

Sustainable WASH Systems Learning Partnership

SANITATION IN SMALL TOWNS – DEBRE BIRHAN, ETHIOPIA: BASELINE ASSESSMENT REPORT

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Acronyms

DBWSSE	Debre Birhan Water Supply and Sewerage Enterprise
ETB	Ethiopian Birr
FGD	Focus Group Discussion
FS	Fecal Sludge
FSM	Fecal Sludge Management
HHS	Household Survey
KII	Key Informant Interview
MSS	Municipal Services Sanitation
NGO	Non-governmental Organization
PAE	Public Administration Small and Micro Enterprise
PAH	Public Administration Health
PAR	Public Administration Environment
SCA	Sanitation Cityscape Approach
SDU	Service Delivery Unit
SEUHP	Strengthening Ethiopia Urban Health Project
SFD	Fecal Waste Flow Diagram (also known as Shit Flow Diagram)
SPP	Service Provider Private
SPU	Service Provider Utility
SWS	Sustainable WASH Systems
ULG	Urban Local Government
USAID	United States Agency for International Development
UWSSP	Urban Water Supply and Sanitation Project
WASH	Water, Sanitation, and Hygiene

Glossary

Actors	Stakeholders who directly or indirectly influence the WASH system. This can refer to specific individuals or organizations (e.g., water operators, health extension workers, water committees, non-governmental organizations, and government agencies).
Enabling environment	A set of interrelated sector functions that permit governments and public and private partners to engage in the WASH service delivery development processes in a sustained and effective manner. This includes all the policy, capacity, institutional, and financial frameworks necessary for sustaining and replicating WASH schemes. A positive enabling environment builds the attitudes, capacity, and practices for effective and efficient functioning of organizations and individuals.
Facilities	The physical infrastructure that collects, treats, and distributes water or collects, transports, treats, and disposes of waste (e.g., pumps, pipes, wells, and tanks).
Factors	Any element, aspect, or component of the WASH service system thought to directly or indirectly influence the WASH system (e.g., finances, water resources, policies, and management).
Organizational Network Analysis	A methodology that employs Social Network Analysis for mapping and measuring of connections between organizations.
Stakeholders	Persons or organizations with a vested interest or influence on WASH systems.
Systems thinking	A perspective of seeing and understanding systems as wholes, rather than as a collection of parts, where the outcomes of the system are a result of the complex, dynamic interaction and interdependence of the components (factors) of the system.
Systems tool	A specific activity or form of analysis for extracting information on system properties (e.g., factors, actors, interconnections, and feedbacks) to gain understanding of the causes of system behavior or outputs. Systems tools can include qualitative and/or quantitative approaches to data collection and analysis.
Systems-based approach	An adaptive set of multifaceted interventions that support individual, organizational, institutional, and broader systems change with consideration for processes, relationships, and incentives for performance toward improving effective service delivery.

WASH network	The formal and informal structure of actors and their interconnections (relationships) to one another that influence WASH system sustainability.
WASH services	The outputs of a system that provide affordable access to clean water and safe sanitation, with considerations for monitoring, maintenance, and accountability between consumers, operators, and regulators.
WASH system	All of the social, technical, institutional, environmental, financial factors, actors, motivations, and interactions that influence WASH service delivery within a given context, institutional, or geo-political boundary.

Executive Summary

Purpose

This report presents findings of a baseline assessment of sanitation services conducted in April and May 2018 in Debre Birhan, a town of 113,693 people¹ in the Amhara Region of Ethiopia. This work was carried out under the Sustainable WASH Systems Learning Partnership (SWS), funded by the United States Agency for International Development (USAID) and led by Tetra Tech in partnership with LINC and IRC.

The purpose of the assessment is to understand the sustainability of sanitation services delivery, in particular: (1) the living environment and sanitation service provision, (2) the extent and current operations of the sanitation service delivery environment, (3) the status of the enabling environment for achieving and sustaining city-wide sanitation services, and (4) the nature of relationships between local stakeholders involved in sanitation service delivery.

Methodology

Tetra Tech deployed the Sanitation Cityscape Approach (SCA) to design and frame the baseline and analysis. The SCA tracks indicators across three different “environments” that comprise the local system – the living environment, the service delivery environment, and the enabling environment. This approach also allows for an understanding of the interfaces and relationships between these domains.

LINC led the application of an Organizational Network Analysis (ONA) to understand the nature of the relationships and interactions among local stakeholders involved in delivering sanitation services. The analysis focused on quantifying and visualizing the network structure, and providing a basis for measuring changes.

In addition to a household survey, data collection for the SCA and ONA required engaging a group of stakeholders involved in sanitation service delivery in Debra Birhan through key informant interviews and focus group discussions. Feedback was then solicited from informants on the initial findings and underlying assumptions of the different analyses during a baseline reporting workshop on May 30, 2018.

Key Findings

Living Environment

Four distinct neighborhood typologies were generated (based on housing units, infrastructure, tenure, and neighborhoods), from which appropriate sanitation interventions to increase the sustainability of services can be targeted. Residents identified their top development priorities as rainwater management, streetlights, and roads. Sanitation was listed sixth. The only neighborhood that prioritized sanitation above other development interventions had both a high proportion of tenants and turnover of residents. This suggested a sanitation service model (i.e., well-managed commercial public toilets, shared sanitation,

¹ Central Statistics Agency of Ethiopia 2017 projection. Debre Birhan Municipality estimates a total population of 160,000.

and potentially container-based sanitation solutions) would be more appropriate in this type of setting than a product-model (i.e., toilet upgrades).

Service Delivery Environment

There is no centralized sewer network in Debre Birhan and all sanitation facilities are onsite. Approximately 50 percent of sanitation technologies can be classified as improved facilities, 37 percent as limited, and 12.5 percent as unimproved as per WHO/UNICEF's Joint Monitoring Program 2017 definitions.² A fecal flow analysis revealed only an estimated 18 percent of fecal sludge (FS) generated in Debre Birhan is safely managed until disposal. Moreover, 54 percent, 47 percent, and 6 percent of FS is not safely managed at the containment, emptying, and transport stages, respectively. Half of households surveyed rely on communal latrines (e.g., shared services managed by a group of families). Communal latrines were the most common toilet for tenants, whereas most owners had private toilets. There are four public pay-per-use toilets in the town. The cleanliness and operational level of these facilities is poor. The operators subcontracted by the municipality find it difficult to mobilize investments or maintenance funds with no public budget allowance available. Mechanized fecal sludge management (FSM) services are widely available in Debre Birhan. The town has 10 trucks, two utility and eight private, but only 40 percent of the emptying market is for domestic FS including public and communal latrine blocks. Moreover, some neighborhoods are inaccessible to trucks and subsequently do not receive emptying services. The utility emptying operations focus primarily on FSM for public institutions, while the private sector emptying operations focus on providing daily effluent management for local industries. A 7 hectare disposal site with infiltration trenches is operated by the utility, but the site is overloaded with both fecal and industrial effluent causing multiple management issues including pungent smells and runoff to nearby farms.

Enabling Environment

The enabling environment for FSM services is moderate when compared to the wider sanitation situation in the town. Private sector operators actively participate and the financially sound utility manages the emptying, transport, and treatment portions of the sanitation value chain. Outside of FSM, the wider enabling environment for achieving sustained universal sanitation services, including household and shared toilets (both communal and public), is much weaker. Some significant challenges remain around sector coordination (leadership, collaboration, and oversight) and there are no strategic planning or service-level targets for sanitation. There is also no sector monitoring, no real institutional home, no coordination, and no public finance or budget allocation for shared sanitation, which is a critical part of the urban sanitation puzzle. The comprehensive national Integrated Urban Sanitation and Hygiene Strategy, which assigns the coordination role to the municipality, is not yet acknowledged or operationalized at the town level.

² Accessed at: <https://washdata.org/monitoring/sanitation> (October 11, 2018).

Interactions and Interfaces within the Sanitation Stakeholder Network

The ONA findings identified the nature of the relationships among actors and several key entry points for SWS interventions aimed at sustainability of services and gaps in stakeholder relationships. For example, there is a clear pattern of organizations that tend to make requests and those that tend to receive requests. As expected, requests typically flow up from kebeles (administrative divisions or wards) to town-level organizations. It is also worth noting that kebele governments play a critical role in problem solving at the community level. The ONA findings also show that organizations involved in day-to-day maintenance operations are not integrated into decision-making processes. This has implications for the learning alliances' membership and activities.

I.0 Introduction

I.1 Debre Birhan Context

Debre Birhan has a population of 113,693³ and is in the North Shewa Zone, Amhara Region of Ethiopia, approximately 120 kilometers northeast of Addis Ababa (see Figure I). The city has a well-performing public utility, Debre Birhan Water Supply and Sewerage Enterprise (DBWSSE), which provides emptying services and manages a fecal sludge (FS) disposal site. A scoping visit in August 2017 determined Debre Birhan to be a suitable setting for Sustainable WASH Systems Learning Partnership (SWS) activities because of the town's advanced levels of sanitation services, relative to other similarly sized Ethiopian towns. Additionally, Debre Birhan is targeted in the World Bank's Second Urban Water Supply and Sanitation Project (UWSSP) that began in 2017. Seventy percent of the estimated \$241 million for this project is allocated to sanitation in 22 secondary cities.⁴ The task manager of UWSSP is supportive of collaboration in Debre Birhan and Tetra Tech will work with the utility to ensure activities of the two projects are aligned, to the extent possible.

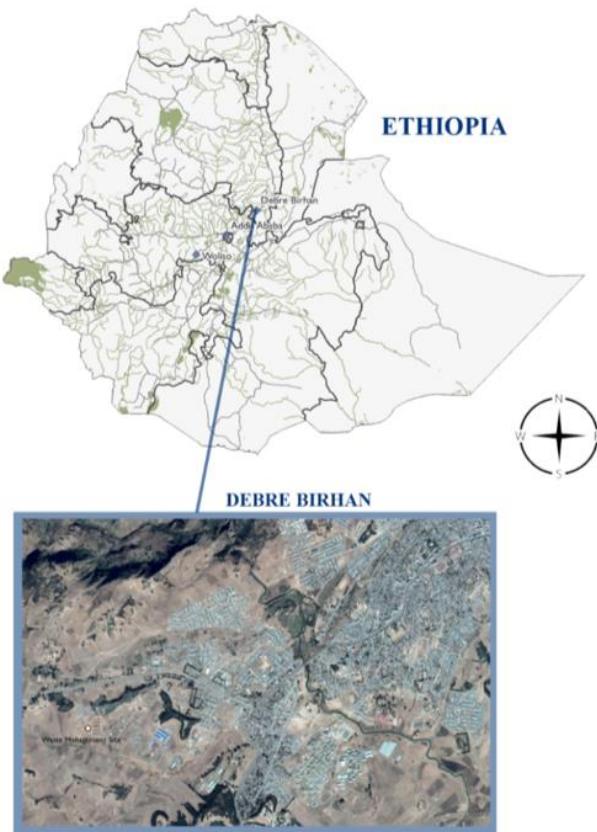


Figure I. Administrative (Regional) Map of Ethiopia

³ Central Statistics Agency of Ethiopia 2017 projection. Debre Birhan Municipality estimates a total population of 160,000.

⁴ Tetra Tech also investigated a collaboration with the John Snow International (JSI) Strengthening Ethiopia Urban Health Project (SEUHP). While initially supportive of a collaboration, the JSI project ended. During the baseline, Tetra Tech identified opportunities to build on SEUHP's work, namely through existing relationships between kebele administrations and the Health Office.

1.2 Purpose of the Baseline

A baseline assessment of sanitation service delivery focused on factors and actors across the sanitation value chain is critical to the initial “understanding by stakeholders” phase of the SWS theory of change (see Figure 2). It serves as an entry point to begin dialogue with local stakeholders. The tools used and information collected in the baseline assessment respond to the requirements of the SWS learning agenda.

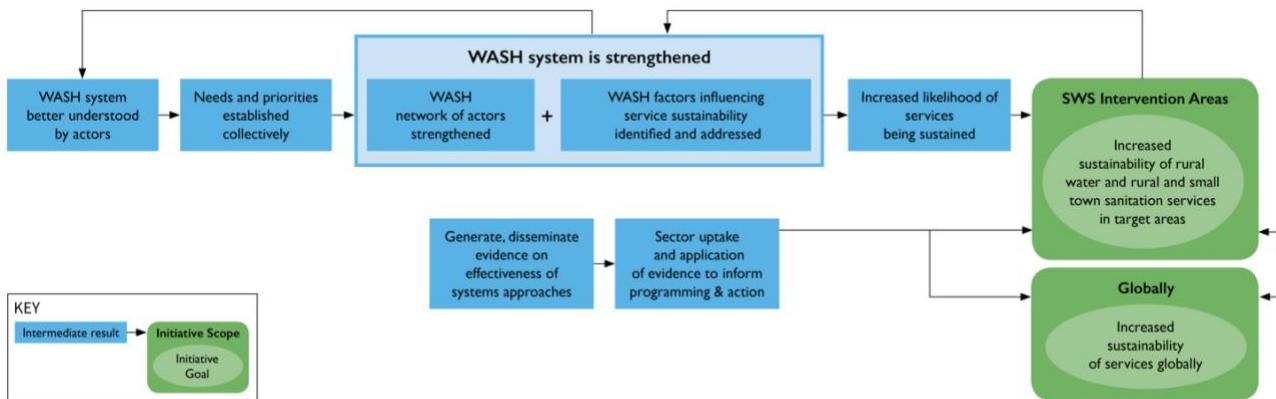


Figure 2. SWS Theory of Change

1.3 Objectives

The objective of the baseline assessment is four-fold:

1. To understand the conditions at the community level and basic sanitation (and other) service provision;
2. To understand the service delivery environment and the extent and current operations of sanitation services;
3. To identify the status of the enabling environment at the city level and respective factors that influence sanitation services directly or indirectly; and
4. To understand the relationships between actors within the WASH network that comprise the local system, including across the three above-mentioned environments.

The assessment engaged a group of 14 local stakeholders involved in sanitation service delivery who may eventually organize into a learning alliance, a self-selecting group of organizations that influence the sanitation service delivery system and are committed to improving system outputs and sustainability. Results of the baseline assessment are intended to provide insights for learning alliance members to enhance decision making and to define specific interventions to improve the sustainability of services. In addition, over the life of the project, SWS will re-apply the same diagnostic tools to monitor changes in the service delivery system resulting from SWS interventions. The Organizational Network Analysis

(ONA) will be repeated twice, at the mid-line and an end-line, while the Sanitation Cityscape Approach (SCA) will be repeated only at the end-line.

2.0 Baseline Methodology

2.1 Approach

The assessment deployed two diagnostic tools, the SCA and ONA. The SCA considers factors across three different environments. These are the living environment, the service delivery environment, and the enabling environment (see Figure 3).

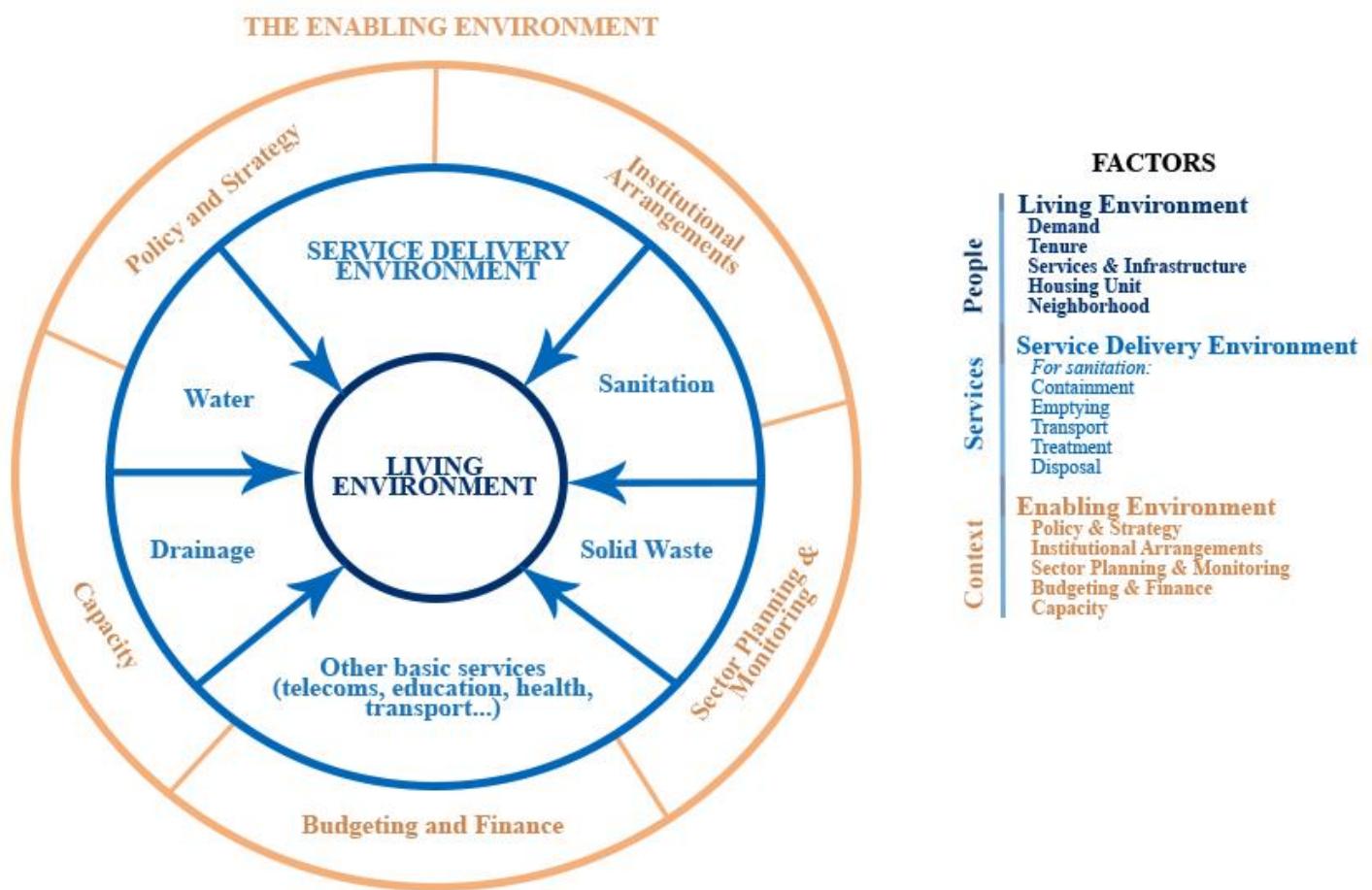


Figure 3. The Sanitation Cityscape Framework

The living environment presents profiles on tenure, housing units, neighborhoods, and the nature of other basic services (e.g., water, sanitation, drainage, and solid waste). The service delivery environment profile includes formal and informal sanitation providers across the sanitation service delivery chain, as well as their respective relationships to the municipality. The enabling environment profile includes institutional roles and relationships (stakeholders, sector coordination, service delivery arrangements, and regulation and accountability). It focuses on the city-level environment, notably how the national policies and mandates translate at the municipal and town levels. The interfaces and relationships between these domains are described in Section 3.5.2 on page 40. The research questions related to each of the factors within the three environment types are presented in Annex A on page 47.

To better understand and visualize the relationships and interactions among local stakeholders involved in delivering sanitation services, LINC led the application of an ONA, which complemented the SCA. The ONA survey methodology and questionnaire was refined in consultation with IRC and Tetra Tech to reflect realities on the ground and alignment with the aims of the wider baseline assessment.

2.2 Data Collection Methods

Data was generated using the following research tools:

- **Household Surveys** to gather information on the living conditions and environment including access to basic services, perceptions, and satisfaction around sanitation;
- **Key Informant Interviews (KIs)** to gather information on sanitation service delivery, the nature of stakeholder relationships, and the enabling environment. ONA data was collected through KIs with key stakeholders identified by Tetra Tech, in consultation with local government and others prior to the assessment;
- **Public and Communal Toilet Surveys** to collect data from users through a sample spot-check of selected public and communal toilets facilities;
- **Focus Group Discussions** to collect qualitative data at the community level from residents and community representatives; and
- **Observation and Site Visits** to collect supplementary data on sanitation service delivery.

2.3 Sampling and Respondents

2.3.1 Household Survey

The 113,693 residents of Debre Birhan reside in nine kebeles (administrative divisions or wards) and five sub-kebeles. Households ($n=308$) were sampled from all nine kebeles using a stratified random approach. Each kebele was sampled with a ratio of participants to kebele population that remained consistent across different kebele sizes. The survey took place from April 10–15, 2018 and was conducted by four enumerators. Households were systematically sampled. Enumerators walked in a random direction from the entrance of the kebele from the main access road and sampled every fourth house walking in random directions at intersections. They alternated the side of the road each time a house was sampled.

2.3.2 Key Informant Interviews

Table I on page 9 lists key informants who participated in the study. Two rounds of interviews were conducted. The first round was performed for the SCA with a team comprised of a local team leader, a local learning alliance facilitator, a translator, a sanitation specialist, and the international team leader. Interview guides were prepared for different stakeholders and all interviews were conducted in Amharic. Responses were translated and notes were taken in English. The second round of interviews was performed by a team of two enumerators hired and trained by LINC, with responses recorded electronically using a hand-held tablet.

Public Organizations

The municipality's Sanitation and Beautification, Urban Development and Housing, and Infrastructure (drainage) Development offices participated in a joint interview with the deputy city manager (who was also the manager for Urban Development and Housing) and the managers of the other offices.

Table 1. Public Organization KIs

Name/Organization	Key Informant Title
Water Supply and Sewerage Enterprise	Manager/Deputy Manager ⁵
Water Supply and Sewerage Enterprise	Technical Manager
Sanitation and Beautification Office	Manager
Health Office	Manager
Finance and Economic Development Office	Manager/Budget Officer
Municipality	Manager
Urban Development and Housing	Manager
Infrastructure Development Office (Drainage)	Manager
Environment Protection Office	Manager
Small- and Micro-Enterprise Office ⁶	Manager
Trade and Industry Office	Manager
Urban Health Extension (kebele 06)	Kebele UHEW
Local Administration (kebeles 02, 03, 06)	Kebele CEO

Private Sector/Non-Governmental Organization (NGO)

Table 2. Private Sector/NGO KIs

Name/Organization	Key Informant Title
Vacuum Truck Operator	Owner/Manager/Operator
Emmanuel Development Association (NGO)	Manager
Public Toilet Operator	Operator

⁵ The manager of the Water Supply and Sewerage Enterprise was unavailable, so this interview was with the deputy manager (who is also the technical manager of the DBWSSE).

⁶ The Small- and Micro-Enterprise Office was not available for interview.

2.3.3 Public and Communal Toilet Survey

Ten public and communal toilets were randomly selected to collect data on their users, their frequency of use, management model, quality, and the frequency of emptying.

2.3.4 Focus Group Discussions

Two focus groups were held with representatives from kebeles 06 and 02. Participants were selected through a snowball technique to target specific issues (the first set of participants was identified and in turn asked to recruit other participants):

- In kebele 06, seven focus group participants were contacted through the kebele chairman, and were active members in various community development organizations and activities. They were natural community leaders and representatives. The focus group discussion took place in the chairman's office but he was not present. This focus group highlighted specifics around kebele organization and development priorities.
- In kebele 02, six focus group participants gathered around a communal toilet, most were part of the toilet user group. Discussions highlighted specifics around sustained use and management of communal toilets.

3.0 Results

The following section presents the results of the SCA by factor for each of the three environments: living, service delivery, and enabling. It also presents the ONA findings related to the nature of the relationships among local actors involved in service delivery and three types of communication interactions within the network

3.1 Characteristics of Respondents

The demographics of the 308 respondents to the household survey (see Figure 4 below and Figure 5 on page 12) were as follows:

- Of the respondents, 60.84 percent ($n=188$) were female; 36.89 percent ($n=114$) were male.
- Of the households, 26.60 percent ($n=76$) were female-headed; 73.14 percent ($n=226$) were male-headed.
- Heads of the household made up 48 percent ($n=88$) of respondents, while the rest of respondents were other family members.
- The average household size was 8.38 members; the median was 5 household members.
- The average age of the head of the household was 51.9 years, with a median age of 51 years.

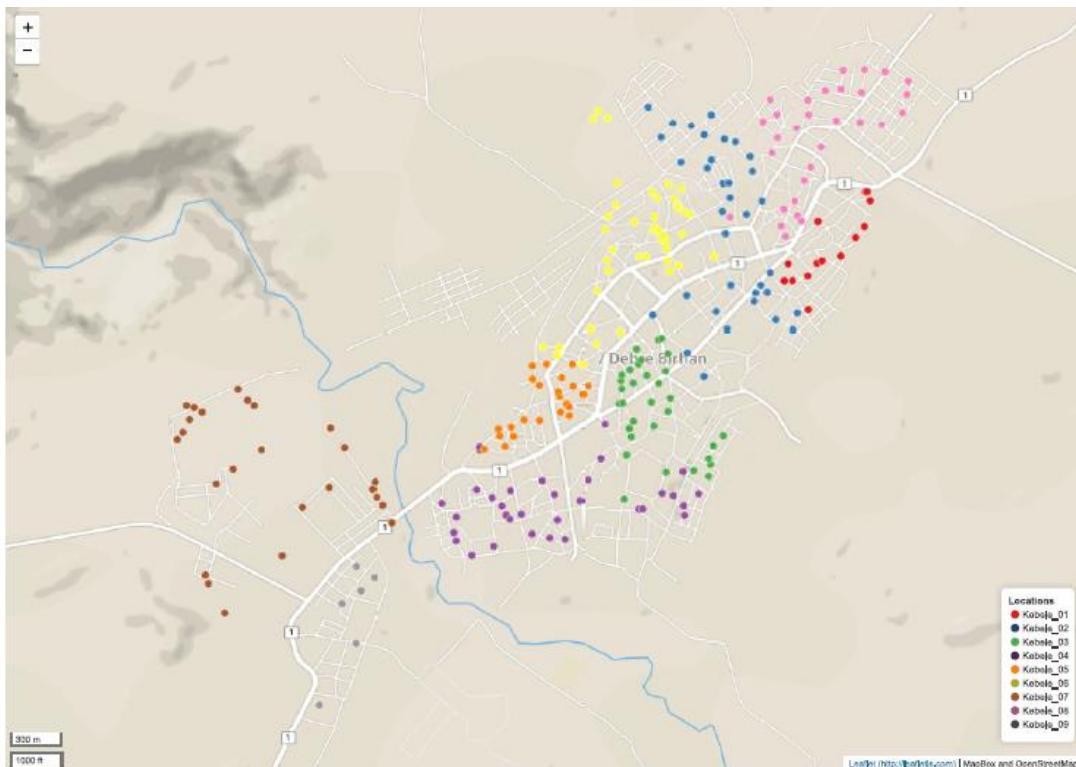


Figure 4. Household Survey: Debre Birhan Baseline ($n=308$)

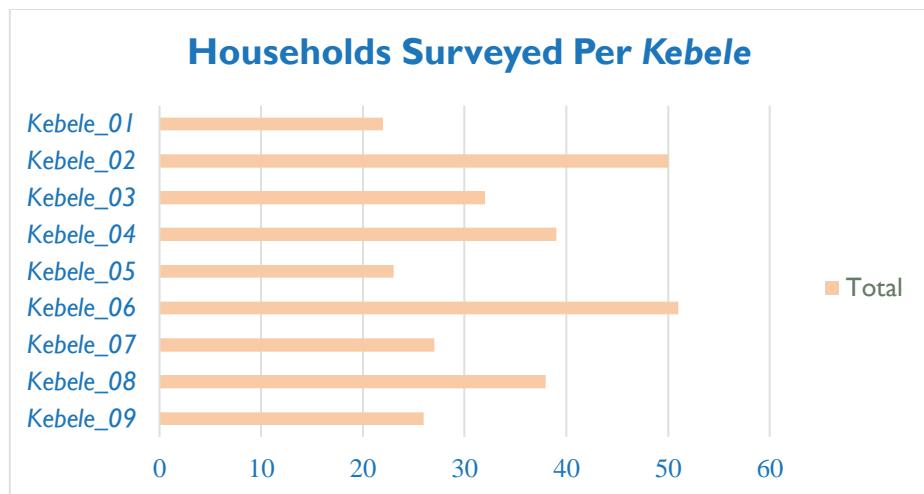


Figure 5. Households Per Kebele

3.2 Living Environment Results

Analyzing the living environment provides an understanding of the wider context beyond sanitation and the key factors that affect urban living and infrastructure and underpin where sanitation sits in terms of residents' priorities and their agency to make improvements to their living environment.

3.2.1 Demand for Basic Services

Residents were asked open-ended questions to identify the most important development need in their neighborhood. Rainwater drainage, streetlights, and roads were the most commonly cited priorities (see Figure 6, where the X-axis represents the number of responses against any given issue). Improved sanitation was the top priority in kebele 02, and the third priority (behind grey water and solid waste management) in kebele 06 (see Spotlights on kebeles 06 and 02 on pages 20 and 21). In the other kebeles, sanitation improvements were of lesser priority compared to other development needs.

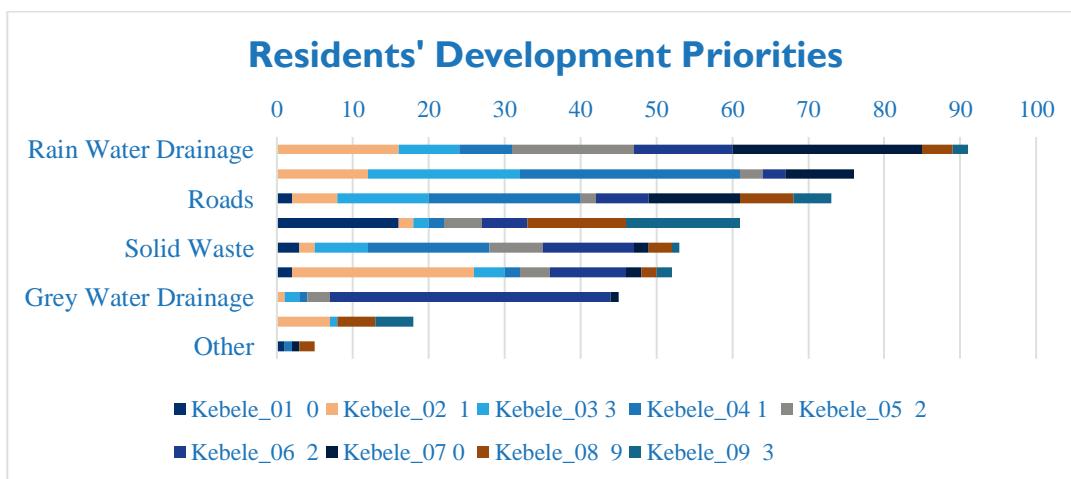


Figure 6. Residents' Development Priorities by Kebele

3.2.2 Living Conditions Diamond

The SCA uses the Living Conditions Diamond tool⁷ to provide an overview of the living environment of any given settlement. The tool uses four factors to describe the living environment: tenure, housing unit, infrastructure, and neighborhood, worked out as percentages of potential total coverage, where 100 percent represents the ideal neighborhood. The percentages are calculated as follows:

- The tenure axis is a composite of the percentage of owner occupiers, the length of stay, and fear of eviction in any settlement;

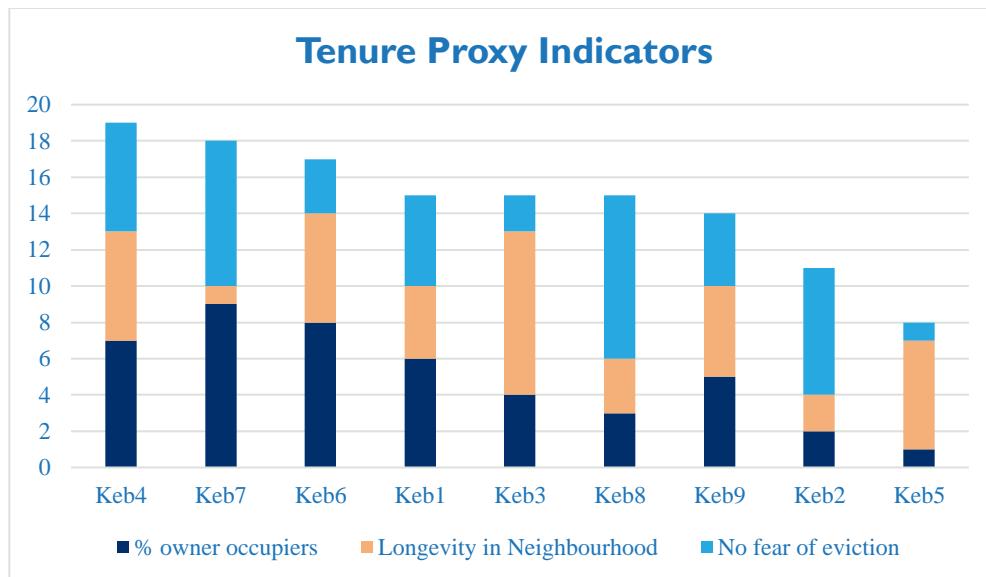


Figure 7. Tenure Proxy Indicators

- The housing axis is a percentage of the number of houses with permanent materials of walls, floor, and roof in any settlement;

⁷ Gulyani, Sumila, and Ellen M. Bassett. "The Living Conditions Diamond: An Analytical and Theoretical Framework for Understanding Slums." *Environment and Planning A* 42, no.9 (2010): 2201-219. doi:10.1068/a42520.

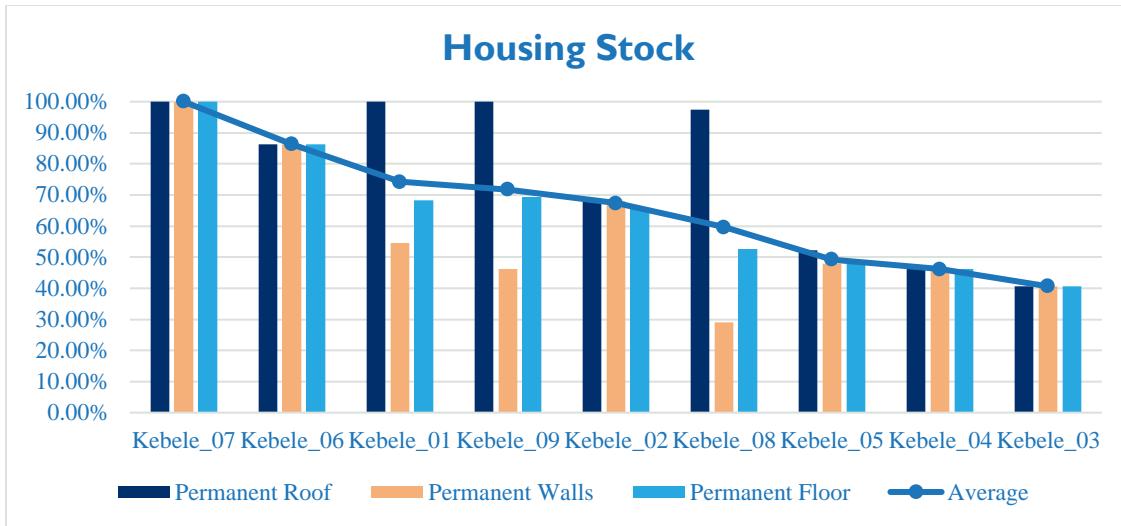


Figure 8. Housing Stock

- The infrastructure axis is a composite percentage of the number of houses with electricity to plot and drains outside plot, paved or tarmacked roads outside plot, street lighting, garbage disposal service, and private sanitation and water; and

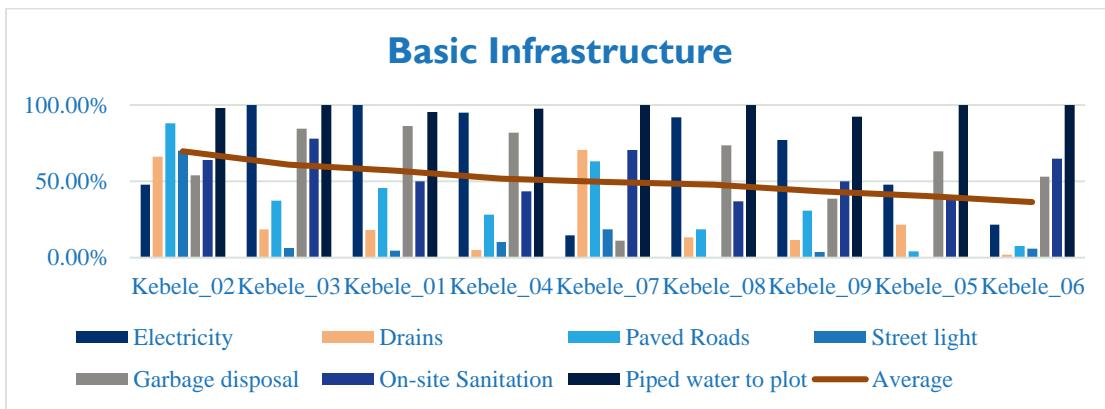


Figure 9. Basic Infrastructure

- The neighborhood axis is a composite percentage of the number of residents' good perception of the cleanliness, location with respect to access to roads and transportation, and safety of their neighborhood.

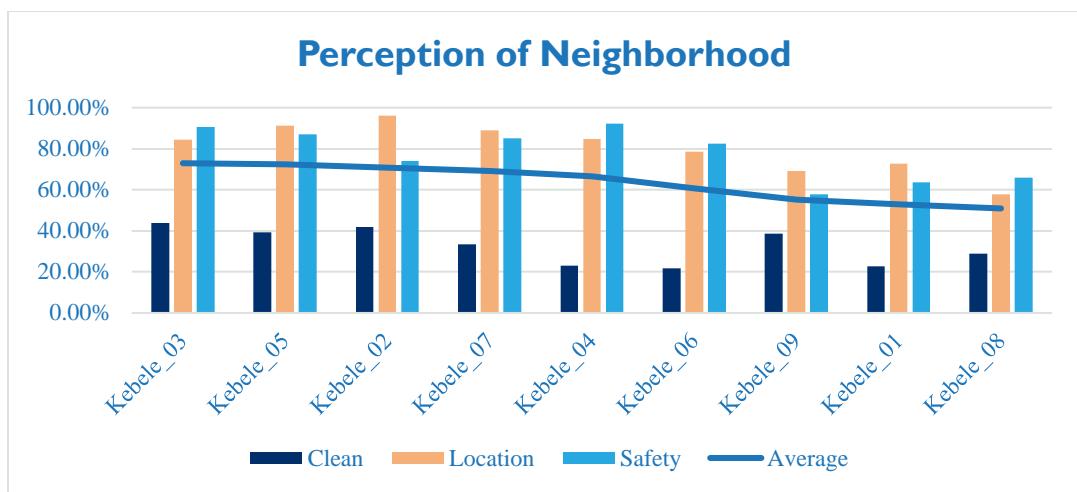


Figure 10. Residents' Perceptions of Their Neighborhood

Each is represented as a percentage composite and plotted on a spider diagram axis to produce a Living Conditions Diamond for the nine kebeles of Debre Birhan, which can be grouped into four main types according to their similarities (see Figures 12 to 15 beginning on page 16).

Average monthly incomes were compared to the typology groupings to validate the Living Conditions Diamond logic. That is, similar economic profiles map onto the neighborhood typologies, or logical explanations for any differences (see Figure 11). Overall, the kebele typologies and income profiles of each kebele map into similar groups and validate the living condition typologies.

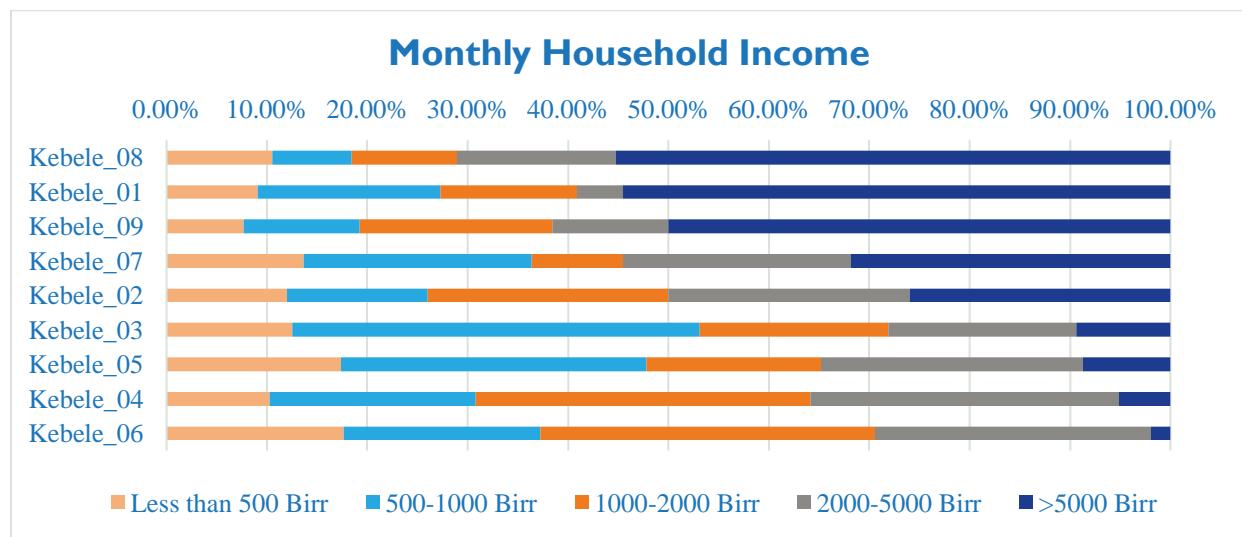


Figure 11. Average Household Monthly Incomes

Neighborhood Type A (Kebeles 01, 08, and 09). These kebeles are located on the outskirts of town (01 and 08 to the east, and 09 to the west). Kebeles 01 and 09 have slightly higher quality housing stock than 08, but the median number of years people have lived in the neighborhood is also higher (14 and 17 years versus 9 years, respectively). The economic profiles analysis confirms that Neighborhood Typology A has similar economic profiles with approximately 50 percent of the residents in the highest income bracket (Ethiopian Birr [ETB] >5,000/month or \$180/month) and relatively similar distribution across the lower income bands. The profiles suggest these neighborhoods have a high concentration of higher-end earners who live on the outskirts of town where space is less likely to be an issue and private onsite sanitation systems are a viable solution. For the lower income brackets, or those lacking space, shared onsite systems are likely to be preferred.

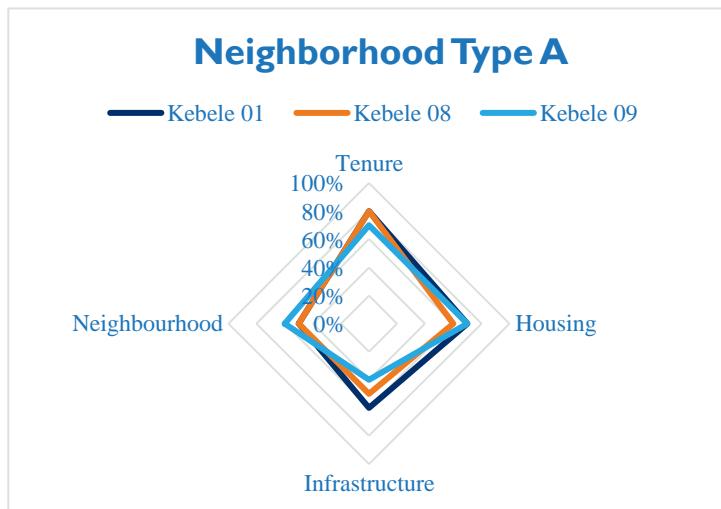


Figure 12. Living Conditions Diamonds for Neighborhood Type A

Neighborhood Type B (Kebeles 06 and 07). These areas have good tenure and housing stock, so investments in private and household infrastructure are likely to be high. However, the data suggests there are some deficiencies in public infrastructure. One KII suggests that drainage (grey water and rainwater) is a problem in kebele 06. The economic profiles of kebeles 06 and 07 are similar across the lower-income band categories, with both kebeles having approximately 35 percent earning under ETB 1,000 or \$36 per month. However, almost a third (31.82 percent) of households surveyed in kebele 07 were in the highest income bracket, compared to a very small minority in kebele 06 (1.96 percent). This difference between the two kebeles correlates to the living conditions model, which shows a higher scoring for kebele 07 compared to 06. Although these profiles share a similar living environment, a third of kebele 07 residents are higher earners. This proportion is not present in kebele 06. For sanitation services, the profile suggests the area might have higher levels of private and household infrastructure, such that initiatives to improve and upgrade onsite systems would be appropriate. However, it is likely a range of sanitation upgrades or options (and financial support) are needed to include the lower-income brackets to achieve good coverage.

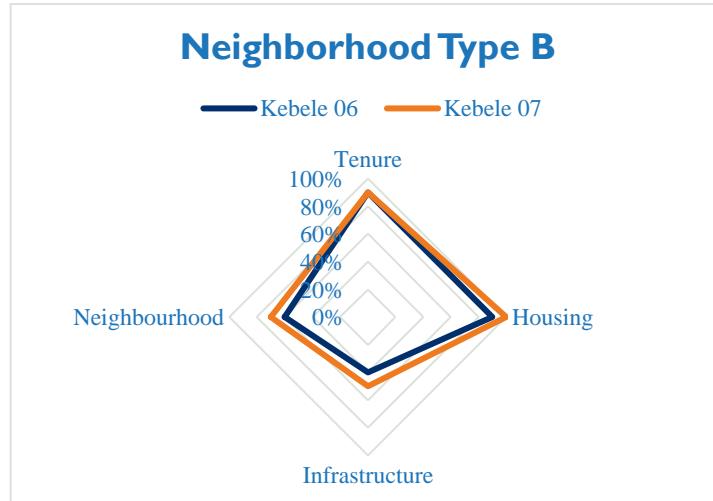


Figure 13. Living Conditions Diamonds for Neighborhood Type B

Neighborhood Type C (Kebeles 03 and 04). These areas have relatively strong tenure characteristics,⁸ but the housing stock and public infrastructure (specifically drainage, roads, streetlights, and sanitation) are lower than the town average. The economic profiles of kebeles 03 and 04 are similar but not identical. This correlates to the living condition profiles. Kebele 03 has 40.63 percent in the ETB 500-1,000 per month band (\$18-36) and 37.5 percent sitting in the ETB 1,000-5,000 (\$36-182) compared to 20.51 percent and 64.1 percent respectively for kebele 04. This slightly higher economic profile of 04 correlates to the living conditions diamonds. These kebeles are located in the center of town, adjacent to one another and south of the main road. This profile is typical of a town center where residents may pay a premium for the location over housing quality. These are low-income areas, with little investment in the housing stock, and space is likely to be limited. Low-income households are unlikely to be willing or able to invest large amounts in sanitation hardware, shared onsite sanitation, or potentially container-based solutions, which are likely to be an appropriate solution for many.

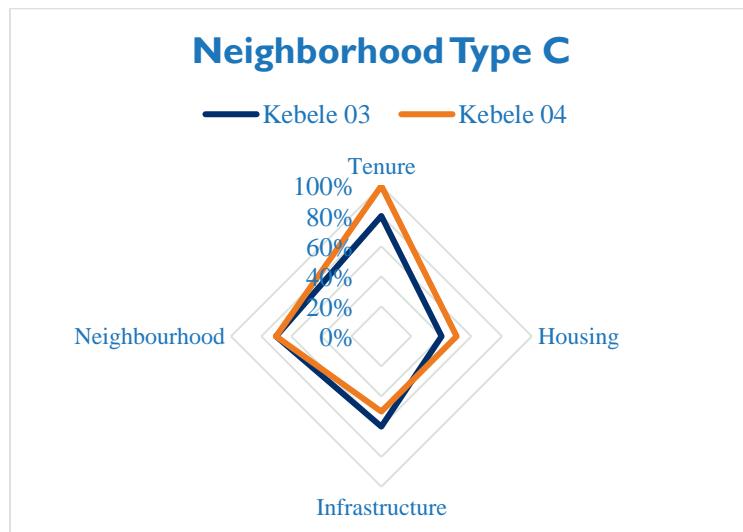


Figure 14. Living Conditions Diamonds for Neighborhood Type C

Neighborhood Type D (Kebeles 02 and 05). Kebeles 02 and 05 have similar living conditions profiles, but kebele 05 is significantly lower on all but the neighborhood perception axis. These are the only two kebeles where the number of tenants was greater than the number of owner occupier households (46 percent owners in kebele 02 and 43 percent in kebele 05). In kebele 02, the turnover of residents is quick, with the median number of years of living in the neighborhood being 3.6 years. In kebele 05, this number is 20 years. However, 60 percent of households surveyed in kebele 05 claimed their area had been marked for redevelopment, the result is a similarly insecure tenure situation in both areas. These kebeles scored mid to low on housing stock and infrastructure. There were no streetlights

⁸ Tenure is a complex set of arrangements. Strong tenure characteristics would be a majority of owner occupiers, residents who have lived in the area for several years, and a low fear of eviction. These measures are often relative to other parts of the city and not absolute.

and few paved roads and drainage channels. The economic profiles of kebeles 02 and 05 are similar, but confirm what is shown in the living conditions model—that kebele 05 is lower income than 02. Half of the residents in kebele 02 earn less than ETB 2,000 (\$72) per month. In kebele 05, a little less than half of the residents (47.82 percent) earn less than ETB 1,000 (\$36) per month. This profile suggests service-based, rather than product-based, sanitation interventions would be most appropriate. Low-income and tenant households are unlikely to invest in sanitation hardware, but may benefit from a service-based approach (i.e., well-managed commercial public toilets, shared sanitation, and potentially container-based sanitation solutions). Adequate access roads or modified emptying equipment are also required to provide an FSM service to all households. Furthermore, there is a potential for landlords to invest in products such as latrines.

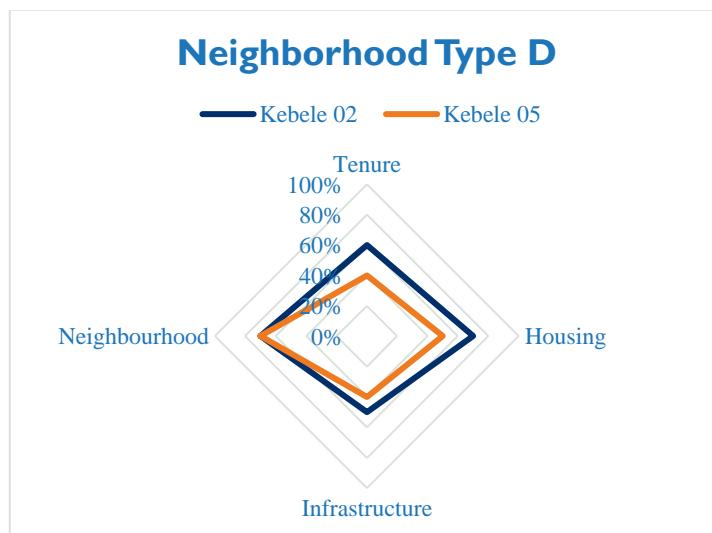


Figure 15. Living Conditions Diamonds for Neighborhood Type D

Spotlight on Kebele 06

Kebele 06 is an example of a neighborhood with good tenure, housing stock, and higher levels of private and household infrastructure. As observed in Figure 16, the primary development priority for kebele 06 residents is grey water management (e.g., proper disposal of wastewater generated through household activities such as bathing). Soil infiltration is poor, so even households with seepage struggle to get rid of their daily effluent. Households are left with little option but to discharge their grey water into the storm water drain, a practice contrary to the Public Health Proclamation No. 2001/2000 and the advice delivered to households under the urban environmental health package.

Residents' Development Priorities for Kebele 06



- | | |
|-----------------------|-----------------------|
| ■ Grey Water Drainage | ■ Rain Water Drainage |
| ■ Solid Waste | ■ Improved Sanitation |
| ■ Roads | ■ Electricity |
| ■ Street Light | |

Seven communal toilets managed by user committees serve low-income residents. Committees are responsible for cleaning, emptying, and maintaining the toilets. All of them are operational and most have regular and effective cleaning schedules. Committees collect fees to cover the cost of emptying services provided by the utility or private emptiers.

Various community-level organizations exist in the kebele, including: “one-to-five residents” arrangements (where there is one representative for every five households), development committees, and youth and women’s associations. These segments of the community assist in law enforcement, fundraising, and helping the poor.

There are 14 savings groups in kebele 06, including the women’s association savings groups and the *Edir* (the traditional association of residents). *Edirs* are traditionally organized to cover funeral costs and support deceased families. In kebele 06, the *Edirs* also support development activities. These savings structures, both formal and informal, provide a strong social cohesion and are considered very useful by the “development army” (health extension workers who are instrumental to the Government of Ethiopia’s strategy to ensure essential social services reach the last mile).

Spotlight on Kebele 02

Kebele 02 is one of the poorest and older kebeles in Debre Birhan, with some commercial activities, dense occupation, and small alleyways and streets.

Sanitation is a priority issue for residents in this neighborhood. There are two public latrines (one operational) and seven communal latrines, but the kebele chairman suggests more are needed. Construction of communal latrines is a recognized development priority and the kebele administration and municipality cooperate to locate land for new construction.

The social cohesion and organizational structures are well-defined and strong with the one-to-five household networks and the development armies. These networks are effectively used for all types of community interventions, meeting on a weekly basis to raise issues as required. There are 16 savings groups supported by the NGO Emmanuel Development Association with 394 members. From this fund, 12 homes have been built and allocated to the poorest (these homes did not include toilets).

In 2014 and 2015, there were many reports of households discharging contents of pit latrines to the storm water drains. Efforts of awareness-raising and enforcement have reportedly reduced this practice dramatically. Health Extension Officers raised awareness around this practice and breaches are punished with a written warning before escalating to a fine of ETB 500 (\$18) and then ETB 1,000 (\$36) for non-compliance. No reports of illegal dumping have been reported since August 2017.⁹ Five households in this kebele have sought and been granted permission by the kebele chairman to connect their latrines to the storm water drain, because there are no access roads for mechanized pit emptying.

3.3 Service Delivery Environment

3.3.1 Containment

According to the household survey, 51.14 percent (n=157) of respondents use a private latrine and 48.21 percent (n=148) use a communal or shared toilet with other households. Public toilets are pay-per-use and open to the public, while communal toilets are shared with several households within a clearly defined user group. Public toilets are typically located in high-traffic locations such as markets, stadiums, and bus stops, and are used by nearby households. Less than one percent (n=2) of surveyed households relied on public latrines as their primary sanitation facility (see Figure 17 on page 22). A higher proportion of landowners, 62.30 percent, have private facilities compared to 48.39 percent of tenants in public housing with private sanitation facilities. The majority of tenants of private landlords use communal and shared facilities, 76.27 percent. Household survey data on types of shared sanitation facilities appears in Table 3 on page 22.

⁹ Note that the rainy season, which is when this practice is most likely to occur, is from May or June to September.

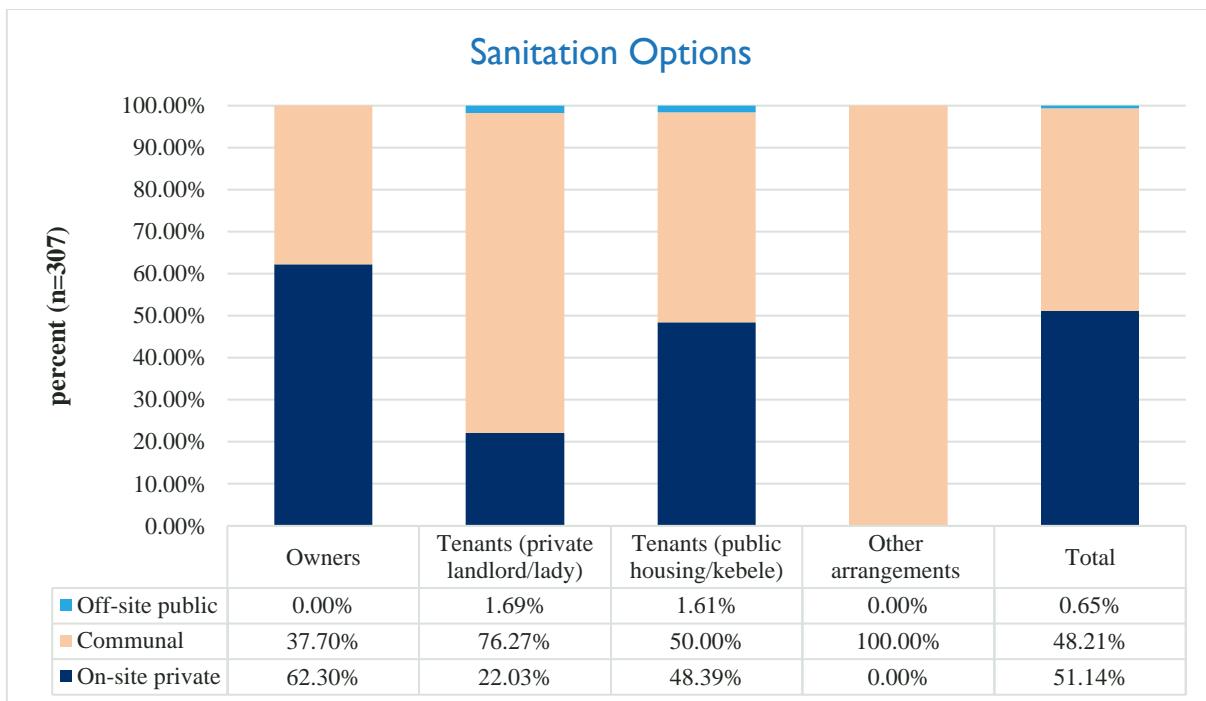


Figure 17. Sanitation Options by Tenure Status

Table 3. Types of Shared Sanitation Technologies

Sanitation Technology	Number	Percentage
Facilities in condominium housing	1	.81%
Washable slab direct pit	88	70.97%
Pour flush connected to septic tank	1	.81%
Pour flush into direct or offset pit	1	.81%
Traditional slab; damaged or no superstructure direct pit	33	26.61%
Total responses	124	100%

Household sanitation facilities in Debre Birhan are typically concrete slabs with an open drop hole to a dry pit or tank below; covers and lids are uncommon. Pour flush toilets exist in condominium housing built under the Government of Ethiopia's low-cost housing program.

Table 4. Differences in Standards for Sanitation Facilities¹⁰

Government of Ethiopia (Ministry of Health)¹¹	Joint Monitoring Program¹²
<ul style="list-style-type: none"> • Floor cover/platform made from locally available materials such as wood logs, timber/lumber, bamboo logs, stone, concrete, or plastic slab • Has lid/cap for latrine hole cover • Floor that doesn't have cracks/holes to prohibit flies/rats breeding • Floor cleanable or washable • Has superstructure made of locally available materials 	<ul style="list-style-type: none"> • Flush/pour flush to piped system, septic tanks or pit latrines • Ventilated improved pit latrines • Composting toilets or pit latrines with slabs

Spotlight on Shared Sanitation

This report differentiates between public and communal toilets by user group, where public toilets are open to anyone and operate on a pay-per-use basis and communal toilets are used by a defined user group with specific arrangements. Communal toilet blocks are usually managed by a user community representative and maintenance is assigned to the users.

There are four public toilets in Debre Birhan. Their management is outsourced from the municipality to a small or medium enterprise or charity for operation. In some cases, these roles are offered to vulnerable or less able-bodied individuals as an income source. Users are charged ETB 1 (\$.036) per use. The cleanliness and operational level of public toilets is often poor because there is no public budget allocation for maintaining them. Subsequently, it is difficult to mobilize investments or maintenance funds.

There are 45 communal toilets in the town, between 2 and 18-years-old, with an average of 6 years.¹³ The baseline assessment surveyed seven communal and three public toilet blocks about their management models. The communal latrines ratio of users to a stall was 8 to 20 persons per day. For public toilets the numbers were 50 to 68 users per stall, per day. Emptying was also typically more frequent for the public toilet blocks. From the blocks visited, the communal blocks with well-defined user groups and clear responsibilities for management at the community level, were better managed than the public toilets. The income charged from both communal and public toilets is insufficient to cover operational and maintenance costs beyond regular emptying, with both the operators and the municipality looking to the other to cover these costs.

¹⁰ The international definition of improved sanitation does not align directly to the Ethiopia definition.

¹¹ Federal Democratic Republic of Ethiopia, MoH.

¹² WHO and UNICEF (2017). “The new JMP ladder for sanitation” <https://washdata.org/monitoring/sanitation>.

¹³ Data provided by the municipality.

3.3.2 Emptying¹⁴

For users of private onsite facilities, 34.30 percent ($n=106$) of households surveyed had emptied their pits, and 40.42 percent ($n=128$) had not. Only 38.67 percent ($n=41$) of the households who had emptied their toilets responded regarding the frequency of emptying, which averaged every 4.29 years, a figure that is skewed by a small number of systems going 20 years without being emptied. The median value for emptying is every two years (see Figure 18).

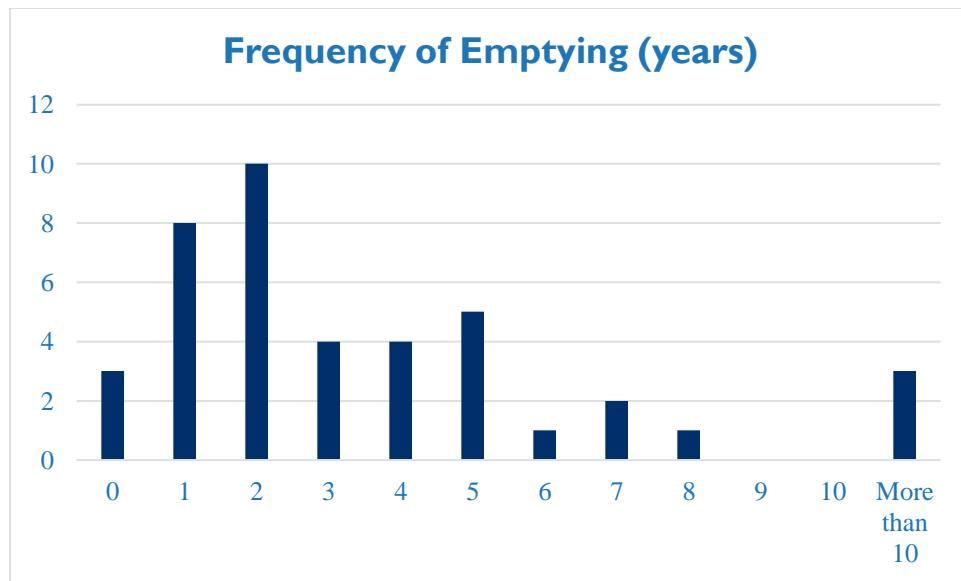
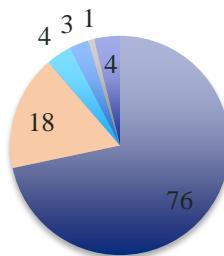


Figure 18. Frequency of Emptying Onsite Sanitation Systems

The most common emptying method for onsite sanitation systems in Debre Birhan is vacuum truck, with over 88.7 percent ($n=94$) of household respondents using mechanized services (see Figure 15 on page 19). DBWSSE appears to be the primary service provider for domestic emptying, with 71.70 percent ($n=76$) of respondents having selected them. However, it is unclear whether households can make accurate distinctions between DBWSSE and the private emptiers (see Tables 5 to 7 beginning on page 26), especially given that the private emptiers are working on behalf of DBWSSE. The data suggests DBWSSE manages 36.64 percent of an estimated total of 32,792 cubic meters (m^3) of FS that is collected on an annual basis in Debre Birhan.

¹⁴ Institutions such as universities, offices, hospitals, and schools were beyond the scope of the baseline.

Household Onsite Sanitation Emptying Methods (percent, n=106)



- Contracted the utility truck
- Contracted a private enterprise truck
- Emptied it myself (manual)
- Abandoned/covered
- Paid manual emptying
- No response / don't know

Figure 19. Method of Onsite Sanitation Emptying

The baseline identified very low levels of manual emptying practices in Debre Birhan. Several key informants said manual emptying was not practiced in the town. Of the household respondents, 4.7 percent (n=5) admitted to emptying the pit manually. In four of these cases, the households did the work themselves. This suggests there are no established manual emptying services in Debre Birhan. When pressed on how households that could not be reached by mechanized emptying vehicles managed their pits, or what those who were unwilling to pay for emptying did, several KIIs reported the practice of connecting the pit or septic tank to the storm drainage channels, as mentioned in kebele 06. Households typically resort to this practice during the rainy season. It is also a commonly known to be an ongoing problem with hotels that do this on a regular basis because their tanks are inadequate. Although efforts by the Urban Health Extension officers have decreased the practice, it still exists for households that are inaccessible by truck.

3.3.3 Transport

FS is transported in Debre Birhan using 10 trucks (see Table 5 on page 26). DBWSSE owns two vacuum tankers, both of which are 10-years-old. The DBWSSE technical manager said downtime is frequent, with long repair turnarounds and a lack of spare parts. DBWSSE was not able to provide accurate downtime figures, but based on the KIIs and observations during the baseline and pre-baseline trips, it is estimated 50 percent of DBWSSE's operational emptying capacity is lost to downtime. There are four private operators who work autonomously under a service agreement with DBWSSE, but require permission to dump at the FS dumping location managed by DBWSSE.

Table 5. Estimated Annual Fecal Sludge Volumes for Debre Birhan

Vacuum Tank Operator ¹⁵	Number of Trucks	Detail	Estimated number of FS trips ¹⁶	Estimated Annual Vol. FS (m ³)
DBWSSE	2	8 m ³ each	1,507	12,056
Private Operator I (service agreement with DBWSSE)	4	9 m ³ (estimate)	1,152 (estimate)	10,368
Private Operator 2	2	8 m ³ and 10 m ³	576	5,184
Private Operator 3	1	9 m ³ (estimate)	288 (estimate)	2,592
Private Operator 4	1	9 m ³ (estimate)	288 (estimate)	2,592
Total	10		3,811	32,792
Truck to population ratio¹⁷	1 truck for 2,260 households			

The high ratio of emptying trucks per capita in Debre Birhan (1 truck per 2,260 households) could be explained by the private emptying market being sustained by the industries relying on the same trucks for their effluent management. This is noteworthy, as any changes on the industrial effluent management side may have repercussions on the sanitation services available in the town.

Table 6. DBWSSE Vacuum Truck Operators Trips July 2016 - July 2017. Source: DBWSSE.

	Residential	Public Institutions	Commercial	Industrial sites	Others	Total number of trips
Regular	490	256	168	7	8	929
Urgent	118	321	128	11	0	578
Total Trips	608	577	296	18	8	1,507
Total Annual Volumes (m ³)	4,864	4,616	2,368	144	64	12,056
Percentage of total	40.35%	38.29%	19.64%	1.19%	.53%	100%

¹⁵ Both the hospital and the prison also have a truck in Debre Birhan. These were not included here as they are not available to the domestic market.

¹⁶ There are some assumptions here. The private enterprise does not record the type of waste, only the customer type. Therefore, this report assumes (1) only the domestic customers are FS or septage, and (2) the utility only collects FS.

¹⁷ Assuming five people per household.

Table 7. Comparing DBWSSE and One of the Private Enterprises

	Domestic FS (Annual)			Non-Domestic (Annual)			Total (for two trucks)		Total Per Truck	
	# trips	Volumes (m ³)	% of customer base	# trips	Volumes (m ³)	% of customer base	# trips	Volumes (m ³)	# trips	Volumes (m ³)
DBWSSE (2 trucks)	608	4,864	40.34%	899	8,091	59.65%	1,507	12,056	753	6,028
Selected private enterprise (2 trucks) ¹⁸	576	5,211	40.0%	864	7,776	60.0%	1,440	12,987	720	6,480

In terms of customer base, 40.34 percent of DBWSSE customers are domestic (households and communal toilets), 38.29 percent are public institutions, and 19.29 percent are commercial (see Table 6 on page 26 and Table 7 above). Only 1.19 percent of the customer base is industrial. DBWSSE charges ETB 400 (\$14.58) for scheduled service or ETB 495 (\$18.04) for urgent service.¹⁹ The private enterprises collect FS and septage as well as industrial effluents, such as liquid yeast from the breweries. The private emptying companies charge ETB 600–700 (\$22–25) to both domestic and non-domestic clients, regardless of the waste type. The service to empty onsite sanitation systems typically adds a small amount of water, agitates the contents, and aspirates as much as feasible; the vault may not fully empty. Households reported paying between ETB 100–1,000 (\$3.65–36.5) with an average of ETB 483 (\$17.61), which suggests flexibility in what the private emptying companies are charging, depending on their services. There are seven blocks of condominium apartments sites in the town²⁰ where septic tanks collect the wastewater at ground level.

3.3.4 Disposal

An FS disposal site is on the outskirts of the town in kebele 07. The 7-hectare site has eight 1,500 m³ infiltration trenches. FS is deposited directly in the trenches, which allows for seepage of the liquid portion of the waste. It is assumed all FS collected is transported to this location, as there were no reports of other disposal sites or use of FS by farmers. Effluent from local industries (liquid yeast waste from breweries) is also disposed here. There is a pungent smell and runoff reaching nearby farms. There are no residences within a 100-meter radius of the site, but there is no effective treatment of the existing waste.

The site is managed by DBWSSE, which issues permits to private emptiers allowing limited access to the site. Private enterprises pay ETB 3,000 (\$109.35) per month for site access. The daily allocation at the

¹⁸ The operator has two trucks, one of 8 m³ and another of 10 m³. The breakdown was not available therefore the total volumes are assuming an average volume of 9 m³. Figures calculated from March 2018 extrapolated to an annual basis.

¹⁹ Data from DBWSSE.

²⁰ Wudineh, Fraol Abebe. "Evaluation of Sewerage System Sustainability Technically Around Condominiums Areas: A Case Study in Debre Berhan, Ethiopia." *American Journal of Environmental Protection* 4, no. 6 (2015): 318. Doi:10.11648/j.ajep.20150406.18.

time of the baseline was two trips for FS domestic waste, and five trips for non-domestic waste. Previous reports suggest that when private enterprises are prohibited from using this site, they discharge their waste adjacent to the site, causing further nuisance and health risks.²¹

Annually, an estimated 3,811 trips are made to the disposal site with an estimated 32,792 m³ of fecal waste (see Table 7 on page 27). However, it is evident a significant proportion of the private enterprise waste is not FS, but other effluent. From their data, it is not possible to confirm accurate figures of FS compared to other effluents. However, in the case that all non-domestic collections are industrial effluent, those volumes could be as much as 32,264 m³ (i.e., as much as the FS volumes).

Not in My Backyard Protest

In March 2018, residents and farmers close to the FS dump site that also received brewery waste (liquid yeast) and was adjacent to the landfill site, blocked the entrance road in protest of the odor and leaching nuisance. In response, the mayor and DBWSSE promised to relocate the effluent disposal site. They set a 3-month time frame, and during this time DBWSSE imposed a restriction on the number of disposal visits. At the time of the baseline, private enterprises were permitted to dump five industry and two household loads per day. There were no restrictions for the DBWSSE FSM trucks, which typically dumped 0 to 5 loads per day. As of September 2018, the site was closed, with the exception of a 15-day period during which the utility was allowed to access the site. The construction of the new site remains incomplete due to delays caused by the rainy season. The two breweries, Habesha and Dashen, contributed ETB 2.3 million (\$81,919) for the construction of the site's access road and an additional ETB 2.6 million (\$92,605) for compensation to farmers who used the land for grazing.

3.3.5 Reuse

No reuse activities were identified during the baseline. On occasion, the farmers have asked for the liquid yeast from the breweries (not FS), but the emptiers are not willing to do this as their trucks tend to get stuck in the soft ground if they dump on the fields.

3.3.6 Initial SFD Graphic

Fecal Waste Flow Diagram (also known as Shit Flow Diagram or SFD) graphics can be useful tools to visualize a snapshot of any given sanitation situation in a town. The baseline assessment captured sufficient data to make an initial SFD graphic (see Figure 16 on page 20). The intention is for this SFD graphic to be updated and developed with additional data as available.

The following assumptions are inherent in this initial SFD:

²¹ <https://www.ijser.org/researchpaper/Utility-Service-Provision-from-Planning-Perspective-The-case-of-Debre-Birhan-Town-ANRS-Ethiopia.pdf>

- An estimated 6.5 percent of the town is being serviced by septic tanks connected to a soak pit with some groundwater risk, assuming 75 percent treatment efficiency. This includes an estimated 3 percent of the town living in condominium blocks connected to onsite septic tanks.
- An estimated 4 percent of the town is being serviced by poorly constructed septic tanks that act as a holding tank.
- The scope of the baseline did not aim to capture the range of underground technologies (this is difficult to determine). The SFD is prepared based on some degree of semi-permeable walls and open-bottom dry pits (87 percent). It is assumed all the pits are lined, given the levels of mechanical emptying, as unlined pits would likely collapse. As there were several reports of poorly designed septic tanks, these are included as open-bottom tanks rather than true septic tanks.
- A third technology group refers to a tank with no outflow that is discharging directly to open drains (3 percent).
- The baseline did not capture the risk of groundwater pollution. The SFD was prepared assuming a 50 percent risk to groundwater.
- The SFD works based on 40 percent of pits having never been emptied and 89 percent of pits that are emptied using mechanized services, with no illegal dumping and no treatment.
- A rate of 7 percent open defecation was used upon advice of the Town Health Office.
- The hospital, university, prison, and hotels are not factored into this analysis. For reference, all of these omitted organizations rely on septic tanks (10 hotels, by means of a sewer connection connected to a large septic tank). Several hotels in the town have been identified as discharging fecal waste to drainage channels. If this data were captured in the SFD, it would negatively influence the proportion of FS delivered to the treatment sites.

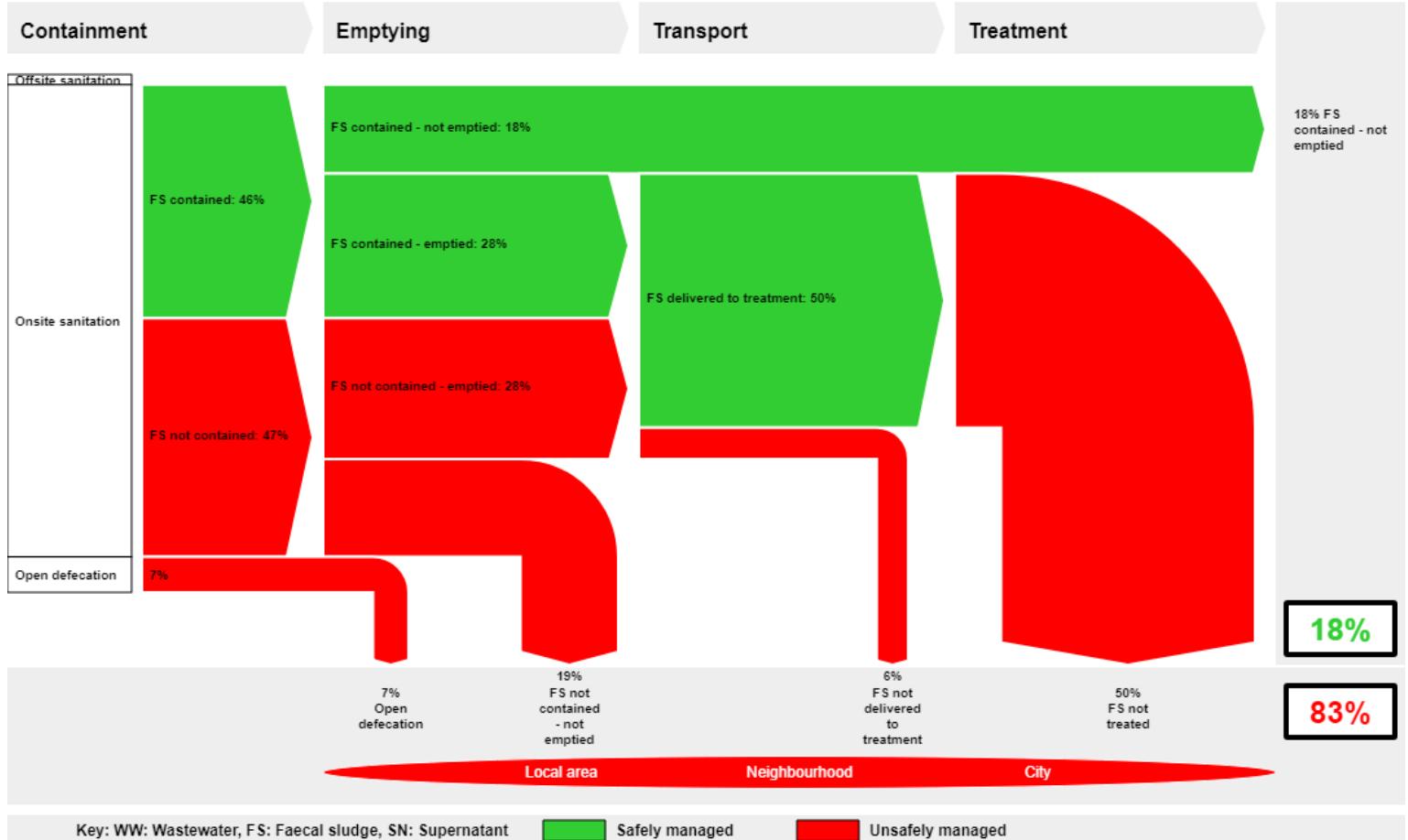


Figure 20. Debre Birhan Initial Level SFD

The initial SFD (see Figure 20) was presented to Debre Birhan sanitation service delivery stakeholders on May 29, 2018 for validation. The graphic is based on the outcomes of that meeting. The SFD indicates that risks to safely managed FS are around the onsite systems themselves and how well they contain pathogens. This depends on the actual qualities of onsite infrastructure and the real risk of groundwater contamination, if any. A second risky practice is the discharging of FS to drainage channels. Ongoing efforts are being made to curtail this at the household level through SEUHP. However, commercial entities such as the hotels are known to discharge waste in this way and curtailing this practice is less effective. Given the high number of dry pits in Debre Birhan, it is anticipated not all the waste is removed by the vacuum tankers during an emptying operation. Finally, the FS treatment is not adequate to be rated as safely managed, but the sludge is deposited in earth trenches to dewater and eventually

be covered. The waste is largely contained in one location, and with current plans to move the location to a site further from residential areas, the associated environmental and health risks will be reduced.

Identifying which sludge treatment option is optimal for Debre Birhan would require a more comprehensive assessment of the types (physical characteristics) and accurate volumes of different types of sludge arriving at the treatment site. For example, fresh sludge from public toilets is “stronger” than sludge that has been contained for years in a household pit, and the ratio will influence the appropriate treatment technology. Viable options include basic settling or thickening tanks or drying beds, given the availability of liquid yeast biogas from the two breweries.

3.4 Enabling Environment

3.4.1 Policy and Strategy

Sanitation policy guidance is currently dispersed across the policy documents of several different sectors, without a clear framework around which to build a common vision. Three federal ministries have explicit urban sanitation mandates:

- **Ministry of Health (MoH):** promotion of safe disposal of solid and liquid wastes by households and awareness of its public health impacts;
- **Ministry of Urban Development and Housing:** coordinated support and capacity building in urban centers, including solid waste management services; and
- **Ministry of Environment, Forestry, and Climate Change:** environmental protection, including regulation of waste disposal.

In addition, water resource development policy looks at integrating water supply and sanitation at the development stage.

The MoH is often regarded as the lead agency nationally for sanitation, a role that includes working with other relevant ministries. The MoH led a very effective rural sanitation program and pioneered a focus on sanitation awareness, hygiene behavior, and promotion of toilet building by households. Extension of this approach to urban areas proved more challenging and the MoH’s role in urban sanitation is less clear. The Ministry of Water, Irrigation, and Electricity has no explicit urban sanitation mandate, but derives its authority from its mandate to oversee water and sewerage utilities and its leading role in the One WASH National Program. The Ministry of Culture and Tourism also plays an active role as it is responsible for overseeing the waste management practices of hotels and recreational facilities and protecting heritage sites. The Food, Medicine, and Health Care Administration and Control Authority has a wide-ranging regulatory role, including monitoring and enforcement of sanitary standards.

Gaps and overlaps blur the lines of accountability. Pulling together the relevant strands of existing policies will help clarify the urban sanitation mandates of the key ministries and flag the areas where further guidance is needed. Role clarification provides a stronger basis for collaboration and better institutional alignment will enhance effectiveness.

The relevant policy and strategies framing sanitation service delivery in Debre Birhan are as follows:

Integrated Urban Sanitation and Hygiene Strategy

The 2017 Integrated Urban Sanitation and Hygiene Strategy falls under the overarching One WASH National Program in Ethiopia. It outlines the strategy for urban sanitation in Ethiopia, led by the MoH. This strategy takes the entire sanitation service chain into account, from emptying to disposal or end use. It also recognizes the importance of improving hygiene standards and addresses aspects of environmental protection. Prior to this, FSM was addressed in a fragmented manner.

The WASH Implementation Framework operationalizes the One WASH National Program, which is based on a Memorandum of Understanding among the Federal Ministries of Health, Education, Water, Irrigation and Energy, and Finance and Economic Development. The WASH Implementation Framework provides the requisite foundation for improved service delivery at the national level.

Public Health Proclamation No. 2001/2000

This proclamation prohibits the discharge of untreated liquid waste generated from septic tanks, seepage pits, and industries into water bodies or water convergences. It mandates any institution or organization providing public service has the obligation to organize clean, adequate, and accessible toilet facilities for its customers. It allocates responsibility for public toilet cleanliness to the city administration.

Environment Protection Act 2002

The Environment Protection Act 2002, for hotels and industries, enforces regulations for effluent discharge onto land or waterbody, unless the effluent is within parameters set out in the regulation.

Prevention of Industrial Pollution Regulation 2009

This regulation connects the licensing of an industrial factory to compliance with effluent discharge. At present, the Integrated Urban Sanitation and Hygiene Strategy works across the entire sanitation value chain, though it has yet to be operationalized at sub-national levels. Theoretically, it recognizes that town or city administrations will bear the most responsibility for urban sanitation and the mayor will be responsible for creating and leading the necessary platforms for the coordination and delivery of services. None of the key informants referred to the strategy during our interviews with them.

At the kebele level, the Environmental Health officers work closely with the kebele Enforcement Office to monitor any households discharging septage and FS to open drains. The Health Office was revealed to be the primary connection or interface between municipal-level government and kebele- and sub-kebele-level stakeholders. Public health is one of the nine core packages of the Urban Health Extension Program and sensitization around this practice forms part of the training. Households are given a notice warning, then fined ETB 500 (\$18), then ETB 1,000 (\$36) for non-compliance. The Urban Environmental Health Extension program has been reinforced through the SEUHP via the local NGO Emmanuel Development Organization.

At the municipal level there is no environmental regulation authority and enforcement is less robust, particularly with respect to breaches of the effluent and public health regulations by commercial and industrial entities. The Trade and Industry Office provides licenses to businesses, which theoretically should be done based on compliance with all regulations (i.e., on the recommendation of other administrative offices), but the Office reports not being able to maintain this systematically. For example, the tannery was granted a license with the agreement they would, in the future, conform to the effluent standards. Now established, the tannery discharges untreated effluent to the river and has asked the municipality to pay for the effluent management infrastructure. Other examples include a hotel closed by the Health Office because they discharged septage to open drains running through kebele 02. But because many of the 300 staff who worked in the hotel also lived in the same kebele and had lost their employment and income, they successfully lobbied to allow the hotel to reopen.

The municipality's core interests revolve around creating a clean and comfortable city in which to live and work, solving housing problems, providing public services, and making the land a source of fair wealth. Operationally there is no strategic plan for sanitation; the municipality sees their role in sanitation as limited—having outsourced FSM to DBWSSE and the management of public toilets to small or medium enterprises. The Urban Land and Housing Management Office believes having a sanitation master plan would strengthen the efforts to solve sanitation problems in the town. Fortunately, Debre Birhan is one of the areas included in a new project financed by the World Bank to get technical support on issues related to sanitation and urban planning. Neither within DBWSSE nor at municipal level is there a dedicated pro-poor unit, strategy, or policy that specifically addresses the sanitation challenges seen in lower-income areas.

3.4.2 Institutional Arrangements

Even though Ethiopia has been decentralizing powers and functions to regional and town authorities since 1995, the authority and leadership of federal ministries (i.e., MoH, Ministry of Urban Development and Housing, and Ministry of Environment, Forestry, and Climate Change) remains unchanged. Many KIIs articulated a lack of coordination between the key sanitation stakeholders, with no clear lead agency or coordination for comprehensive urban sanitation service delivery within Debre Birhan's sanitation system. This was further confirmed by the ONA which revealed coordination is primarily horizontal, occurring among government stakeholders. However, it should also be noted that kebele-level interactions are primarily with non-governmental stakeholders (i.e., NGOs, private operators).

The organization of Debre Birhan town management is presented in Figure 21 on page 34, and the interfaces and relationships within the sanitation system in Debre Birhan are described below. These include points of interaction among stakeholders involved in urban sanitation and provide entry points or opportunities for targeted interventions by the learning alliance.

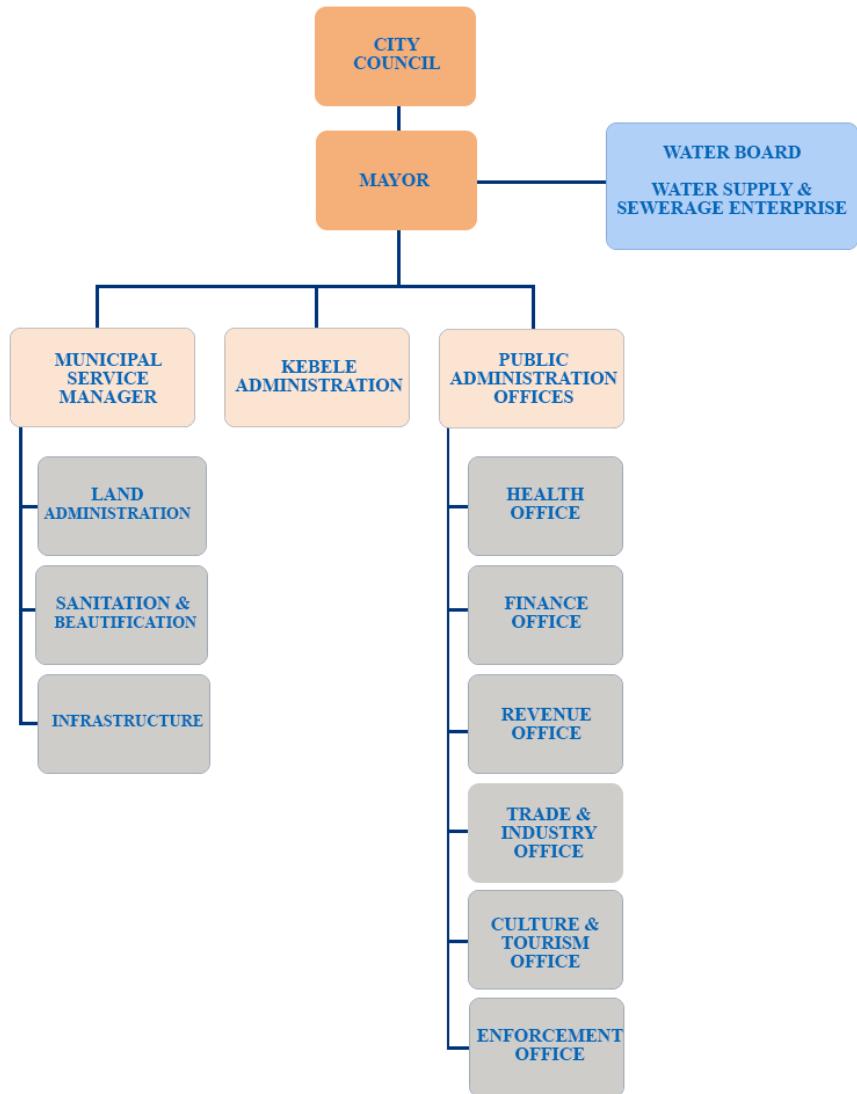


Figure 21. Organigram of Debre Birhan Town Management

The Kebele and Sub-Kebele are the lowest administrative units in Debre Birhan, governed by a chairperson with a skeleton administrative structure representing the public administrative offices (e.g., health, enforcement). The kebele administration has effective relations with the community through different lines of public mobilization, including development armies, one-to-five household clusters, the Youth and Women's Associations, and Edirs. Traditionally, Edirs are organized to cover funeral costs and support deceased families. However, in the kebeles visited, Edirs are also being used to support development activities such as building houses for the poorest. The Women's Association also runs several savings groups. All of these community-based structures, both formal and informal, demonstrate a good social cohesion and provide an effective and useful mechanism and interface between formal town offices and the very granular household level.

Most household and communal toilets are self-built and managed at the sub-kebele level. Some of the community toilets are financed through local savings groups while others are built by NGOs and transferred to residents for management. Critical stakeholders involved in the day-to-day operations and maintenance of communal and public toilets, such as vacuum truck operators and public and communal latrine operators, are notably disconnected from the network of stakeholders in the town. Although they have strong connections with their respective kebele administration, they have little interaction with decision-makers at the municipal level.

The Municipality and Public Administration Offices

Under the Integrated Urban Sanitation and Hygiene Strategy and WASH Implementation Framework, the responsibility for coordination for integrated sanitation is tasked to the municipality. This policy, however, is not yet known at the town level and has yet to be operationalized. Sanitation is not a priority or interest of the municipality and there is no budget or other resource allocation to sanitation. For example, public toilets fall under the remit of the municipality with a service agreement to manage all aspects of the operation and maintenance of the facilities given to an operator, a small or medium enterprise or charity. To date the municipality has provided little to no oversight or support for the maintenance of these facilities.

The urban health extension workers, and supported enforcement officers, are the primary conduit for encouraging and monitoring good household sanitation practices through their public health package.

The Finance and Local Economy Development Office monitors the usage of resources, allocates budgets to the development activities of the city, plans budgets, and tracks the performances of each section of the administration. The planning starts at the kebele level. The residents identify their priorities and the kebele chairs summarize at a city level. The Finance Office receives the budget limit from the region and prioritizes projects, then approves the capital and recurrent budget.

The Sanitation and Beautification Office has no direct responsibilities for FSM. Their activities focus on solid waste management and land administration and organization. The roles and responsibilities are relatively well articulated and operationalized, except for environmental enforcement and regulation above kebele level.

The Town Hygiene Committee focuses on enforcement and is comprised of the Police Department, Justice Office, Trade and Industry Office, Culture and Tourism Office, and Health Office. The committee convenes around improper sanitation activities and complaints. They work together to solve breaches in environmental and public health, within the mandate of their offices. In practice, the legislation is difficult to enforce because of the economic implications of closing businesses. This may become an important interface in relation to improved management of industrial and commercial waste.

DBWSSE is responsible for emptying, transport, and treatment; formerly this was the municipality. It acts as a key interface around several issues and actors, notably in relation to relocating the FS dumping site; formerly this was the municipality. This may become a contentious interface between industry, the

municipality, and DBWSSE because of industry's use of the DBWSSE-managed area to dump their effluent.

There is no formal association of the private emptiers, but DBWSSE acts as the natural interface for all the emptiers as the holder of the service contracts with the private enterprises to conduct emptying on their behalf. A monthly DBWSSE customer forum provides a mechanism for community representatives to voice concerns regarding water and sanitation.

DBWSSE operates under the **Debre Birhan Water Board** which directs, oversees, and monitors their operations, as per the national guideline for Urban Water Supply and Sewerage Services. It provides an important interface between the operations of the utility (DBWSSE) and the municipality and region as it is comprised of selected key representatives (the City Women and Children Office, Regional Women and Children Office, a community representative, Regional Water and Irrigation Office, electricity representative, and the utility manager.) There are no representatives from Health, Education, or Finance on the Water Board, which might suggest a gap in terms of the visibility and ownership.

Private Sector – Unlikely Sanitation Stakeholders

Hotels and industries emerged as important stakeholders during the baseline. Hotels were identified by several of the key informants as culprits of discharging septage to the drainage channels. The regulatory framework exists to close polluting businesses, but enforcement is not effective, as the larger polluters are notably the largest employers and closing them down has widespread economic implications. It would be useful to know more about the reasons for their practice (i.e., does it save costs or are there other challenges in their effluent and septage management?) and the volumes of waste they are generating.

Sixty percent of the private sector FS emptiers' customer base is non-domestic and a significant level of that is industrial effluent, notably brewery yeast. There are two different dynamics at play here. First, industrial effluent is being discharged at the municipal site allocated for fecal sludge. This means DBWSSE is managing industrial waste outside of their mandate. The dumping site has filled and is also causing nuisance (smell) to the local residents. The private enterprises pay a small fee to use the site, but the industries themselves bear no additional cost. Private enterprises charge the same rate regardless of the type of waste or customer type. Second, the demand for industrial effluent management is potentially sustaining the FS market and attracting emptiers to the city, meaning more trucks are available for domestic emptying.

3.4.3 Sector Planning and Monitoring

The Debre Birhan Water Board is comprised of seven members of the local urban government bodies who direct, oversee, and monitor the performance of DBWSSE. This is conducted through an annual plan approved by the board.

There is no sanitation master plan for Debre Birhan. However, planning is underway as part of a World Bank project targeting sanitation in the town. At present there is no strategic sanitation planning and there are no specific sanitation service targets or charter.

DBWSSE holds a monthly customer forum where customer representatives (e.g., community, school, religious, or business leaders) may voice concerns or complaints. This is managed by the DBWSSE public relations officer. This platform is commendable, but without clear performance targets it is difficult to assess how efficient it is as an accountability mechanism. At the time of the baseline, water shortage and the FSM dump site were the primary issues of concern raised at the forum.

3.4.4 Budgeting and Finance

DBWSSE is financially liquid. They generate sufficient income to cover their operations, primarily from their water supply services. They plan and manage their own budget for both capital and operational costs subject to approval of the Water Board. There is presently no capital investment in sanitation. DBWSSE's sanitation spending is on the operation and maintenance of the two trucks and the FSM disposal site. These costs are incorporated into an annual budget plan that is put to the board for approval. In 2016, 100 percent of the utility's operational costs for FSM were recovered through service charges.²²

In terms of public finance for sanitation, no budget was allocated by the municipality for any sanitation works in the last two years.²³ The generation of finance at the town level is limited by the fiscal administration system in the region, where the town can only retain a limited amount while the balance passes to the regional treasury.

3.4.5 Capacity for Urban Sanitation Service Delivery

Within DBWSSE, the management of the FSM trucks and service operators falls under the remit of the technical manager, a recent civil engineer graduate. His role includes both water provision and sanitation. He has received no formal training on FSM. He has one dedicated caseworker for the FSM activities.

As part of the USAID SEUHP program, Urban Health Extension officers are now recruited as qualified nurses with 3 months of supplementary training. Previously 1 year of health extension training was necessary for non-graduates or qualified nurses. The first phase of capacity building targeted at these officers focused on material, newborn, and child health. The second phase was WASH focused. The officers interviewed during the baseline reported receiving refresher training for the former, but not the latter.

Capacity around environmental protection is weak, with the Environment Office located under Land Administration Department and no mandate to enforce environmental protection laws.

²² Data provided by the DBWSSE.

²³ The key informant had only been in office two years, no data was available on the situation prior to his taking up the role.

3.4.6 Enabling Environment Overview

Each of the indicators for the enabling environment is scored against a set of criteria (see indicators 3.1 to 3.5, Annex A on page 52). This is an adapted framework of the CSDA.²⁴ The main adaption is the use of sewered and non-sewered sanitation side by side. Total scores for each indicator are worked out as a percentage of the total possible and plotted on a spider diagram (see Figure 22).

The enabling environment for sanitation service delivery in Debre Birhan must be analyzed carefully. It is important not to assume the enabling environment for one type of service delivery is the same for all service delivery mechanisms. For FSM – where the utility manages the emptying, transport, and treatment portions of the sanitation value chain with participation from private sector – the enabling environment looks reasonable, although there are some significant challenges around sector coordination. No one body is responsible for sanitation oversight and there is currently no real strategic planning or service-level targets. However, the autonomous and financially solvent DBWSSE anchors FSM services in Debre Birhan (see Figure 18 on page 24).

Sanitation coverage figures and the SFD imply that a critical area for improving sanitation service levels in Debre Birhan falls beyond the mandate of the utility. If the enabling environment for communal toilets in Debre Birhan is considered, a much weaker enabling environment is revealed with no sector planning and monitoring, no real institutional home or coordination, and no public finance or budget allocation for a critical part of the urban sanitation puzzle (see Figure 18 on page 24).

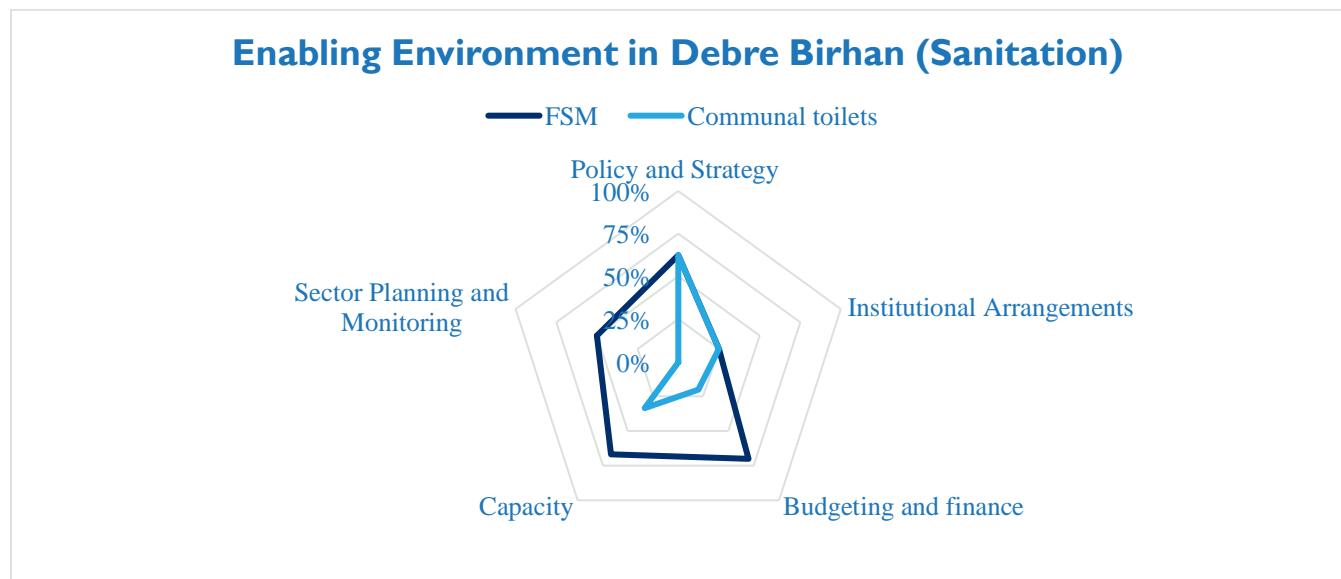


Figure 22. Enabling Environment of Debre Birhan (Sanitation Services)

²⁴ Accessed at: <http://documents.worldbank.org/curated/en/461321468338637425/pdf/106805-REVISED.pdf>

3.5 WASH Stakeholder Network

3.5.1 Organizational Network Analysis

The ONA examined three dominant relationship types: information sharing, problem solving, and coordination among the participating organizations (see Table 8 on page 40). The ONA simulation produced several graphics depicting the nature of the relationships, strength of interactions among actors, and quantitative metrics commonly used in the discipline of systems mapping (e.g., density, reciprocity, degree). Below is a summary of the overall findings from the ONA followed by results for each of the three specific relationship types.

Table 8. Network Relationship Types

Relationship Type	Attributes
Problem-solving request (made and received)	Types of requests (based on categories) Reliability in addressing request (noted by requestor)
Information sharing outside of formal reporting (shared or received)	Frequency (once per month or more; less than once per month) Use of information (noted by recipient)
Direct coordination of activity planning or implementation	None

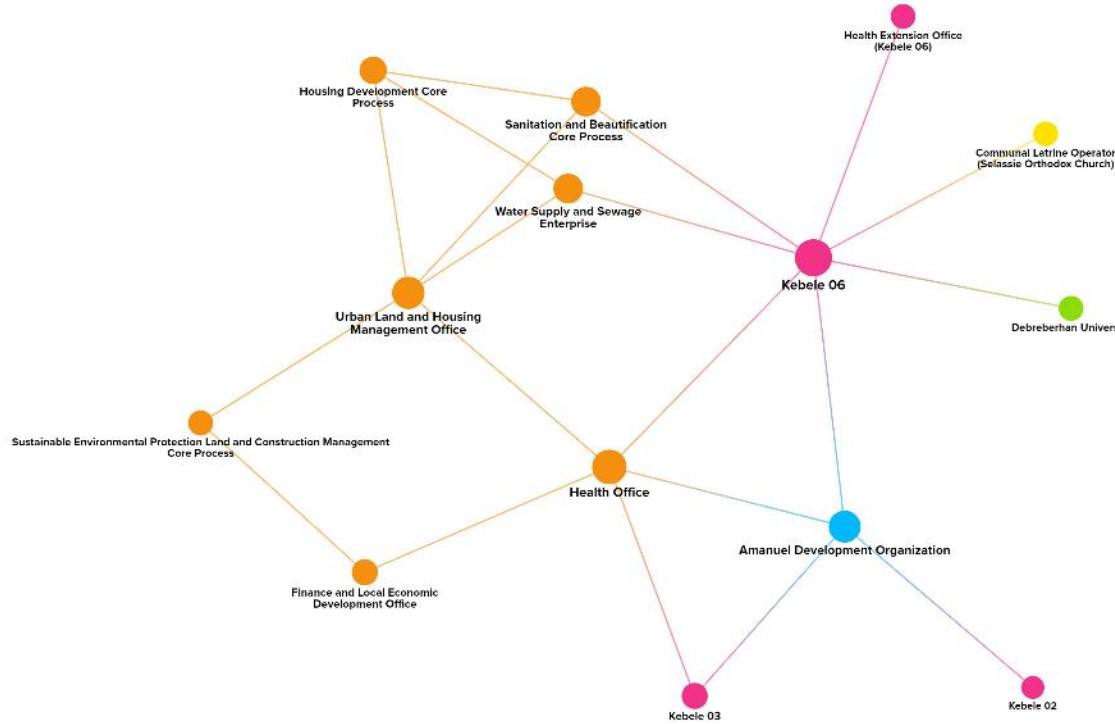


Figure 23. Coordination Network Structure

3.5.2 Specific Relationship Findings

Information Sharing

This relationship type focuses on information sharing outside of formal reporting, frequency (once per month, more, or less than once per month), and how the information is used, as noted by the recipient.

- The network of information-sharing relationships is characterized by strong ties among government stakeholders, both town and kebele; the one NGO, Emmanuel Development

Association; and Debre Birhan University, the academic institution. However, organizations involved in day-to-day operations and maintenance of latrines have limited connections to the network and are barely involved in information sharing with the network (see Figure 24).

- While the average organization has just over nine information-sharing connections, these are heavily skewed, with five organizations representing half of all information-sharing connections (Utility, Health Office, kebele 02, Sanitation and Beautification Department, and Emmanuel Development Association).
- The three organizations with the most day-to-day involvement in latrine operations and maintenance – the vacuum truck emptying company and communal and public latrine operators – each only have one information-sharing connection to the network, mostly through the kebeles.

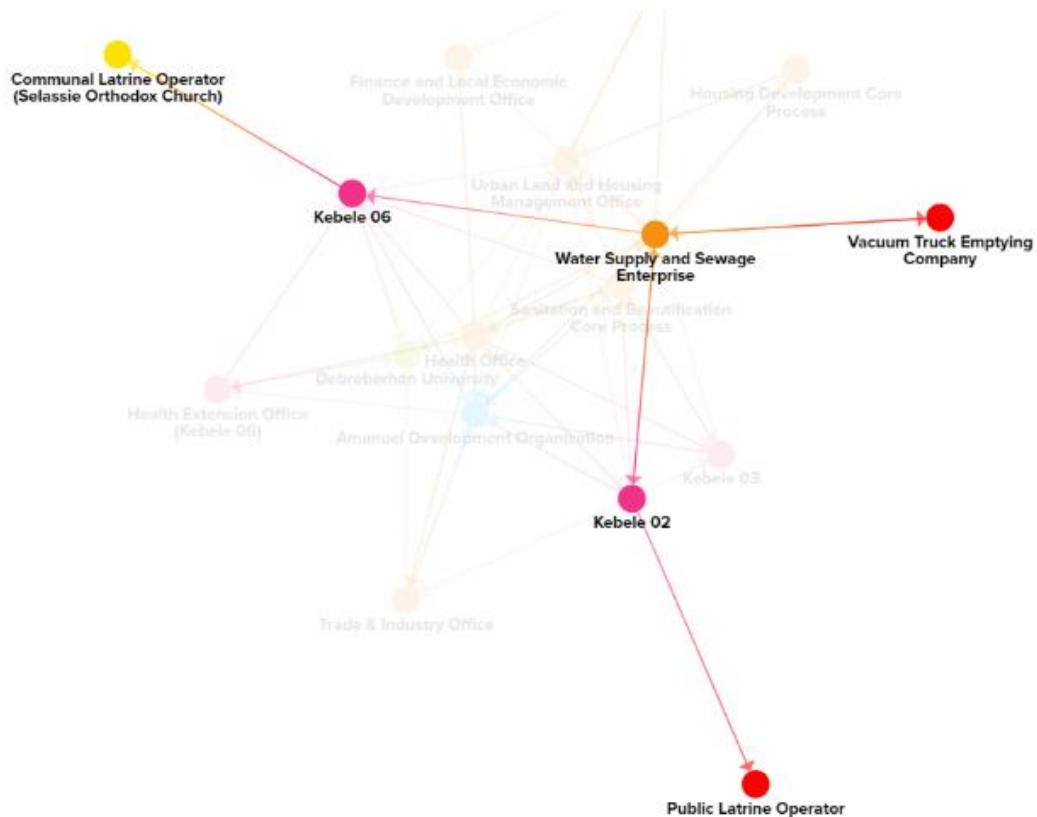


Figure 24. Information-sharing Relationship Network, with Day-to-Day/Maintenance Connections

Problem Solving

This relationship type focuses on the types of requests made and received by stakeholders and the reliability in addressing requests, as noted by the requestor. The network of problem-solving relationships has a similar structure to information sharing, although connections are somewhat more evenly distributed through the network.

- Problem-solving relationships are most likely to involve requests for expertise or technical assistance and least likely to involve requests for studies or information.
- The two key bridging organizations for coordination in the network are the Health Office and kebele 06. When these organizations are removed, the coordination network becomes highly fragmented. Even with these organizations included in the network, the public latrine operator and vacuum truck operator are not involved in any coordination relationship in the network.

Coordination

The relationship type focuses on the direct coordination of activity planning or implementation among stakeholders.

- The two key bridging organizations for coordination in the network are the Health Office and kebele 06. When these two organizations are removed, the coordination network becomes highly fragmented (see Figure 25).
- Even with these organizations included in the network, the public latrine operator and vacuum truck operator are not involved in any coordination relationship in the network.

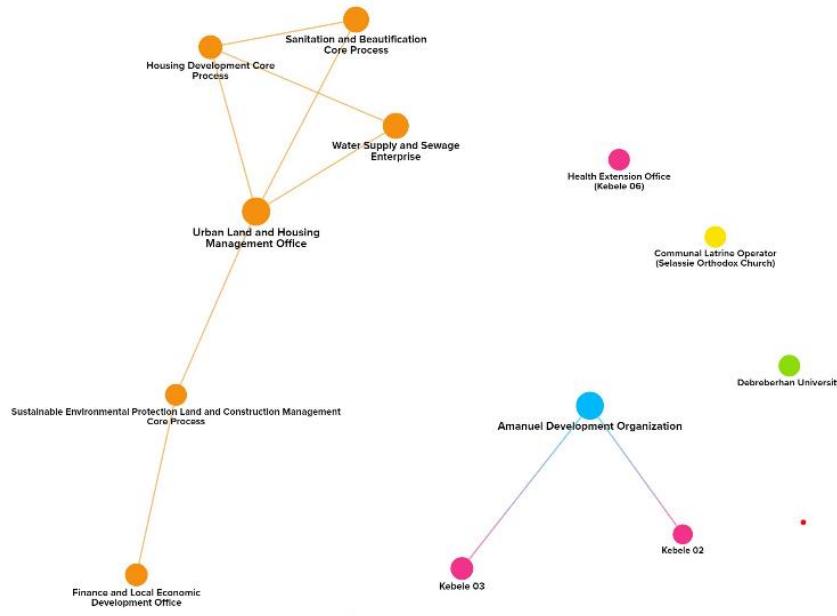


Figure 25. Coordination Relationship Network, with Kebele 06 and the Health Office Removed

4.0 Conclusions

The SCA baseline of Debre Birhan identified how the sanitation service delivery systems link to the wider urban environment. The following conclusions have emerged from the synthesized findings:

4.1 At the Living Environment Level

- **Sanitation should be linked to other development priorities of residents in Debre Birhan.** The top priorities identified were rainwater management, streetlights, and roads. Sanitation was listed sixth. Moreover, greywater management was cited by many residents as a priority. There may be more traction linking sanitation with other interventions and FSM should not proceed in isolation from other urban development priorities.
- **Communal toilets are a critical part of the sanitation infrastructure in Debre Birhan.** Critical elements for success include having a defined user group, having a clear lead on responsibility, and taking advantage of the local savings groups that already exist in many of the communities, if possible. Community savings groups may provide a platform for financing to rehabilitate existing facilities to ensure they are safely managing FS.
- **Shared toilets need a clear management model.** This is of note for the shared toilets visited during the baseline, for example the Selassie Church site, which needs a review of their management model, communal or public.
- **Alternative financing mechanisms and models are critical for better managed public toilets.** Public toilets are poorly maintained. There is no planning or budgeting for operation and maintenance beyond regular emptying, which is paid for by the operator from user fees. In commercial and high-transit locations, there may be scope for commercial toilet blocks where other commercial activities are run from the same location to boost the commercial viability of the toilet.

4.2 At the Service Delivery Level

- **Mechanical emptying is widespread, however, there is a need for intermediate pit-emptying technology for households inaccessible by vacuum tankers.** Technologies such as the Pit Vidura, which incorporates an intermediate pump at the household level, allows vacuum trucks to extend their cables into inaccessible locations. This might be appropriate for trial by DBWSSE.
- **A more detailed assessment of the waste streams would identify optimal waste treatment and re-use solutions.** There are options to treat the FS in isolation through low-cost FS treatment technologies. However, the abundance of liquid yeast may also present waste-to-resource opportunities which, if viable, could offset the waste management costs (e.g., biogas using mixed fecal waste, municipal organic waste, and yeast). Further technical analysis and support is needed to explore these options.

4.3 At the Enabling Environment Level

- **There are several key interventions that require municipality support.** These include locating a new FS treatment site, managing industrial effluent in a sustainable manner, and improved enforcement of breaches of environmental and public health by commercial and industrial entities.
- **The regional fiscal administration limits municipality control of the budget.** Finance and economic cooperation is likely needed to address sanitation challenges. Alternative financing mechanisms may be required to adequately fund sanitation services.
- **Kebele-level urban health extension and enforcement officers are the primary public health control mechanism for curtailing the clandestine practice of managing FS outside of transport (i.e., households discharging septage effluent to drain).** This is a powerful mechanism and community-level sanitation interventions should work with and through them to gain traction and increase sustainability.
- **The enabling environment is not the same for all aspects of sanitation service delivery.** It is important to consider how interventions might improve all aspects of the sanitation service delivery chain. Outside of FSM, the wider enabling environment for achieving sustained universal sanitation services – including household and shared toilets (both communal and public) – is much weaker.
- **A sustainable solution is needed for the industrial wastewater management.** The DBWSSE FS dump site should not be managing industrial effluent as the site cannot handle the volumes of effluent and it increases the disturbance to neighboring communities. DBWSSE requires the cooperation of the municipality and local administration offices to manage this problem appropriately and sustainably. Relocation will only offer a temporary solution. Hotels and industries are unlikely stakeholders in the sanitation service delivery system, but are important polluters in the Debre Birhan context.

5.0 Recommendations for Strengthening the System

Potential interfaces or components to target for improvement are as follows:

- Sanitation interventions should be tailored to the living conditions and types of settlement. The findings revealed four types of settlements in Debre Birhan and each kebele was categorized accordingly. Service-based interventions, rather than investment in fixed infrastructure, may be more appropriate for kebeles 02 and 05, which have the lowest living conditions and a greater proportion of tenants than owner occupiers. On the other hand, the settlement types with good tenure but poor housing infrastructure will potentially be more receptive to communal rather than private onsite facilities.

- The location and activities for public toilets need to be selected carefully to ensure successful uptake. Community savings groups may provide a platform for co-financing public toilet blocks. Furthermore, the operators may require additional support beyond the technical and financial managing of the business, especially in the case of those who are vulnerable or less abled.
- Appropriate key performance indicators should be developed for sanitation service delivery for DBWSSE, the private sector emptiers, and the municipality.
- A more detailed assessment of the waste streams would identify optimal waste treatment and re-use solutions. There are options to treat the fecal waste in isolation through low-cost FS treatment technologies; however the abundance of liquid yeast may also present waste-to-resource opportunities. If viable, it could offset the waste management costs (e.g., biogas using mixed fecal waste, municipal organic waste, and yeast). Further technical analysis and support is needed to explore these options.
- Coordination for sanitation service delivery at the town level needs improvement. This could potentially occur through existing structures and committees and include representation from the community and Health, Environment, DBWSSE, Trade and Industry, Enforcement, and the Central Municipal Offices.
- A dialogue needs to be started around commercial and wastewater effluent management. Prohibiting emptying trucks to dump industrial effluent on the FS dump area is likely to lead to illegal dumping. Some dialogue and consideration of carrot and stick incentives for the industries to cooperate is required. Enforcement is complex as closing the largest polluters has economic repercussions.

6.0 Emergence of a Learning Alliance

In a validation workshop held on May 29, 2018, SWS presented baseline findings and underlying assumptions to local stakeholders for discussion. There were representatives from the utility, various implicated municipal and kebele administration offices, the private sector, and communities. SWS undertook a lengthy exercise with participants to correct the initial SFD. Participants generally agreed with the findings and most assumptions, but had extensive discussions about the validity of self-reported incomes by households (an issue that may be pursued by the learning alliance) and the prevalence of open defecation as reported. With regards to the latter, the Health Office conducted a study that reported a rate of 7 percent for open defecation in the town. However, the Health Office manager revealed concerns that open defecation is underreported, a sentiment supported by other participants.

Participants expressed an interest in developing a learning alliance to strengthen coordination among stakeholders. The activities of the learning alliance would address the above recommendations where they align with and support implementation of the second World Bank UWSSP underway in 2018. It is anticipated activities will center around two issues considered prominent by local stakeholders: (1) communal and public latrines and (2) the disposal site. Going forward, the learning alliance, with support

from SWS, will facilitate learning and strengthen the capacity of local stakeholders to sustain sanitation infrastructure interventions under the World Bank project. Debre Birhan has a Steering Committee that oversees project implementation, but its members recognize gaps in its ability to fulfill their mandate (e.g., in developing business and management models for sustaining services of the utility and other service providers).

Annex A: Indicators Measured in the Baseline

The Living Environment

INDICATOR	SUB-INDICATOR	DATA SOURCES	METHOD	RESEARCH QUESTION	OUTPUT
I.1 Demand for basic services	Top 5: Development priorities (water, sanitation, land, roads, security, employment)	Residents	FGD	Rank 1-5 (1 most important)	Ranking
	Perspective of residents of prioritization of sanitation and meeting their needs	Residents	FGD	Do you think the urban local government (ULG) takes your needs and concerns into account?	
	Satisfaction of sanitation	HH	HHS	How satisfied are you with the toilet you normally use? Why?	scale
I.2 Tenure	Settlement tenure type and mix	HH	HHS	How satisfied are you with the emptying service you normally use? Why	Percent of satisfied
				Is this house owned, rented, or rent free?	Tenure mix
				If rented, does the owner live in the same building/plot	y/n
				If home owner, do you own the land?	Legal title; Customary or other title; no
	Duration of stay	HH	HHS	Do you currently fear eviction?	y/n
				Number of years of residence in current housing unit	years
				Number of years in settlement	years

INDICATOR	SUB-INDICATOR	DATA SOURCES	METHOD	RESEARCH QUESTION	OUTPUT
I.3 Housing Unit	Permanent Walls	HH	HHS (observation)	Permanent Walls	y/n
	Permanent Floors (inside)	HH		Permanent Floors (inside)	y/n
	Assessment of building quality	HH		Assessment of building quality	Good; average; dilapidated
I.4 Infrastructure and Services	Electricity to plot	HH	HHS (ask/observation)	Is there electricity to the plot?	
	Piped water to plot			Water access	
	Access to toilet			Sanitation access	
	Drain outside plot			Is there a grey water drain running outside the plot?	
	Paved Road			Is there a paved road outside the plot	
	Street Lights outside plot			Are there street lights on the road/path outside the plot?	
	Garbage disposal system			Does the HH use a garbage disposal collection service or system?	
I.5 Neighborhood	Type of neighborhood	LA	Site visit	What is the typology of settlement	Categorization
	Cleanliness	HH	HHS	Do you consider your neighborhood to be clean?	y/n
	Location / transport	HH	HHS	Do you consider your neighborhood a good location in the city (in terms of transport links; employment)?	y/n
	Safety	HH	HHS	Do you consider your neighborhood safe?	y/n
	Crime	HH	HHS	Have you been a victim of crime in the past year?	y/n
	Cost / m ²	LA or HH	KII	Do you know the cost of a m ² of land in this neighborhood?	y/n

The Service Delivery Environment

INDICATOR	SUB-INDICATOR	DATA SOURCES	METHOD	RESEARCH QUESTION	OUTPUT
2.1 Containment	Sanitation access	HH & Literature	HHS	Which toilet do you usually use? (i.e. on-site/offsite/shared/flying toilet)	Description and percent of population using this type
	Sanitation technology	HH & Literature	HHS	If on site, what type of toilet/latrine do you have? (unimproved, improved, pour flush; septic tank)	Description and percent of population using this type
	Number of operational (including clear maintenance plans) public toilet and communal toilets	PTO	Site Survey	How many of the communal toilets are operational? How many have a clear maintenance plan?	
2.2 Emptying	Diversification of customer base for FSM services	Service provider – utility (SPU), Service provider - private (SPP)	Site visit	Percent of customers of using the pit emptying services being domestic	Percent
	Inventory of emptying service providers (manual and	SPU, SPP	KIIs	Methods and types of equipment, no of vehicles	Numbers, types of vehicle and equipment, capacity
		HH	HHS	Have you ever emptied the tank/pit? If yes, how?	Percent of

INDICATOR	SUB-INDICATOR	DATA SOURCES	METHOD	RESEARCH QUESTION	OUTPUT
2.3 Transport	mechanical)				population that have their onsite sanitation technology emptied
	Frequency and volumes of HH emptying	SPU, SPP	KII	Monthly volume of sludge removed by vacuum truck	
		HH	HHA	How often have you emptied your toilet or septic tank?	Number of years
	Average number of visits per day by the vacuum truck (indicative of efficiency)	SPU, SPP	KIIs	How many emptying visits did you do yesterday? The day before?	
	Cost of emptying	HH, SPU, SPP	HHS, validate with FGD	Cost of emptying	Money
	Capacity of emptying	SPU, SPP	KII	Do the emptiers fully empty the pits? What is a typical extraction process? How to manage pits that have high levels of solids?	Descriptive
2.3 Transport	Transport practices	SPU,SPP, literature	KII	Method of waste water transport and percent of the population served by centralized/decentralized sewers has their wastewater reaching treatment facilities	Descriptive and percent
		SPU, SPP, site visit	KII	Methods used for transport of FS	Descriptive and percent
	FS pathways and volumes	HH, SPU, SPP	KII, HHS	Percent of FS that is collected that is removed from HH immediate environment	
			KII, HHS,	Percent of FS that is collected that reaches a treatment	

INDICATOR	SUB-INDICATOR	DATA SOURCES	METHOD	RESEARCH QUESTION	OUTPUT
			emptier, site visit	facility	
2.4 Treatment	Quantities of FS arriving at FS treatment plant	SPU, SPP	KII, site visits	Volumes arriving at FS treatment sites ²⁵	
		SPU, SPP, log book	Site visit	Number of visits per month by the vacuum trucks (disaggregated by private vs commercial customers)	
		SPU	KII, site visits	Capacity and design of FS treatment plant	
		SPU	KII, site visits	Volumes arriving at FS treatment sites that is effectively treated	
		SPU	KII, site visits	Volumes of transported FS is disposed of with/without treatment?	
2.5 End use / disposal	Re-use	SPU, SPP	KII, site visits	Quantities of FS that get reused; how it is reused and who manages the process	

²⁵ The utility only keeps track of their own volumes. It is unlikely the baseline will capture the adequate data to validate the volumes arriving at the FS site, returning an initial SFD. Assumptions and data gaps will be made explicit.

The Enabling Environment

INDICATOR	SUB-INDICATOR	DATA SOURCES	METHOD	RESEARCH QUESTION	OUTPUT	SCORE
3.1 Policy and Strategy	Appropriate policy to context	SPU, Municipal services sanitation (MSS), literature	KII, literature analysis	Is there an appropriate sanitation policy that covers the typical sanitation service delivery (FSM, public toilets)? Is it acknowledged and available (national or local or both)?	I: legal and regulatory mechanisms for FSM exist and are operational .5: legal and regulatory mechanisms for FSM exist but are not operational 0: no legal and regulatory mechanisms for FSM exist	0
	Appropriate regulation and enforcement	SPU, PAR MSS, literature	KII, literature analysis	Are there regulations in place that enact the policy (at national and local level)? Such as local bylaws and enforcement? How are the regulations enforced? By whom?	I: Exists and operationalized .5 Exists but not operationalized 0: Doesn't exist	.5
	Pro-poor	SPU, MSS, Public administration small and micro enterprise (PAE)/ Public administration health (PAH), literature	KII, literature analysis	Is there a pro-poor unit, strategy or policy that specifically addresses the sanitation challenges typically seen in poorer areas?	I: Exists and operationalized .5 Exists but not operationalized 0: Doesn't exist	0
	Interests of ULG	SPU, MSS, PAE, PAH	KII	What are the strategic interests and priorities of DBWSSE and ULG? Overall and general for improving sanitation (or related basic services).	I: Sanitation is a priority for ULG 0: Sanitation is not a priority for ULG	0
3.2.	Roles and responsibilities	SPU, MSS, PAR	KII, literature	According to the administrative framework who is responsible for		

INDICATOR	SUB-INDICATOR	DATA SOURCES	METHOD	RESEARCH QUESTION	OUTPUT	SCORE
Institutional Arrangements			analysis	providing or delivering sanitation services? Please explain the arrangements.		
		MSS, PAE, PAH, PAR	KII, literature analysis	Who else is involved in delivering sanitation services in Debre Birhan (i.e., public sector, departments, private sector)?		
		MSS	KII, literature analysis	Are these institutional roles and responsibilities for sanitation service delivery clearly defined and operationalized at town level?	I: Clearly defined and operationalized .5: Clearly defined but not operationalized 0: Not clear	.5
		SPU, MSS, PAE, PAH, PAR	KII, literature analysis	In practice, who leads the coordination between the different agencies? Is it effective? What are the challenges?	I: Clear lead agency and effective coordination .5 lead agency but limited coordination 0: no clear lead agency and poor coordination	0
3.3 Sector Planning & Monitoring	Service targets	MSS, SPU	KII, literature analysis	Are there service targets or a service charter for sanitation? Where are these articulated (i.e., a national development plan or city development plan)? What are they? If at national level, are/how are they being adapted for city level?	I: targets are clearly included .5: service levels are included, but no targets stated 0: no reference to service levels or targets	0
	Monitoring	MSS, SPU	KII, literature analysis	Who monitors the performance of DBWSSE and how?	0: The ULG is not meaningfully involved in the monitoring of the Service Delivery Unit (SDU) .5: The ULG formally	1

INDICATOR	SUB-INDICATOR	DATA SOURCES	METHOD	RESEARCH QUESTION	OUTPUT	SCORE
3.4. Budgeting and Finance					monitors the performance of the SDU, but does not do so in a transparent or participatory manner I: The ULG effectively monitors the performance of the SDU (e.g., standing committee of council)	
	Planning	SPU, MSS	KII, literature analysis	Does DBWSSE have any interaction with community groups? (such as participatory planning or social accountability or oversight mechanisms)	0: No (or Yes, but ineffective) .5: Yes, but only partially effective I: Yes, the SDU has effective participatory planning / social accountability /	I
	Financial planning and procurement	MSS, PAF	KII, literature analysis	In practice, does the ULG plan and manage the procurement of capital investments or infrastructure required for the service? The de facto situation is revealed by the extent to which central agencies (directly or indirectly) provide or control the capital infrastructure for the relevant urban service delivery function. If infrastructure investments are made through local accounts, but the ULG does not have meaningful	0: No: a higher-level authority plans and manages the procurement of capital investments /infrastructure required for the service .5: The ULG (or SDU under ULG) has partial control over infrastructure planning and procurement I: The ULG (or SDU under ULG) has full control over	

INDICATOR	SUB-INDICATOR	DATA SOURCES	METHOD	RESEARCH QUESTION	OUTPUT	SCORE
Sanitation delivery unit				control over planning and prioritization, please assign half of the points indicated.	infrastructure planning and procurement	
		MSS, PAF, SPU	KII, literature analysis	In practice, is the ULG responsible for planning and procuring the recurring costs (including operation and maintenance, HR) required for providing the service?		
		MSS, PAF, SPU	KII, literature analysis	Does the ULG approve and manage the budget of the DBWSSE or service delivery unit?		1
		MSS, PAF, SPU	KII, literature analysis	Are sanitation investments incorporated into an approved and used investment plan, including ensuring adequate human resources and technical assistance? (Ideally a medium-term plan, but if not, at least an annual plan)	1: Yes .5: Partially 0: No	1
	Spending and cost recovery	SPU	KII, literature analysis	What is the current annual DBWSSE spending for sanitation? (Break down if possible)		
		PAF (or whoever holds the budget)	KII, literature analysis	What percentage of operation and maintenance costs ²⁶ are recovered through tariffs?	1: full cost recovery .5: partial cost recovery 0: no cost recovery	.5

²⁶ Referring to all sanitation services provided by utility, municipal department for sanitation and beautification, etc.

INDICATOR	SUB-INDICATOR	DATA SOURCES	METHOD	RESEARCH QUESTION	OUTPUT	SCORE
		MSS, PAF	KII, literature analysis	What are the current annual public-sector investments in sanitation?	I: public investments in sanitation are sufficient .5: public investments in sanitation are limited 0: no public investments or dedicated budget line in sanitation	0
3.5. Capacity	Capacity and resourcing of ULG	MSS	KII	In the ULG how many people are dedicated to sanitation? What is their role and other demands? What are their capacity challenges?		.5
	Capacity and resourcing of DBWSSE	SPU	KII	How many people in DBWSSE are dedicated to sanitation (number and percent)? What is the roles? What are their biggest challenges? (Prompt regarding capacity, time, resources)		.5

Interfaces

INDICATOR	SUB-INDICATOR	DATA SOURCES	METHOD	RESEARCH QUESTION	OUTPUT
4.1 What are the key interfaces and/or relationships and gaps in sanitation service delivery?	Organization of stakeholders	LA, HH	KII, FGD	Is there community leadership or organization? What is its objective and how often does it meet?	Descriptive and ranking
		LA	KII, FGD	How many saving groups are there in the kebele?	Number
		SPU, SPP	KII	Is there an association of emptiers? How well is it organized? Number of members, who are the members? What is the aim? How effective?	Descriptive and ranking
	The nature of the relationships between stakeholders	HH, SPU, SPP	HHS, KII	Does DBWSSE have any direct link with households for sanitation? If so what (e.g., contracts, payments)?	Descriptive
		HHS	HHS	How did you (HH) locate your chosen emptier?	
		HHS	HHS	What was the trigger to get pit or tank emptied?	
		LA, MSS, PAE, PAH	KII	Is there a relationship between community leadership and ULG? Do they meet formally? If yes, how often? Why? When? What is the nature of this relationship? Is it effective?	Descriptive and ranking
		SPU, SPP	KII	Is there a relationship between the emptiers and DBWSSE? Do they meet formally? If yes, how often? Why? When? What is the nature of the relationship (e.g., contract, license, forum for debate, information)?	Descriptive and ranking
		SPU, MSS	KII	Does DBWSSE meet with the ULG? If yes, how often? Why? When? What is the nature of this relationship (e.g., service contract, legal requirement etc.)? How do they share information, communicate, etc.?	Descriptive and ranking

To learn more about the Sustainable WASH Systems Learning Partnership, visit:
<http://www.globalwaters.org/SWS>

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