



**REGIONAL BENCHMARKING OF
LARGE WATER SUPPLY AND SANITATION UTILITIES
2015/2016 REPORT**



June, 2017

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FOREWORD

This third regional benchmarking report has seen the inclusion of the water supply and sanitation Utilities in Zanzibar and Uganda, bringing the total reported Utilities to eight, from six since inception of the report. This is in line with the Strategic Plan objectives of the Eastern and Southern Africa Water and Sanitation (ESAWAS) Regulators Association to extend the exercise to the rest of the region and thereby spur improvements in water supply and sanitation service delivery through comparative reporting.

The dissemination of the 2015 report during the 10th ESAWAS annual general conference included the sharing of experiences from the benchmarked Utilities in areas of good performance. The report was further disseminated by presentations at the 18th African Water Association (AfWA) Conference, the International Water Association (IWA) 3rd International Water Regulators Forum and the 13th African Forum for Utility Regulators (AFUR) Conference. It is the intention of ESAWAS to continue raising the profile of the report as a useful tool to gauge the performance of the single or largest Utility in a country, in order to formulate appropriate interventions and regulations that incentivise good performance.

At the close of the Millennium Development Goals (MDGs), the UN 2015 Report shows that the ratio of the world population with access to improved drinking water supply increased from 76% in 1990 to 91% and access to improved sanitary facilities was extended from 54% to 68%. However, over 80% of wastewater is still discharged untreated into rivers, lakes and oceans and drinking water supply is contaminated for lack of sewage systems. About 1.8 billion people remain without access to clean drinking water.

This third regional benchmarking report is in tandem with the status of the MDGs report. As the world gains tract in transitioning to the Sustainable Development Goals, effective regulation will play a key role in incorporating a holistic approach to implementing government policy and fostering improvements in water supply and sanitation service delivery.

ACKNOWLEDGEMENTS

The Eastern and Southern Africa Water and Sanitation (ESAWAS) Regulators Association wishes to acknowledge the dedication of its Member institutions to support the regional benchmarking exercise and successfully produce the third annual regional benchmarking report in a row. In addition, Members have included the outputs of this exercise in their respective country performance reports which have further enhanced the value of this report.

Of special mention are the Zanzibar Utilities Regulatory Authority (ZURA) of Zanzibar and the Water Utility Regulation Department (WURD) of Uganda for their keen interest and first-time participation in the benchmarking exercise. This is in fulfilment of ESAWAS's intention to extend the exercise to the rest of the region.

ESAWAS continually thanks the water supply and sanitation Utilities benchmarked in this report for lauding the usefulness of the report, providing feedback and their full participation during its dissemination.

It remains the aim of ESAWAS that this report will continue to spur performance among our WSS Utilities to the benefit of the citizenry.

ABBREVIATIONS/ACRONYMS

AdeM	Águas da Região de Maputo
CRA	Conselho de Regulação de Aguas
DAWASCO	Dar es Salaam Water and Sewerage Corporation
ESAWAS	Eastern and Southern Africa Water and Sanitation
EWURA	Energy and Water Utilities Regulatory Authority
IBNET	International Benchmarking Network
KPI	Key Performance Indicators
LWSC	Lusaka Water and Sewerage Company
LEWA	Lesotho Electricity and Water Authority
NCW&SC	Nairobi City Water and Sewerage Company
NWASCO	National Water Supply and Sanitation Council
NWSC	National Water and Sewerage Corporation
QoSSS	Quality of Supply and Service Standards
RURA	Rwanda Utilities Regulatory Authority
SDGs	Sustainable Development Goals
UN	United Nations
WASAC	Water and Sanitation Corporation
WASCO	Water and Sewerage Company
WASREB	Water Services Regulatory Board
WSS	Water Supply and Sanitation
WUPI	Water Utility Performance Index
WURD	Water Utility Regulation Department
ZAWA	Zanzibar Water Authority
ZURA	Zanzibar Utilities Regulatory Authority

EXECUTIVE SUMMARY

This third benchmarking report presents an analysis of the performance of large water and sewerage Utilities in eight countries of the Eastern and Southern African region for the period 2015/2016.

The benchmarked Utilities selected as either the single or largest Utility in the country were: Nairobi City Water and Sewerage Company (NCW&SC) of Kenya; Dar Es Salaam Water and Sewerage Corporation (DAWASCO) of Tanzania; Lusaka Water and Sewerage Company (LWSC) of Zambia; Águas da Região de Maputo (AdeM) of Mozambique; Water and Sanitation Corporation Ltd (WASAC) of Rwanda; Water and Sewerage Company (WASCO) of Lesotho, National Water and Sewerage Corporation (NWSC) of Uganda and Zanzibar Water Authority (ZAWA) of Zanzibar.

The analysis of the performance was done against ten key performance indicators and benchmarks defined by ESAWAS. The key performance indicators (KPIs) were grouped according to similarity in the components of Quality of Service, Economic Efficiency and Operational Sustainability. Finally the performance of the Utilities was ranked using an integrated measurement of performance in the aforementioned components, called the Water Utility Performance Index.

The main results show that the best performing KPIs were Water Quality, Hours of Supply, O&M Cost Coverage and Staff/1,000 W&S Connections while the worst performing KPIs continued to be Sewerage Coverage and NRW.

The report recommends an urgent and critical need for Governments to direct investments to extending service coverage and hours of supply if the Sustainable Development Goals (SDGs) are to be met. Further, Utilities are implored upon to devise innovations and strategies to contain costs, reduce water losses and improve collections for financial viability.

This report is organised as follows: the first section gives an overview of the ESAWAS Regulators Association; the second section describes the regional benchmarking framework; the third section presents the comparative performance analysis and the final section of the report discusses the main conclusions and recommendations of the benchmarking exercise.

CHAPTER 1. OVERVIEW OF ESAWAS REGULATORS ASSOCIATION

1.1 BACKGROUND

Access to safe drinking water and adequate sanitation remains a key developmental agenda for governments world-over. According to the UN Sustainable Development Goals (SDGs), 'Water and sanitation are at the very core of sustainable development, critical to the survival of people and the planet'. It is in cognisance of the foregoing that water sector reforms initiated by most governments in the Eastern and Southern African region in the last 20 years, focussed on improving the provision of water supply and sanitation (WSS) services.

The water sector reforms also emphasised the need for stronger institutions to improve WSS service delivery. Hence, autonomous regulatory authorities have been established to ensure improved, affordable and efficient service delivery while protecting consumers against potential abuse of monopoly power (limited scope for competition/choice by customers).

The goal of regulating WSS services is thus to improve and maximise the well-being of the whole population. Regulators aim to ensure efficient, affordable, reliable and quality services while balancing the commercial interest (sustainability) with that of social consideration.

Regulators are often 'no one's child' with a delicate balancing act. However, in recognising the need for collaboration in the development of an effective WSS regulatory framework, the Eastern and Southern Africa Water and Sanitation (ESAWAS) Regulators Association was formed in 2007, to exchange experiences and knowledge on WSS regulation through regional cooperation on issues of mutual concern and interest. The ESAWAS Regulators Association is registered under the Societies Act Cap 119 of the Laws of Zambia and is governed by a Constitution ratified among the members.

1.2 OBJECTIVES AND MEMBERS OF ESAWAS

The ESAWAS Regulators Association seeks to enhance the regulatory capacity of members to deliver quality and effective regulation to achieve public policy objectives through cooperation and mutual assistance. The objectives of the ESAWAS Regulators Association as stated in its Constitution are:

a) Capacity Building and Information Sharing

Facilitate information sharing and skills training at national, regional and international level to enhance the capacity of members in WSS regulation;

b) Regional Regulatory Co-operation

Identify and encourage the adoption of best practices to improve the effectiveness of WSS regulation in the region.

The ESAWAS Regulators Association is currently composed of eight members that are: Water Services Regulatory Board (WASREB) of Kenya; the Water Regulatory Council (CRA) of Mozambique; the Rwanda Utilities Regulatory Authority (RURA) of Rwanda; the Energy and Water Utilities Regulatory Authority (EWURA) of Tanzania; the National Water Supply and Sanitation Council (NWASCO) of Zambia; the Lesotho Electricity and Water Authority (LEWA) of Lesotho; the Agency for Regulation of Electricity, Potable Water and Mines (AREEM) of Burundi and the Zanzibar Utilities Regulatory Authority (ZURA) of Zanzibar. The overview of the regulators is given in Table 1.

Table 1: Overview of ESAWAS Members

	Regulator	Established by	Year begun operations	Number of regulated Urban WSS Utilities
1	National Water Supply and Sanitation Council (NWASCO), Zambia	Water Supply and Sanitation Act No. 28 of 1997	2000	18
2	Water Regulatory Council (CRA), Mozambique	Decree No. 74 of 1998	2000	15
3	Water Services Regulatory Board (WASREB), Kenya	Water Act of 2002	2003	103
4	Rwanda Utilities Regulatory Authority (RURA), Rwanda	Law No. 39 of 2001	2003	1
5	Energy and Water Utilities Regulatory Authority (EWURA), Tanzania	Cap 414 of 2001	2006	130
6	Lesotho Electricity and Water Authority (LEWA), Lesotho	LEA Act of 2002, LEA Amendment Act of 2011	2013	1
7	Agency for Regulation of Electricity, Potable Water and Mines (AREEM), Burundi	Decree No. 100/320 of 2011	2015	1
8	Zanzibar Utilities Regulatory Authority (ZURA), Zanzibar	Act No. 7/2013	2015	1

The regulators have generally been mandated to undertake both economic and technical regulation of WSS service provision to ensure a balance between the quality of the service, the interests of consumers and the financial sustainability of the providers.

For effective regulation, a number of instruments and tools have been put in place and generally include:

- Licensing: All WSS providers are required to operate under a license issued by the regulator except in Mozambique where the regulator, CRA, signs a regulatory agreement/contract with the provider that defines the regulatory framework.
- Development and Enforcement of Guidelines, Regulations, Rules and Standards: Various guidelines, regulations, rules and standards have been developed and enforced to ensure compliance to the governing water supply and sanitation legislation. Some key regulations, guidelines and standards include: Minimum Service Level, Business Planning, Corporate Governance, Reporting and Quality of Supply and Service Standards (QoSSS).
- Tariff Setting: All WSS providers are required to submit tariff applications to the regulator for analysis and approval.
- Performance Monitoring and Quality Control: The regulators undertake regular inspections of utility infrastructure and operations. Areas of non-compliance are addressed through written directives and orders.
- Sector Performance Reporting and Information Dissemination: The regulators have in place systems for data collection on the performance of the Utilities that is used for sector reporting. All the regulators produce annual reports on the performance of the sector which is published and disseminated to the public.

1.3 IMPLEMENTATION OF ESAWAS STRATEGIC PLAN

ESAWAS begun the implementation of its second Strategic Plan for the period 2016-2018 which is anchored on three strategic objectives as follows:

- i. Strengthen regulatory capacity among Members and within the region
- ii. Facilitate experience and knowledge transfer
- iii. Improve operations of ESAWAS Regulators Association

On overall, about 85% of the Strategic Plan was executed successfully. Major activities undertaken in the year under the three objectives and key focus areas were as outlined in Table 2.

Table 2: Implementation Performance for 2016 Strategic Plan activities

OBJECTIVE 1: STRENGTHEN REGULATORY CAPACITY AMONG MEMBERS AND WITHIN THE REGION	
Key Focus Area	Performance
Undertake Peer Review of Regulators	<p>The fourth regulatory Peer Review was successfully held for CRA, Mozambique from 22nd -26th August 2016. All Members participated in the Peer Review with a total team of 14.</p> <p>Major findings were centred on the need to review legislation to strengthen regulation of operators, improve sanitation regulation and enhance consumer participation. The team lauded the strong approach to decentralised regulation and enhanced benchmarking framework.</p>
Extend benchmarking exercise for large utilities in the region	<p>The second regional benchmarking report was published by end of June 2016 with support from GIZ-Tanzania through EWURA.</p> <p>The main results from the benchmarking analysis highlighted a performance disparity by the Utilities among the components of Quality of Service, Economic Efficiency and Operational Sustainability. A number of the Utilities performed well in one component and poorly in one or two of the others. In overall, the report shows that the best performing KPIs were Staff/1000 Connections and Collection Efficiency while the worst performing KPIs were O&M Cost Coverage and NRW.</p>
Provide support to WSS regulators newly established or under formation in the region	<p>AREEM, Burundi as a newly formed regulator and member of ESAWAS was supported to participate in the regulatory Peer Review of CRA in order to gain in-depth hands-on knowledge of regulatory systems and practices through peer exchanges.</p>

Table 2 cont'd: Implementation Performance for 2016 Strategic Plan activities

OBJECTIVE 2: FACILITATE EXPERIENCE AND KNOWLEDGE TRANSFER	
Key Focus Area	Performance
Document and share good practices in regulation	Good practices in tariff setting were documented and shared.
Undertake technical regulatory exchange programmes	<p>A Technical regulatory exchange meeting on Tariff Setting was successfully held in Lusaka, Zambia from 28-30th June, 2016. The participants were composed of staff directly handling tariff setting.</p> <p>The meeting proposed that an ESAWAS handbook for tariff setting be developed that will detail the good practices documented. This will be undertaken under the ambit of the ESAWAS Technical Committee.</p>
Establish/Strengthen partnership with other WSS sector associations	<ul style="list-style-type: none"> • AFUR participated and presented at the ESAWAS 10th AGM at the invitation of ESAWAS. • WHO-Regnet gave a focussed presentation on Water Safety Planning at the ESAWAS 10th AGM, at their request. • ESAWAS gave presentations on the regional benchmarking report at the African Water Association (AfWA) Congress in Kenya and the International Water Association (IWA) Congress in Australia. • A request for partnership in capacity building was received from Shepperd&Wedderburn of Scotland who were invited to present at the 10th AGM for consideration of the nature of partnership proposed.
OBJECTIVE 3: IMPROVE OPERATIONS OF ESAWAS REGULATORS ASSOCIATION	
Focus Area	Performance
Hold Annual General Meeting (AGM)	The 10 th AGM was held in Dar es Salaam, Tanzania from 1 st -4 th November, 2016 under the theme ' <i>Regulating for the Future – Incorporating Sustainable Development Goals (SDGs)</i> '. The AGM drew over 70 participants from about eleven different countries.
Update Website	The website was updated periodically with activities undertaken by ESAWAS.
Increase membership	ZURA of Zanzibar became the 8 th Member of ESAWAS at the 10 th AGM.
Source external funds for activities	Out of a budget of US\$52,000 to be sourced from external support, about 85% was secured through direct support for activities such as Peer Review, AGM, Technical Exchange Meeting and publication of benchmarking report.

CHAPTER 2. REGIONAL BENCHMARKING FRAMEWORK

2.1 RATIONALE FOR REGIONAL BENCHMARKING

Benchmarking is a key regulatory tool for assessing and improving the performance of WSS Utilities by comparing the performance of a Utility against itself from past trends, against others and against good practice. However, in the Eastern and Southern African region, the largest Utility tends to have no peers while some countries only have a single WSS provider, thus making reasonable comparison of performance difficult.

In order to design appropriate performance incentives and set minimum targets for key indicators, regulators need to establish where a Utility is coming from (past trends), how it has performed against others (comparative performance) and how it has performed against good practice (acceptable performance).

Hence for large or single Utilities that have no comparable peer within a country, regional benchmarking becomes an essential tool to gauge and incentivise performance improvements. While the operating environments may differ from country to country, by benchmarking against similar sized Utilities, lessons can be drawn, by both the regulator and the utility, on how to improve performance.

In cognisance of the foregoing, in 2015, ESAWAS developed a regional benchmarking framework by a process of harmonising the Key Performance Indicators (KPIs) and benchmarks used by the different regulators. Key benchmarks to be achieved by Utilities have been set in the respective Minimum Service Level guideline /Quality of Supply and Service Standards (QoS) developed by the regulators (*see Annex 1*). EWURA has set a Service Level Benchmark based on good practices while CRA utilises boundaries set under its indexing model. RURA, WASREB and NWASCO have defined an acceptable benchmark to be achieved. LEWA, AREEM and ZURA being relatively new, are yet to establish benchmarks for the KPIs.

The regional benchmarking report therefore presents the platform by which large Utilities can be compared to similar sized Utilities within the region. The results of the benchmarking exercise are therefore intended to serve as a support tool to:

- foster improvement in the WSS services by creating competition among the benchmarked Utilities;
- identify strengths and weakness within the Utilities and areas for improvements;
- generate information for decision making; and
- contribute to the attainment of targets with respect to country visions and SDGs.

2.2 BENCHMARKING TOOLS

For the purpose of regional benchmarking, ESAWAS combines the use of the International Benchmarking Network (IBNET) tool developed by the World Bank with the Water Utility Performance Index (WUPI) developed by CRA as described hereunder.

- **IBNET:** The IBNET Toolkit provides a set of financial, technical and process indicators (mainly capturing the institutional context in which the Utilities are operating) for the assessment of utility performance in the provision of water and sewerage services. This set of indicators provides the basis for cross-utility and cross-country comparisons. IBNET caters for a large number of indicators in different categories such Service Coverage, Non-Revenue Water, Quality of Service, Cost and Staffing and Financial Performance, amongst others.
- **WUPI:** Analysing single KPIs individually is a useful way to analyse the performance of a utility at technical level. However, by only using single KPIs in the performance analysis, it is difficult to conduct an integrated evaluation of the overall performance of the Utilities in closely related indicators. Thus the WUPI is a composite indicator to evaluate the performance of the Utilities in an integrated way for a set of similar indicators (see Annex 3 for a detailed description).

2.3 BENCHMARKING KPIs

Ten KPIs are used for regional benchmarking as follows:

- i. Water Coverage
- ii. Sewerage Coverage
- iii. Water Quality
- iv. Hours of Supply
- v. Non-Revenue Water
- vi. Operational and Maintenance (O&M) Cost Coverage
- vii. Collection Efficiency
- viii. Metering Ratio
- ix. Staff per 1,000 Connections
- x. Staff Cost as a proportion of O&M Costs

The indicators are grouped into three main components namely,

- a) Quality of Service- *relating to the extent and assurance of the service;*
- b) Economic Efficiency - *relating to the viability of the service provider;* and
- c) Operational Sustainability – *relating to operational efficiencies.*

Performance boundaries for regional benchmarking were defined by considering the minimum average performance of the Utilities, as well as the minimum for the acceptable benchmark among the countries. The weights were arrived at by a process of normalisation of the various weights defined by the different regulators.

Table 3 shows the framework used for regional benchmarking.

Table 3: Regional Benchmarking KPIs and Performance Measurements

	INDICATOR	DEFINITION	CALCULATION	ACCEPTABLE BOUNDARIES	WEIGHT
QUALITY OF SERVICE					
1	Water Coverage	% of total population with access to improved water supply: individual household connection, kiosk, public standposts, communal/shared tap	[Total Population Served/Total Population in the Service Area]	75-90%	10
2	Sewerage Coverage	% of total population with access to sewerage services (no septic tanks)	[Total Population Served/Total Population in the Service Area]	40-70%	5
3	Water Quality <ul style="list-style-type: none"> • Residual Cl (w0.4) • Bacteriological (w0.6) 	% of water samples undertaken meeting quality requirements	% of tests compliant in relation to applicable / national standards	90-95%	15
4	Hours of Supply	Aggregated average hours of supply (per town/zone/area etc) in the reporting period	Sum of weighted averages per town	16-20	10
ECONOMIC EFFICIENCY					
5	O&M Cost Coverage by Billing	The level of costs covered by billed amounts	[Billed Amount/O&M Costs]	100-150%	10
6	Collection Efficiency	The collected amounts from the billing	[Collected amount/Billed amount]x100	85-95%	15
7	Staff Cost	Personnel Cost as a proportion of O&M cost	[Personnel Cost/ O&M Costs]*100	30-35%	5
OPERATIONAL SUSTAINABILITY					
8	Staff/1000 Connections	Staff per 1,000 water & sewerage connections	[Total Number of Staff x 1,000]/[No. of Water + Sewerage Connections]	5-8	5
9	NRW	Water that does not produce revenue in a given period	[System Input Volume (imported + produced) – billed Volume]/System Input Volume	30-35%	15
10	Metering Ratio	The proportion of metered customers from the total	[Functional Metered Connections]/Total Connections]x100	85-95%	10

CHAPTER 3. PERFORMANCE ANALYSIS

The regional benchmarking exercise is not restricted to the members of the ESAWAS Regulators Association due to the value generated from the exercise. Therefore any country in the Eastern and Southern African region can participate in the exercise in order to have a comparative view of the performance of a Utility.

It is worth noting that the ESAWAS regional benchmarking framework can also be used by individual regulators to further compare the performance of more Utilities in the country against other Utilities in the region and thereby draw comprehensive conclusions regarding the performance of the local Utilities.

In the 2015/16 period, eight Utilities participated in the exercise from Kenya, Tanzania, Zambia, Mozambique, Rwanda, Lesotho, Uganda and Zanzibar. Uganda does not yet have an autonomous regulator but was able to participate through the Water Utility Regulation Department (WURD) under the Ministry of Water and Environment.

This section focuses on the analysis of the performance of the eight Utilities.

3.1 REPORTING PERIOD

In conformity with country requirements, the regulators have different reporting periods as follows:

- July-June for WASREB, RURA, EWURA, WURD and ZURA
- April- March for LEWA
- January –December for NWASCO and CRA

Hence the data used in this report is drawn from the respective reporting period as applicable.

3.2 OVERVIEW OF BENCHMARKED UTILITIES

Only the largest or single Utilities in each country were selected for benchmarking. These are: Nairobi City Water and Sewerage Company (NCW&SC) of Kenya; Dar Es Salaam Water and Sewerage Corporation (DAWASCO) of Tanzania; Lusaka Water and Sewerage Company (LWSC) of Zambia; Águas da Região de Maputo (AdeM) of Mozambique; Water and Sanitation Corporation Ltd (WASAC) of Rwanda; Water and Sewerage Company (WASCO) of Lesotho, National Water and Sewerage Corporation (NWSC) of Uganda and Zanzibar Water Authority (ZAWA) of Zanzibar.

The general profile about the Utilities is shown in Table 4, while a detailed profile is presented in Annex 2. All the Utilities are publicly owned companies.

Table 4: General Profile of Benchmarked Utilities

Utility	Abbreviation	Country	Areas of operation	Year Established
Lusaka Water and Sewerage Company	LWSC	Zambia	Lusaka city; Kafue; Chongwe; Luangwa; Chilanga	1989
Águas da Região de Maputo	AdeM	Mozambique	Greater Maputo City	1999
Nairobi City Water and Sewerage Company	NCW&SC	Kenya	City of Nairobi	2003
Dar Es Salaam Water and Sewerage Corporation	DAWASCO	Tanzania	Dar Es Salaam city; Kibaha; Bagamoyo;	2005
Water and Sewerage Company	WASCO	Lesotho	Maseru + 15 urban centres	2010
Water and Sanitation Corporation	WASAC	Rwanda	Kigali + all urban centres in the country	2014
National Water and Sewerage Corporation	NWSC	Uganda	Kampala + 169 towns	1972
Zanzibar Water Authority	ZAWA	Zanzibar	Zanzibar	2006

The oldest water Utility is NWSC, Uganda having been established in 1972 to operate in three major towns. A revision of the law in 1995 saw an extension of the mandate of NWSC to cover more towns.

LWSC, Zambia was established in 1989 for the sole purpose of providing services to the capital city, Lusaka. However, in 2008 the mandate of the Utility was extended to cover the entire Lusaka Province.

WASAC, Rwanda has been in existence since 1976 operating as ELECTROGAZ until 2010 when the national parastatals charged with water and electricity distribution were merged into the Energy, Water and Sanitation Authority. The 2010 law was repealed in 2014 to split the functions of electricity and water, and hence the establishment of WASAC.

The rest of the Utilities have maintained the same mandate as at the time of their establishment.

The key background data about the Utilities is shown in Table 5.

Table 5: Key background data on Benchmarked Utilities

Utility	Population in the Service Area 2014/15	Number of Water Connections 2014/15	Annual Water Production (m ³ /yr) 2014/15	Population in the Service Area 2015/16	Number of Water Connections 2015/16	Annual Water Production (m ³ /yr) 2015/16
NCW&SC, Kenya	3.89 Million	312,426	201,861,138	4.07 Million	333,326	200,352,109
LWSC, Zambia	2.25 Million	94,184	80,564,003	2.33 Million	97,008	84,330,000
DAWASCO, Tanzania	4.59 Million	142,960	88,367,060	5.19 Million	156,059	103,982,762
AdeM, Mozambique	2.17 Million	245,180	75,828,468	2.22 Million	255,202	73,151,000
WASCO, Lesotho	0.51 Million	85,131	18,748,694	0.61 Million	90,544	23,858,512
WASAC, Rwanda	2.65 Million	156,618	41,061,229	2.65 Million	175,646	42,187,531
NWSC, Uganda	5.49 Million	418,031	96,415,644	7.50 Million	472,193	102,775,678
ZAWA, Zanzibar	1.50 Million	82,641	40,000,000	1.54 Million	85,525	60,000,000

From Table 5, NWSC had the largest population in its service area while WASCO had the smallest. NCW&SC still had the highest volume of water produced, more than double of any of the Utilities. NWSC had the highest number of connections while ZAWA had the least.

DAWASCO had a significant increase in production, due to expansion of the lower Ruvu plant resulting in an 18% increase in volume of water produced per day.

AdeM suffered a drop in production due to the continued drying of the Maputo dam as a consequence of a three-year drought, which further led to water rationing.

3.3 PERFORMANCE BOUNDARIES

In order to obtain an integrated view of the Utilities' performance, benchmarking has been done using both single KPIs and composite indicators as defined under the WUPI. The single KPIs (using traffic light colours) and components for grouped indicators are shown in Table 6.

The KPIs boundaries established by ESAWAS are constrained to the current scenario and could be revisited in the following years if the trends shift.

Table 6: KPIs and Performance boundaries

Component	KPI	Good	Acceptable	Poor
Quality of Service	Water Coverage	>90	90-75	< 75
	Sewerage Coverage	>70	70-40	< 40
	Water Quality	>95	95-90	< 90
	Hours of Supply	>20	20-16	< 16
Economic Efficiency	O&M Coverage	>150	150 – 100	< 100
	Collection Efficiency	>95	95 – 85	< 85
	Staff Cost	<30	30-35	>35
Operational Sustainability	Staff/1,000 Water and Sewerage Connections	<5.0	5.0 – 8.0	>8.0
	NRW	< 30	30 – 35	>35
	Metering Ratio	>95	95 – 85	< 85

3.4 PERFORMANCE ANALYSIS

The performance analysis was done according to the clusters of indicators in the components of

- i. Quality of Service
- ii. Economic Efficiency
- iii. Operational Sustainability

Per component of indicators, the performance results by single KPIs are presented first, then the performance is analysed using the WUPI, which integrates the single KPIs.

3.4.1 QUALITY OF SERVICE

The quality of service is measured using four KPIs: water supply coverage, sewerage coverage, water quality and hours of water supply.

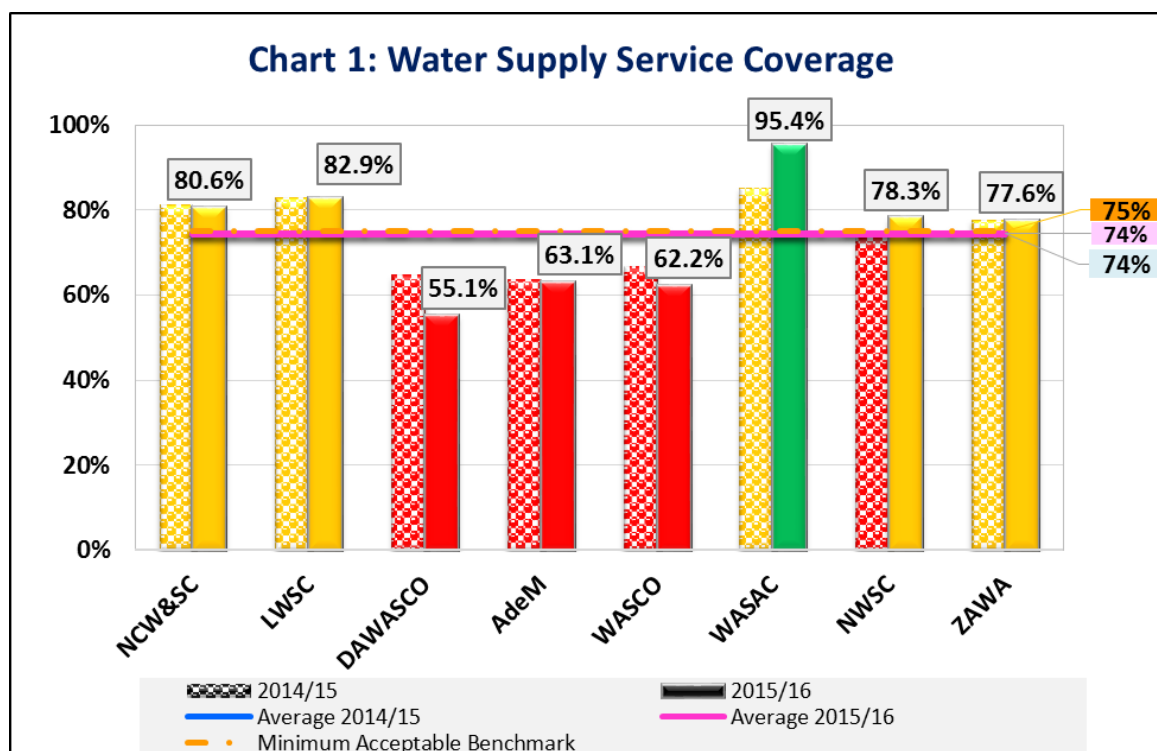
3.4.1.1 Water Supply Service Coverage

Water supply coverage considers the domestic population served through individual household connections, public standpipes and water kiosks. Table 7 shows the number of domestic water connections per Utility. All Utilities increased connections with the highest additions recorded by NWSC and WASAC. For NWSC, the increase was partly as a result of the transfer of several small piped water systems to its jurisdiction.

Table 7: Domestic Water Connections

Utility	Domestic Connections 2014/15	Domestic Connections 2015/16
NCWSC	307,132	309,629
LWSC	85,280	89,042
DAWASCO	137,783	150,778
AdeM	236,954	241,965
WASCO	66,683	76,442
WASAC	150,692	169,123
NWSC	337,451	382,874
ZAWA	81,496	82,971

Chart 1 shows that the average water supply service coverage remained the same and marginally below the acceptable benchmark of 75%.



NCW&SC, LWSC, NWSC and ZAWA met the acceptable benchmark. WASAC progressed to meet the good benchmark of 90% through the introduction of a performance award for exceeding quarterly targets for new connections that saw a significant jump in connections added.

DAWASCO and WASCO recorded a drop in coverage. For DAWASCO, following a regulatory study, the people served by water bowsers that were previously reported as covered were removed from the calculation. For WASCO, the rate of population growth was higher compared to the increase in persons served.

3.4.1.2. Sewerage Service Coverage

Mozambique and Rwanda have separate entities for sewerage and sanitation services¹, hence only NCW&SC, LWSC, DAWASCO, WASCO, NWSC and ZAWA which provide sewerage services, were analysed.

Due to the unreliability of data regarding septic tanks, only the sewerage services by network were considered. The number of sewerage connections are shown in Table 8 while service coverage is depicted in Chart 2.

Table 8: Sewerage Connections per Utility

Utility	Sewerage Connections 2014/15	Sewerage Connections 2015/16
NCW&SC	208,554	228,998
LWSC	31,388	32,137
DAWASCO	18,568	18,643
WASCO	6,593	7,165
NWSC	19,303	20,355
ZAWA	3,000	3,000

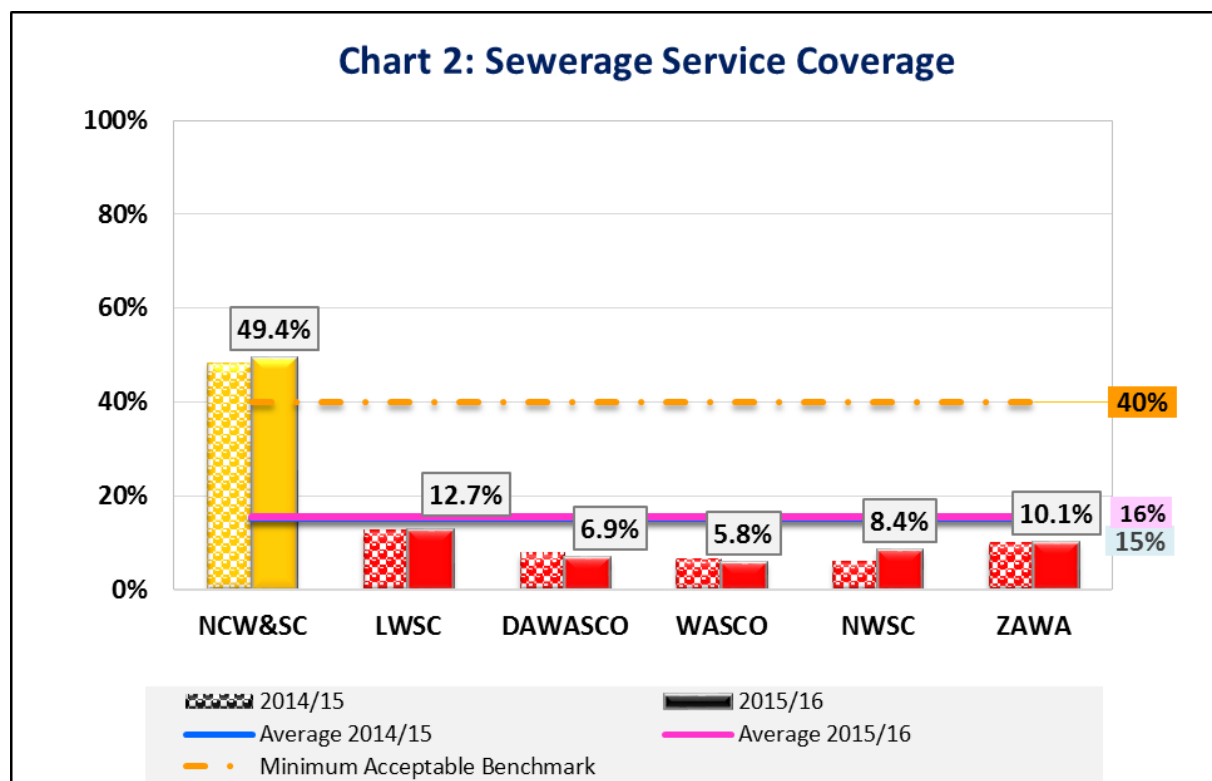
Apart from NCW&SC which had a significant increase in connections after commissioning a project for bulk sewer systems, the rest of the Utilities recorded minor additions of sewerage connections. The apparent increase for WASCO was from a data verification exercise that saw the inclusion of pre-paid customers that were seweraged but previously left out.

¹ Sewage regulatory activity for Maputo city has not yet been established as negotiations with the City Council (entity responsible for the Sewage) still underway. According to the Department of Water and Sanitation of the Maputo Municipal Council, the sewerage coverage in the city is around 11%.

Kigali does not have a centralised sewer system and the private operator providing sewer services is not under regulation

Chart 2 shows a dismal picture of sewerage service coverage by network at an average of 16% which was far below the acceptable benchmark of 40%. Only NCW&SC maintained coverage above the acceptable benchmark.

The low sewer service coverage figures in most Utilities imply that the majority of the population are either served through septic tanks or a form of onsite sanitation. This underscores the urgent and critical need for investment in sewerage infrastructure in order to ensure the safe management of faecal matter and wastewater that can pose a serious risk to public health and the environment. In addition, this calls for increased public awareness on the need to connect to a centralised system (particularly in densely populated urban areas) as opposed to the use of improperly designed and located septic tanks that could cause groundwater pollution.

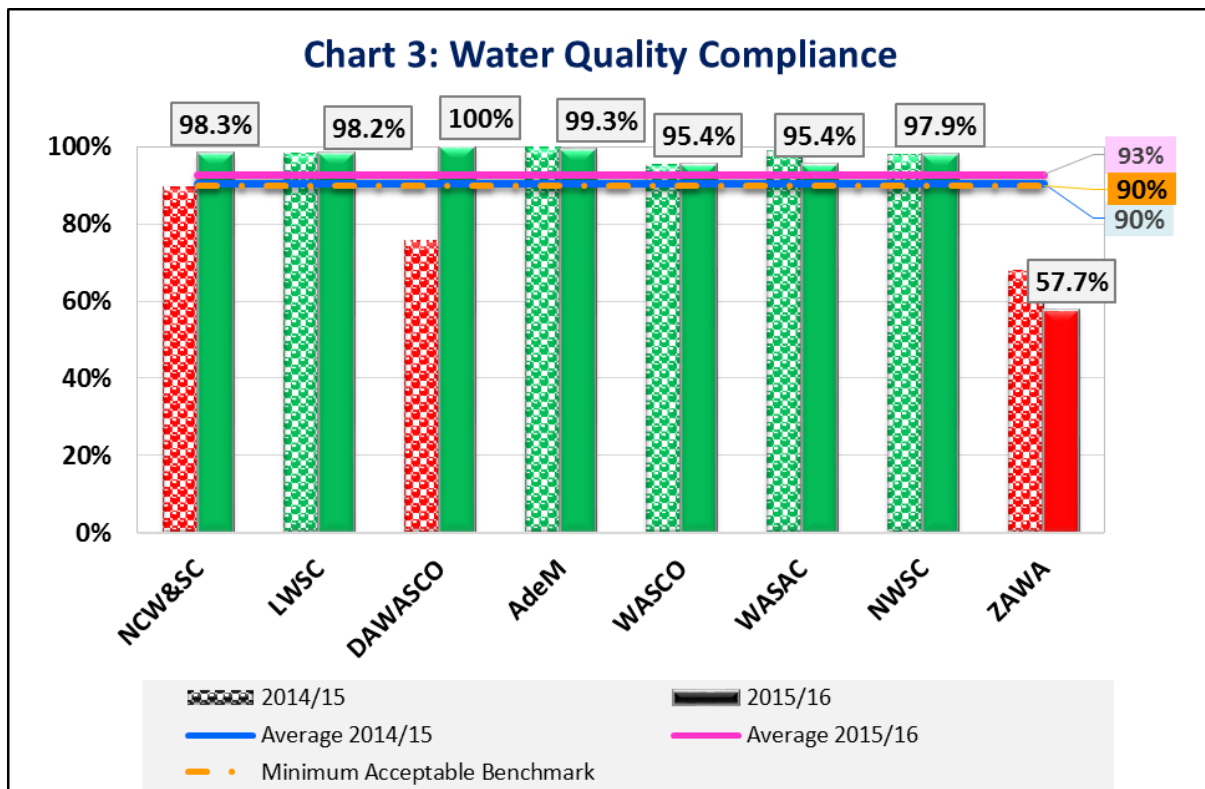


3.4.1.3. Water Quality

Drinking water quality measures the potability of water supplied by a Utility. It is a critical performance indicator since it has a direct impact on the health of consumers. However, individual countries have different standards for water quality in conformity with the national standards.

Therefore, the drinking water quality result presented in Chart 3 is a composite indicator considering compliance in the parameters of Residual Chlorine (40%) and Bacteriological (60%) in terms of number of tests carried out against the required and number of tests meeting the respective national standards.

Chart 3 shows that the average water quality compliance improved to 93%, above the acceptable benchmark of 90%.



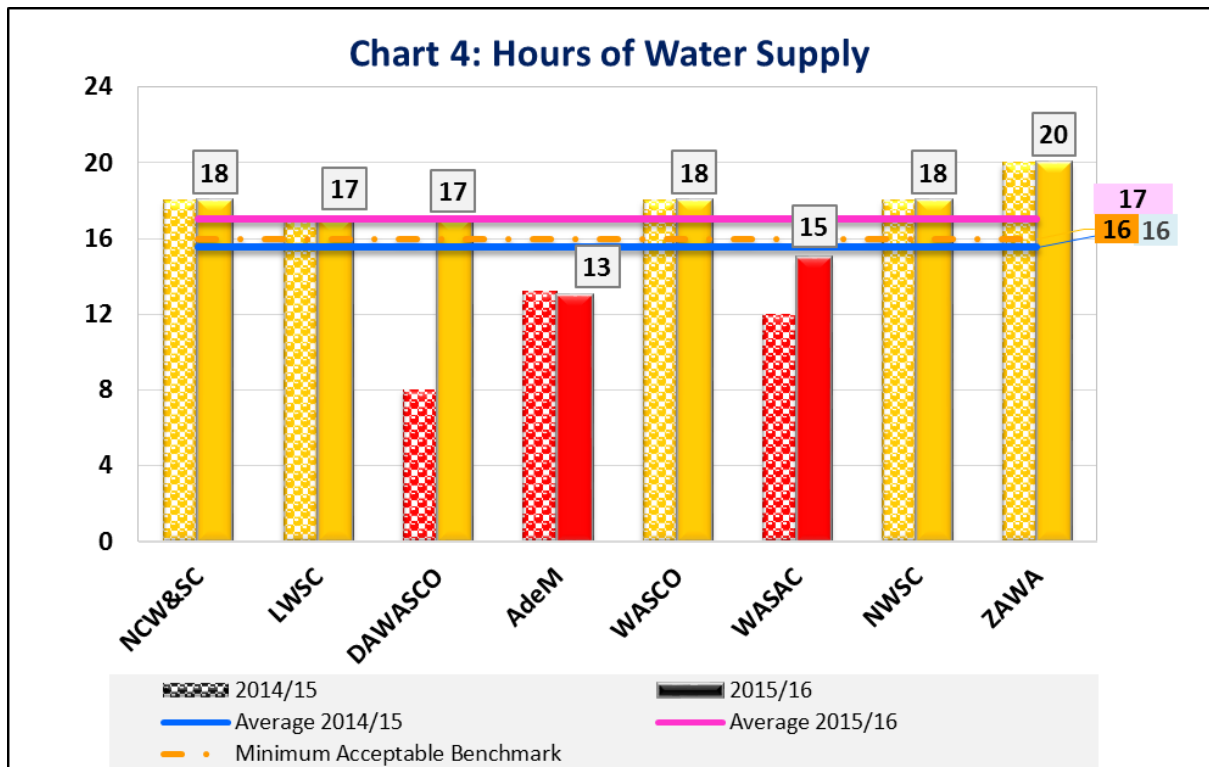
Apart from ZAWA, all the Utilities met the good benchmark of 95%. NCW&SC and DAWASCO that were previously below the acceptable benchmark, improved compliance to standards and to the required number of tests, respectively.

ZAWA dropped even further below the acceptable benchmark due to lower compliance to the national standards. It must be noted that the regulator, ZURA, does not yet have a guideline for required number of tests.

3.4.1.4. Hours of Water Supply

Hours of Supply refers to the average number of hours per day that a Utility provides water to its customers. It measures the continuity of services of a Utility and thus the availability of water to the customer. It is an important indicator of quality of service and shows the extent to which the Utility is making progress towards the fulfilment of the human right to water and sanitation in terms of availability of water in sufficient quantities.

The average hours of supply improved slightly by 1 hour and above the minimum acceptable benchmark of 16 hours as shown in Chart 4.



Apart from AdeM and WASAC, the rest of the Utilities were above the minimum acceptable benchmark.

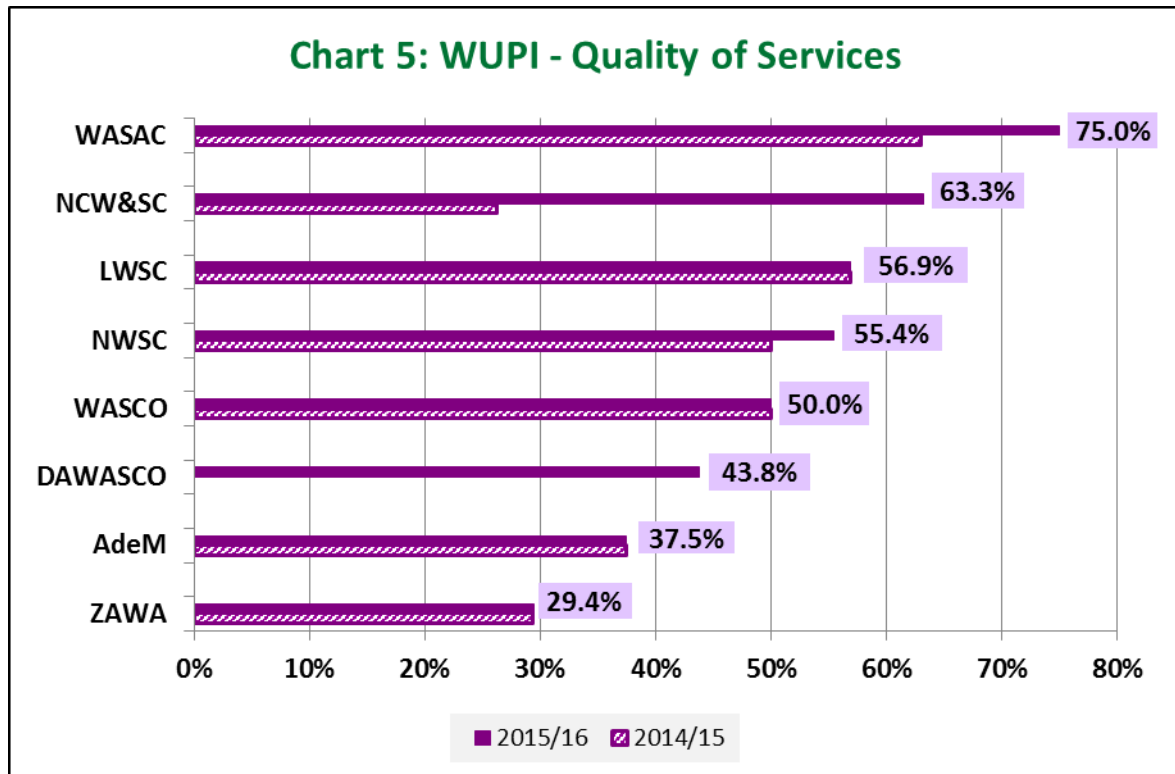
However, only DAWASCO and WASAC recorded significant improvements in hours of supply. For DAWASCO, the improvement was attributed to the increase in water production by 18% coupled with reduced NRW from 56% to 53% while domestic connections only increased by 9%. For WASAC, the improvement was due to an increase in production volume by 25,000m³/day in Kigali, in addition to a change in the rationing programme to boost hours supplied to some areas that had lower supply and reduced hours to areas that had very high supply.

Reduced borehole yields in the dry seasons and sustained electricity load shedding continued to hamper improvements in hours of supply for LWSC. Similarly, AdeM faced challenges of reduced production due to the continued drying of the Maputo Dam.

Nairobi, Lusaka and Maputo are in urgent need of investment to increase production volumes which are far below the demand.

3.4.1.5. Integrated Performance - Quality of Services

The integrated performance for the WUPI-Quality of Services shown in Chart 5 was measured by using the Water Supply Coverage, Sewerage Coverage, Water Quality and Hours of Supply indicators.



WASAC maintained the best performance in the WUPI-Quality of Services, largely driven by good performance in water supply coverage and water quality compliance.

NCW&SC showed improved performance from 26.2% in the previous period and ranked second from 5th position, owing to the improvement in water quality compliance.

Equally, DAWASCO leaped in performance from bottom with 0% in the previous period as a result of improvements in water quality compliance and hours of supply.

LWSC, WASCO and AdeM maintained the same performance levels but dropped in the rankings.

NWSC as a new entrant performed reasonably well on the ranking while ZAWA trailed bottom.

3.4.2. ECONOMIC EFFICIENCY

According to the IMF Regional Economic Outlook: Sub-Saharan Africa, '2016 was a difficult year for many countries, with regional growth dipping to 1.4%- the lowest level of growth in more than two decades'. Commodity prices increased and exchange rates depreciated. Countries affected by slow economic growth included Zambia, Mozambique, Lesotho, Rwanda and Uganda. However, countries like Kenya and Tanzania generally maintained high growth rates.

The Economic Efficiency performance was analysed using three KPIs: Operation and Maintenance (O&M) Cost Coverage by Billing, Collection Efficiency ratio and Staff Cost as a proportion of O&M Costs.

3.4.2.1 Comparison of Residential Water Bill and Cost of Connection

A water bill is a charge made for the usage of water at a particular property. A comparison of water bills charged by the different Utilities for the same volume of water was done in order to demonstrate the average amount spent by a customer on water usage only. Hence the comparison does not include fixed or sewer charges.

The comparison of a residential water bill in Table 9 is made using three criteria:

- (i) a lifeline or pro-poor consumption of 5m³ which is usually subsidised;
- (ii) a bill for 30m³ which tends to be an average consumption for domestic customers; and
- (iii) an average domestic bill for a Utility.

Table 9: Comparison of Residential Water Bill and Cost of Connection

Utility	Lifeline Consumption at 5m ³ (\$)	Bill at 30m ³ (\$)	Average domestic bill (\$)	Average Cost of Domestic Connection (\$)
NCW&SC	2.03	14.70	11.70	25
LWSC	1.91	13.33	11.21	80
DAWASCO	3.91	23.46	14.99	125
AdeM	2.40	17.34	5.60	69
WASCO	3.23	32.41	5.73	109
WASAC	2.22	14.74	7.62	67
NWSC	4.70	26.00	7.37	Not Available
ZAWA	1.71	19.82	1.87	

From Table 9, NWSC had the highest charge for the lifeline consumption bill while ZAWA, LWSC and NCW&SC charged less than or about US\$2. However, for the bill at 30m³, WASCO and LWSC charged the highest and least, respectively.

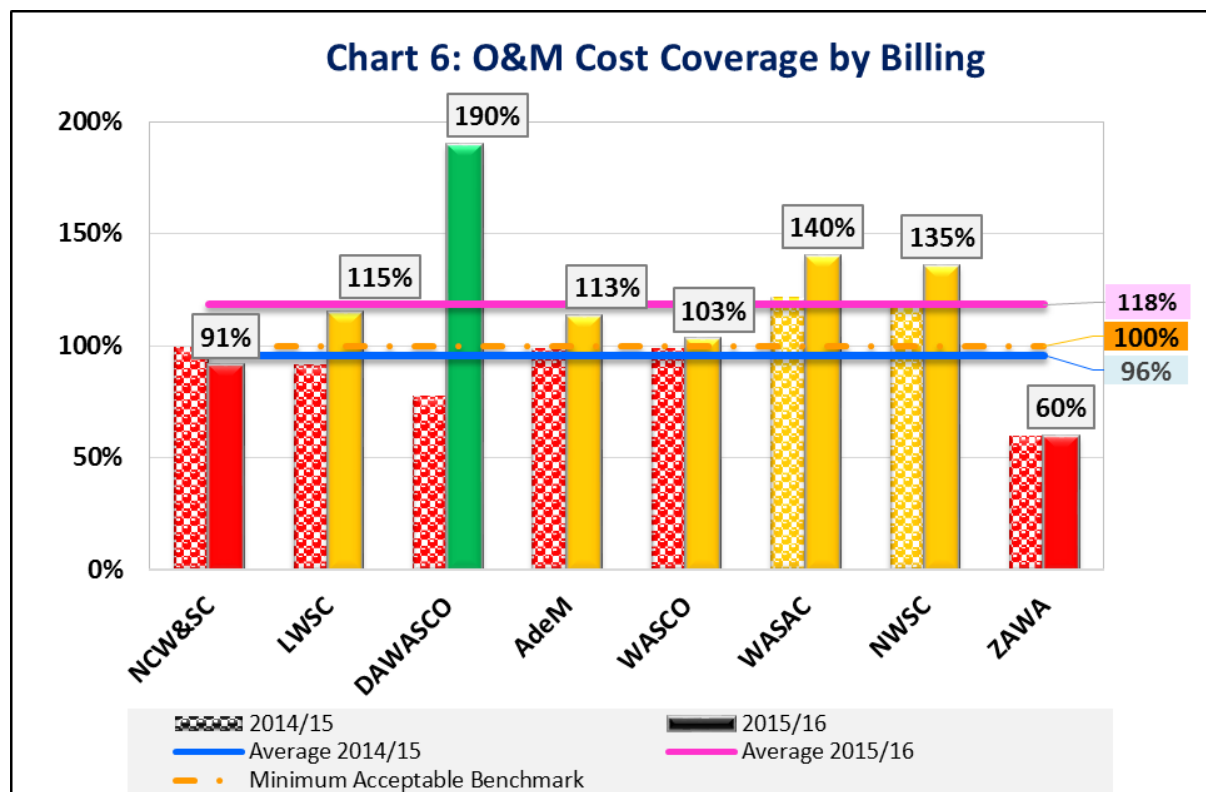
The average domestic bill for all Utilities was less than 30m³ indicating that the average water consumption from the Utilities is less than 30m³ per month. For AdeM, WASCO, WASAC, NWSC and ZAWA, the average domestic bill is closer to the lifeline consumption. This should prompt the Utilities to review the design of the tariff structure.

The cost of a water connection can act as a barrier to access. Regulators and Utilities must thus endeavour to ensure that this cost is not prohibitive to customers while balancing the commercial aspect of the business. The cost of a new connection is generally based on the materials required in relation to the distance from the mains. NCW&SC offered the least charge for a new connection.

3.4.2.2 Operation and Maintenance Cost Coverage by Billing

Operation and Maintenance (O&M) Cost Coverage in Chart 6 is the extent to which internally generated funds through billing for water and sewerage services, cover the cost of running a utility. It is a measure of the financial sustainability of a Utility. A Utility is said to have reached full cost coverage when it reaches above 150% O&M Cost Coverage. At this level a Utility is able to meet its O&M costs and undertake capital development.

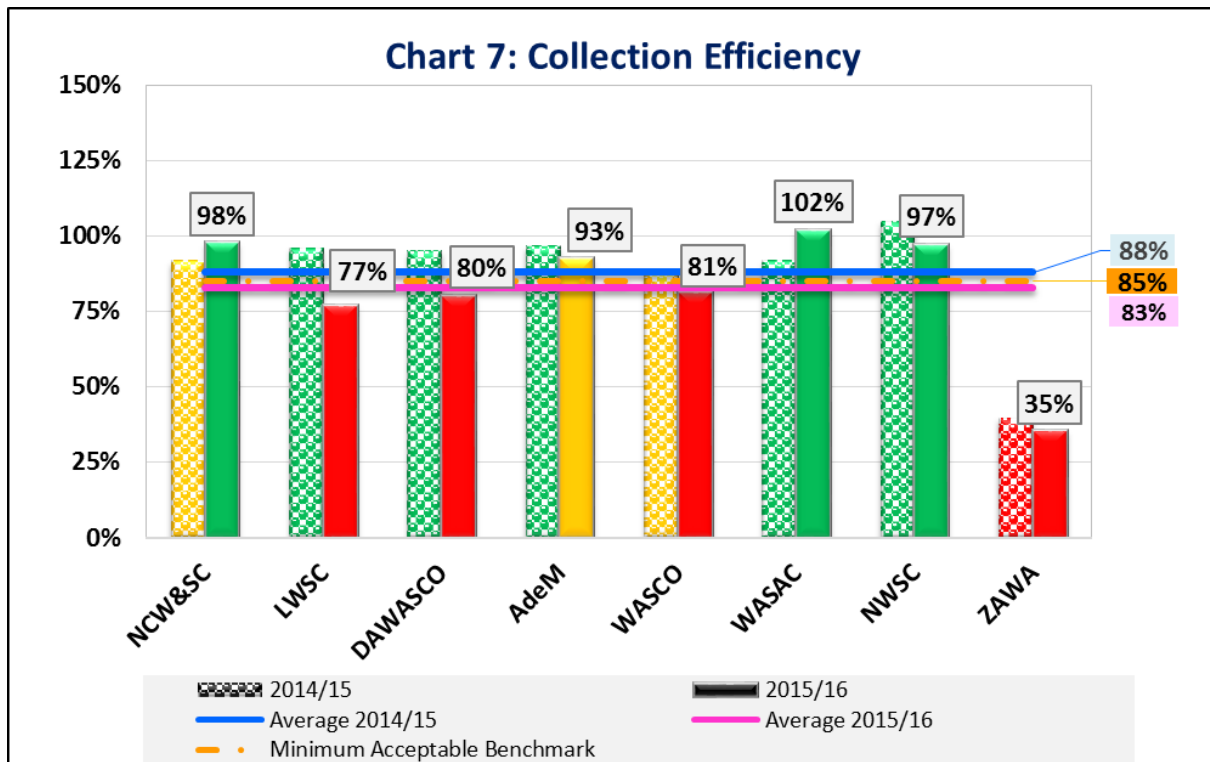
In the reporting period, the average O&M Cost Coverage by Billing improved to 118%, above the minimum acceptable benchmark of 100%. NCW&SC and ZAWA were the only Utilities below the acceptable benchmark. The improvements by DAWASCO, LWSC, AdeM, WASAC and NWSC were due to a higher increase in revenue compared to the increase in costs



3.4.2.3. Collection Efficiency

Collection Efficiency in Chart 7 shows the level of cash income in the Utility against the billed amounts for water and sewerage services only. Collection ratios above 85% are a key factor in sustaining financial performance of water and sewerage services Utilities, both in the short and medium term.

The average Collection Efficiency ratio dropped to 83%, below the minimum acceptable benchmark of 85%. AdeM was above the acceptable benchmark while NCW&SC, WASAC and NWSC met the good benchmark of 95%.



Four Utilities, LWSC, DAWASCO, WASCO and ZAWA were below the acceptable benchmark.

LWSC experienced a drop in collection efficiency due to delayed payment of bills by Government institutions, which are major customers.

The collection efficiency for ZAWA was critically low indicating either customer dissatisfaction with the service or resistance of customers to pay for services that were, until recently, free.

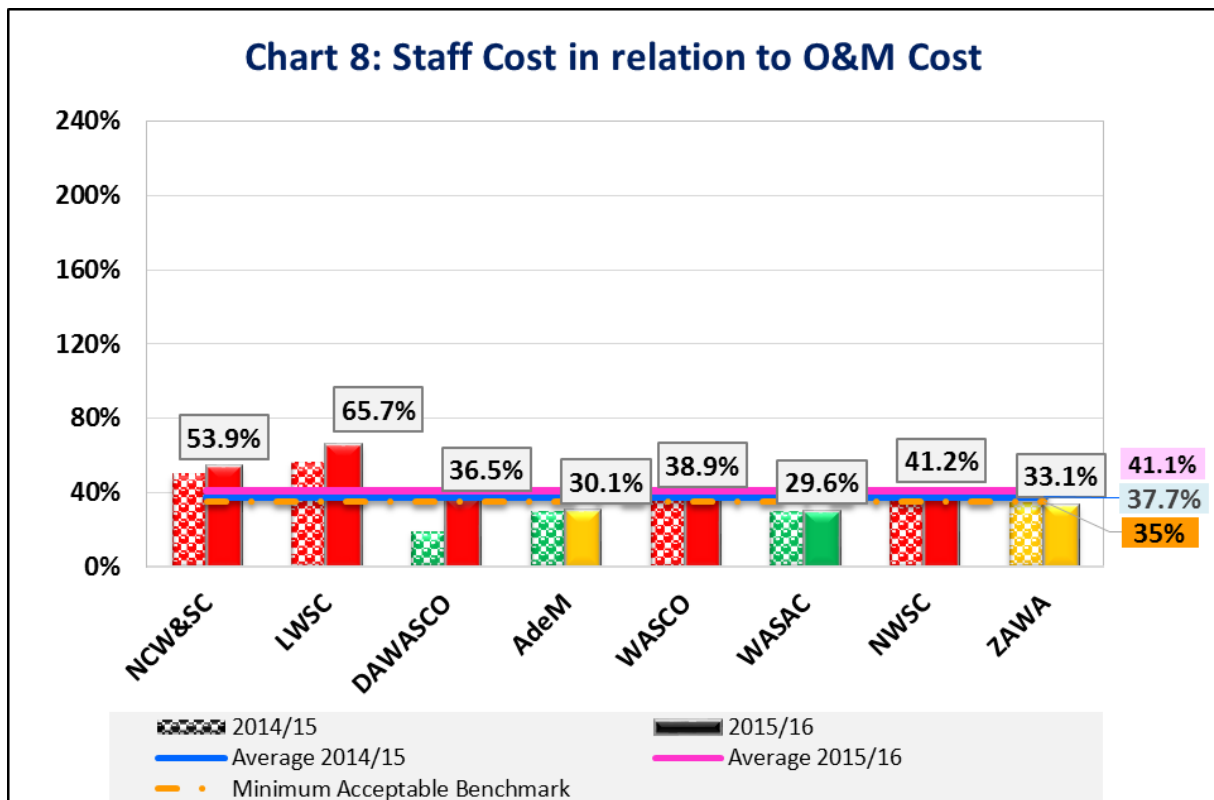
3.4.2.3. Staff Cost as a proportion of O&M Costs

The staff cost is analysed against the O&M costs of the utility and presented in Chart 8. The internationally accepted “bottom line” for the staff cost is 30% of the total cost. To put the cost proportion in perspective, the number of staff per Utility is shown in Table 10.

Table 10: Total Staff per Utility

Utility	Total Staff 2014/15	Total Staff 2015/16
NCW&SC	2,948	3,506
LWSC	889	899
DAWASCO	924	906
AdeM	831	842
WASCO	535	543
WASAC	793	734
NWSC	2,752	2,860
ZAWA	700	687

NCW&SC and NWSC had the highest complement of staff, at three times more than any of the other Utilities.



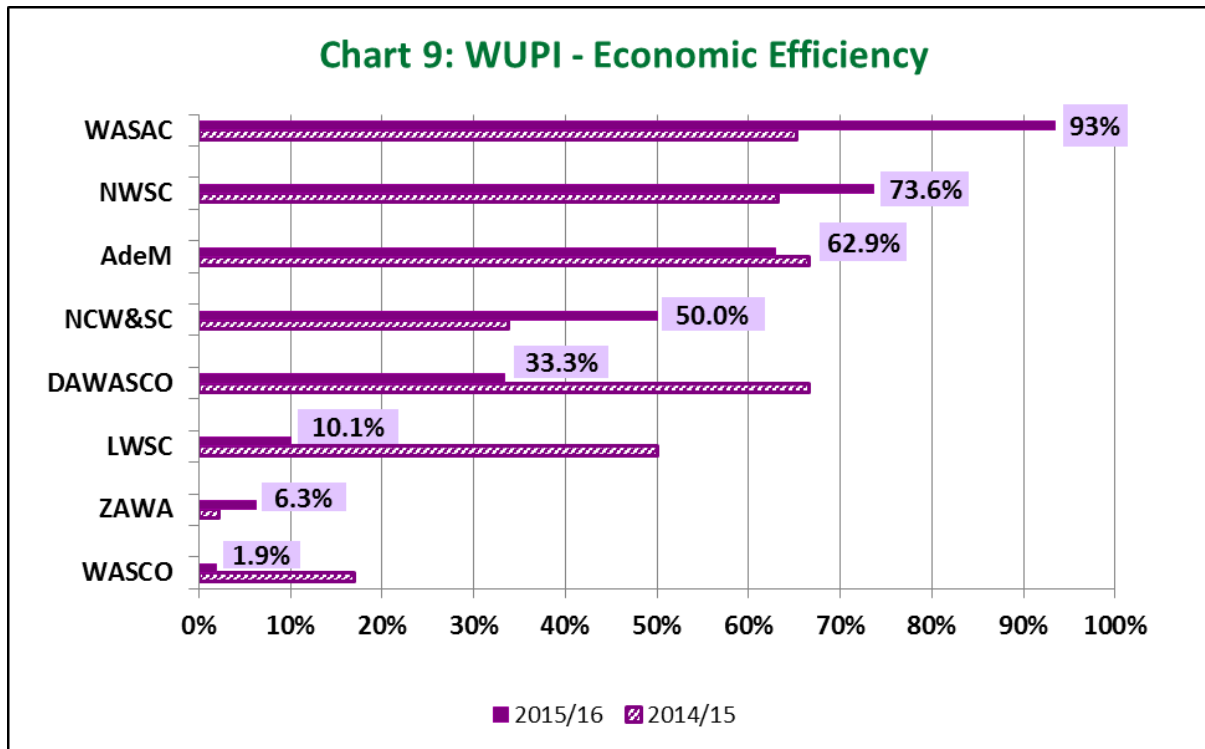
The average proportion for staff costs against O&M costs dropped even further below the minimum acceptable benchmark of 35%.

NCW&SC and LWSC had unacceptably high proportions of staff costs. NCW&SC recruited 558 additional staff against regulatory advice and tariff conditions, leading to a drop in O&M Cost coverage.

For LWSC and DAWASCO, the staff costs increased significantly despite a reduction in the overall O&M costs.

3.4.2.4. Integrated Performance –Economic Efficiency

The WUPI-economic efficiency as shown in Chart 9 was used to obtain an integrated view of the Utilities’ performance in the three KPIs of Operation and Maintenance (O&M) Cost Coverage by Billing, Collection Efficiency ratio and Staff Cost as a proportion of O&M Costs.



WASAC improved its ranking from 3rd to 1st position with a strong performance in the Economic Efficiency component. This is evident by the good performance in all three KPIs.

NCW&SC also improved its ranking from second-last to 4th position as a result of improved collection efficiency.

DAWASCO dropped from 1st to 5th position while WASCO continued to trail bottom due to a decline in performance in Collection Efficiency ratio and Staff Cost as a proportion of O&M Costs.

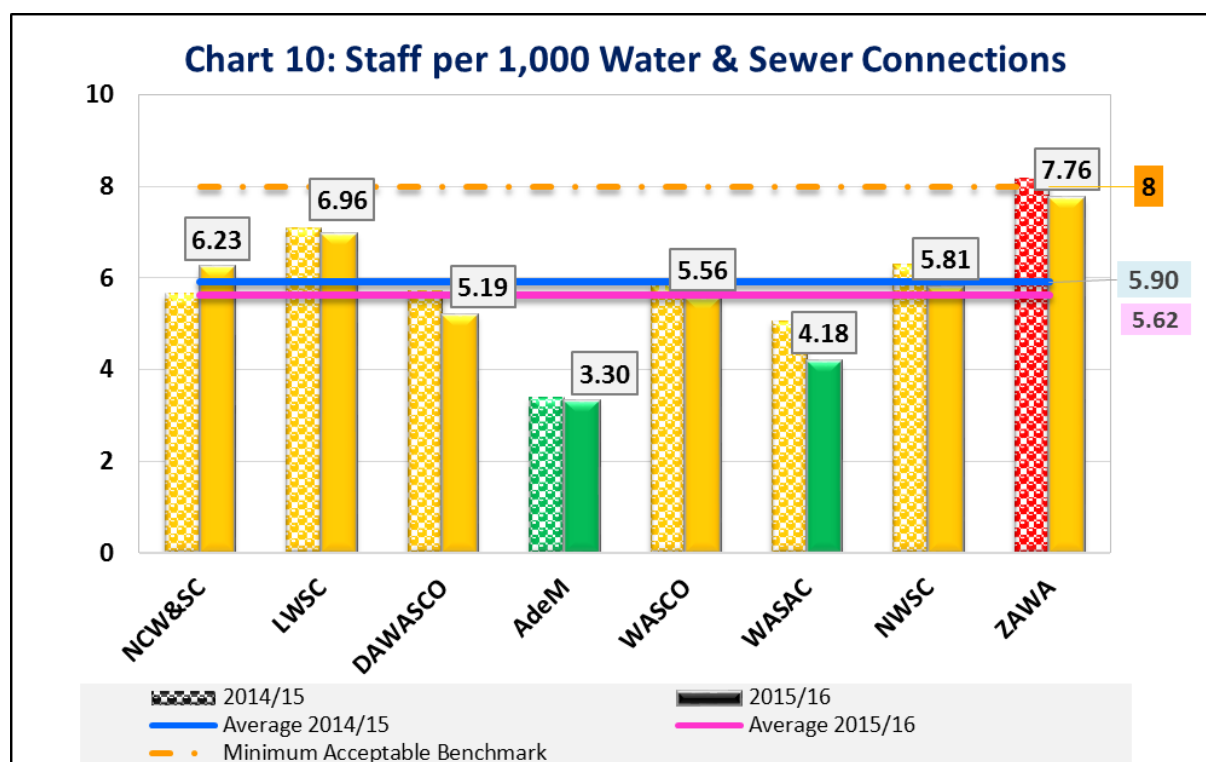
3.4.3 OPERATIONAL SUSTAINABILITY

The Operational Sustainability component is measured using Staff per 1,000 Water and Sewer Connections, Non-Revenue Water and Metering ratio.

3.4.3.1. Staff per 1,000 Water and Sewer Connections

Staff per 1,000 Water and Sewer Connections, shown in Chart 10, indicates the number of employees servicing 1,000 connections. It measures the efficiency of Utilities in utilising their staff and hence a low figure is desirable. However this measure is affected by factors such as nature of human settlement, skills mix, Utility business model (outsourcing), geographical distributions of areas served and where a Utility provides water alone or water and sewerage connections.

The average for Staff per 1,000 Connections improved further below the minimum acceptable benchmark of 8. All Utilities met the acceptable benchmark while AdeM and WASAC met the good benchmark.

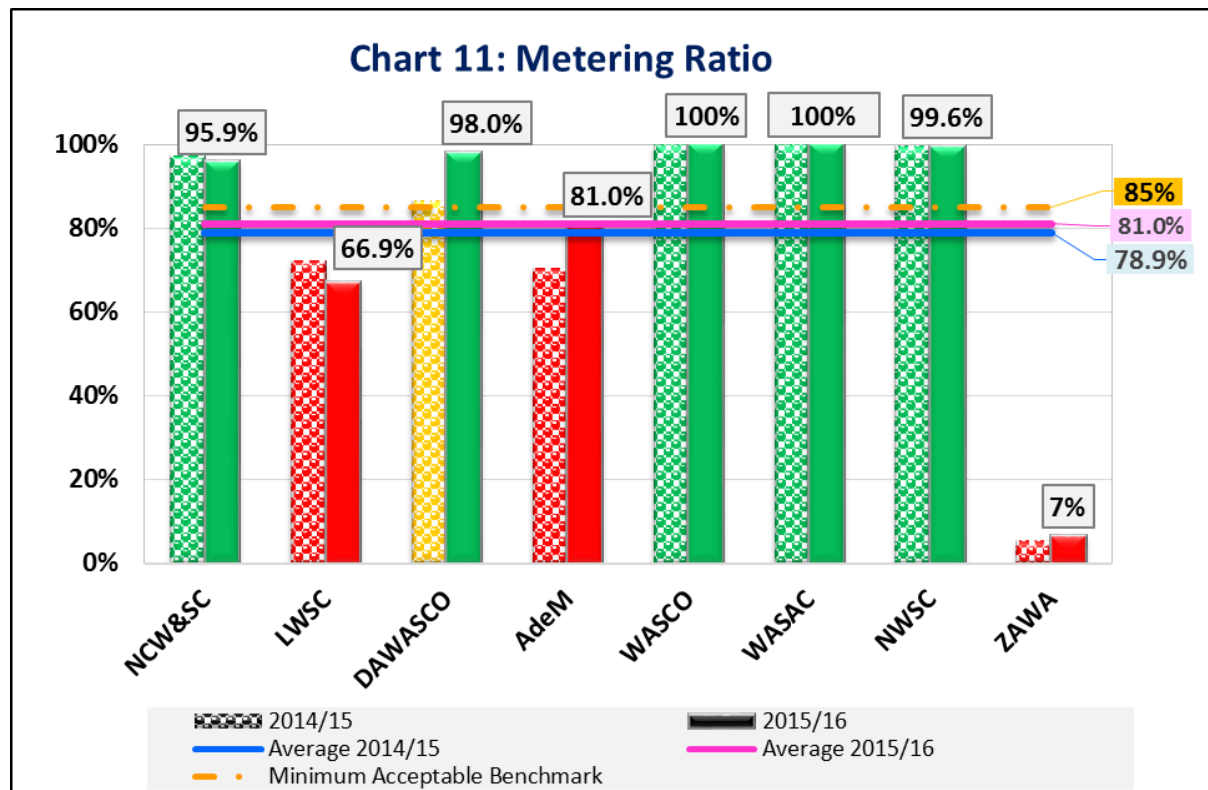


The performance for NCW&SC declined due to the undesirable increase in staff despite an increase in connections. ZAWA met the benchmark due to a reduction of staff against an increase in connections.

3.4.3.2. Metering ratio

Metering ratio is the proportion of metered connections compared to the total connections. Metering is closely linked to the management of water losses as it measures the volume of water consumed by customers.

The average metering ratio improved to 81% but was still below the minimum acceptable benchmark of 85%. Five Utilities met the good benchmark of 95%. DAWASCO made laudable efforts to improve metering ratio almost to 100%.



LWSC, AdeM and ZAWA remained below the acceptable benchmark.

LWSC experienced a drop in metering ratio as a result of a high failure of postpaid and prepaid meters in a number of branches due to a combination of factors ranging from technology to management. From the meters procured in the year, about 5,234 meters went to replacements of faulty ones while 7,289 were new meter installations. In addition, 4,228 faulty meters could not be repaired and were removed from the system.

The low metering ratio for ZAWA was of grave concern. This means that the premise of the business for production and consumption are significantly based on estimates and could lead to a poorly designed tariff and management of water losses. There is urgent need for investment to improve the metering ratio.

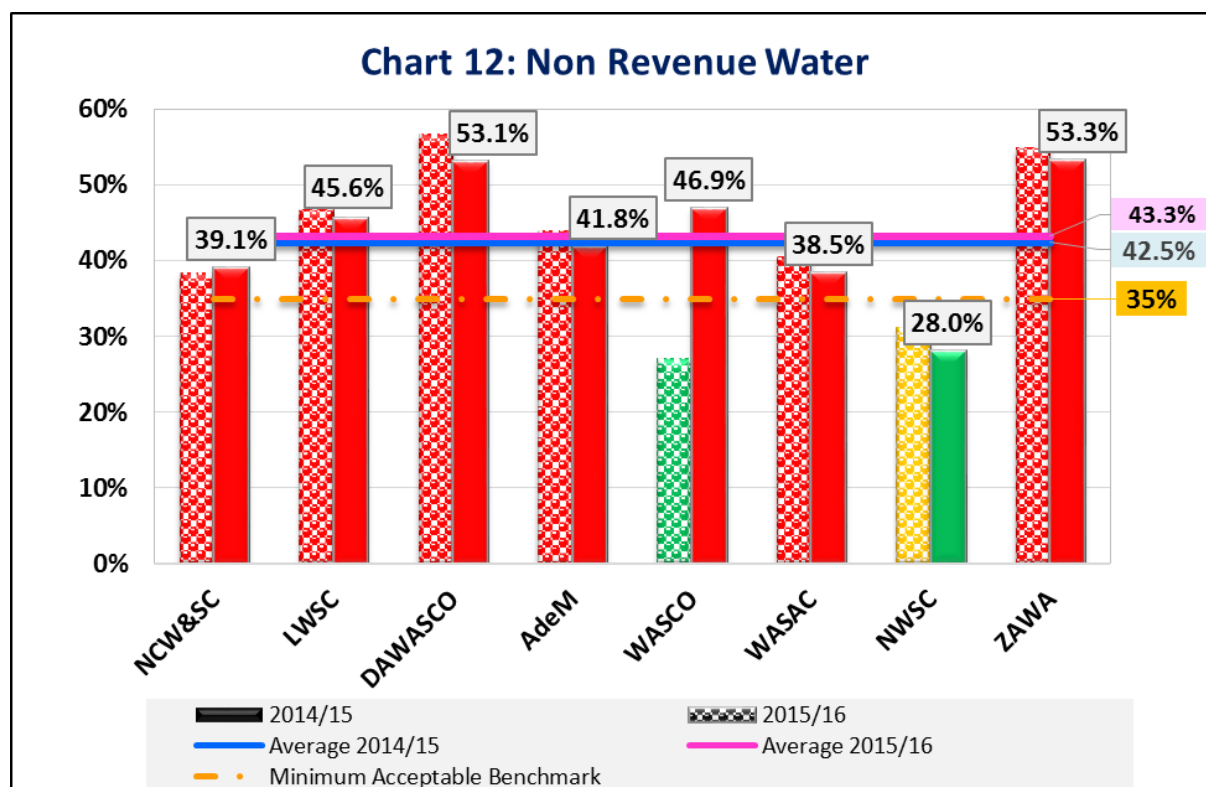
3.4.3.3. Water Losses

Non-Revenue Water is water that has been placed in the distribution system but lost before reaching the customer, that is, water produced but not sold. It measures the efficiency of a Utility in delivering the water it produces to customers' take-off points. It is made up of technical losses (leakages), commercial losses (illegal connections/water theft, metering errors and unbilled authorised consumption). Water losses imply revenue loss and becomes a key area for Utilities to address urgently.

As shown in Chart 12, the average NRW worsened to 43.3%, way above the minimum acceptable benchmark of 35%. Only NWSC met the good benchmark of less than 30%. The rest of the Utilities did not meet the acceptable benchmark.

DAWASCO improved its NRW following an increase in metering ratio and undertook a study in two areas to reduce NRW by introduction of district /zone meters and replacing meters more than five years old.

WASCO experienced increased water losses due to numerous pipe bursts after increasing production because of a dilapidated porous network. Further, as a result of a drought, some of the main lines were vandalised by villages along the route.



However there are different perspectives as to the most appropriate measure of NRW. A percentage approach can make Utilities with high levels of consumption, or compact networks, look to be better performing than those with low levels of consumption or extensive networks.

Thus, for NRW to be truly meaningful, it is related to the distribution network and customer connections as shown in Table 11.

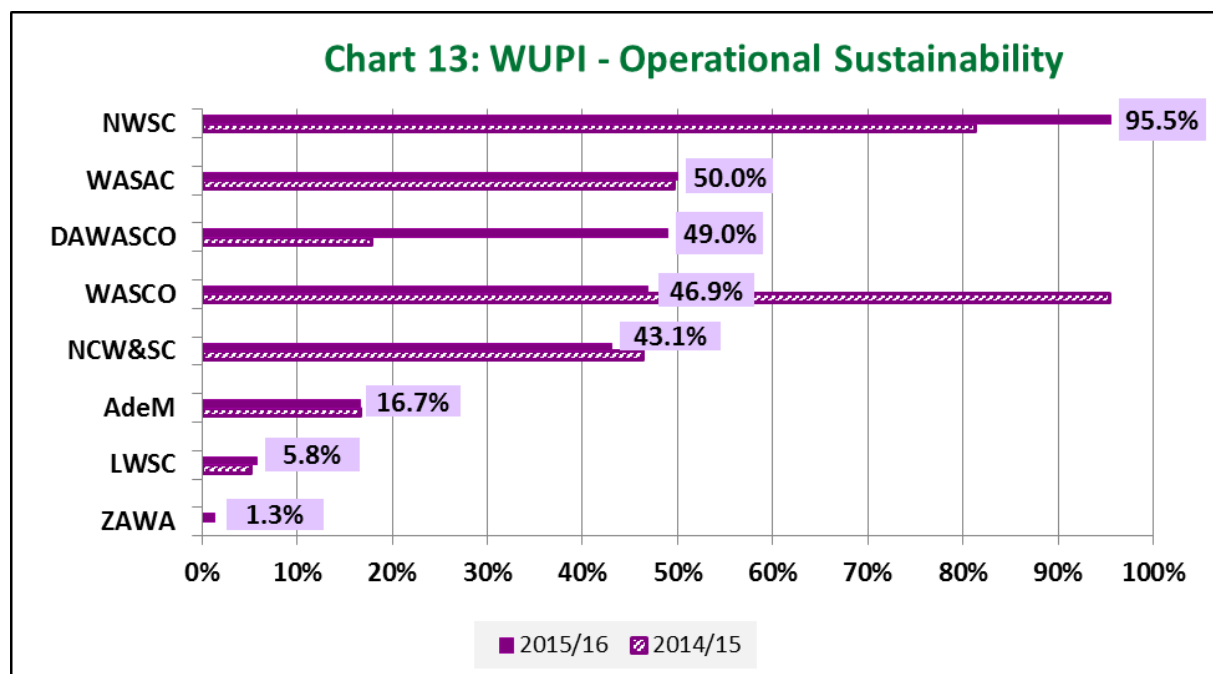
Table 11: Non Revenue Water in terms of Length of Network and Connections

Utility	Length of Network	Water Production	Connections	Non Revenue Water		
				%	m ³ /km/day	m ³ /conn/day
NCW&SC	3,000	200,352,109	333,326	39.06%	183.0	1.65
LWSC	1,719	84,330,000	97,008	45.57%	134.4	2.38
DAWASCO	2,625	103,982,762	156,059	53.10%	108.5	1.83
AdeM	3,000	62,833,000	255,202	32.26%	57.4	0.67
WASCO	2,081	23,858,512	90,544	46.90%	31.4	0.72
WASAC	7,225	42,187,531	175,646	38.47%	16.0	0.66
NWSC	9,760	102,775,679	472,193	28.02%	28.9	0.60
ZAWA	1,929	60,000,000	85,525	53.33%	85.2	1.92

NCW&SC and WASAC had the highest and lowest water losses per km/day, respectively while LWSC and NWSC had the highest and lowest water losses per connection/day.

3.4.3.4. Integrated Performance – Operational Sustainability

The WUPI Operational Sustainability as shown in Chart 13 is based on the aggregation of the three KPIs- Staff per 1,000 Water and Sewer Connections, Non-Revenue Water and Metering Ratio.



NWSC ranked 1st, largely driven by a good performance in NRW. DAWASCO improved its performance from second-last to third position due to the improvement in all three KPIs. WASCO's performance declined due to the increase in NRW.

3.5 SUMMARY ANALYSIS

This section summarises the main findings of the performance analysis by using the single KPIs (Table 12) and the overall WUPI (Chart 14) which aggregates the three components of Quality of Services, Economic Efficiency and Operational Efficiency.

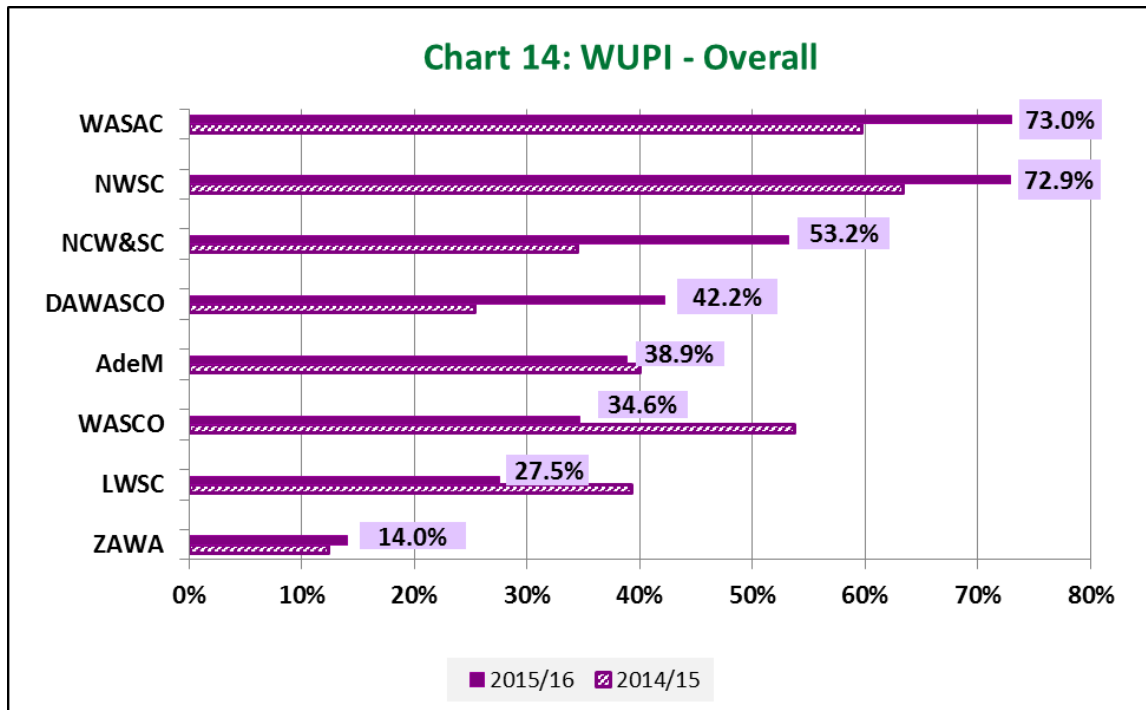
Table 12: Summary of Utility Performance

	KPI	NCW&SC	LWSC	DAWASCO	AdeM	WASCO	WASAC	NWSC	ZAWA
Quality of Services	Water Coverage	80.6%	82.9%	55.1%	63.1%	62.2%	95.4%	78.3%	77.6%
	Sewerage Coverage	49.4%	12.7%	6.9%	-	5.8%	-	8.4%	10.1%
	Water Quality	98.3%	98.2%	100%	99.3%	95.4%	95.4%	97.9%	57.7%
	Hours of Supply	18	17	17	13	18	15	18	20
Economic Efficiency	O&M Cost Coverage	91%	115%	190%	113%	103%	140%	135%	59.7%
	Collection Efficiency	98%	77%	80%	93%	81%	102%	97%	35%
	Staff Cost vs O&M Costs	54%	66%	36%	30%	39%	30%	41%	33%
Operational Sustainability	Staff/1,000 W&S Connections	6.23	6.96	5.19	3.30	5.56	4.18	5.81	7.76
	Metering Ratio	96%	67%	98%	81%	100%	100%	99.59%	6.6%
	NRW	39.1%	45.6%	53.1%	41.8%	46.9%	38.5%	28.0%	53.3%

The best performing KPIs were Water Quality, Hours of Supply, O& M Cost Coverage and Staff/1,000 W&S Connections where not more than two Utilities did not meet the acceptable benchmark.

The worst performing KPIs continued to be Sewerage Coverage and NRW where only one Utility met the acceptable benchmark.

From Chart 14, WASAC, Rwanda emerged as the best performer in all the three components aggregated, followed narrowly by NWSC, Uganda.



NCW&SC, Kenya and DAWASCO, Tanzania improved in the ranking from second-last and last positions to third and fourth positions, respectively.

WASCO, Lesotho and LWSC, Zambia dropped in performance from second and fourth positions, respectively.

CHAPTER 4: CONCLUSIONS

By comparing the individual performance of the Utilities using the different performance components (quality of service; economic efficiency; operational efficiency), it is possible to make inference on the total performance of a Utility.

In the 2015/16 reporting period, the general picture of performance can be summarised in the three components as follows:

- **Quality of Service** – the Utilities made a lot of effort to improve/maintain Water Quality Compliance above the minimum acceptable benchmark. However, Water Coverage, Sanitation Coverage and Hours of Supply barely improved or stagnated. This underscores the urgent and critical need for Governments to direct investments to these areas if the SDGs are to be met.
- **Economic Efficiency** – All Utilities had improved revenue despite an increase in costs hence the increase in O&M Cost Coverage by billing. However, collection efficiencies of less than 85% and high staff costs posed a threat to the viability of the Utilities. This calls for innovations and strategies by Utilities to contain costs and improve collections.
- **Operational Sustainability** – All Utilities continued to perform well in managing staff efficiencies. There was also laudable effort to maintain or increase metering ratio to 100%. However, NRW remained unacceptably high and worsening. Utilities, especially those with high metering ratio, must concert efforts to closing every loophole for water losses.

From the comparison of performance among the Utilities, the following are the conclusions and recommendations made for the individual Utilities:

- **NCW&SC:** the Kenyan utility presented good performance in the Quality of Services and medium performance in Economic Efficiency and Operational Sustainability components. This was marked improvement from the low performance in all three components in the previous period. NCW&SC needs to concert efforts to improving Sewerage Coverage and O&M Cost Coverage, as well as reducing staff costs.
- **DAWASCO:** the Tanzanian utility made good strides in improving the Quality of Services and Operational Sustainability components. However, performance in the Economic Efficiency component declined. DAWASCO needs to urgently improve Water & Sewerage coverage, collection efficiency and further reduce NRW.
- **LWSC:** the Zambian utility showed declining performance in the Economic Efficiency component and continued low performance in the Operational Sustainability component. The Quality of Services component remained static. LWSC needs to improve Sewerage Coverage, collection efficiency and metering ratio. More effort must be concerted to reducing staff costs and NRW.

- **AdeM:** the Mozambican utility had similar performance to the previous year with good though declining performance in Economic Efficiency but low performance in both the Operational Sustainability and Quality of Services components. AdeM needs to still focus on investments for infrastructure and service extensions to increase coverage and hours of water supply. Improving metering ratio and reducing NRW must also be key in the agenda, especially in view of dropping production levels.
- **WASCO:** the Lesotho utility's performance declined markedly in the Economic Efficiency and Operational Sustainability components while the Quality of Services component remained static. WASCO must concert efforts to mobilising investments for water supply and sewerage extensions and reducing NRW. In addition, service affordability must become a key concern for increasing water supply and sewerage coverage.
- **WASAC:** the Rwandese utility maintained and improved its high performance in the components of Quality of Services and Economic Efficiency. The Operational Sustainability component though unchanged, showed medium performance. **WASAC was the only Utility to have 7 indicators that met the good benchmark** from 8 of the indicators that met the acceptable benchmark. However, the Utility still needs to focus efforts to further reducing NRW and improving hours of supply.
- **NWSC:** the Ugandan utility had good performance in the components of Economic Efficiency and Operational Sustainability while performance on the Quality of Services was medium. **NWSC is the only Utility to have NRW meeting the acceptable benchmark.** This could serve as a learning point for other Utilities, especially that NWSC is almost 100% metered. NWSC needs to concert efforts to increasing the sewerage coverage and reducing staff costs.
- **ZAWA:** the Zanzibari utility had low performance in all three components. There is urgent need to direct investments and efforts to improving all KPIs for ZAWA if it is to become viable.

It is ESAWAS's intention that Utilities, regulators and Governments use this information to arrive at decisions that will spur improvements in the Utilities for the well-being of the citizenry as a whole.



Annex 1: COMMON KPIS WITH BENCHMARKS SET BY EACH REGULATOR

	WATER COVERAGE	SEWERAGE COVERAGE*	WATER QUALITY	HOURS OF SUPPLY	NRW	O&M COST COVERAGE	COLLECTION EFFICIENCY	METERING RATIO	STAFF EFFICIENCY
WASREB			Residual Chlorine, Bacteriological						Staff per 1,000 water and sewer connections
Acceptable Benchmark	80-90%	80-90%	90-95%	16-20	20-25%	100-149%	85-95%	95-99%	5-8
Weight	30	15	30	20	25	25	20	15	20
NWASCO			Residual Chlorine, Bacteriological Physio-Chemical(<i>Turbidity, pH, Metals, Colour</i>)						Staff per 1,000 water connections
Acceptable Benchmark	80-90%	80-90%	95%	18-20	20-25%	100-150%	85-90%	100%	6-8
Weight	5	5	20	15	10	15	20	15	10
EWURA			E-Coli, Turbidity						Staff per 1,000 water connections
Service Level Benchmark	100%	30%	98%	24	20%	150%	95%	100%	5
Weight	5	40	15	5	15	10	15	15	10
CRA		N/A	Residual Chlorine, Bacteriological, Physio-Chemical (<i>Turbidity, pH, Conductivity</i>)						Staff per 1,000 water connections
Boundaries	40-80%	-	65-100%	9-24	25-47%	85%-150%	80-90%	80-90%	10-15
Weight	5.5		33	5	25.5	13	8	5	5
RURA		N/A	Residual Chlorine, Bacteriological						Staff per 1,000 water connections
Acceptable Benchmark	80-90%		90-95%	16-20	20-25%	#	85-90%	95-99%	5-8
Weight	25	-	25	20	25		20	20	20
LEWA, ZURA			Residual Chlorine, Bacteriological						
Benchmark	Not yet defined								

*Mozambique and Rwanda have separate entities providing sewerage services.

#The water utility in Rwanda had until June 2014 been a single Utility providing both electricity and water. Hence, the Utility had been unable to separate O&M costs for water services only given that the costs incurred, for example at headquarters, could not be allocated either to electricity or water, thus the benchmark could not be defined

Annex 2. DETAILED PROFILES OF UTILITIES

DAR ES SALAAM WATER AND SEWERAGE CORPORATION (DAWASCO) - TANZANIA																							
Water Utility	<p>The DAWASA Act 2001 established Dar es Salaam Water and Sewerage Authority (DAWASA) as the asset owner responsible for capital investment. DAWASCO has entered into a two-year lease contract with DAWASA starting from 1st July 2016 responsible for overall operation and management of water supply and sanitation services to the capital Dar es Salaam City and parts of Kibaha and Bagamoyo in Coast Region. DAWASA/DAWASCO reports functionally to the Ministry of Water and Irrigation.</p> <p>The total population in the DAWASCO operation area is 5,188,030 people. The sources of water are Ruvu and Kizinga rivers and 20 boreholes located in various areas within the service area. The utility has a sewerage system with sewer line of 189.27km long and eight (8) waste water stabilization ponds.</p>																						
General Data About Water Utility	<table border="0"> <tr> <td>Abbreviation</td> <td>DAWASCO</td> </tr> <tr> <td>Start of Operations</td> <td>2005</td> </tr> <tr> <td>Number of Towns in Operation Area</td> <td>3</td> </tr> <tr> <td>Total Population in Operation/Service Area</td> <td>5,188,030</td> </tr> <tr> <td>Total Water Connections</td> <td>156,059</td> </tr> <tr> <td>Total Waste Water/Sanitation Connections</td> <td>18,643</td> </tr> <tr> <td>Total Production/year</td> <td>103,982,762m³</td> </tr> <tr> <td>Total Staff</td> <td>906</td> </tr> <tr> <td>Annual O&M Costs</td> <td>TZS 46,048,551,574</td> </tr> <tr> <td>Annual Water and Sewerage billing</td> <td>TZS 87,400,000,000</td> </tr> <tr> <td>Annual Water and Sewerage Collections</td> <td>TZS 70,157,984,389</td> </tr> </table>	Abbreviation	DAWASCO	Start of Operations	2005	Number of Towns in Operation Area	3	Total Population in Operation/Service Area	5,188,030	Total Water Connections	156,059	Total Waste Water/Sanitation Connections	18,643	Total Production/year	103,982,762m ³	Total Staff	906	Annual O&M Costs	TZS 46,048,551,574	Annual Water and Sewerage billing	TZS 87,400,000,000	Annual Water and Sewerage Collections	TZS 70,157,984,389
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Water																							
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ÁGUAS DA REGIÃO DE MAPUTO (ADEM)- MOZAMBIQUE

Water Utility

Maputo Water Supply System, supplies water to the metropolitan area of Maputo and is managed by the Water Society of Maputo Region (AdeM) under Lease Contract.

In 2010, after evaluation by the Government of the Delegated Management Framework implementation process, FIPAG (Water Asset Management Fund) acquired the majority shareholder position of AdeM. Functionally, AdeM reports to the Ministry of Public Works.

The total population in the AdeM operation area is 2,224,114 people. The main source of water is the Umbeluzi River. The Utility does not provide sewerage services.

General Data About Water Utility

Abbreviation	AdeM
Start of Operations	2010
Number of Towns in Operation Area	3
Total Population in Operation/Service Area	2,224,114
Total Water Connections	255,202
Total Waste Water/Sanitation Connections	N.A
Total Production/year	73,151,000m ³
Total Staff	842
Annual O&M Costs	MT 1,328,703,475
Annual Water Billing	MT 1,504,272,000
Annual Water Collections	MT 1,392,275,000

Tariff Structure

*Exchange Rate: MT62.43to 1US\$ (2016)

DOMESTIC				
Tariff Band	Service Availability rate (Fixed rate)	0 -5 m ³ (Fixed value)	5m ³ -10m ³	Above 10m ³
	MT/Month	MT/Month	MT/m ³	MT/m ³
	60.00	73.00	22.00	35.00

NON DOMESTIC				
Category	Municipalities	Minimum Consumption (Commercial, Public)	Minimum Consumption (Industrial)	Above Minimum Consumption
	MT/m ³	Mt/Month	MT/Month	MT/m ³
MT./m ³	14.60	925.00	1,850.00	37.00

Note :

- There is a social consumption up to 5m³ and all domestic tariffs include a fixed charge;
- In case of faulty meter, customers are billed according to the average of previous three meter readings;
- The initial sewerage tax fee will be 10% and will be applied as soon the negotiations are finalised with Municipalities Authority

RWANDA WATER AND SANITATION CORPORATION (WASAC)- RWANDA

Water Utility

WASAC was established in August 2014 with the mandate to produce and distribute Water and provide Sanitation services in all Urban areas in Rwanda. The Company was created in replacement of the Energy, Water and Sanitation Authority (EWSA), a public Utility that was providing both Water and Electricity. WASAC reports functionally to the Ministry of Infrastructure but is overseen strategically by a Board of Directors.

WASAC is the water service provider for Kigali and all other towns in Rwanda and was created to operate on commercial basis and inherited all water infrastructures and is mandated to improve the service and coverage in all urban areas. In the current arrangement, WASAC is also mandated to mobilize capital investment and execute major water investment works (through projects & programs) in rural areas before handing over the assets to districts (assets holders) that also delegate the management to private operators (rural).

The total population in the WASAC operation area is 2,645,067 people. The sources of water are mainly surface water from rivers, lakes and springs as well groundwater (only in Kigali). The Utility does not provide sewerage services.

General Data About Water Utility

Abbreviation	WASAC
Start of Operations	2014 (August)
Number of Towns in Operation Area	14
Total Population in Operation/Service Area	2,645,067
Total Water Connections	175,646
Total Waste Water/Sanitation Connections	Not applicable
Total Production/year	42,187,531
Total Staff	734
Annual O&M Costs	FRW11,264,951,205
Annual Water and Sewerage billing	FRW15,789,527,208
Annual Water and Sewerage Collections	FRW16,109,732,300

Tariff Structure

*Exchange Rate: FRW726.46 to 1US\$ (2015/16)

DOMESTIC						
Tariff Band	Public taps & lifeline block (0-5 m ³)	6-20 m ³	21-50 m ³	51-100 m ³	Above 100m ³	Kiosks
FRW/m ³	323	331	413	736	847	323

NON-DOMESTIC	
Category	Industrial
FRW./m ³	736

Note :

- No approved flat rate tariff but can be used in case of faulty meter and customers are billed according to the average of previous three meter readings
- No sewerage tariff fixed yet since no centralized sewerage system

LESOTHO WATER AND SEWERAGE COMPANY (WASCO) - LESOTHO

Water Utility

The Water and Sewerage Company (PTY) Ltd was established through a Water and Sewerage Act No. 13 of 2010, thereby making it fully fledged private company wholly owned by the Government of Lesotho earmarked to deliver water and sewerage services in the urban centres of the country. WASCO reports functionally to the Ministry of Energy, Meteorology and Water Affairs., but is overseen strategically by a Board of Directors.

With effect from 2012 and in order to enhance its operational efficiency and effectiveness, WASCO was placed under regulation undertaken by the Lesotho Electricity and Water Authority (LEWA), as per the LEA Act 2002 as Amended. LEA Amendment Act 2011 extended the Mandate of Lesotho Electricity Authority (LEA) to include the regulation of water and sewerage services, having regulated the electricity sub-sector only since 2004.

The total population in the WASCO operation area is 614,239 people.

Industries and commercial premises, particularly in Maseru, use about 64% of the water produced, and domestic customers consume 36%.

General Data About Water Utility

Abbreviation	WASCO
Start of Operations	2010
Number of Towns in Operation Area	10 towns plus 6 designated urban areas
Total Population in Operation/Service Area	614,239
Total Water Connections	90,544
Total Waste Water/Sanitation Connections	7,165
Total Production/year	23,858,512 m ³
Total Staff	543
Annual O&M Costs	M227,291,000
Annual Water and Sewerage billing	M233,856,000
Annual Water and Sewerage Collections	M190,539,000

Tariff Structure

*Exchange Rate: M13.77 to IUS\$ (2016)

DOMESTIC					
Tariff Band	0-5kl	> 5-10kl	> 10-15kl	>15 kl	Standpipe
M./m ³	4.51 (<i>fixed</i>)	7.64	13.42	18.50	6.11 (flat rate)
Standing Charge	21.93	40.90			

NON-DOMESTIC			
Category	Institutions	Non-Domestic	Churches/Schools
M./m ³	12.21	12.21	12.21
Standing Charge	393.39	272.35	196.70

Note:

- Sewerage charged on 85% of water consumed at M8.92
- Water closet customers charged on 60% of water consumed at M8.92

NAIROBI CITY WATER AND SEWERAGE COMPANY (NCW&SC)- KENYA

Water Utility

In 2002 the Kenyan government launched an ambitious programme of reforms for the water sector through the enactment of the Water Act 2002. The new legislation separated policy formulation, regulation, water resources management, water services and created clear roles and responsibilities of the newly established key water institutions. This resulted in the establishment of the Water Services Regulatory Board (WASREB) in 2003 to oversee the implementation of policies and strategies relating to provision of water and sanitation services. Also established were regional Water Services Boards (WSBs), in the capacity of asset holders, and over 100 Water Service Providers (WSPs), as their appointed agents for actual service delivery.

Nairobi City Water and Sewerage Company (NCW&SC) was incorporated in December 2003 and appointed by the Athi Water Service Board (AWSB) as its agent with the mandate of providing water and sewerage services within the jurisdiction of the city of Nairobi. Further the Constitution of Kenya (CoK-2010) devolved water service provision to the 47 county governments. Therefore NCW&SC is now wholly owned by the County Government of Nairobi. The Company is ISO 9001:2008 certified.

Nairobi City has an estimated population of 4,066,608. The sources of water are four namely Thika dam Ruiru dam, Sasumua dam and Kikuyu Springs The four water sources jointly produce 550,000 m³/day for the city against its demand of 750,000m³/day. The utility has two waste water treatment plants, Dandora with a treatment capacity of 180,000m³/day and Kariobangi with a treatment capacity of 80,000m³/day.

General Data About Water Utility

Abbreviation	NCW&SC
Start of Operations	2003
Number of Towns in Operation Area	1
Total Population in Operation/Service Area	4,066,608
Total Water Connections	333,326
Total Waste Water/Sanitation Connections	228,998
Total Production/year	200,352,109 m ³
Total Staff	3,506
Annual O&M Costs	KSHS 8,826,750,200
Annual Water and Sewerage billing	KSHS 8,042,791,000
Annual Water and Sewerage Collections	KSHS 7,864,559,000

Tariff Structure

*Exchange Rate: KSHS100.43 to 1US\$ (2015/16)

WATER TARIFF						
Category	Domestic	Institutions	Commercial	Industrial	Water to Kiosks for Resale	Bulk Water to WSPs for Resale
Consumption Block	KSHS./m³					
0-6	34	34	34	34	20	35
7-20	53	53	53	53		
>20	64	64	64	64		
	Schools and Colleges					
0-600	48					
601-1200	55					
>1200	60					

Note :

- Sewerage is charged at 75% of the water billed for all customers with a sewer connection.
- Resale by manned kiosk vendors and communal water dispensers is Kshs 2 per 20-litres.
- Resale at ATM water dispenser is Kshs 0.50 per M³
- Bulk meter for gated communities is at Kshs 53 per M³

LUSAKA WATER AND SEWERAGE COMPANY(LWSC) - ZAMBIA

Water Utility

Lusaka Water and Sewerage Company (LWSC) was established in 1989 under the Companies Act to provide water supply and sanitation services to the Greater City of Lusaka. In the 90s, Zambia embarked on water sector reforms that saw the establishment of the WSS regulator, NWASCO and brought LWSC under regulation through the Water Supply and Sanitation Act, No. 28 of 1997.

In 2008, LWSC, as a private limited liability company, became a provincial utility for Lusaka Province and extended its WSS services to five other towns. LWSC is fully owned by the Local Authorities in Lusaka Province namely Lusaka, Luangwa, Chongwe, Kafue, Chilanga and Chirundu. The Ministry of Local Government and Housing has principal oversight of all WSS Utilities in Zambia.

The total population in the LWSC operation area is 2,327,832. The main sources of water are the Kafue River situated about 65km from Lusaka town, Chongwe River and Zambezi River and over 100 boreholes situated in various areas. 60% of the water for Lusaka city is produced from the boreholes. The utility has a sewerage system with two mechanised treatment plants and about six sewage ponds.

General Data About Water Utility

Abbreviation	LWSC
Start of Operations	1989
Number of Towns in Operation Area	6
Total Population in Operation/Service Area	2,327,832
Total Water Connections	97,008
Total Waste Water/Sanitation Connections	32,137
Total Production/year	84,330,000 m ³
Total Staff	899
Annual O&M Costs	ZMW218,883,351
Annual Water and Sewerage billing	ZMW251,898,942
Annual Water and Sewerage Collections	ZMW194,296,039

Tariff Structure

**Exchange Rate: ZMW10.28 to IUS\$ (2016)*

DOMESTIC						
Tariff Band	0 - 6	6 - 30	30 - 100	100 - 170	+170	Kiosks/ Public Tap
Lusaka - K./m ³	3.93	4.72	5.35	6.29	7.71	3.75
Kafue, Chongwe, Luangwa- K./m ³	2.52	2.99	3.30	3.62	4.09	
Chirundu- K./m ³	2.52	3.78	4.51	5.98	5.98	

NON-DOMESTIC			
Tariff Band	0-30	30-170	+170
Lusaka - K./m ³	6.85	9.46	10.76
Kafue, Chongwe, Luangwa- K./m ³	5.38	7.99	9.13
*Chirundu- K./m ³	5.48	6.49	7.93

Note :

- Flat rates for non-metered customers vary per customer category (i.e High, Medium and Low) and have remained unchanged for three years.
- Standing/Fixed monthly meter charge is K8 for domestic and K20 for non-domestic.
- The sewerage tariff is 30% and 45% of water for domestic and non-domestic respectively
- Sanitation surcharge is 2.5% of water bill levied on all customers (except kiosks and stand pipes) specifically for sanitation service extension and improvements.

NATIONAL WATER AND SEWERAGE CORPORATION (NWSC) - UGANDA

Water Utility

The National Water and Sewerage Corporation (NWSC) is a public utility company 100% owned by the Government of Uganda. The Corporation was established in 1972 under Decree No: 34. At its inception in 1972, the Corporation operated in three (3) major towns of Kampala, Jinja and Entebbe. These laws were revised in 1995 by the NWSC Statute and later on the statute was incorporated in the Laws of Uganda as CAP 317 (Laws of Uganda 2000). The primary aim of this was to revise the objectives, powers and structure of NWSC to enable the corporation operate and provide water & sewerage services in areas entrusted to it on a sound commercial and viable basis.

The Water Utility Regulation Department, under the Directorate of Water Development in the Ministry of Water and Environment, is responsible for regulation of provision of water supply and sanitation services.

The total population in the NWSC operation area is 7,502,874. NWSC produces about 100 million cubic meters of water per annum from 56 water treatment facilities and is distributed through 9,759 kms of water mains. In addition, NWSC operates 3 conventional sewerage treatment plants and 28 waste stabilisation ponds with a total sewer network length of 556.2Km.

General Data About Water Utility

Abbreviation	NWSC
Start of Operations	1972
Number of Towns in Operation Area	170
Total Population in Operation/Service Area	7,502, 874
Total Water Connections	472,193
Total Waste Water/Sanitation Connections	20,355
Total Production/year	105,710,206 m ³
Total Staff	2,860
Annual O&M Costs	UGX215,889,807,000
Annual Water and Sewerage billing	UGX292,338,646,748
Annual Water and Sewerage Collections	UGX284,127,997,772

Tariff Structure

**Exchange Rate: UGX3,402.22 to 1US\$ (2015/16)*

DOMESTIC		
Tariff Band	/m ³	Price per 20 ltr Jerrycan
Domestic	1,553	31
Public Standpipe	2,490	50

NON DOMESTIC		
Tariff Band	/m ³	Price per 20 ltr Jerrycan
Institution/Government	3,065	61
Commercial <500m ³ /month	3,760	75
Commercial >500-1,500m ³ /month	3,760	75
Commercial >1,500m ³ /month	3,005	60

ZANZIBAR WATER AUTHORITY (ZAWA) - ZANZIBAR

Water Utility

The Zanzibar Water Authority (ZAWA) which was established under Act. No. 4 of 2006, is a semi-autonomous entity with the overall management of water supply services and Water Resources management in Zanzibar. ZAWA has the responsibility of providing clean, reliable and good quality water supplies through the operation and maintenance of water infrastructure, and development of new waterworks in the urban and rural areas of Unguja and Pemba islands. It is also responsible for the management and regulation of water resources and effluent discharges in Zanzibar

In 2013, Zanzibar Utilities Regulatory Authority (ZURA) was established under the ZURA Act No.7/2013 as a multi sectoral regulatory authority. ZURA begun operating in 2015 and brought ZAWA under regulation.

The total population in the ZAWA operation area is 1,543,245.

General Data About Water Utility

Abbreviation	ZAWA
Start of Operations	2006
Number of Towns in Operation Area	6
Total Population in Operation/Service Area	1,543,245
Total Water Connections	85,525
Total Waste Water/Sanitation Connections	3,000
Total Production/year	60,000,000 m ³
Total Staff	687
Annual O&M Costs	TSH10,092,122,038
Annual Water and Sewerage billing	TSH6,025,274,271
Annual Water and Sewerage Collections	TSH2,130,991,849

Tariff Structure

**Exchange Rate: TSH2,126.46 to 1US\$ (2015/16)*

DOMESTIC		
Tariff Band	0-8	+8
TSH/m ³	667	1,540

NON DOMESTIC		
Tariff Band	0-1000	+1000
Institutional TSH/m ³	924	2,259
Commercial TSH/m ³	821	2,259

Note :

- Flat rate is TSH4,000 per month

ANNEX 3. WUPI

The Water Utility Performance Index (WUPI) was developed following the guidelines suggested by the OECD-JRC (2008). In summary, the OECD-JRC (2008) recommends to build the composite indicators following 10 steps: 1) development of a theoretical framework; 2) selection of the basic indicators; 3) imputation of missing data; 4) multivariate analysis; 5) normalisation; 6) weighting and aggregation; 7) robustness and sensitivity; 8) back the details (indicators); 9) association with other variables; and 10) dissemination.

The Water Utility Performance Index (WUPI) is a composite indicator developed by CRA on 2012. The WUPI used at CRA has been harmonized for this regional comparison. The WUPI allows to measure the performance of the Utilities in an integrated way by aggregating three main performance components: quality of service, economic efficiency and operational sustainability. 10 KPIs are used to build up the WUPI and are clustered in the three components.

The WUPI uses the max-min technique for the KPIs normalisation. The aim of the KPIs normalization is to transform the set of KPIs selected for the construction of the WUPI, which are expressed in different units of measurement, into a homogeneous set of variables, all of which are measured in the same unit. The KPIs are then measured on a scale that ranges from 0 (the worst possible performance) to 1 (the best possible performance). For ESAWAS, it was pre-established the minimum and maximum threshold values for each indicator to perform the indicator normalisation (see Annex 1).

The final step of the construction of the WUPI is the aggregation of all of the normalised indicators into the three WUPI components and the overall WUPI. The weighted sum of the indicators, which assume total compensation among the indicators is used to aggregate the indicators. This linear aggregation of the indicators is calculated using the following formulas:

$$WUPI_{quality_service, i} = \frac{\sum_{k=1}^{k=4} w^*_k \cdot I_{k, i}}{\sum_{k=1}^{k=4} w^*_k} \quad WUPI_{economic_efficiency, i} = \frac{\sum_{k=5}^{k=7} w^*_k \cdot I_{k, i}}{\sum_{k=5}^{k=7} w^*_k}$$

$$WUPI_{operational_sustainability, i} = \frac{\sum_{k=8}^{k=10} w^*_k \cdot I_{k, i}}{\sum_{k=8}^{k=10} w^*_k} \quad WUPI_{overall, i} = \sum_{k=1}^{k=10} w^*_k \cdot I_{k, i}$$

Where i refers to the specific water utility under analysis, w^*_k is the relative importance of the KPI k , and $I_{k,i}$ is the normalised value of the KPI k for water utility i .

ANNEX 4: COMPOSITION OF ESAWAS TECHNICAL COMMITTEE FOR BENCHMARKING

Name	Position	Task
Peter Njaggah	Director-Technical Services, Water Services Regulatory Board, Kenya	Chairperson – Technical Committee Data Collection, Analysis, Reporting
Thuso Ntlama	Manager- Economic Regulation, Lesotho Electricity and Water Regulatory Authority, Lesotho	Secretary – Technical Committee Data Collection, Analysis, Reporting
Jacques Nzitonda	Director of Water and Sanitation Regulation, Rwanda Utilities Regulatory Authority, Rwanda	Data Collection, Analysis, Reporting
Chola Mbilima	Commercial and Financial Inspector, National Water Supply and Sanitation Council, Zambia	Data Collection, Analysis, Reporting
Exaudi Fatael	Acting Director of Water and Sanitation, Energy and Water Regulatory Authority, Tanzania	Data Collection, Analysis, Reporting
Anselmo Munhequete	Operations Technician-Northern Region, Water Regulatory Council, Mozambique	Data Collection, Analysis, Reporting
Yvonne Magawa	Executive Secretary, ESAWAS Regulators Association	Team Coordinator- Consolidating data and Logistics