2 quantity norms was very low for both woredas.

Focusing on utility-managed water supply, as found in South Ari's capital Gazer and the Mile woreda towns Mile and Andale, the proportion of households accessing water services in line with GTP quantity norms was also found to be very low. This analysis further showed low levels of reliability of water supply and non-functionality and abandonment of public taps. A bit less than a quarter of households were found to have access to piped water supply on premise in Gazer and Mile.

Considering the current low service levels in the two woredas, going towards achieving the SDGs and ensuring the provision of at least basic water services for all in the two woredas, will require huge efforts in increasing coverage of water schemes, increasing services levels and ensuring sustainable service provision.

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