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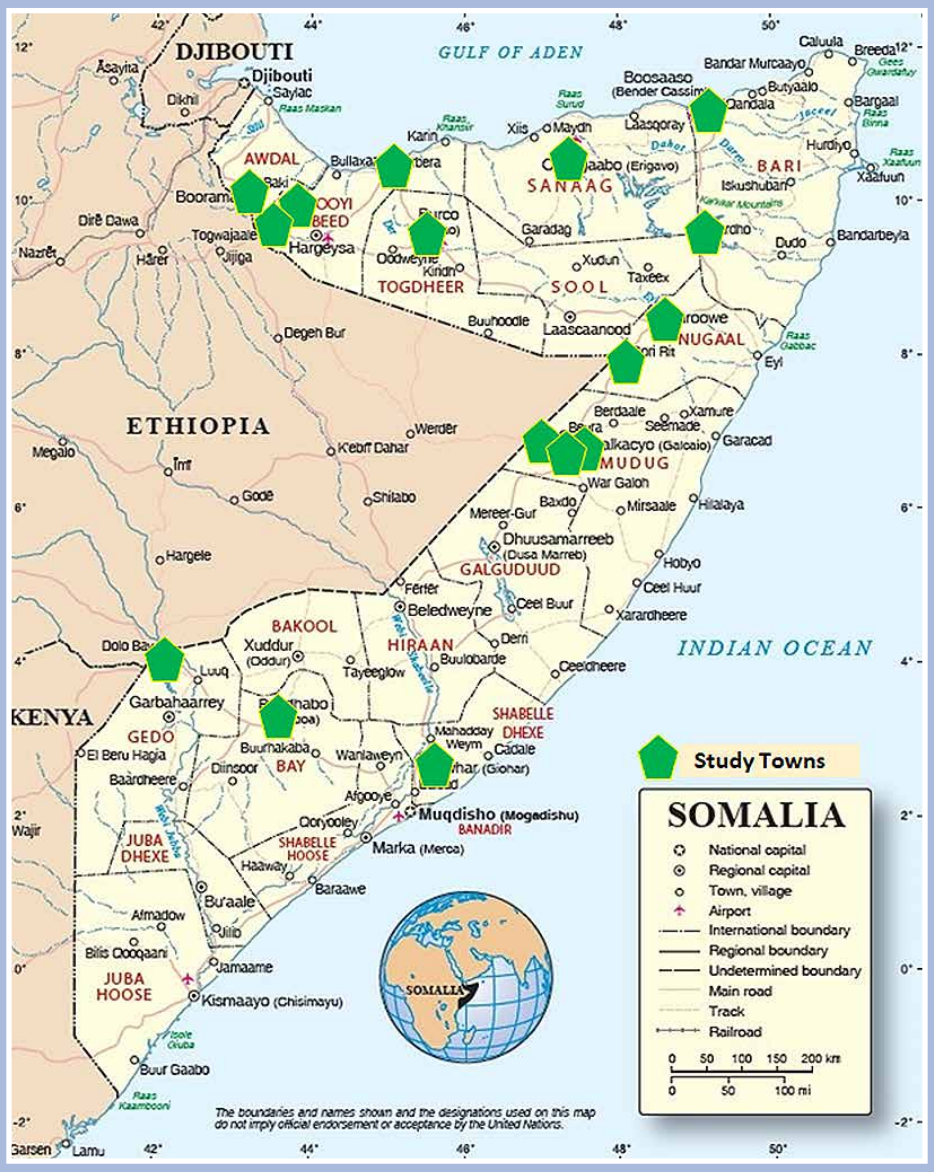
Public Private Partnership (PPP) in Urban Water Supply System

A Review Study of Somalia



This study is completed as part of the consultancy assignment on
"Public Private Partnership in urban water supply in Somalia - Study on fact finding and future course"

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ABSTRACT

In Somalia, only 64 percent of the urban population have access to piped water systems and 46 percent have access to improved sanitation. IDPs account for about 1.2 million people with only 41 percent having access to water supply services.

More than three decades of conflict has diluted service delivery capacity and stretched Somalia's basic services, including water supplies. With the collapse of state water institutions, a vibrant private sector led by local entrepreneurs and the diaspora saw a business opportunity. Initially, the Somali entrepreneurs started water businesses as private service providers. UNICEF and the European Union then pioneered the Public-Private Partnership (PPP) approach in Somalia in 1997.

UNICEF Somalia carried out a study to investigate how the government and private sector can collaborate in the management of water service delivery in Somalia. The research was intended to find a tool to measure the performance of water utilities by evaluating five main domains such as access and service coverage, billing efficiency, collection efficiency, operational costs, expenditure and revenue.

The study evaluated sixteen towns in three regions of Somalia, namely: Somaliland, Puntland and the South Central region. The expectation of this review assessment was to probe and identify the effectiveness of the management model of the urban water supply system in Somalia.

The water utilities managed by PPP companies are performing well in Somalia. SHABA water utility in Somaliland scored highest, followed by GALWA in Puntland and Warjinay for South Central. Highest tariffs have been recorded in Erigavo, Somaliland, while the lowest tariffs are charged by Burao Water Agency, which is a public entity.

The research concluded that there is room for improvement for all the water utilities visited. Of course, some are better than others. But overall, the water operators need support in terms of building capacity in management, technical and financial planning. Despite the environmental challenges some water utilities are facing, there is growing consensus they all operators lack technical knowledge.

Considering willingness to pay for water, the residents are willing to pay more for better services. A major complaint from consumers is the intermittent supply even in piped and metered household connections, thereby reducing the confidence level on service providers.

Somaliland and Puntland have implemented legal frameworks for the water service delivery, while in South Central, the legal framework document is still in draft mode. The capacity of the regional governments is very weak in terms of leading the development of the water sector. Puntland has shown commitment in the development of a better PPP model compared to the other member states.

Having access to water on premises has reduced the time used for hauling water, thus allowing girls to attend schools and enjoy improved health. On the other hand, women are participating more in business, by owning some of the water kiosks as small businesses. Jowhar has the highest level of women as business owners.

In terms of sustainability, the research has uncovered that all PPPs including SHABA, GALWA and Warjinay rely on technical, financial and managerial assistance from UNICEF and other multilateral organizations. However, all utilities are found self-sustained in terms of operation and management of the existing systems.

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Finally, the team gratefully acknowledges the community/ water-users who provided their valuable input during this study.

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1. INTRODUCTION

1.1. Background

The current population in Somalia is estimated to be around 14.3 million. Over 2.6 million people are currently internally displaced due to decades of climatic shocks and conflicts. The majority have moved to urban areas. Seventy-five percent of IDPs in Somalia have settled on public and private land in and around the cities. Somalia's urban population is growing rapidly, partly because of significant, forced migration into urban areas caused by protracted conflicts, insecurity and cyclical natural disasters. The current urban population is estimated at 42 percent, with a growth rate of around 4 percent per annum. However, JMP-2019 suggested 44 percent urban population.

Only 64 percent of the urban population have access to piped water systems and 46 percent have access to improved sanitation. IDPs account for about 1.2 million people with only 41 percent having access to water supply services. With urban populations on the rise, existing water and sanitation services are extremely stretched with failing management arrangements, leaving an even larger proportion of the population to rely on intermittent, poor quality and unaffordable services.

Over three decades of conflict has diluted service delivery capacity and stretched Somalia's basic services, including water supplies. With the collapse of state water institutions, a vibrant private sector led by local entrepreneurs and the diaspora saw a business opportunity: initially the business-oriented Somalis started water businesses as private service providers. UNICEF and the European Union then pioneered the Public-Private Partnership (PPP) approach in Somalia in 1997. Since then, several other key donors to the sector, including USAID and the Danish Government, have also come on board to support this initiative.

Since their formation, PPPs were largely ad-hoc to cover the gap after the collapse of state institutions. One of the key challenges faced by the utilities was having the technical skills to manage the water supplies. However, with a ready market for a valued commodity, it provided a good investment opportunity for local entrepreneurs. This vibrancy in the private sector has attracted the interest of donors who are keen to provide support in capital expenditure on essential infrastructure, policy development, and improvements on management, capacity development and technical guidance.

The Public-Private Partnership approach compensates for the lack of institutional capacity within Somalia's public sector by promoting the increased involvement of the private sector in providing water supply services. Through this approach, the different and complementary roles of government and private sector are strengthened, with UNICEF as facilitator to the process. Moreover, the interests of the community are safeguarded through their representation in management boards.

The PPP approach has focused on hardware inputs including construction, extension and rehabilitation, as well as software inputs including: training on bookkeeping, general accounting, financial management, billing systems, stocks and assets control, personnel management, training on operation and maintenance of water equipment, setting concession agreements, business planning, tariff setting, water regulations and water law.

Over time, a more realistic market has developed, with a growing number of private investors from different regions and with contract designs based on a more pragmatic allocation of risks between partners. What emerges from examining the available empirical evidence is that well-designed partnerships between the public and the private sectors are a valid option to turn around poorly performing water utilities in Somalia.

In the challenging environment of Somalia, the focus of water PPP should not be about attracting direct private investment, but rather about using private operators to improve service quality and efficiency. This approach fosters a virtuous circle whereby the utility improves its financial situation and gradually becomes able to finance a larger share of its investment needs. Although concessions have worked in a few places, contractual arrangements that combine private operation with public financing of investment appear to be the most sustainable option in Somalia. An obvious implication for governments and donors is that they need to remain heavily engaged in the water sector.

1.2.Study Objectives

The broad aim of this review assessment is to probe and identify the effectiveness of the management model of the urban water supply system in Somalia. The study also aims to assess the building blocks of the PPP concept and the strengths and weaknesses in the regulation, management, operations and sustainability of the urban water supply service delivery model.

Followings are the specific objectives of the study:

- To formulate the different parameters that help to measure the effectiveness of the management model of urban water supply service delivery system.
- To analyse the status and conducive political environment of scaling up the PPP managed service

delivery model across three study regions (Somaliland, Puntland and South Central)

- To recommend actions to be considered for scaling up the PPP modality for urban water supply systems management.

1.3. Scope of the Assignment

This study provides objective information and analysis on the performance of water utilities of urban towns in Somalia either managed by PPP or Public modality. It reviews the spread of urban water systems across the country and assesses whether and how they have helped to improve services and expand access for the populations concerned. The study uses a structured framework to assess the performance of 16 water utility (11 PPPs and five public managed systems). The study was conducted in sixteen towns from three regions such as Somaliland (Borama, Tog Wajaale, Gabiley, Berbera, Burao and Erigavo), Puntland (Bossaso, Qardo, Garowe, Burtinle, Goldogob, Bacadwyene and Galkayo) and South Central Region (Dollow, Baidoa and Jowhar) of Somalia.

The analysis focuses on the coverage and the financial efficiency of the water utilities. To the extent that the available data permits, five dimensions of performance are analysed: access and coverage; billing efficiency; tariff-collection efficiency; operational-cost recovery and non-revenue water (in a form of revenue collection). The limitations and pitfalls inherent in the analysis of each performance dimension are addressed. The term Public-Private Partnership (PPP) is used in different ways in the literature, so it is important to clarify what this report is about: The PPP projects analysed in this study are those in which the provision of urban water services is delegated by contract to a private operator, which usually takes over the management of an existing utility.

This study is not intended as a policy manual, nor is it a census of the PPP projects operating in the urban water sector. Neither does it presume to systematically assess the relative performance of public versus private models of service delivery, although in the few cases where such information is available and relevant, comparisons are made. Finally, it is important to keep in mind that a PPP is merely one instrument among many for improving performance outcomes, and its efficacy depends on the presence of a constellation of other measures: sectoral policies, regulatory oversight mechanisms, financing instruments, subsidies, and related poverty targeting programs. Those measures, although important, are not the focus of this study.

Table 1: Assessed Urban Water utility and their locations

Region	Town	Water Utility	Management Modality
Somaliland	Borama	Shirkada Adeega Biyaha Awdal (SHABA)	PPP
	Tog-Wajaale	Wajale Water Agency (WWA)	Public
	Gabiley	Gebilley Water Authority (GWA)	Public
	Berbera	Berbera Water Agency (BWA)	Public
	Burao	Burao Water Agency (BUWA)	Public
	Erigavo	Erigavo Water Agency (EWA)	Public
Puntland	Bosaso	Golden Utility Management Company (GUMCO)	PPP
	Qardho	Hodman Water Company (HOWACO)	PPP
	Garowe	Nugal Water Company (NUWACO)	PPP
	Burtinle	Mahiigan Water Supply Company (MAWASU)	PPP
	Bacadweyn	Bacadweyn Water Company (BAWACO)	PPP
	Goldogob	Goldogob Water Agency (GOWACO)	PPP
	Galkayo	Galkayo Water Agency (GALWA)	PPP
Central-South	Dolow	Dolow Water Management Company (DWMC)	PPP
	Baidoa	Warjinay Water Supply Company (WARJINAY)	PPP
	Jowhar	Farjano Water Supply Company (FARJANO)	PPP

2. METHODOLOGY AND CONCEPT

The study combined both qualitative and quantitative methods of information gathering and analysis. This study began with extensive research on existing literature concerning different aspects of the urban water sector in the study sites. The consultant visited each water utility as shown in the figure to assess the functionality and management of the urban water PPP facilities. The consultant interacted with senior management of the water utilities, local leaders, regional coordinators, water-user associations and the public office holders who provided key information for this study. The study assessed five performance indicators as described below to evaluate the performance of the selected urban towns of Somalia.

Table 2: Study Methodology

METHODOLOGY	RATIONALE	INSTRUMENT
Document/ literature review for identification of UNICEF's PPP in urban water supply in Somalia.	Desk research to investigate the current PPP situation and how it can be expanded/enhanced.	Review of literature in PPP, designing of questionnaire and logistics.
Performance indicators questionnaire and face to face interviews & Institutional observation.	Key informants' interview with selected respondents with regards to water utility management either PPP or public.	Structured discussion with the heads of utility companies, local government, youth and women.
One on one discussion with the regional coordinators, Water User Associations (WUAs), end users, students and business community.	The discussion will extract and provide a deeper understanding of the PPP issues.	Consultant will facilitate the discussion for the stakeholders.
Direct observations	Observation methods for data collections	Was integrated as a check list on the questionnaire survey.
Performance indicator tool	Evaluation process for each utility	Performance Pentagon

2.1. Performance Parameters

The performance measure of water distribution systems is a measure of the set of indicators. To quantify and calculate the performance measures, it is always necessary to take into consideration possible parameters which might have essential roles for achieving proposed goals. The proper maneuver and design of water distribution systems rely on many factors or parameters. These could be: consumer demand - which varies in a random way both temporally and spatially; the possible failure or removal from service of one or more electromechanical components in the system (pipes, pumps, valves, joints, etc.); the quantity of water actually available in the tanks to make up any increase in demand arising on a daily or weekly basis and the quality of water delivered to consumers etc.

Moreover, various external factors like system, society, religion, culture, economy, technology, human attitude, available resources, needs etc., have direct or indirect impact on the performance of the water utility. The performance may vary as per considered factors associated with it. A well-performing utility in Somalia might be considered as a vulnerable utility in a developed country context. While considering the study of the performance, one should consider those factors as impact parameters by which one can calculate water utility performance in a realistic and reliable manner. Hence the different number of parameters should be considered for the performance measurement depending upon the aforementioned factors. The five different parameters considered in this study that might play an imperative role during a performance calculation are described in subsequent headers.

The value of performance parameters range from 0 to 1: higher value denotes a good performance and vice versa. This study considers the following performance parameters for the analysis:

2.1.1. Access and Coverage (Ac)

The access and coverage of a water distribution system is the geographic area where a water utility can supply the water during its operation. Generally, water authorities frequently produce coverage maps to indicate the system's intended service area. In water supply systems, the coverage depends on several factors such as the source yield; topography; population; type of institution; demand;

pressure; pipe diameter etc. Some areas receive better coverage, whilst others have to face particular obstacles to fulfil the demand of a particular area.

In this study, 'coverage' is considered the effective service area that is supplied either by the water distribution system through household connection or within 250 meters of a kiosk.

2.1.2. Billing Efficiency (Be)

'Billing efficiency' is a measure of the efficiency of the proportion of the quantity of water that has been billed out of supplied water, which includes both metered and unmetered sales to the consumers. In this study, this indicator is measured based on the number of connected customers receiving bills each month against the total number of connections or services provided.

2.1.3. Collection Efficiency (Ce)

The 'collection efficiency' compares the amount that was collected in a given time period to the amount of receivables (bills) that were available for collection in that time period. In this study, an indicator is measured based on the amount collected against the amount billed during a year, expressed as a percentage.

It is common for poorly performing public utilities to have low bill-collection rates because of sloppy enforcement and the fact that people often resent paying for poor services. Bill collection is an area in which it is widely assumed that private operators are efficient, because of direct financial incentives.

2.1.4. Operational Cost Expenditure (Oc)

The 'operational cost expenditure' is the covering the costs of any given expense related to the operation and management of the water system and utility. This indicator is calculated based on the expense recovery ratio, divided by the operational expenditure by a total revenue collection. If the operational cost expenditure ratio is less than one (1), it indicates that the utility is self-sustained in terms of operational expenditure. External support may be required only for capital investment to upgrade or expand the water system.

2.1.5. Revenue Water (Rw)

The annual volume of water lost is an important indicator of water-distribution efficiency, both in individual years, and as a trend over a period of years. High and increasing water losses are an indicator of ineffective planning and construction, and of low operational maintenance activities. The terms 'water losses', 'non-revenue water' and 'unaccounted-for water' (UFW) are usually used to address the losses of water in the distribution network.

A high level of water loss is one of the major challenges facing water utilities across the developing world. This includes a) physical losses, due to leaks and theft of water from the system; and b) commercial losses, due to unpaid bills, and water that is unbilled or incorrectly billed because of poor metering or poor customer records. The difference between the amount of water a utility puts into the distribution system and the amount of water billed to consumers is known as 'Non-Revenue Water' (NRW). NRW has a serious effect on the financial viability of water utilities through lost revenue, lost water resources, and increased operational costs. High levels of NRW reduce a utility's capacity to fund necessary expansions of services, especially for low-income consumers. It is now widely acknowledged that NRW is a key indicator of a utility's operational and financial performance. A high level of NRW normally indicates a water utility that lacks good governance, autonomy, accountability, and the technical and managerial skills necessary to provide a reliable service.

In this study, the 'revenue water' is considered as an actual financial gain from the sales of water. The revenue water is calculated as follows:

Revenue Water (Rw) = 1 - NRW

2.2. Performance Measurement Bands

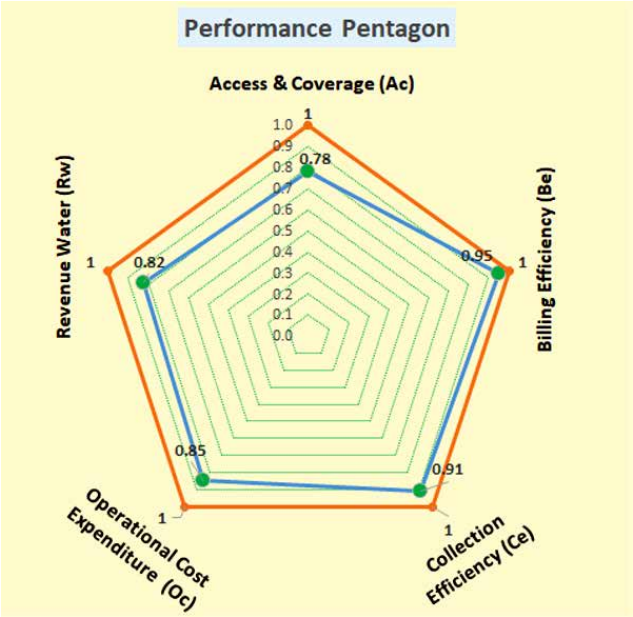
There is an increasing interest in the assessment of water utilities' performances; however, a universal and acceptable definition or measure of performance is yet to be discovered.

This study used a concept of "Reliability Polygons" developed by Jagadishwar Barun (2009) during his research in "Economic Aspect of Reliability Analysis of Water Distribution Systems". The term "Reliability Polygons" has been converted to "Performance Pentagons", as this study aimed to assess the performance of the water utility by measuring the five parameters described above. Depending upon various factors, the number of parameters could either be increased or decreased to get insight into a detailed calculation of the water utility performance. The performance of the water utility is then expressed in five different categories such as: Very low, Low, Medium, High and Very High.

2.2.1. Performance Pentagon

Figure 2-1 depicts the visual interface of system reliability calculated through the pentagon method.

Figure 2.1: Performance Pentagon



Derivation of Performance calculation formula for Reliability Pentagon;

Here,	Access and Coverage	= Ac
	Billing Efficiency	= Be
	Collection Efficiency	= Ce
	Operational Cost Expenditure	= Oc
	Revenue Water	= Rw
	Performance Indicator	= PI

For the Pentagon, Angle between two lines in centroid to vertex = 360/5 = 72

Applying the Sine rule for calculation of performance by using pentagon rule, Barun (2009) derived following formula:

$PI = 0.2 \{B_e (A_c+C_e) +R_w (C_e+O_c) +(O_c*A_c)\}$

Sample Calculation:

Performance of unit Pentagon (PI)

$= 0.2 \{B_e (A_c+C_e) +R_w (C_e+O_c) +(O_c*A_c)\}$

$= 0.20 \{1(1+1) + 1(1+1) + 1*1\}$

$= 1$

$= 100\%$

Similarly, the performance of a water utility company can be measured using a sample pentagon from Figure 2-1.

Performance Indicator (PI)

$= 0.2 \{B_e (A_c+C_e) +R_w (C_e+O_c) + (O_c \times A_c)\}$

$= 0.20 \{0.95(0.78+0.91) + 0.82(0.91+0.85) + (0.85x0.78)\}$

$= 0.74$

$= 74\%$

2.2.2. Performance Measurement Band

Performance indicators are measured by the analysis of defined parameters that express the performance of a water utility and recommend the performance category. The water utilities are further categorized based on their performance-indicator score measured in percentages.

Following Table 3 suggests a performance category as an indicator that articulates the performance of a water utility in shrewd manner;

Table 3: Performance Measurement Band for Water Utility

SN	Performance Indicator (%)	Performance Category
1	< 40	Very Low
2	>40 to < 60	Low
3	> 60 to < 70	Medium
4	> 70 to < 80	High
5	> 80	Very High

3. OVERVIEW OF THE STUDY TOWNS

Somalia is the world's 44th largest country, with a current population of about 14 million. The capital city Mogadishu, has over 2.5 million residents. Another populated city is Hargeisa, in Somaliland, with a population of over 1 million. The remainder of the population is spread among other major towns. About 10 towns have populations that range from just over 100,000 to almost 700,000, while about 25 towns are with populations of around 10,000 residents.

The assessment has been carried out for sixteen cities/towns covering three different regions across the country. At first, the study was targeted to be carried out only in the towns that operate water supply systems under a PPP modality. However, due to the distinct nature of the water utility in Somaliland, it was considered better to carry out the study in additional towns where government/municipality is managing water utilities.

3.1. Somaliland Region

The study was conducted in six towns of Somaliland. Borama is the only town in Somaliland that operates a water system through a PPP modality. Another five towns such as Tog-Wajaale, Gabiley, Berbera, Burao and Erigavo are being managed by a public water utility.

During 2013-2018, UNICEF implemented the European-Union-funded 'Urban Water Supply Project' in four towns (Borama, Tog-Wajaale, Burao and Erigavo) of Somaliland.

3.1.1. Borama Town: Shirkada Adeega Biyaha Awdal (SHABA)

Borama is the capital of the Awdal Region, Somaliland, and one of the three populous towns. Though no real census has been taken, the present population of the town is estimated about 250,000 inhabitants (Source: Borama Municipality).

In 1993, UNICEF assisted the rehabilitation of water supply systems by operationalizing the four boreholes dug by the Chinese. However, the water system of the town had collapsed by 2000.

In August 2000, the citizens of Borama and Amoud University organized a workshop to find a sustainable solution to the continuous water crisis. After the workshop, UNICEF came forward with the idea of managing the water system in Borama through a PPP modality to support the people of Borama. The concept was endorsed by the Ministry of Water and Mineral Resources, and the local government approved the initiative. The concept was presented to the local business community who had shown their willingness to be part of the proposed partnership.

The Shirkada Adeega Biyaha Awdal (SHABA) was established in October 2003 under a PPP lease agreement with the Ministry of Water Resources (MoWR) and the Municipality of Borama. A ten-year tripartite lease agreement was signed by entities comprised of the Local Government, MoWR and SHABA, thus transferring the responsibilities of the water service delivery to the then, newly ventured, SHABA Company. SHABA is governed by a five-member Board of Directors (BoD). This is the only water facility in Somaliland operating and managed under a PPP modality.

Because of good performance indicators, the SHABA lease agreement has been extended for another 10 years, ending in 2023. Performance indicators from SHABA suggest that the company is performing well above the local and regional standards. The calculated average water production is estimated to be around 4,200 m^3/per day. Currently, there are seven productive boreholes that are operational and supplying water to the town. The number of connections has substantially increased from 130 HH connections in 2003 to 14,419 HH connections in 2018. The tariff is set at US$1.2 per cubic meter of water.

3.1.2. Tog-Wajaale Town: Wajaale Water Authority (WWA)

Tog Wajaale (also known as Wajaale) is a major hub city situated on the border between Ethiopia and Somaliland. It is a busy city that links the two countries. The town has an estimated population of around 80,000.

UNICEF Somalia, in partnership with UN-HABITAT and Terre Solidali (TS), has implemented a project "Improving Urban Water Service Delivery in Somaliland" funded by the EU. To strengthen the enabling environment, UNICEF continues working closely with the Ministry of Water Development. The partnership arrangements for the programme implementation include United Nations agencies; multilateral partners; NGOs; PPP companies and water users' associations. The system was inaugurated in December 2018.

UNICEF and partners facilitated in establishing the CAAFI Utility Company (CUC), under a PPP modality, to operate the water system within the framework of Public Private Partnership arrangements. The CAAFI was expected to take over the management of the water system once it is commissioned and to expand the tertiary water distribution system through household connection.

The shareholders have collected three hundred thousand dollars ($300,000) for the initial operation of the newly ventured utility. The process of registering the Tog-Wajaale PPP Company with the Ministry of Commerce and Investment has been completed. The operating contract for

Tog-Wajaale has been signed by the tripartite agreement between the MoWR, CAAFI and the municipality of Tog Wajaale. UNICEF capacitated the CAAFI company on the financial and management aspects of running the PPP company. Tog-Wajaale municipality has donated land to CAAFI Water Utility in the event of registration. The land will be office premises for CAAFI.

A project was formally inaugurated in 2nd December 2018, at an inaugural ceremony, where UNICEF handed over the project to the MoWR. The handover includes two functional boreholes, 24km of transmission pipeline, a 500m^3 main water tank, a 50m^3 overhead water tower, an 8km distribution network and five functional water kiosks.

At present, the water supply system is being managed by the Wajaale Water Authority (WWA) under a public water utility modality. As this project was recently handed over and no significant changes have been made in the system, no further analysis on performance evaluation was carried out.

3.1.3. Gabiley Town: Gabiley Water Authority (GWA)

Gabiley is a town located 58km west of Hargeisa, the capital of Somaliland. It is in the centre of the Gabiley District, bounded on the north by the Gulf of Aden, on the west by the Awdal Region, on the east by the Hargeisa District, and on the south by the Somali Region of Ethiopia. The town hosts a population of around 110,000.

Initially, the residents of Gabiley agreed to pilot a PPP model to manage the water system in the town. The Zam Zam Water Utility was established in 2006. Unfortunately, the shareholders withdrew their initial capital after 10 years of managing the service and handed over a management responsibility of water system to the Municipality of Gabiley, turning it into a public facility.

One of the major challenges that Zam Zam water utility faced under the PPP is that the company never succeeded to invest in public infrastructure and failed to deliver on their commitments. The municipal authority took over the responsibility from the company and managed the facility for nearly two years. Despite several attempts on reviving the water system, the municipality failed and transferred the responsibility to the Ministry of Water Resources (MoWR). Currently, the system is being managed by Gabiley Water Authority (GWA) with direct support from the MoWR.

According to the General Manager of GWA, there are 2,700 households connected to the piped water system, which accounts for about 35% of the core, town residents. The rest of the inhabitants get their water through water kiosks and trucking. The town of Gabiley also supplies water to the surrounding villages, such as Geed Balaadh, Boqor, Wajaale, Kala Baydh and Botor.

3.1.4. Berbera Town: Berbera Water Agency (BWA)

Berbera is a coastal city and the capital of the Sahil Region of Somaliland. The town hosts around 80,000 people.

Berbera's original water supply system goes back to the Ottoman Empire in the 19th Century, a gravity induced system using the Dubaar Spring at the foot of the mountains as its natural source. The spring water flowed to collection wells and then to water points through asbestos-cast iron pipes.

Since the early 1980s, in response to increased demand for water, improvements to the existing system were made by various international organizations. This included the addition of a set of boreholes with better water yields to supply the bulk of the town's water needs.

However, the capacity of the existing system had decreased drastically due to lack of maintenance, poor management and rusting of the well's screens and pipes. Furthermore, clogging of the old pipes (with incrustation of sediment) had caused a serious decrease in the water supply, and cracks in the networks during times of low flow allowed surrounding contaminants to pollute the water.

In July 2008, in response to these needs and with funding from the European Union, UNICEF started working with the community in Berbera to rehabilitate and expand the existing system and fundamentally improve its operation and management. The project has also supported the improvement of the water system management through establishing a Public Private Partnership that involves all stakeholders - the community, the water authority and the private sector - to ensure a more sustainable delivery of services.

Currently, the Berbera Water Agency (BWA) is managing the water supply system of the town under a public utility management system. The system has a production capacity estimated to be at 5,600m^3 per day in the wet season from three separate aquifers. Normally, Dubaar Springs and Faradero are the source of water for the agency. Recently, Kal Gumere well field has been discovered to have very high potential. The agency faces a challenge of salinated water from Dubaar Springs and has been working to neutralize it by mixing it with water from other wells. Berbera has the potential to increase its revenue if block rates are charged. Berbera Port and a number of other businesses are benefiting from the low, fixed tariffs. These consume an unlimited amount of water and the price tag is only US$1 per cubic metre.

3.1.5. Burao Town: Burao Water agency (BuWA)

Burao is the largest city in the Togdheer, Somaliland, and also serves as the capital of Togdheer Region. Burao is the second-largest city in Somaliland with an estimated population of 500,000.

In 2004, UN-Habitat implemented a water supply improvement project that increased water production from an average of 540m³ per day to a volume of 1,245m³. Over the same period, the maximum pumping capacity went up by 169 percent. The availability of clean and affordable piped water substantially increased, while dependency on unsafe water from shallow wells was reduced. The Burao piped water supply system was extended by 5km. Between 2000 and 2004, the number of households with a water connection rose from 665 to 2,184. The number of communal water kiosks increased from 90 to 152.

Burao Water agency (BWA) nearly collapsed nine years ago due to poor management and aging equipment. It was re-established in 2011 by the MoWR with a loan from the Central Bank of Somaliland. The system was being managed through the public utility system model, where the Ministry of Water Resources, Burao municipality, water agencies and the Water Board (representing customer interests) provided management, financial and technical oversight for the sustainability of the project.

In 2013, UNICEF and the partners implemented the EU-funded water supply project in Burao with three other towns. With this project in Burao, a 14km pipeline was connected to 16 boreholes outside the town. About 3,000 households were then connected directly to the water system in addition to the 15,000 households already connected through Burao Water Agency.

To date, the Burao water agency provides piped water to nearly 70 percent of the population in Burao town through a 70km pipeline. Household connections have increased from 5,331 in 2010 to 18,027 by late 2018. Equally, the number of boreholes increased from five to 16 (though two of these are currently non-operational). Recently, UNICEF drilled a deep borehole that yields 35m3/hr. Connection of this borehole to the existing water supply system will significantly increase water production capacity. At present, water production is estimated to be 5,500m3/day. The utility provides free water to IDPs, mosques, hospitals and other agencies, resulting in high volume of non-revenue water.

3.1.6. Erigavo Town: Erigavo Water Agency (EWA)

Erigavo is the capital and largest town of the north-eastern Sanaag region of Somaliland. The total population of Erigavo town is estimated around 40,000.

A UNICEF-EU funded water supply project facilitated the drilling of one borehole, and the connection of two boreholes to the main water tank, with a 7Km pipeline extension. A 500m³ water reservoir has also been constructed. Moreover, the project has also organized community mobilizations. And stakeholder and community sensitization workshops on the PPP management model, all completed during early in early days of the project. The number of shareholders (15) and value of each share (US$ 7,500) have been agreed upon during detailed shareholder meetings. The project also formed a Water User Association (WUA) to ensure consumer-rights protection.

Unfortunately, the efforts of introducing a PPP managed water utility model were in vain, as the mayor has insisted the infrastructure be completed before the establishment of the PPP company. In Erigavo, the bank account is yet to be opened. The Mayor continues to insist that the software component should come only after the completion of the hardware infrastructure component. Additionally, the town is not easily accessible to international staff due to security reasons. Therefore, the delays experienced with the installation of the water distribution network had further negative impacts on the issues related to the establishment of the PPP Company.

At present, the water supply system is being managed by the Erigavo municipality through the Erigavo Water Agency. The water system is supplying water to 1,280 billed customers. Water users pay around US$ 4 per cubic meter i.e. highest water tariff in Somalia.

3.2. Puntland Region

Seven towns from the Puntland State of Somalia are part of this study. All seven towns assessed operate a town water system through a PPP modality.

The cost of water across the Puntland State of Somalia is strictly governed by the Government. During the drought of 2018, the cost per cubic meter of water in Puntland was set to USD1.3 across the region.

The PPP model has dominated the business market in Puntland. The residents of these seven towns are reaping the benefits of a better managed water system.

3.2.1. Bosaso Town: Golden Utility Management Company (GUMCO)

Bosaso is a city in the north-eastern Bari Province of Somalia. It is located on the southern coast of the Gulf of Aden. The municipality serves as the region's commercial capital and is a major seaport within the Puntland State.

Bosaso's total population is estimated at around 700,000 residents. About 150,000 are registered as internally displaced people (IDPs), primarily from conflict-stricken parts of southern Somalia, and whom have sought refuge in camps on the outskirts of the city.

Bosaso's municipal water company collapsed with the fall of the central government of Somalia in the late 1980s. In early 1991, the residents tried to re-establish the public water utility with the support of a German non-governmental organization (NGO), thus laying the

foundation for 'GUMCO', in March 2000. A 10-year PPP lease agreement was signed with Puntland State Water, Energy and Natural Resources (PSAWEN). Late last year, in 2018, GUMCO signed another 20-year agreement with PSAWEN for the new Duud Shabeel spring basin area.

GUMCO is governed by Board of Directors (BoD) consisting of five members and the company is managed by a General Manager. The utility is currently serving through 4,000 household connections and some water kiosks. The calculated average water production is estimated to be just below 3,000m^3/day from 15 operational boreholes. The water tariff is set at US$1.3/m^3. From 2011 to late 2018 GUMCO did not establish any new house connections due to the shortage of production. Fortunately, the company has recently received a (nearly) five-million euro grant from the EU and the Italian Government to boost up the production.

3.2.2. Qardho Town: Hodman Water Company (HOWACO)

Qardho, also known as Gardo, is another town in the north-eastern Bari Region of Puntland. It is the center of the Qardho District. The population of Qardho town is around 200,000 inhabitants.

November 2005 marked the establishment of the Hodman Water Management Company under a 10-year PPP lease agreement with the Puntland State Water, Energy and Natural Resources (PSAWEN). In July 2017, the lease agreement contract was extended for another 20 years, ending 2037.

The initial financial investment of the company was estimated to be around $70,000. The utility is serving almost 3,960 registered household connections. There are five productive boreholes currently serving the town with daily production of 1,210m^3. Two of the five boreholes are running on solar technology while the other three use diesel engines. Unfortunately, water quality of these two boreholes is not potable due to high salinity. The operator needs to mix water from other boreholes with its high salinity water to make it potable.

Recently, the Norwegian Refugee Council (NRC) has completed the drilling of two new boreholes to be powered by solar technology. The HOWACO will facilitate the connection of these boreholes to the existing water distribution network.

One of the key challenges, however, is the leakage of the main water reservoir. The reservoir is crumbling and requires immediate replacement. Another challenge is the lack of booster pumping stations. The town has grown rapidly, and the terrain is very hilly. Therefore, the utility company requires booster pumps to supply the elevated parts of town.

3.2.3. Garowe Town: Nugal Water Company (NUWACO)

Garowe is the capital of Nugaal Region and the administrative capital of Puntland in north-eastern Somalia. Garowe is one of the largest cities in Somalia with a growing population that include IDPs. Before the civil war in Somalia, Garowe's population was only about 10,000. Thousands of people moved from war-affected areas (particularly from the south of Somalia) to Garowe, because it was considered relatively peaceful and largely unaffected by the war. The IDPs have invested considerably in Garowe to make it their new and permanent residence. By now, the greater Garowe area has an estimated total population of 250,000. The IDP population in Garowe is over 35,000 (5,000 households) and constantly increasing.

Like other public water utilities in Somalia, Garowe's town water supply system collapsed in the late 1980s. At the end of the civil war, in early 1991, the residents of Garowe tried to revive the town water supply system and came up with the idea of running the system through private modality. In 2006, with technical and financial support from UNICEF, the Nugaal Water Company (NUWACO) was established and a 10-year lease agreement signed with the Puntland State Water, Energy and Natural Resources (PSAWEN). The lease agreement was extended (for another 10 years) to end in 2026. The lease agreement also established a tariff system for Garowe water consumers as well as a consumer committee, making this arrangement a Public Private Partnership (PPP).

NUWACO is governed by Board of Directors (BoD) consisting of five members and the company is being managed by a General Manager. The BoD meets monthly for strategic decision making. The PPP has well-written by-laws governing the utility company. The initial financial establishment from twenty-eight shareholders was estimated to be nearly $700,000. In addition to managing the PPP company for the water-supply service, NUWACO is also engage in the business of construction, especially for drilling of boreholes and the construction of water-supply related civil infrastructure.

In 2007, UNICEF funded a capacity building project for NUWACO Public Private Company for management of the water utility and for an improved financial system. The computerized billing system was introduced by installing a software program: Billing Information Management System (BIMS).

There are currently 13 productive boreholes providing water to the town of Garowe, with a daily production of 3,500m^3. Out of the 13 operational boreholes, five boreholes run with solar energy while the other eight use diesel engines. NUWACO has a plan to convert all the diesel-powered systems to solar energy. Every month, NUWACO spends about 20 percent of the total revenue for fuel to run the generators. The company is negotiating

with 'SHURAAKO', a financial institution, to secure a loan to migrate the system from diesel-powered to renewable energy. With a 40litre per capita per day need for drinking and domestic use, Garowe town needs 10,000 m^3 of water a day. The current inflow to the system from the town water source is merely 4,000 m^3 - leaving a gap of 6,000 m^3.

By the end of 2018, the company, NUWACO, had connected more than 10,725 households (About 100,000 people 40% of 250,000) to the water system through a 7km distribution pipeline. The remainder of the areas receive water through water kiosks or water trucking. Overall, Garowe's water supply system coverage is 70 percent of the geographic area of Garowe town, with a capacity of serving only 40 percent of total water demand. The company defines the coverage as "a direct service connection to the household or a water kiosk within a reach of 250m from the farthest household".

3.2.4. Burtinle Town: Mahiigan Water Supply Company (MAWASU)

Burtinle is a small town in the Nugal Province of Puntland. Burtinle has an estimated urban population of 100,000 inhabitants.

Mahiigan Water Management Company (MAWASU) was established in October 2015 under a 10-year PPP lease agreement with Puntland State Water, Energy and Natural Resources (PSAWEN). Initially, 15 businessmen had drilled one borehole to supply the town of Burtinle, but later, during their tenure as a PPP, they have since acquired another borehole that is used to supply water to the town.

Over the course of three years (2016-2018), US$1 million has been invested into the town's water supply system: UNICEF, through UK Aid funding, has assisted in the extension of water distribution lines and the construction of a main-reservoir tank of 400m^3. MUWASA, like other PPPs, has shown a positive trajectory in terms of financial returns. Like other PPPs also, however, MUWASA faces a challenge of limited technical and managerial capacity, among other ongoing issues.

The water utility is currently serving nearly 2,500 household connections in town. There are two operational boreholes currently serving the town of Burtinle, with a daily production of 792m^3 per day. The water is supplied through 16km of distribution pipelines. However, according to the company, the water deficit is nearly 1,000m^3/day. The company charges US$100 for new household connections within a 10-meter range from the main pipeline. Consumption tariffs are set at $1.3/$m^3$ for household connections, and a different rate for the IDPs, which is $1.00/$m^3$.

3.2.5. Bacadweyne Town: Bacadweyn Water Company (BAWACO)

Bacadweyn is a town in the north-central Mudug Region of Puntland. The town has an estimated population of 20,000 inhabitants. The town is strategically located as a hub for livestock markets.

The Bacadweyn Water Company (BAWACO) was established in April 2010 under a 20-year PPP lease agreement with the Puntland State Water, Energy and Natural Resources (PSAWEN). During the initial phase, the 21 shareholders invested about US$141,000 to form and establish the company.

The utility is currently serving nearly 800 peri-urban customers. There is only one production borehole, however, with a daily production of 250m^3. The company charges $120 for household connections located within the vicinity of 20 meters from the main pipeline. As a town, Bacadweyn is famous for its livestock market, thus the company also supplies water for the livestock.

3.2.6. Goldogob Town: Goldogob Water Agency (GWA)

Galdogob is a small town that serves as the capital of the Galdogob District within the Mudug province of Puntland. It is located in the western part of the Mudug region bordering Ethiopia's portion of the Somali-majority Kilinka Shanaad, and is a popular rest-stop for Somali travelers heading to and from Addis Ababa, Werder, Djibouti, Jijiga, Dire Dawa, and Geladi. The town hosts about 100,000 full-time inhabitants.

The Goldogob Water Agency (GWA) was established in 2005 under a 20-year PPP lease agreement with the Puntland State Agency for Water, Energy and Natural Resources (PSAWEN). The utility is governed by a Board of Directors (BoD) consisting of seven members.

There are five operational boreholes supplying water to the town. Two boreholes are solarized and the other three run on diesel power. An estimated average water production is 1,260m^3/day. The utility is serving nearly 4,000 household connections. Goldogob is also a hub for livestock markets and the utility supplies water to the livestock, thus increasing the demand for water during market times.

For a new household connection, the utility company charges US$50 per connection for those houses within a 10-meters radius from the main pipeline. The water tariff is set to US$1.8 and US$1.0/m^3 for household connections and IDPs respectively. The company charges the highest water tariffs in Puntland. The company supplies free water to mosques and public institutions as part of their corporate social responsibility (CSR). The water management committee is also mandated to resolve customer-relations issues.

3.2.7. Galkayo Town: Galkayo Water Agency (GALWA)

Galkayo is the capital of the north-central Mudug region of Somalia. The town of Galkayo is divided into two administrative areas separated by a distinct boundary, with three of the four districts governed by the Galmudug State and one northern district Israac governed by Puntland state. It has an estimated population of 300,000 inhabitants in the Puntland side.

The water supply system almost collapsed during the civil war. When the civil war ended in early 1991, the residents of Galkayo town tried to revive the public water utility without much success. However, fortunately, with financial and technical support from UNICEF, the town water management system was later operated under a PPP modality: In August 2003, GALWA was established and it signed a 20-year PPP lease agreement with the Puntland State Water, Energy and Natural Resources (PSAWEN). The initial financial establishment of the company was estimated to be nearly $145,000 with seven shareholders.

The GALWA company is currently serving nearly 15,000 household connections. There is another company, called Daryeel, also supplying water to more than 2,000 households. GALWA is supplying water through six boreholes producing 5,500m^3/day with a daily demand deficit of 2,000m^3 per day. A high-capacity diesel engine of 400kva is providing energy to the pumping stations. The company spends more than US$16,000 per month for fuel. The company has a plan to convert diesel power into solar power to minimize operational costs.

As in other towns of Puntland, the water tariff is set at $1.3/$m^3$ for household connections. The rate for the IDPs is $1.00/$m^3$ and $1.00/$m^3$ for bottling companies. As part of a corporate social responsibility (CSR), the company provides free water to the mosques and public institutions. In terms of minimum time to repair (MTR), GALWA is the only utility company in Puntland that guarantees the repair of break-downs in less than 12 hours. UNICEF is currently constructing a 750,000-litre overhead water tank for the town.

3.3. South Central Region

In South Central Region, the study was carried out in three towns:, Dollow, Baidoa and Jowhar. All these towns received water through a PPP modality.

3.3.1. Dollow Town: Dollow Water Management Company (DWMC)

Dollow, a town in the southern Gedo Region, falls under the Jubaland administration of Somalia. The town sits along the Jubba River. Dollow is strategically located between Kenya, Ethiopia and Somalia. The town is a hub for livestock markets and town water provides water to the livestock during droughts. Due to its central location, the town currently hosts more than 150,000 inhabitants, including IDPs and returnees. Most of the IDPs and returnees are supported in camps. These IDP camps receive water from humanitarian partners, either through a shallow, well-connected piping system or water trucking.

Dollow Water Management Company (DWMC) was established in 2011 under a 10-year PPP lease agreement with a district administration. The water system was managed by the community elders prior to the establishment of DWMC.

The company is supplying water through five shallow wells with a daily water production of 200m^3, providing a piped water supply service to 1,205 households. The water sources come from one shallow well which is powered by solar technology, while the other wells use very old diesel engines of about 30 to 40 KVAs that consume an excessive amount of fuel. Additionally, the water system is also facing the threat of the rivers drying up, due to reoccurring droughts in the region. Previously, the Jubba River did dry up during first four months of 2018, which hugely affected the water supply system.

In Dollow, the water tariffs are $1.2 - $1.3/$m^3$, depending on the exchange rate. However, the rate within the IDP camps is US$0.75/$m^3$.

3.3.2. Baidoa Town: Warjinay Water Supply Company (Warjinay)

Baidoa is the capital of the South-West State of the Federal Republic of Somalia. As per the Baidoa water supply master plan 2019, the residential population in Baidoa is estimated to be 176,421. This number was determined with a count of the houses present in the area carried out using satellite images in high resolution and with the reinforcements of a field survey done with a sample of 530 households.

A survey carried out in September 2018 by 13 international organizations and three Ministries estimated that the Internally Displaced Peoples (IDPs) living in Baidoa and in its outskirts aggregate to 214,363. However, the government of South-west State estimate that the total population of Baidoa is around 500,000, comprised of the host community and IDPs.

In Baidoa, most boreholes are over 20 years old and their inconsistent, inadequate or total lack of maintenance has resulted in poor yields. People are, therefore, primarily dependent on rainwater catchments or shallow wells, which are vulnerable to contamination by effluent and general human waste. Studies carried out on groundwater availability have ascertained that hydro-geological conditions in the area are favourable for the development of groundwater supplies in the Bay and Bakool regions. A handful of these wells had long provided reliable and safe water. But since the outbreak of civil war, though the supply continued, over time, many of the wells fell out of operation due to damages incurred through the war. Those

that are still functional have been serving well beyond expectations and are in urgent need of replacement.

Around 20 percent of residents are relying on drinking water from shallow wells in their premises, but over 50 percent buy water from vendors. There are three companies providing the piped water supply services in Baidoa, including WARJINAY PPP Company, CAAFI Company and a lone private-service business man, Mr. Abdullah Mohamed Daror.

These three entities only manage to meet small portion of the total demand. Consequently, the population is forced to buy water from private suppliers, who transport water with donkey carts and trucks, which makes the price of water for most of residence quite expensive.

With the support of UNICEF, WARJINAY was established in 2007 as a Public Private Partnership Company. The WARJINAY company is governed by a Board of Directors (BoD) consisting of five members and it is managed by General Manager. The company manages one spring and 11 major, productive boreholes, yet of which only two boreholes produce water during the peak of the dry season (December-March). WARJINAY also manages a) the infrastructures built by a Chinese Cooperation in the 1970s - two 500m^3 reservoirs and 8,930m of ductile iron pipelines b) the water distribution system built by UNICEF – comprised of approximately 9,000m of U-PVC pipes (ranging from OD 90-200mm in width), c) the tertiary distribution network built by the PPP company amounting to some 38km of U-PVC pipes (ranging from OD 3mm-OD 110mm). Most of these are not suitable for pressure lines and are subsequently the cause of most the system leakages) and d) various minor structures build by several NGOs and UN Agencies to supply water to IDPs settlements.

The water distribution network set up by WARJINAY covers about 28 percent of the households in Baidoa, or about 10,000 household connections. The system is supplying about 4,800m^3 water/day to consumers during the wet season (May to November) and the supply drops down to 2,000m^3 per day during the dry season.

CAAFI is a fully private water company established in Baidoa in 2015 as water bottler, and in 2016 expanded its business to include water distribution. The company has about 2,500 connections. CAAFI's water distribution system is made of relatively small sized U-PVC pipes (i.e. a maximum OD 110 mm), with a total length of about 16km. The system is provided by three elevated reservoirs (two of 75m^3 and one of 125m^3).

Water prices in Baidoa are relatively high due to scarce water resources. The existing water tariff per cubic meter of water are presented in following table:

Table 4: Existing price of Water per cubic meter in Baidoa

Company	HH Connection	Water Kiosk	Institution
WARJINAY Co.	US$ 1.3	US$ 0.75	US$ 0.5
CAAFI Co.	US$ 1.5	US$ 1.5	US$ 1.5

Additionally, there are several private water vendors including that of Mr. Abdullah Mohamed Daror, an individual private company providing household water connections to some 200 households. Other small vendors provide water services to customers by donkey carts, water trucking or other means. Water prices depend on the season, and range between US$ 5 and US$ 25/ m^3.

To improve the overall water supply situation in Baidoa, UNICEF, in partnership with Ministry of Energy and Water (MoEWR) developed the "Baidoa Water Supply Master Plan", which was endorsed in the first quarter of 2019. The master plan aims to implement the Baidoa water supply project in three phases:

Table 5: Scope, Costs and Timeline of Baidoa Water Supply Master Plan

Phases	Costs (US$)	Timeline
Immediate Scope	25,915,100	3 to 5 years
Medium scale intervention	36,573,500	5 to 10 years
Full scale intervention	7,043,600	Beyond 10 years
Total (US$)	69,532,200	

3.3.3. Jowhar Town: Farjano Water Supply Company (FWSC)

Jowhar is the capital of Hirshabelle State of Somalia. Jowhar is also the administrative capital of the Middle Shabelle Region of Somalia. The town is situated along a major road, 90km north of the capital, Mogadishu. The town has four sub-districts: Horseed, Kulmis, Bulo Sheikh and Hantiwadaag, and is home host to a number of IDPs giving a total of around 200,000 inhabitants, including the IDPs.

The establishment of Jowhar's town water supply system happened in the 1980s by the German NGO, Technical Cooperation (GTZ), and its construction was completed in 1983. The water system was vandalized during the civil war in the 1990s.

In 1997, with a support of the EU, UNCEF re-established the water system and reformed the Farjano Water Supply Company (FWSC), under a PPP modality. Since 1997, the water system of the town is being run by FWSC, which has taken over the management and maintenance of Jowhar Town Water Supply System as a PPP. Under this project the new boreholes were drilled, and the water supply system was rehabilitated and has been expanded.

At present, most of the population in Jowhar receives water from three high-yielding boreholes and three shallow wells. The system produces about 800m^3 of water per day. The water system has two water storage tanks with a capacity of 225m^3 - located in the sub-districts of Horseed and Kulmis. These storage tanks feed the water supply to five primary supply lines, i.e. to Horseed, Bulo Sheikh, Hantiwadaag, Kulmis and UN agencies. The secondary and tertiary pipe networks further feed in, connecting to other households and water kiosks.

The company currently supplies water to 3,000 registered, household connections across the town. Tariff rates for Farjano range from US$ 1-2/m^3. It is notable that the company empowers business-women by letting them operate and manage a total of 109 water vendors/ kiosks in Jowhar, the highest in the county.

4. RESULT AND DISCUSSION

Based on the scope of this study, the concept and described methodologies have been applied to 15 urban towns across Somalia to measure the performance of existing water utility companies. A detailed study of Tog-Wajaale was not carried out in this study, as this water utility has only been established for less than a year.

4.1. Performance of urban Water PPPs and Public Utilities in the regions

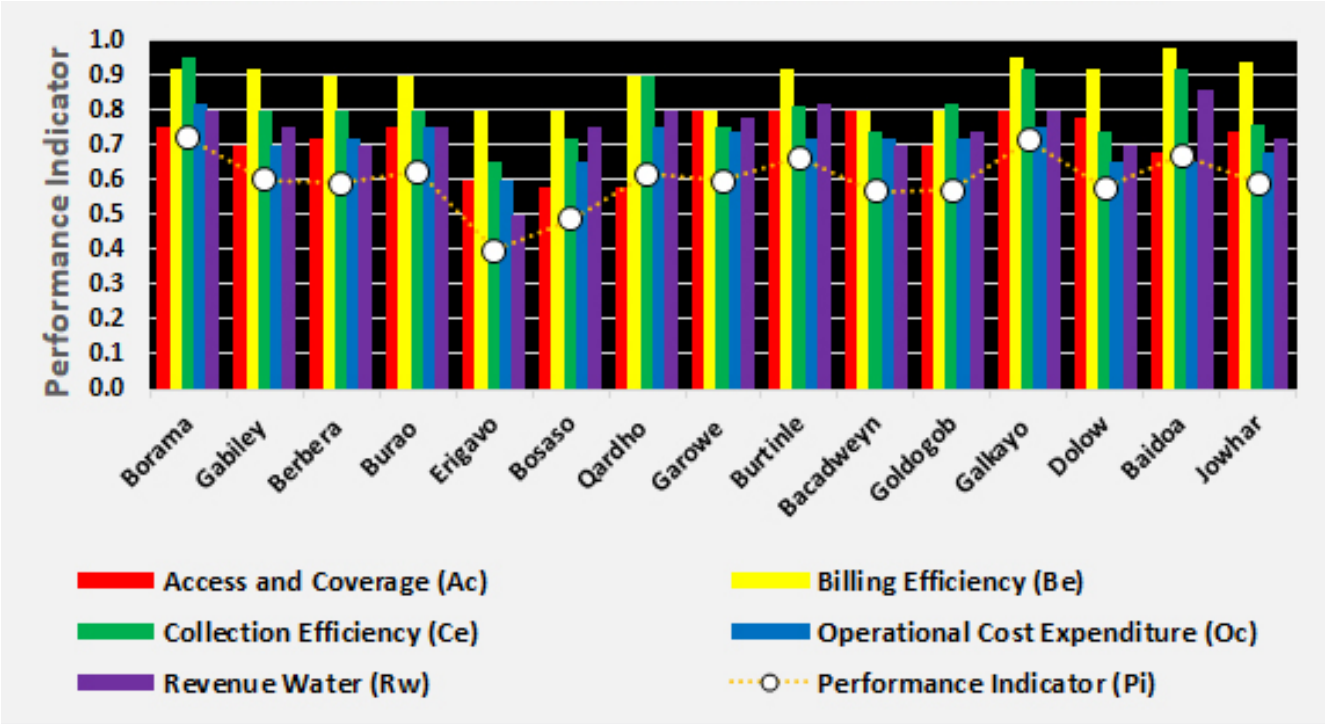
The performance indicators of 15 towns have been evaluated and presented in Table 6 below. Out of 15 towns, SHABA and GALWA companies, under PPP management models, are performing highest with scores of 72% and 71% respectively. Six water utilities' performances have been found in a 'medium' category, whereas the other remaining seven water utilities are performing low. Amongst all the utilities, the Erigavo Water Agency from Somaliland region is performing at the lowest level, scoring only 40 percent

Table 6: Ranking of Urban Water Utilities in Somalia

Region	Town	Water Utility	Management Modality	Perfomance score	Rank	Management Modality
Somaliland	Borama	Shirkada Adeega Biyaha Awdal (SHABA)	PPP	72%	1	High
Puntland	Galkayo	Galkayo Water Agency (WWA)	PPP	71%	2	High
Central-South	Baidoa	Warjinay Water Supply Company (WARJINAY)	PPP	67%	3	Medium
Puntland	Burtinle	Mahiigan Water Supply Company (MAWASU)	PPP	66%	4	Medium
Somaliland	Burao	Burao Water agency (BUWA)	Public	62%	5	Medium
Puntland	Qardho	Hodman Water Company (HOWACO)	PPP	62%	6	Medium
Somaliland	Gabiley	Gebilley Water Authority (GWA)	Public	60%	7	Medium
Puntland	Garowe	Nugal Water Company (NUWACO)	PPP	60%	8	Medium
Somaliland	Berbera	Berbera Water Agency (BWA)	Public	59%	9	Low
Central-South	Jowhar	Farjano Water Supply Company (FARJANO)	PPP	59%	10	Low
Central-South	Dolow	Dolow Water Management Company (DWMC)	PPP	58%	11	Low
Puntland	Goldogob	Goldogob Water Agency (GOWACO)	PPP	57%	12	Low
Puntland	Bacadweyn	Bacadweyn Water Company (BAWACO)	PPP	57%	13	Low
Puntland	Bosaso	Golden Utility Management Company (GUMCO)	PPP	49%	14	Low
Somaliland	Erigavo	Erigavo Water Agency (EWA)	Public	40%	15	Low

The performance score of each water utility has been calculated based on five defined parameters; figure 4-1 (below) presents the performance indicators of each of the parameters and overall performance score:

Figure 4.1: Performance parameter and score of Urban Water Utility in Somalia



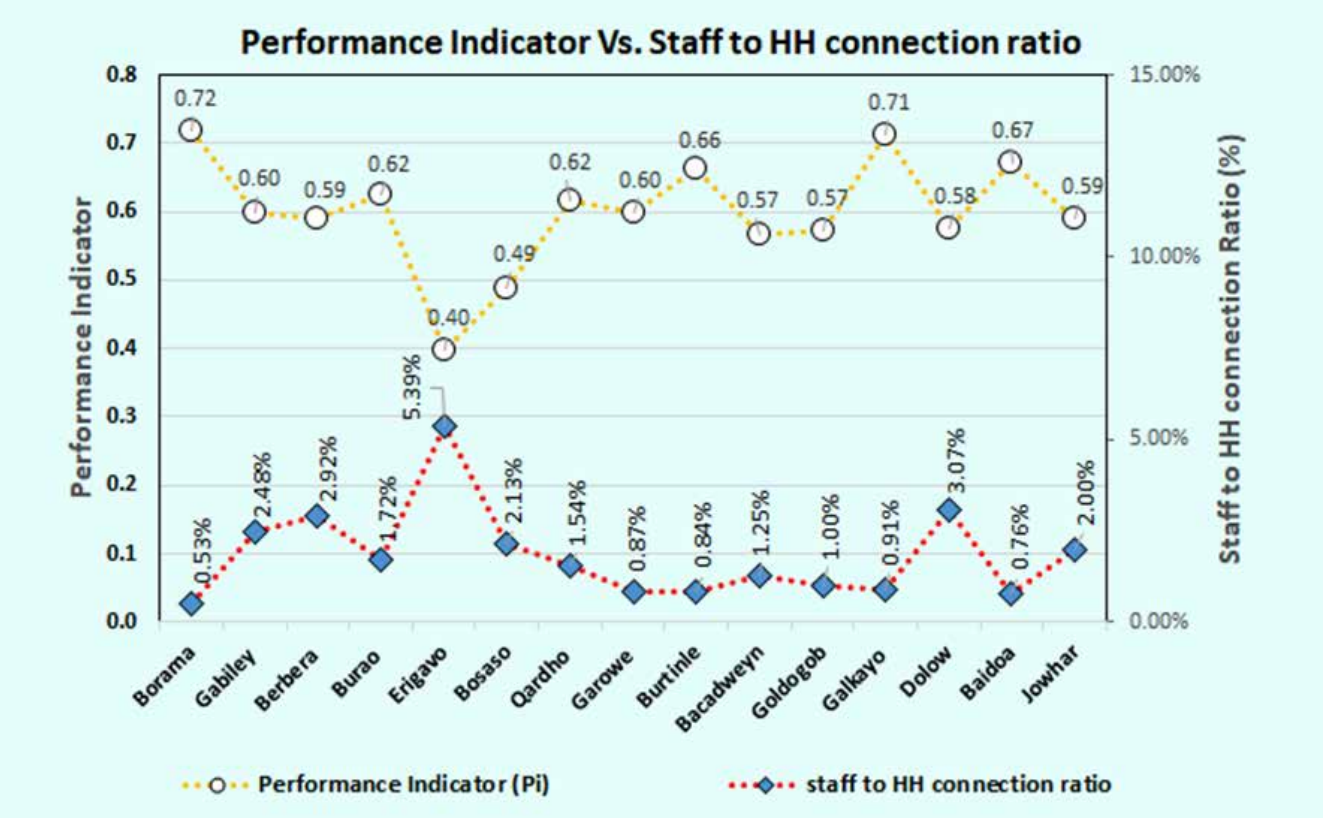
The study also tried to explore the relation between number of staff employed in each water utility against the total number of household-water connections. The data of household connections for each town has been extracted from the information provided by the water utilities. The population of the town was extracted from the most updated sources. However, there is no reliable demographic information available in the country. Additionally, the number of households is calculated by estimating that each household has eight residents. The ratio of staff to household connection is calculated and presented in a table 7:

Table 7: The ratio of number of staff to household connection

Town	Estimated Population	Number of HHs	Household Connection	Number of Staff in PPP	Staff to HH connection ratio
Borama	250,000	31,250	14,419	77	0.53%
Gabiley	110,000	13,750	2,700	67	2.48%
Berbera	80,000	10,000	4,800	140	2.92%
Burao	500,000	62,500	18,027	310	1.72%
Erigavo	40,000	5,000	1,280	69	5.39%
Bosaso	700,000	87,500	4,000	85	2.13%
Qardho	200,000	25,000	3,960	61	1.54%
Garowe	250,000	31,250	10,725	93	0.87%
Burtinle	100,000	12,500	2,500	21	0.84%
Bacadweyn	20,000	2,500	800	10	1.25%
Goldogob	100,000	12,500	4,000	40	1.00%
Galkayo	300,000	37,500	15,000	136	0.91%
Dolow	150,000	18,750	1,205	37	3.07%
Baidoa	500,000	62,500	11,000	84	0.76%
Jowhar	200,000	25,000	3,000	60	2.00%

From the analysis, no significant correlation was found between staff to household connections ratio and the performance indicators. SHABA is the best performing water utility with a performance score of 72%, however, it has the least staff to household connection ratio. On the other hand, Erigavo has a higher staff to household connection ratio but the lowest performance score. The figure 4-2 below shows the status of the fifteen water utilities regarding the relation between performance indicator and staff to household connection ratio:

Figure 4.2: Performance based on Staff to household connection ratio of water utilities

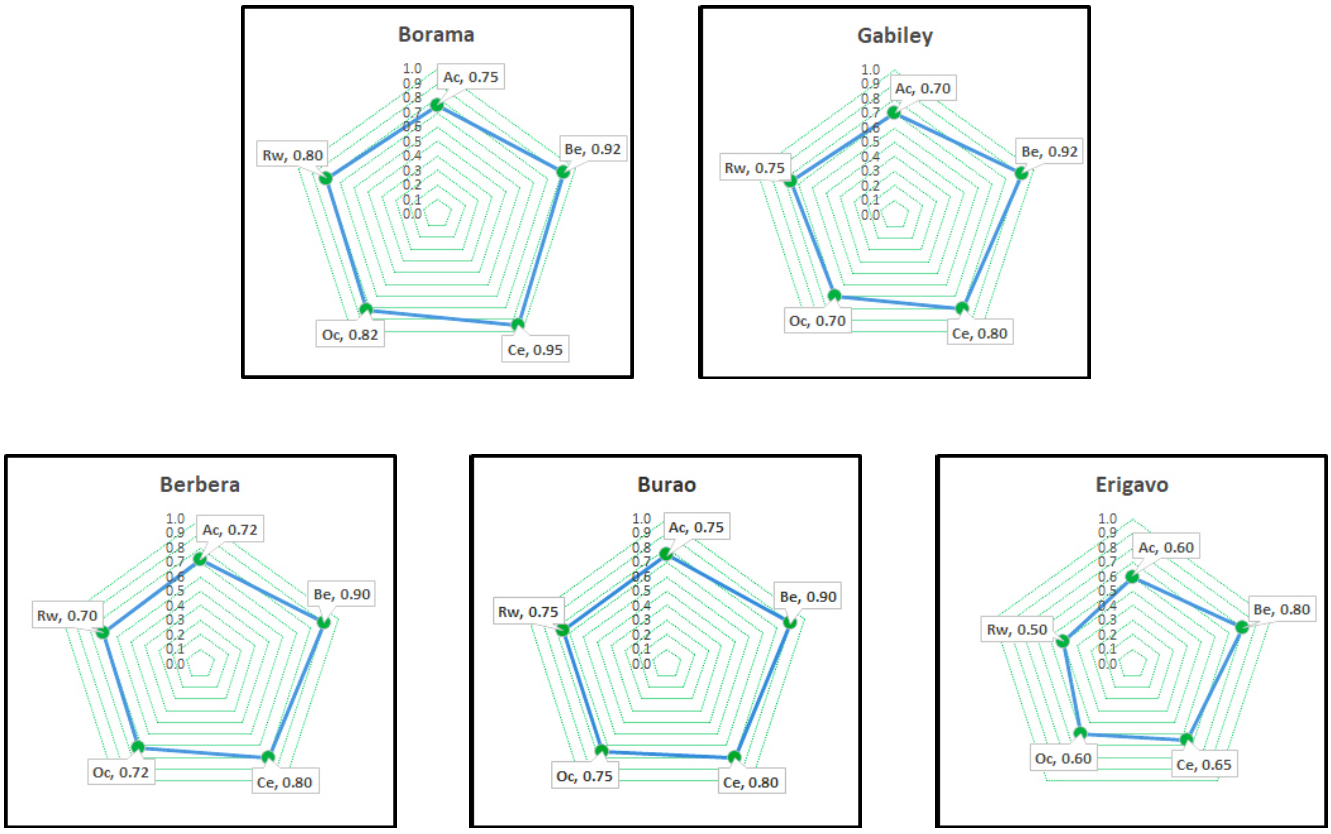


4.1.1. Somaliland Region

The assessment study started in Somaliland. The consultant visited each targeted town and carried out field work. The information was collected using prescribed formats and methodologies.

Based on the analysis of the field data, the performance parameters such as Access and Coverage (Ac), Billing Efficiency (Be), Collection Efficiency (Ce), Operational Cost Recovery (Oc) and Revenue Water (Rw) have been calculated and plotted. The visual presentation of performance parameters of five towns are shown in the figure 4-3. Borama (75%) and Burao (75%) have indicated better "Access and Coverage", followed by Berbera (72%), Gabiley (70%) and Erigavo (60%). On the other hand, Borama (92%), Gabiley (92%), Berbera (90%) and Burao (90%) have relatively similar levels of billing efficiency. Erigavo, however, (80%) is lagging. The collection efficiency of Borama is very high (95%), compared with Gabiley (80%), Berbera (80%), Burao (80%) and Erigavo (65%). All the water utilities in Somaliland have varying operational costs expenditure, eg; Borama (82%) followed by Burao (75%), Berbera (72%), Gabiley (70%) and Erigavo (60%). The result further shows that Borama (80%) recovers a higher water revenue, trailed by Gabiley (75%), Burao (75%), Berbera (70%) and Erigavo (50%).

Figure 4.3: Performance Pentagon of five water utilities of Somaliland



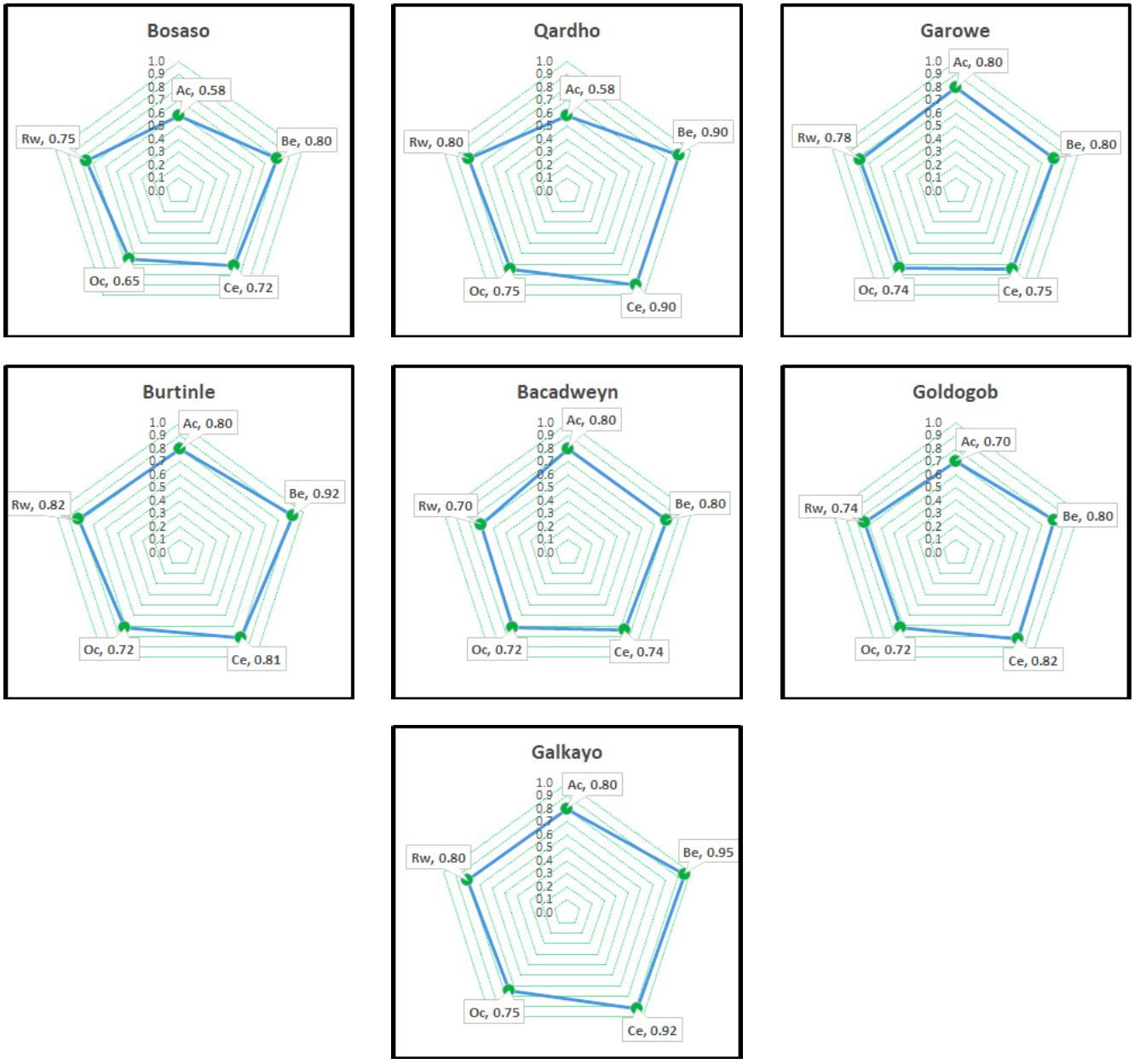
Furthermore, the performance indicator of each water utility has been calculated using a performance pentagon formula. The performance score of Borama stands on 72%, topping other towns. Burao, with a 62% performance score, topped the ranks amongst public utility managed systems in Somaliland, followed by Gabiley, Berbera and Erigavo (scoring 60%, 50% and 40% respectively). As per the analysis, Borama is the best performing water utility in Somaliland, whereas Erigavo must improve in every aspects of their performance parameters. The figure 4-4 shows the comparative performance parameter of the towns.

Figure 4.4: Performance Score of Water Utility in Somaliland region

4.1.2. Puntland Region

Similarly, the visual presentation of performance parameters of seven towns of Puntland region are shown in the figure 4-5. The Galkayo, Garowe, Burtinle and Bacadweyn have better "Access and Coverage" scoring 80% followed by Goldogob (70%), Bosaso (58%) and Qardho (58%) only. Considering the water utilities issues a water bills, a billing efficiency of Galkayo (95%) is highest followed by Burtinle (92%) in the Puntland region. The billing efficiency of Bosaso, Garowe, Bacadweyn and Goldogob standing at 80%. While analysing the collection efficiency, Galkayo (92%) is highest followed by Qardho (90%). The billing efficiency of Goldogob, Burtinle, Garowe, Bacadweyne and Bosaso stands on 82%, 81%, 75%, 74% and 72% respectively. Furthermore, the Qardho and Galkayo are spending about 75% of water revenue to operational and management of the system. Garowe spending 74% to the operational cost followed by Burtinle (72%), Bacadweyn (72%), Goldogob (72%) and Bossaso (65%). The water utilities in Puntland have minimal non-revenue water ranging between 18-30%. The revenue water in Burtinle is highest at 82% followed by Galkayo (80%), Qardho (80%), Garowe (78%), Bosaso (75%) and Bacadweyn (70%).

Figure 4.5: Performance Pentagon of seven water utilities of Puntland



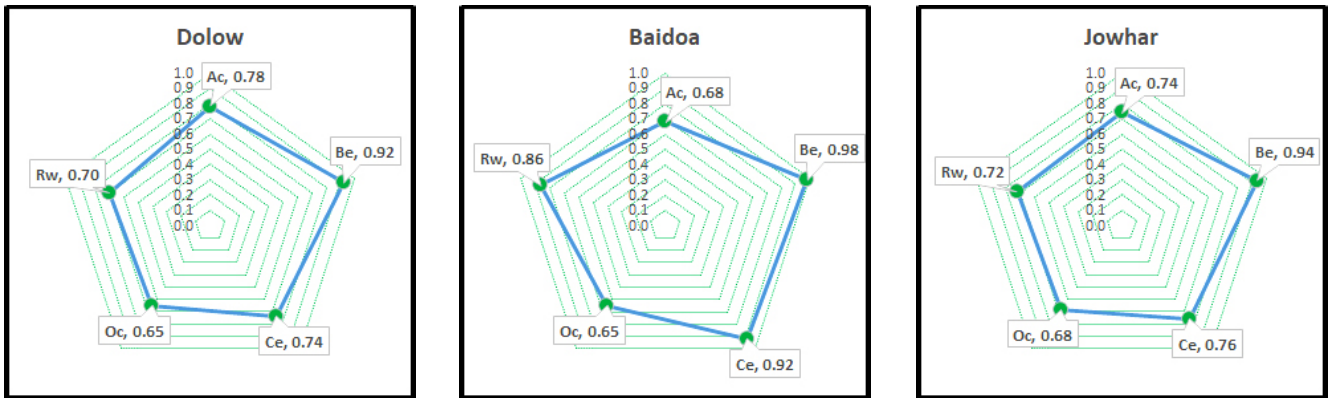
The performance indicators have been calculated using a performance pentagon formula. In Puntland, Galkayo is performing the best with a score of 71%, followed by with a score of Burtinle (66%), Qardho (62%), Garowe (60%), Goldogob (57%), Bacadweyne (57%) and Bosaso (49%). The figure 4-6 presents the performance score of the towns.

Figure 4.6: Performance Score of Water Utility in Puntland region

4.1.3. Central and Southern Region

Due to the fragile security situation, only three towns have been assessed in the South-Central Region. The visual presentation of performance parameters of three towns are shown in figure 4-7. In this region: Dollow scoring 78% has better indicators related to the "Access and Coverage", followed by Jowhar (74%) and Baidoa (68%). The billing efficiency of Baidoa is very high, standing at 98%, whereas Jowhar and Dollow also issue 94% and 92% of water bills to their customers. The collection of the issued bills stands on 92%, 76% and 74% for Baidoa, Jowhar and Dollow, respectively. From an operational cost expenditure perspective, all three water utilities are sustaining spending at 68%, 65% and 65% of total revenues collected.

Figure 4.7: Performance Pentagon of three water utilities of Central-South



The performance scores presented in figure 4-8 reveal their scores as 67%, 59% and 58% for Baidoa, Jowhar and Dollow. Based on those scores, Baidoa is the best performing water utility in the South-Central Region.

Figure 4 8 : Performance Score of Water Utility in Central-South region

4.2. Relevance

Findings from the study reveal that despite the challenges, all urban water PPPs and Public utilities have had a significant contribution towards ensuring the availability and sustainable management of water systems for all, including the poor and IDPs. This is reflected in the positive upward trajectory in quantity and quality of water output and increases in new connections. However, there is a need to expand the water supply systems and service areas to improve the 'Access and Coverage'.

The water utilities have limited capacity on 'Operation and Maintenance', especially in the public utilities in Somaliland. This is related to the inability to train O&M operators or to hire qualified personnel, as well as the fact that some spare parts are not readily available locally and have to be imported from abroad at higher costs. The other main challenge with public utilities is the retention of qualified personnel. The PPP-managed water utilities or water-related private companies generally pay higher remuneration to highly skilled technicians. Thus, the staff of public water utilities are tempted to opt out and get jobs within the private sector.

Private utilities seem to be doing a little better in terms of O&M as they reported having stand-by technicians for break-downs and emergency repairs; even though these were also, indeed, limited in capacity.

Almost all water utilities in the study are able to recover their operational costs through water-revenue collection. However, from a capital expenditure perspective, self-sustainability for the water agencies assessed is yet to be guaranteed, as most, if not all, are still dependent on grants from different sources including UN agencies and NGOs. It is worth mentioning here that SHABA, GALWA and MUWASU water utilities show signs of good management and thus are a sign of self-sustenance for themselves and others.

4.3. Efficiency

In the urban water sector, the PPPs are credited for bringing improvements in operational efficiency and in quality of service; reducing Non-Revenue Water (NRW) and losses, increasing labour productivity and bill collection. Similarly, this study found that in all the three regions assessed, the introduction of PPPs in water supply and management markedly improved efficiency, based on increases in water production, new connections and infrastructure developments, amongst others. Somaliland has exhibited a more efficient PPP in SHABA, closely followed by Puntland with GALWA and MUWASU) scoring highly in the different dimensions of performance.

All the water facilities managed under the PPP model posted an increase in billing efficiency, standing at 90-98%. The study also found that consumers were willing to pay more for services since they were assured of an adequate quantity and quality of the water supply.

In terms of minimum time to repair (MTR), PPPs, especially GALWA, guaranteed the repair of break-downs in less than 12 hours, while public utilities in Somaliland revealed that MTR is around 3 days. The water utilities operating under PPP model reported employing technicians who are on duty 24 hours, 7 days a week. These have rotational schedules and are available to respond to calls for repair as problems arise.

4.4. Effectiveness

Quality and quantity of water output is a widespread problem for water service providers. This can be the result of contaminated sources of water, physical losses such as spills and leakages, monetary losses resulting from theft, unbilled consumption and metering errors. Non-Revenue Water (NRW) is usually considered to be a good proxy for inefficiency. Puntland leads this dimension at < 23 percent of NRW, followed by both South-Central and Somaliland at 24% and 30% respectively. For example, in Qardho, Hodman Water Management Company is challenged by leakages and a crumbling water reservoir. It is also important to note that NRW was lower in the PPP facilities when compared to the purely Public facilities.

Tariff structures appeared to differ across regions and water facilities. This was attributed to the existing policies and the costs of operation. The highest tariff was recorded by Goldogob (Puntland) at $1.8 per/$m^3$ and the lowest by BWA (Burco, Somaliland) $1.2/$m^3$ for household connections. There is sometimes a tendency by the public to opposed PPPs, including water projects, based on the perceptions that private tariff settings would make safe water unaffordable to the poor. However, in most of the communities assessed, people were willing to pay more for the good quality water provided. In all the facilities assessed, Borama seemed to have the best prices which have not been increased for more than four years. In Garowe, prices seemed to fluctuate, and the reason given for this was fluctuating diesel prices and costs of labour.

4.5. Economic and Financial Analysis

In terms of Operating Cost Expenditure (Ratio Total Operating Cost /Total Revenue collection in the year, expressed as a percentage) – all the water utilities are self-sustained and able to cover their operational costs without any external support. SHABA water utility, which is the only PPP-managed water utility in Somaliland, has posted a positive business growth since 2004. In Puntland, Galkayo and Burtinle are the best managed water utilities while in South-Central, Baidoa showed signs of better management especially in terms of coverage, documentation and business forecasting.

Though there may not be clear records, all the urban water PPPs facilities studied have created both direct jobs (managers, engineers, university interns) and indirect jobs (water kiosk operators, water truckers and donkey-cart operators) for the local communities where they operate.

One of the uppermost, fixed costs for water utilities is labour. Keeping an affordable wage structure is crucial to guaranteeing financial viability for the utility. Possession of excess staff numbers increases operational costs and reduces available finances required for infrastructure maintenance and development. Among the utilities assessed, SHABA is performing well, with a staff-to-household connection standing at 0.53% (i.e. 77 staffs for 14,419 household connections), whereas Erigavo has the worst performance despite their staff to household connection ratio, which stands at 5.39 percent (i.e. 69 staffs for 1,280 connections).

4.6. Cross Cutting Issues

4.6.1. Legal and Policy frameworks for Urban Water PPP

There is a need for urban water PPPs to have policy, legal and institutional frameworks. There is a need to put in place an enabling environment to generate and mobilize adequate financial and technical resources for PPPs, as well as to give special incentives to promote PPPs in geographically and economically disadvantaged areas. PPP models cannot flourish and sustain themselves without government financing. In Somalia, the donors, through UN and other development partners, is filling the gap.

Both Somaliland and Puntland have put in place the requisite policies and legal frameworks to support the PPPs. In South-Central, WASH policies and the Water Act are still to be endorsed by the government.

4.6.2. Project Preparation and Design

Public Private Partnerships' project preparation and design are distinguished by their unique features of: sharing assets, risks and costs; distribution of roles and responsibilities; decision-making and maximizing outputs. Such partnership models guarantee leveraging strengths and resources between the public and private sectors. It has been noted in the study that in all regions where water supply related PPPs are operating there is evidence of joint-project preparation and design. Regional or central governments either directly or through their respective ministries/departments and the private companies formed by the residents have been instrumental in the preparation and design of the water projects. Technical and financial support from UN agencies, i.e., UNICEF, UNHABITAT as well as INGOs, has been instrumental in the initial stages of the projects.

All the PPP projects assessed had long-term strategies and plans to guide their operations over a period of time. This is one good step forward towards the success of the PPP projects.

4.6.3. Capacity of the Government and Private Companies

Federal, regional and local governments have key roles to play in the entire urban water PPP project cycle. In all the three regions, governments at different levels showed

different levels of commitment and capacity (management, technical and financial) to implement urban water projects through PPPs. Puntland exhibited higher commitment and capacity followed by Somaliland and South Central. However, they exhibited gaps in contracting, setting and monitoring compliance with standards and other issues.

PPP's approval processes go through several Ministries, Departments and Agencies, at central and regional levels. The high bureaucracy in the approval processes is considered a critical issue by potential investors in PPP projects. The resultant delays sometimes scare off potential investors and lead to losses.

Furthermore, in all the regions reviewed, private companies showed some level of technical and financial capacity in implementing and managing PPPs in the water sector. Somaliland (SHABA) showed higher capacity and experience followed by Puntland (GALWA and MUWASU) and South Central (Dollow). Higher capacity constraints were, however, seen among the PPPs in Puntland and South Central. Technical gaps were highlighted in areas of O&M, general management, procurement, risk identification, quantification and allocation, resource mobilization, financial viability analysis and so on.

4.6.4. Impact on Children and Women

In Africa, 90% of the work of gathering water and wood for the household, and food preparation, is done by women. On average, women and children travel 10-15km per day collecting water and carrying up to 20 litres per trip. In the projects assessed, there were deliberate efforts for inclusion and targeting of the poor, or most vulnerable, segments of society especially women and children, who bear most of the burden resulting from lost time and opportunities. The projects assessed specifically had the following contributions:

Increasing access to safe and clean drinking water to women and children, reducing the burden in terms of distance and time taken to collect water. Furthermore, having potable water at one's premises has increased school attendance and enrolment of girl students.

The study has also revealed that PPPs in the water sector is providing an alternative source of income in the form of water kiosks, which are mainly owned and managed by women.

In addition, most of the water agencies across the three regions also provide free or highly discounted water to Institutions, such as schools, mosques, medical facilities and IDP camps as part of their Corporate Social Responsibility (CSR).

4.6.5. Sustainability of Urban water PPPs and replicability

All the utilities assessed, including SHABA, relied on grants from UNICEF, the European Union and other donors for their capital investments particularly infrastructure. This raises the question on whether these urban water PPPs can be sustained without external financing, especially where the scale of investment is large. This issue will require more scrutiny and analysis to ensure that grants are prudently harmonized with the actual needs of the project, and its beneficiaries, to reduce any negative effects and guarantee project sustainability and value for money. Risks from disasters triggered by extreme climatic events - especially droughts and floods - threaten the sustainability of the projects.

PPPs in water also face the challenge of balancing being commercially and financially sustainable and achieving the social objectives of extending services to the poor.

However, it's important to note that all the private companies in the three regions are local/ national companies that are home-grown, formed by local residents. This increases the opportunities for sustainability and the potential for replication.

SHABA water utility, the only urban water PPP in Somaliland, is well-managed and has been self-sustaining since its establishment in October of 2003. This shows great potential for expansion and replication.

Finally, the simple and small-scale nature of the urban water PPPs assessed demonstrate their potential for scale-up and replication.

Indeed, this study found that, in most cases, the introduction of a PPP markedly improved collection rates. This is the dimension in which the positive contribution of a PPP model was most consistent, with all the towns in the sample achieving significant improvements.

4.7. Drivers for success

- All the regions assessed experience infrastructure deficits which present opportunities for using the PPP framework as a funding model for the development of infrastructure projects that can improve access and coverage.
- The fact that all the regions, except South-Central, have the necessary PPP legislative frameworks and demonstrate their readiness and commitment to adopting PPPs as a funding model to close the existing infrastructure gaps.
- Access to the geographical location in Somaliland and Puntland is safer compared to South-Central.
- Despite some level of incompetence, especially in Puntland and South-Central, all the PPPs have management boards, which play a crucial role in making positive decisions.
- Somaliland has well-established Water User Associations (WUAs) which play a great role in the protection of consumer rights, mediations and so on.
- Political commitment towards implementing PPPs in

Puntland is very strong. However, PPPs need more political support in Somaliland from the Government Ministries. There are positive signs towards this objective.

- The availability of private partners such as Dahabshil International Bank and Shurako Foundation means loans are available to be offered to finance PPP companies at nominal interest rates.
- Findings reveal that all water agencies are not yet operating at their full capacity and this an opportunity for scaling up operations.

4.8. Challenges

- Inadequate capacity to negotiate, structure and manage PPP contracts and identifying and appraising projects that satisfy the core principles of PPPs (including value for money, cost effectiveness and risk transfer).
- The projects implemented reflect a level of experience in implementing PPPs. However, knowledge and skills-generation, or skills transfers, for ensuring expertise, is still a challenge.
- Poor conceptualization of the PPP project in some cases leads to losses, eg, in Gabiley, where the government had constantly subsidized the PPP company for managing water utility, yet it still couldn't survive and finally turned into a public management system.
- Improper management of urban water PPP facilities, especially in South-Central, which increases project costs, delays implementation and changes in scope, and budgets get overrun during implementation.
- The recurrent droughts affecting the entire region are having a toll on the water levels and recharge rates, especially for the boreholes.
- There is poor Operation and Maintenance of the water facilities. This is largely attributed to limited O&M skills and the poor equipment and spare parts in local markets – most have to be ordered from abroad.
- Some donors have shown in consistent support towards funding urban water PPPs even when they have failed to break even and be self-sustaining.
- The high cost of diesel for generators increases the operation costs of water facilities. This eventually increases water tariffs.
- PPPs in water supply systems face challenges in being commercially and financially sustainable, and in achieving the social objectives of extending services to the poor.
- There are gaps in documentation and record-keeping across all the different facilities, with the exception of SHABA.

5. CONCLUSION AND RECOMMENDATION

5.1. Conclusions

The study generally gives a synopsis of the urban water PPPs regime and the varying experiences in the three regions. Despite the challenges identified, the study established that all regions have, to different degrees, benefited from urban water PPP projects through improvements in access, quality, and efficiency of service provision.

That said, there are management, infrastructural and policy gaps that exist in these regions. To facilitate urban water PPPs, therefore, there is need for legislative and institutional reforms and a supportive policy environment anchored on a long-term development plan. There is need to find a balance between tapping the entrepreneurial profit spirit and harnessing private initiatives for socially useful purposes.

The government and implementing agencies should explore the possibility of hybrid urban water PPP models, where investment is largely funded by public money and private operators focus on improving the service and operational efficiency. This will greatly contribute to achieving the social objectives of extending water services to all.

The study findings reveal that all the water agencies are operating below their full potential. With a proper regulatory framework, technological, managerial and private financial support these agencies are capable of breaking even and, further, become self-sustaining.

In addition to the above, the following are points to be considered for the expansion of PPPs in Somalia:

- Water User Associations and committees play a great role in the protection of consumer rights.
- Having a gender-lens across the entire urban water PPP project cycle of individual projects will ensure that protection issues are considered and addressed through the project.
- Small-scale urban water PPPs have a significant role in reaching the poor and marginalized and have a higher potential for replication and sustainability.
- Supplementing private finance with public finances for new and big infrastructure development is important.

5.2. Recommendations

5.2.1. Immediate Intervention

- There is need for the finalization and operationalization of the policy and legislation frameworks where this has not yet been completed.
- It was observed that some oversight institutions lack the necessary regulating capacity. There is need for thorough capacity assessment and development programs on PPPs among the regulating institutions to properly use their mandate in assessing and monitoring compliance, risks and project viability.
- All companies should plan and organise cross-leaning activities across the regions/ projects. Wherever possible, they can organise international exposure and learning trips to countries where the urban water PPP model has greatly succeeded.
- Water utilities can be encouraged to adopt the block-rate tariff-setting method to encourage consumers to save water as well as making more profit for the utility from business consumers who use water for income-generation.

5.2.2. Medium term intervention

PPPs should be designed in a manner that encourages skills transfers, to ensure that at the end of a project, local resource persons would also have gained some experience from the project. Rigorous capacity building efforts should be designed and implemented.

The PPP projects' design stage needs to ensure that accurate data is used in drawing projections for demand and income streams. Over-estimating demand and income may lead to skewed contracts and continuous losses and subsequent failure of the projects.

Have a protection and gender-lens across the entire urban water PPP project cycle of individual projects e.g., a gender-responsive legal framework, stakeholder engagement, project appraisal, design, procurement and contracting. All these will help to reduce gender inequalities and support the empowerment of women. Protection mainstreaming will ensure improving safety, well-being and dignity for crisis-affected and other vulnerable populations.

5.2.3. Longer term intervention

The use of solar energy instead of diesel power to operate the boreholes will reduce operational costs and contribute to environmental protection through the use of green energy. These solar installations can also be used to provide electricity to a few neighbouring houses. Additionally, the operators can earn an extra income for establishing phone-charging centres to supplement their pay checks.

Urban water facilities are encouraged to embrace the mobile utility billing and payment system through Golis, Edahab Services or at regular bank branches. Mobile utility bill payments benefit service-providers and end-users by increasing payment transparency, reducing leakages and operational costs and by providing avenues for financial inclusion. They also benefit mobile operators by helping to drive mobile- money adoption. This can be supported by the relatively good telephone network coverage across the regions.

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