



**REGIONAL BENCHMARKING OF
WATER SUPPLY AND SANITATION UTILITIES
2017/2018 REPORT**



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FOREWORD

This 5th Benchmarking Report of water supply and sanitation Utilities covered the period 2017/2018 and saw an increase in the number of benchmarked Utilities to ten. This followed the inclusion of Lilongwe Water Board (LWB) of Malawi.

The performance of the Lilongwe Water Board in the period 2016/2017 was factored into the report to enable assessment over two periods, which altered some of the performance averages that were reflected in the fourth benchmarking report. The Eastern and Southern Africa Water and Sanitation (ESAWAS) Regulators Association will continue with its quest to expand the benchmarking exercise in the region and possibly beyond, as it is a critical contributor to attainment of Sustainable Development Goal number 6.

ESAWAS believes that benchmarking across the region strongly contributes to improvement in performance and provides the Utilities a learning opportunity of good practices others may be implementing. It also enhances regional cooperation and development by promoting harmonised standards and approaches. Hence, in this report, the ESAWAS Regulators Association made an upward adjustment to benchmarks of four indicators to further spur performance improvement. These indicators were; Water Quality Compliance, Hours of Supply, Collection Efficiency and Metering Ratio. This was in part necessary because a number of Utilities had already made significant strides to attain the previously set yardsticks. Thus, it is worth noting that performance rating of some Utilities was impacted by this change.

This reporting period also coincided with the last year of implementation of the ESAWAS Regulators Association second Strategic Plan for the period 2016-2018. Over 90% of activities that were set out in the plan were achieved by the close of 2018. The new and third Strategic Plan that spans 2019-2021 has four strategic objectives: Develop harmonised regulatory approaches and frameworks; Facilitate experience and knowledge sharing; Undertake and document research in emerging regulatory trends and practices; and Improve operations of the ESAWAS Regulators Association.

ESAWAS members will continue to develop and refine regulation as well as innovate regulatory tools that can position water and sanitation service providers to respond to the everchanging environment and ensure customers' and other stakeholders' expectations are effectively met.

ABBREVIATIONS/ ACRONYMS

AdeM	Águas da Região de Maputo
AFUR	African Forum for Utility Regulators
AMCOW	African Ministers' Council on Water
AREEN	Autorité de Régulation des secteurs de l'Eau potable et de l'Energie
AURA	Autoridade Reguladora de Águas, Instituto Público
CBO	Community Based Organisations
CRA	Conselho de Regulação de Aguas
CRIDF	Climate Resilient Infrastructure Development Facility
DAWASCO	Dar es Salaam Water and Sewerage Corporation
ESAWAS	Eastern and Southern Africa Water and Sanitation
EWURA	Energy and Water Utilities Regulatory Authority
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
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
NRW	Non-Revenue Water
NWASCO	National Water Supply and Sanitation Council
NWSC	National Water and Sewerage Corporation
QoS	Quality of Supply and Service Standards
REGIDESO	Régie de Production et de Distribution d'Eau et d'électricité
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
WIN	Water Integrity Network
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

The ESAWAS Regulators Association continues to grow the number of Utilities being benchmarked. In the reporting 2017/2018 period, one more Utility was brought on board to bring the number to ten. These were Nairobi City Water and Sewerage Company (NCW&SC) of Kenya; Lusaka Water and Sewerage Company (LWSC) of Zambia; Dar Es Salaam Water and Sewerage Corporation (DAWASCO) of Tanzania; Águas da Região de Maputo (AdeM) of Mozambique; Water and Sewerage Company (WASCO) of Lesotho; Water and Sanitation Corporation Limited (WASAC) of Rwanda; Régie de Production et de Distribution d'Eau et d'électricité (REGIDESO) of Burundi; Zanzibar Water Authority (ZAWA) of Zanzibar; National Water and Sewerage Corporation (NWSC) of Uganda; and Lilongwe Water Board (LWB) of Malawi.

This report contains six chapters: Chapter 1 presents an overview of the ESAWAS Regulators Association; Chapter 2 highlights the performance of the Association on its second strategic plan that spanned 2016 to 2018, while Chapter 3 focuses on the Association's third strategic plan for a subsequent three-year period. Chapter 4 describes the regional benchmarking framework and presents the various indicators that are used for benchmarking. It is worth noting that benchmarks for water quality compliance, hours of supply, collection efficiency and metering ratio indicators were revised upwards in this report. Chapter 5 then presents the comparative performance analysis of the Utilities on the various indicators. The report concludes with Chapter 6 which discusses the main conclusions and recommendations of the benchmarking exercise.

Generally, a number of Utilities continued to make progress towards achieving the 'good' benchmark for water coverage as an additional 90,491 domestic connections were made by the Utilities. Similarly, a number of Utilities upped their metering ratios amid increasing number of water connections. There was also good performance in staff/1,000 water and sewerage connections and collection efficiency indicators.

However, the Utilities continue to struggle with non-revenue water, with only NWSC, Uganda meeting the acceptable benchmark at about 34%. Equally, Utilities continued to make insignificant progress in the sewerage coverage indicator. This underscores the need to embrace non-sewered sanitation (NSS) solutions if members are going to achieve universal coverage of sanitation. In this regard, the next benchmarking report will introduce indicators on NSS.

CHAPTER 1. OVERVIEW OF ESAWAS REGULATORS ASSOCIATION

1.1 OBJECTIVES AND MEMBERS OF ESAWAS

The Eastern and Southern Africa Water and Sanitation (ESAWAS) Regulators Association is a network of water supply and sanitation regulators that 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 ESAWAS Regulators Association began informally in 2007 and was officially formed in 2009 by a Memorandum of Understanding. It gained legal personality in 2012 as a registered society in Zambia. The activities of the Association are governed by a Constitution and Rules of Operation.

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 nine members. These are: the Water Services Regulatory Board (WASREB) of Kenya; the Autoridade Reguladora de Águas, Instituto Público (AURA,IP formerly 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 Autorité de Régulation des secteurs de l'Eau potable et de l'Energie (AREEN) of Burundi; the Zanzibar Utilities Regulatory Authority (ZURA) of Zanzibar; and the Water Services Association of Malawi (WASAMA).

In the reporting period, two regulators' mandates were revised. In Mozambique, Decree No. 8/2019, of 18 February renamed CRA to AURA,IP giving it mandate as an authority of water supply and sanitation services in the whole country (Urban+Rural). In Burundi, the mines portfolio was removed from the multi-sectoral regulator thus renaming it from AREEM to AREEN.

A synopsis of the ESAWAS members 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	16
2	Autoridade Reguladora de Águas, Instituto Público (AURA, IP formerly 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	Autorité de Régulation des secteurs de l'Eau potable et de l'Energie (AREEN), Burundi	Decree No. 100/320 of 2011	2015	1
8	Zanzibar Utilities Regulatory Authority (ZURA), Zanzibar	Act No. 7/2013	2015	1
9	Water Services Association of Malawi (WASAMA)	Trustee Act	1998	5

The regulators have generally been mandated to undertake both economic and technical regulation of WSS service provision, ensuring a balance between the quality of the service, the interests of consumers and the financial sustainability of service 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 and Uganda where the regulators sign 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, Water Quality Monitoring, 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.



Ratification of the ESAWAS Constitution by WASAMA of Malawi

CHAPTER 2. PERFORMANCE ON THE 2016 - 2018 STRATEGIC PLAN

ESAWAS completed the implementation of its second Strategic Plan that covered the period 2016-2018. The plan was 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

Overall, over 90% of expected results set out in the plan were achieved by the close of 2018. Table 2 details the performance in each focus area.

Table 2: Performance on 2016-18 Strategic Plan Objectives

Objective 1: Strengthen Regulatory Capacity among Members and Within the Region		
Key Focus Areas	Key Expected Results	Performance
Undertake Peer-Review of Regulators annually.	Member regulators benchmarked and experience on good practices shared.	Three more regulators were peer-reviewed bringing the total to six. CRA, Mozambique (2016), LEWA, Lesotho (2017), RURA, Rwanda (2018).
Extend annual benchmarking exercise for large Utilities in the region.	Results of benchmarking used to enhance tools and promote efficiency of regulated entities.	The number of benchmarked Utilities increased from six to nine with the inclusion of ZAWA, Zanzibar; REGIDESO, Burundi; and NWSC, Uganda.
Improve regulation of sanitation.	A framework for sanitation regulation developed.	A grant was obtained from the Bill & Melinda Gates Foundation and works commenced in October 2018 as a 3.5 years project.
Provide support to WSS regulators newly established or under formation in the region.	Regulators in formative stages supported by older regulators for capacity building.	ZURA, Zanzibar and WURD, Uganda received capacity-building support through onsite visit presentations by the Technical Committee.

Objective 2: Facilitate experience and knowledge transfer		
Key Focus Areas	Key Expected Results	Performance
Consolidate peer review findings into a single handbook.	Peer review findings shared as a package.	This will be initiated in the next Strategic Plan as the sixth Peer Review was undertaken in October 2018.
Document and share good regulatory practices.	Good practices shared among regulators. Toolkit on setting-up regulatory framework developed.	Good practices in tariff-setting documented into a handbook and shared.

Undertake technical regulatory exchange programmes.	Working approaches in key regulatory aspects shared.	One technical exchange meeting was undertaken on tariff-setting in Zambia.
Establish/ Strengthen partnerships with other WSS sector associations.	Members have access to trainings, knowledge and innovations.	Partnerships established by MoU with AMCOW, WSUP and CRIDF.
Update knowledge hub.	Knowledge database updated for Members to share issues, obtain feedback, contribute and access non-public documents/ publications.	Knowledge hub upgraded and non-public documents shared with members.

Objective 3: Improve operations of ESAWAS Regulators Association		
Key Focus Areas	Key Expected Results	Performance
Hold Annual General Meeting.	Issues deliberated upon improve performance of ESAWAS Regulators Association.	Annual General Conference and Meetings held on: <ul style="list-style-type: none"> • 'Regulating for the Future - Incorporating SDGs', in Dar es Salaam, Tanzania (2016). • 'Water Integrity and SDG6 – designing appropriate regulation', in Livingstone, Zambia (2017). • 'The regulatory environment for accelerating access to WSS services with focus on sanitation and climate resilient systems: leaving no one behind', in Nyamata, Rwanda (2018).
Update Website for ESAWAS Regulators Association	Public visibility of ESAWAS increased.	Website upgraded and updated on events and activities undertaken.
Increase membership of ESAWAS Regulators Association.	Number of members increased annually by at least one.	ZURA, Zanzibar and AREEN, Burundi joined as full members, while WASAMA, Malawi joined as an associate member.
Explore options to strengthen Secretariat.	Secretariat can successfully handle increased activities.	One supporting person at the Chairing Member backed-up Secretariat.
Source external funds for activities.	Increased revenue for activities.	Funds received as a grant from BMGF for Non-sewer sanitation regulation and direct support for activities sourced from: GIZ for Peer Reviews and Conferencing, WIN for presenters to 11 th AGM, CRIDF for development of the Strategic Plan for 2019-2021 period.

CHAPTER 3. FOCUS FOR NEXT THREE YEARS

3.1 BREAKING NEW GROUNDS

The ESAWAS Regulators Association formulated a new Strategic Plan that spans the period 2019-2021 to guide its strategic direction as it seeks to expand the scope of regulation to address emerging issues and attainment of SDG6, “Ensuring availability and sustainable management of water and sanitation *for all*”. This is in response to stakeholder calls for the regulators to extend regulation to previously unchartered areas of onsite sanitation and the rural sub-sector. To effectively regulate these spheres, the regulators will have to be guided by harmonised approaches and frameworks and new tools for regulation will have to be developed. Continuous learning and knowledge exchange will also form the bedrock of the new regulatory journey if WSS services are to be accessible to all.

The 2019-2021 Strategic Plan has four Strategic Objectives:

- Developing harmonised regulatory approaches and frameworks;
- Facilitating experience and knowledge sharing;
- Undertaking and documenting research in emerging regulatory trends and practices; and
- Improving operations of the ESAWAS Regulators Association.

The elaborated key focus areas of the plan per strategic objective are in Table 3.

Table 3: Key focus areas for the 2019 -2021 Strategic Plan

Objective 1: Develop Harmonised Regulatory Approaches and Frameworks	
Key Actions	Key Expected Results
Extend annual benchmarking exercise for WSS Utilities in the region.	Sector reporting improved by the introduction of new indicators and alignment with SDGs. Results of Benchmarking used to enhance regulatory tools and promote efficiency of regulated entities.
Improve regulation of sanitation service provision.	Regulatory strategy and framework for inclusive urban sanitation service provision that incorporates non-sewered (onsite) sanitation services developed and implemented.
Address regulation of WSS in the rural areas and small schemes.	A strategy and implementation framework for rural WSS regulation developed.
Develop a regulatory handbook from consolidated findings of six Peer Reviews.	Regulatory Handbook on establishment of a regulator and good practices in regulatory governance & substance developed, published and disseminated.

Promote equity in service provision (pro poor/ vulnerable communities, households and social inclusion).	Key performance indicators established and/or refined to improve measurement and identification of service levels to poor communities.
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Objective 2: Facilitate Experience and Knowledge Sharing	
Key Actions	Key Expected Results
Document and share good practices in regulation.	Good practices shared among regulators.
Undertake technical regulatory exchange programmes.	Working approaches in key regulatory aspects shared.
Promote and support independent regulation within the region.	Improved awareness regarding the role of WSS regulators. Regulators existing, newly formed and under-establishment supported with advocacy and technical expertise.
Establish and strengthen partnerships with training organisations on regulation.	Members have access to specialised training in regulation and curriculum influenced by ESAWAS.

Objective 3: Undertake and Document Research in Emerging Regulatory Trends and Practices	
Key Actions	Key Expected Results
Promote climate resilient WSS services.	Tools developed to promote climate resilience disseminated and applied.
Improve performance with regard to NRW management.	Key case studies addressing both good and bad practice for NRW, captured and disseminated.
Identify new technologies and processes that can significantly enhance regulation.	Technologies for enhanced regulation documented and shared.

Objective 4: Improve Operations of ESAWAS Regulators Association	
Key Actions	Key Expected Results
Hold Annual General Meeting.	Issues deliberated upon improve performance of ESAWAS Regulators Association.
Enhance profile of ESAWAS Regulators Association.	Number of members increased. Visibility increased at regional, Africa and international events through active participation (presentations given, hosting breakaway sessions etc.)
Establish/ Strengthen strategic partnerships with other like-minded WSS sector organizations.	ESAWAS' influence, exposure and reach widened globally.

Objective 4 cont'd: Improve Operations of ESAWAS Regulators Association	
Key Actions	Key Expected Results
Strengthen gender inclusiveness.	Female participation at decision-making level at ESAWAS events and meetings increased.
Strengthen capacity and sustainability of Secretariat.	Secretariat can successfully handle increased activities. Increased revenue for core activities.

3.2 COLLABORATION WITH PARTNERS

Pursuant to its objective of establishing working relations with other organisations who share a common interest, the ESAWAS Regulators Association signed collaboration agreements through memoranda of understanding (MoU) with three organisations as follows:

- African Minister’s Council on Water (AMCOW)** – development of sanitation policies, guidelines, plans and regulations; capacity building and training; joint participation at events; data collection, monitoring and reporting with a view of influencing utility performance and policy direction.



- Climate Resilience Infrastructure Development Facility (CRIDF)** – identification and review of case studies for non-revenue water (NRW) to provide adaptable learning points; development of regulatory frameworks for rural water supply and sanitation regulation; and enhancement of climate resilience in WSS operations.
- Water and Sanitation for the Urban Poor (WSUP)** – strengthen pro-poor strategies for regulators and utilities in their member countries; joint participation in relevant selected regional and international events; and strengthening of capacity building and partnering initiatives to improve and develop the performance of regulators and utilities in water and sanitation services to underserved low income communities.

ESAWAS will continue to pursue mutual collaborations centered on its mission and objectives, looking out for learning and knowledge transfer opportunities particularly on new themes that the Association will embark upon in the 2019 – 2021 Strategic Plan.

CHAPTER 4. REGIONAL BENCHMARKING FRAMEWORK

4.1 RATIONALE FOR REGIONAL BENCHMARKING

Benchmarking is a key regulatory tool for assessing and encouraging improvement in performance of WSS Utilities by comparing the performance of a Utility against that of others or industry's best practices or standards. However, in the Eastern and Southern African region, the largest Utility, in-country, 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 (industry standards or set 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 guidelines /Quality of Supply and Service Standards (QoSSS) developed by the regulators (*see Annex 1*). EWURA has set a Service Level Benchmark based on good practices while AURA utilises boundaries set under its indexing model. RURA, WASREB, NWASCO and WASAMA have defined an acceptable benchmark to be achieved. LEWA, AREEN, ZURA and WURD 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.

4.2 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 AURA, 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 as 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).

4.3 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 benchmarks among the countries. The weights were arrived at by a process of normalisation of the various weights defined by the different regulators.

Table 4 shows the framework used for regional benchmarking.

Table 4: 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 • Residual Cl (w0.4) • Bacteriological (w0.6)	% of water samples undertaken meeting quality requirements	% of tests compliant in relation to applicable / national standards	95-99%	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	18-23	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	90-99%	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	90-99%	10

CHAPTER 5. 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-country against other Utilities in the region and thereby draw comprehensive conclusions regarding the performance of the local Utilities.

In the 2017/18 period, Lilongwe Water Board (LWB) of Malawi was brought on board to bring the total number of Utilities participating in the benchmarking exercise to ten (10).

This section therefore, focuses on the analysis of the performance of the ten Utilities.

5.1 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 AURA, NWASCO, AREEM and WASAMA

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

5.2 OVERVIEW OF BENCHMARKED UTILITIES

The benchmarking exercise considers only the largest or single Utilities from each country. The ten Utilities considered in this report are: Nairobi City Water and Sewerage Company (NCW&SC) of Kenya; Lusaka Water and Sewerage Company (LWSC) of Zambia; Dar Es Salaam Water and Sewerage Corporation (DAWASCO) of Tanzania; Águas da Região de Maputo (AdeM) of Mozambique; Water and Sewerage Company (WASCO) of Lesotho; Water and Sanitation Corporation Ltd (WASAC) of Rwanda; Régie de Production et de Distribution d'Eau et d'électricité (REGIDESO) of Burundi; Zanzibar Water Authority (ZAWA) of Zanzibar; National Water and Sewerage Corporation (NWSC) of Uganda and Lilongwe Water Board (LWB) of Malawi.

The general overview of the Utilities is reflected in Table 5, while a detailed profile is presented in Annex 2. All the Utilities are publicly owned companies.

Table 5: General Profile of Benchmarked Utilities

Utility	Abbreviation	Country	Areas of operation	Year Established
Nairobi City Water and Sewerage Company	NCW&SC	Kenya	City of Nairobi	2003
Lusaka Water and Sewerage Company	LWSC	Zambia	Lusaka city; Kafue; Chongwe; Luangwa; Chilanga, Chirundu	1989
Dar Es Salaam Water and Sewerage Corporation	DAWASCO	Tanzania	Dar Es Salaam city; Kibaha; Bagamoyo;	2005
Águas da Região de Maputo	AdeM	Mozambique	Greater Maputo City	1999
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
Régie de Production et de Distribution d'Eau et d'Électricité	REGIDESO	Burundi	Bujumbura a+ all urban centres in the country	1962
Zanzibar Water Authority	ZAWA	Zanzibar	Zanzibar	2006
National Water and Sewerage Corporation	NWSC	Uganda	Kampala + 217 towns	1972
Lilongwe Water Board	LWB	Malawi	Lilongwe	1947

The basic operational data about the Utilities is shown in Table 6.

Table 6: Basic operational data on benchmarked Utilities

Utility	Population in the Service Area 2016/17	Number of Water Connections 2016/17	Annual Water Production (mil m ³ /yr) 2016/17	Population in the Service Area 2017/18	Number of Water Connections 2017/18	Annual Water Production (mil m ³ /yr) 2017/18
NCW&SC, Kenya	4.25 Million	365,026	181.364	4.33 Million	308,612	172.881
LWSC, Zambia	2.40 Million	102,320	85.577	2.59 Million	109,454	84.695
DAWASCO, Tanzania	5.78 Million	262,476	123.696	6.01 Million	286,115	149.225
AdeM, Mozambique	2.31 Million	256,706	63.645	2.34 Million	258,030	61.901
WASCO, Lesotho	0.69 Million	95,571	22.163	0.69 Million	104,000	22.425
WASAC, Rwanda	3.41 Million	192,969	47.709	3.92 Million	203,070	48.082
REGIDESO, Burundi	5.33 Million	91,241	49.857	5.50 Million	89,058	51.057
ZAWA, Zanzibar	1.51 Million	96,644	51.627	1.58 Million	101,444	56.750
NWSC, Uganda	9.12 Million	524,657	120.737	14.25 Million	587,863	126.191
LWB, Malawi	1.13 Million	67,581	31.892	1.19 Million	88,575	36.918

Because of the wider scope of areas of jurisdiction by NWSC, it has the largest population in its service areas estimated at about 14.25 million people. It also had the most number of water connections in the reporting period. WASCO of Lesotho had the smallest population estimated at about 690,000 people. The Utility with the smallest number of water connections was LWB, at 88,575.

In terms of water production, NCW&SC produced the most at 172.9 mil m³, translating into a per capita production of 109 lt/day against total population in the service area. Despite having the lowest water production, LWB still had a favourable per capita production of 85 lt/day while NWSC, with its huge population in the service areas, had the lowest production per capita at only 24 lt/day.

5.3 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 7.

The KPIs boundaries established by ESAWAS were revised upwards for Water Quality, Hours of Supply, Collection Efficiency and Metering Ratio due to a positive trends shift.

Table 7: 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	100	>95	< 95
	Hours of Supply	24	23-18	< 18
Economic Efficiency	O&M Coverage	>150	150 – 100	< 100
	Collection Efficiency	>100	99 – 90	< 90
	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	100	99 – 90	< 90

5.4 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.

5.4.1 QUALITY OF SERVICE

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

5.4.1.1 Water Supply Service Coverage

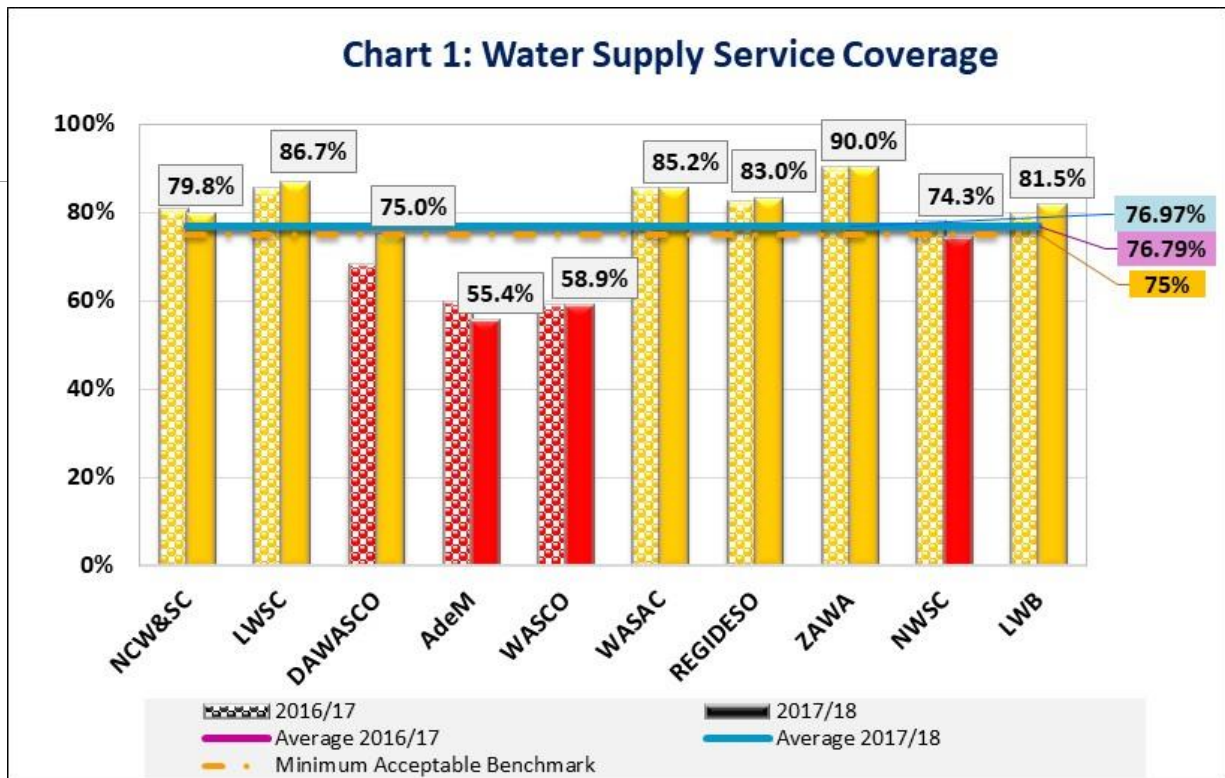
Water supply coverage considers the domestic population served through individual household connections, public standpipes and water kiosks. Table 8 shows the number of domestic water connections per Utility. For water coverage to grow, there must essentially be a corresponding growth in domestic connections against population increases. However, it must also be noted that public taps tend to serve large populations.

Table 8: Domestic Water Connections

Utility	Domestic Connections 2016/17	Domestic Connections 2017/18
NCW&SC	342,879	313,937
LWSC	93,417	99,912
DAWASCO	187,413	211,043
AdeM	243,143	244,332
WASCO	84,554	94,363
WASAC	182,938	192,301
REGIDESO	84,530	88,939
ZAWA	92,907	97,386
NWSC	430,463	479,429
LWB	62,698	73,791

Nine of the ten Utilities reported increases in the number of domestic water connections with the exception of NCW&SC. The biggest increases were made by NWSC, DAWASCO and LWB with additions of 48,966; 23,630 and 11,093 connections, respectively. The drop by NCW&SC was as a result of database clean ups.

Chart 1 shows the water supply service coverage per Utility. The average service coverage remained the same and slightly above the acceptable benchmark of 75%. This is despite a number of Utilities either stagnating or slightly dropping in the indicator. Nonetheless, seven Utilities met the acceptable benchmark, namely; NCW&SC, LWSC, DAWASCO, WASAC, REGIDESO, ZAWA and LWB.



5.4.1.2. Sewerage Service Coverage

Due to unreliability of data regarding septic tanks and other forms of sanitation at the moment, only the sewerage services by network were considered. It must be noted that in Malawi, Mozambique and Rwanda, separate entities for sewerage and sanitation services exist¹, hence only NCW&SC, LWSC, DAWASCO, WASCO, NWSC, REGIDESO and ZAWA which provide sewerage services, were analysed.

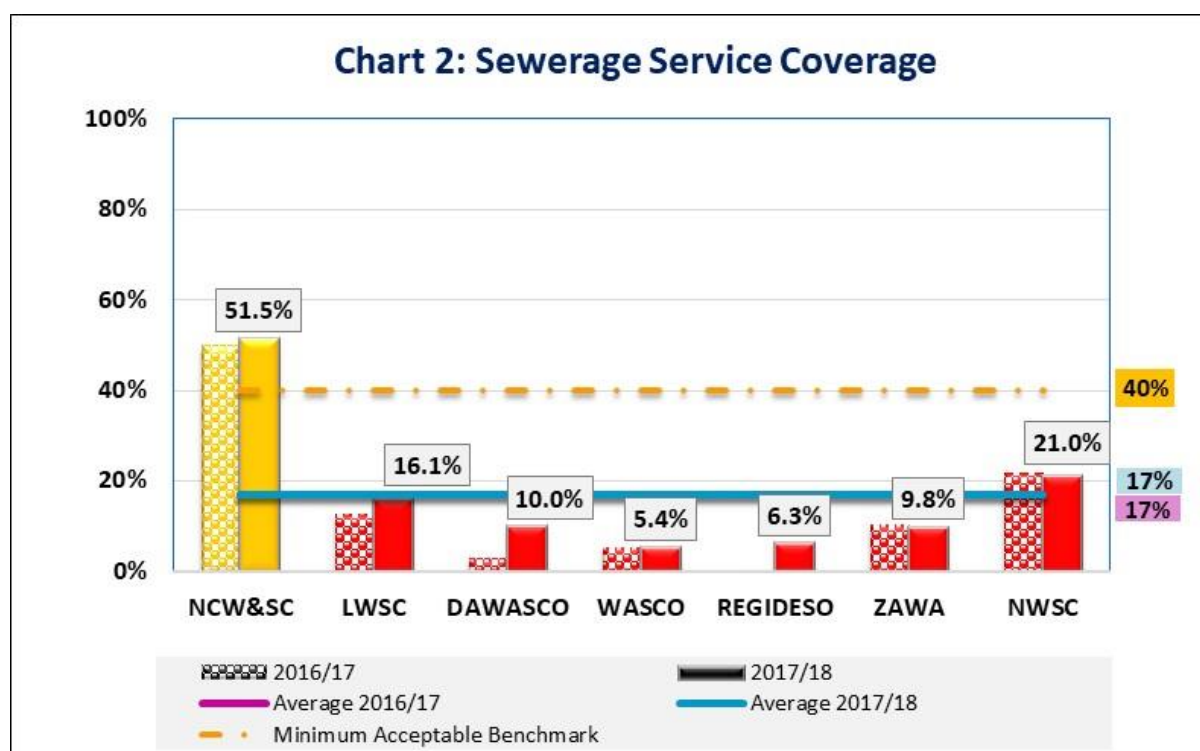
The number of sewerage connections are shown in Table 9 while service coverage is depicted in Chart 2.

From Table 9, NCWSC had the biggest increase in sewerage connections, having brought on board 4,472 more customers. DAWASCO also had a significant increase in the connections, having added 1,692 customers on the sewerage network. The other Utilities recorded only marginal growths in their sewerage connections while WASCO and ZAWA did not record any movements. It must also be stated that REGIDESO requires a thorough inventory of the client base.

¹ The Local Authorities in Malawi are still mandated to provide sanitation services, while this regulatory aspect is still under discussion in Mozambique, with City Councils providing sewerage services. In Rwanda, Kigali does not have a centralised sewer system and the private operator providing sewerage services is not under regulation.

Table 9: Sewerage Connections per Utility

Utility	Sewerage Connections 2016/17	Sewerage Connections 2017/18
NCW&SC	239,623	244,095
LWSC	32,276	32,396
DAWASCO	19,111	20,803
WASCO	7,463	7,463
REGIDESO	N.D ²	5,000
NWSC	21,072	21,616
ZAWA	3,000	3,000



The coverage by sewerage network remained significantly below the minimum acceptable benchmark as can be seen in Chart 2. This implies that the majority of residents in the cities benchmarked rely on other forms of sanitation, presumably onsite facilities. Studies done in cities such as Lusaka suggest that most of these onsite facilities are not constructed to standard and are a major cause of groundwater contamination, that consequently leads to outbreaks of waterborne diseases if such water is consumed untreated³. This underscores the urgent and critical need for Regulators and Utilities to embrace onsite sanitation and ensure all onsite facilities are constructed to acceptable standards and that eventual faecal sludge is properly collected, treated and disposed of safely to safeguard public health.

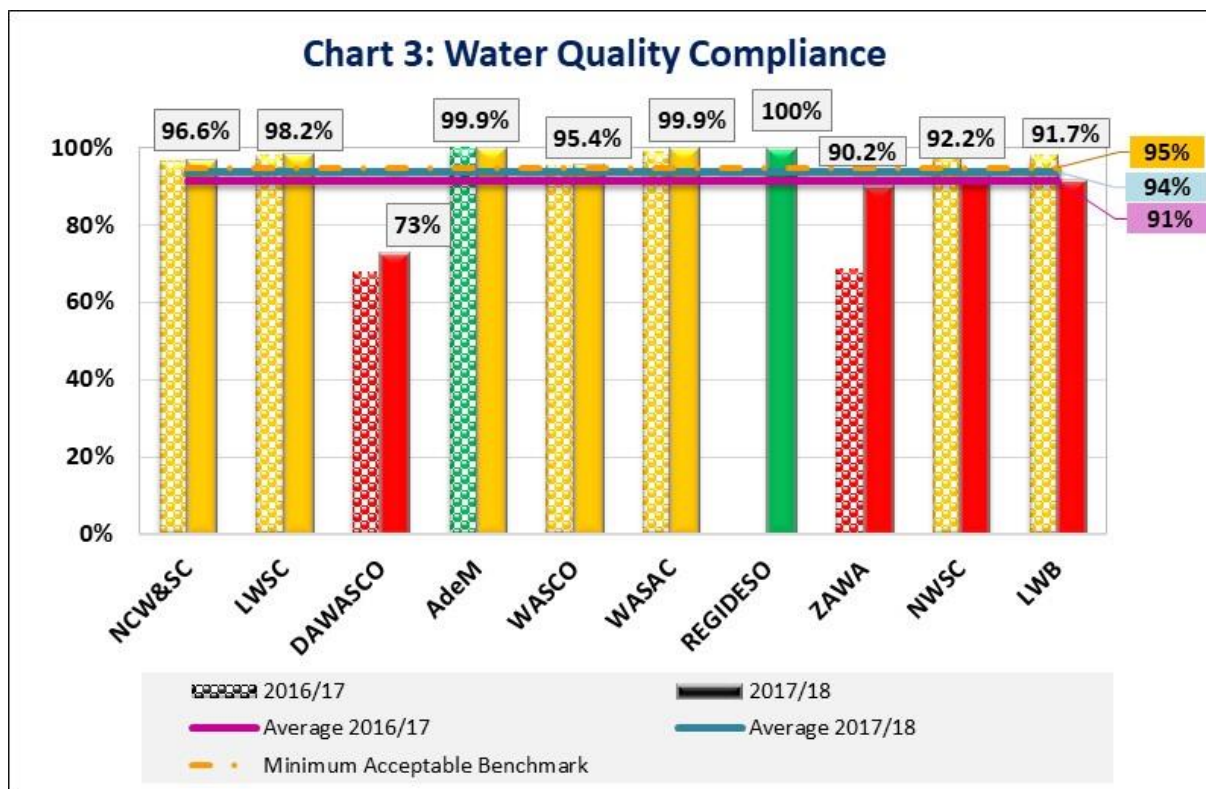
² N.D – No data

³ Water Risks and Solutions Assessment for the Lusaka Water Security Initiative – Zambia, www.luwsio.org

5.4.1.3. 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.

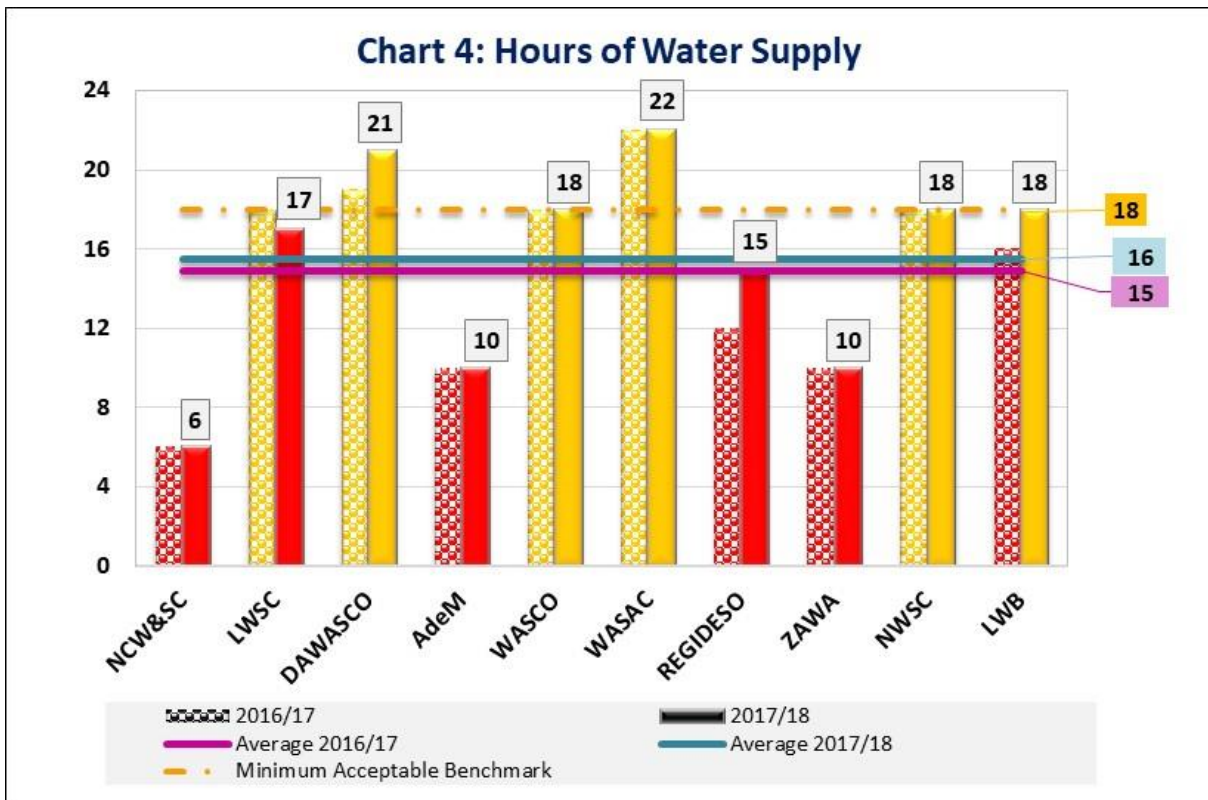
Therefore, the drinking water quality result presented in Chart 3 is a composite indicator considering compliance in the parameters of Residual Chlorine (40%) and Bacteriological (60%) in terms of number of tests carried out against the required and number of tests meeting the respective national standards.



Despite an improvement in the average water quality compliance to 94%, this was below the revised acceptable benchmark of 95% as is depicted in Chart 3. DAWASCO still remained significantly below the acceptable benchmark and the Utility must institute immediate measures to ensure improvement. ZAWA, NWSC and LWB also failed to meet the acceptable benchmark in water quality compliance. The failures for DAWASCO, ZAWA and NWSC were primarily because of fewer tests conducted than were required by national guidelines for both chlorine residue and microbiology. Similarly, the failure to meet the acceptable benchmark by LWB was because fewer bacteriological tests were conducted than were required.

5.4.1.4. Hours of Water Supply

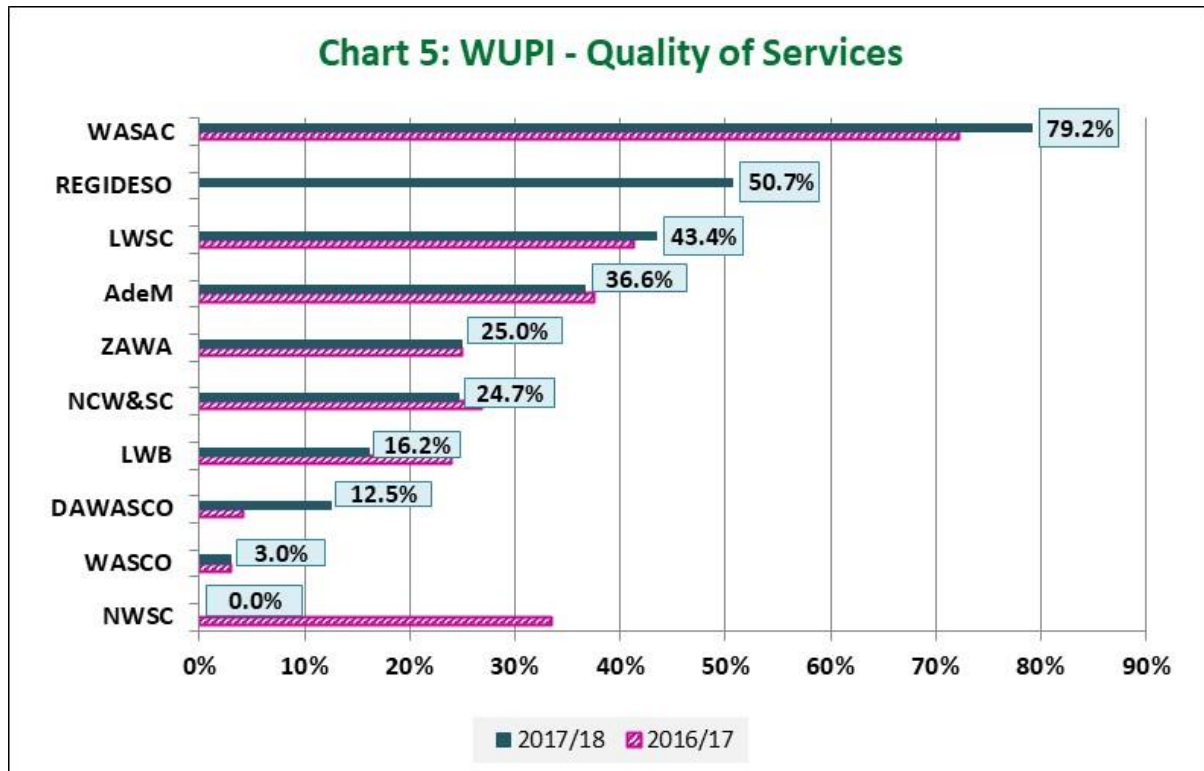
Hours of Supply refers to the average number of hours per day that a Utility provides water to its customers. It measures the continuity of services of a Utility and thus the availability of water to the customer. It is an important indicator of quality of service and shows the extent to which the Utility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



As depicted in Chart 4, the average hours of supply marginally increased to 16 but still fell below the revised acceptable benchmark of 18. DAWASCO, WASCO, WASAC, NWSC and LWB achieved the acceptable benchmark while the rest of the Utilities fell below it. Worryingly, NCW&SC, Adem and ZAWA had extremely low hours of supply. This in part, could be attributed to impacts of climate change that have already begun to be experienced in the region.

5.4.1.5. 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.



Despite stagnation in nearly all the indicators, WASAC still maintained the best performance in the WUPI-Quality of Services, mostly because of strong performance in water quality compliance, hours of supply and water supply coverage. REGIDESO made the biggest leap into second position from eighth while LWSC dropped to third position from second.

The biggest drop was seen in NWSC who slid to the last position from third on the WUPI –quality of services, impacted greatly by the revision in benchmarks.

5.4.2. ECONOMIC EFFICIENCY

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.

It must be noted however, that the countries saw different economic performance outlooks in the period 2017/2018 that could have affected Utility performance. According to the World Bank, non-resource-intensive economies such as Kenya, Rwanda and Uganda recorded solid economic growth in 2018. On the other hand, most countries in Sub-Saharan Africa saw slow

growth at about 2.3% down from 2.5% in 2017. This was attributed to global uncertainty, domestic macroeconomic instability, poorly managed debt, inflation and deficits, among others.⁴

5.4.2.1 Comparison of Residential Water Bill

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 sewerage charges.

The comparison of a residential water bill in Table 10 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 10: Comparison of Residential Water Bill

Utility	Lifeline Consumption at 5m ³ (\$)	Bill at 30m ³ (\$)	Average domestic bill (\$)
NCW&SC	2.00	14.47	6.85
LWSC	2.19	15.28	20.87
DAWASCO	3.65	21.91	12.61
AdeM	2.04	20.73	5.33
WASCO	1.83	35.90	5.83
WASAC	1.90	33.64	6.51
REGIDESO	0.86	6.77	4.72
ZAWA	1.47	15.00	1.75
NWSC	6.30	35.36	8.05
LWB	2.25	24.75	12.46

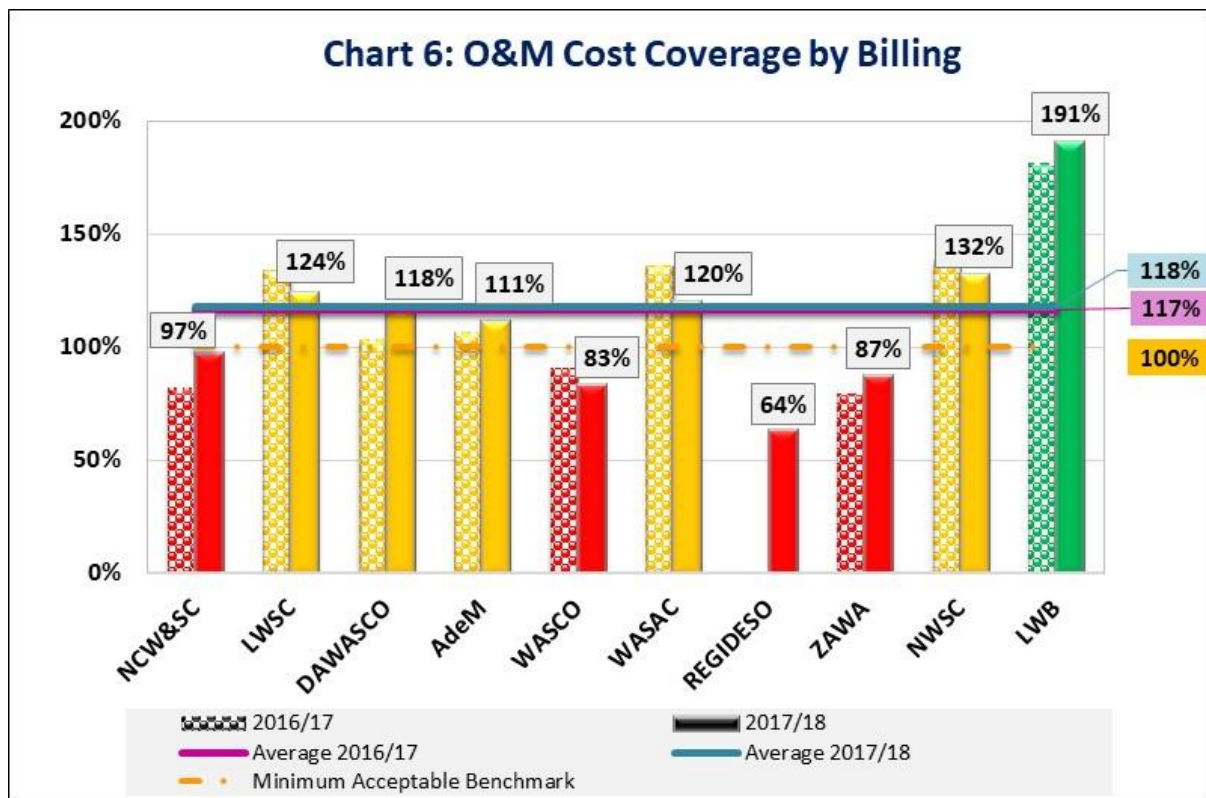
As shown in Table 10, NWSC and DAWASCO had the highest charges for the lifeline consumption bill while REGIDESO, ZAWA and WASCO had the lowest, charging less than US\$2 for 5m³. At an assumed consumption of 30m³, WASCO, WASAC and still again NWSC, had the highest bills of over US\$30. On the other hand, REGIDESO had the lowest bill of US\$6.77, significantly below all the other Utilities.

⁴ Taking the Pulse of Africa's Economy_ <https://www.worldbank.org/en/region/afr/publication/taking-the-pulse-of-africas-economy>

For the average domestic bills, only LWSC showed that on average, customers consumed above 30m³. All the other Utilities' bills showed that on average consumption was between 5 and 30m³, with clients of REGIDESO, ZAWA and NWSC showing consumption tendencies close to the lifeline bracket of 5m³. This could imply a number of things, among them; lower consumption owing to low sewerage coverage or that customers are resorting to alternative water sources for some chores.

5.4.2.2 Operation and Maintenance Cost Coverage by Billing

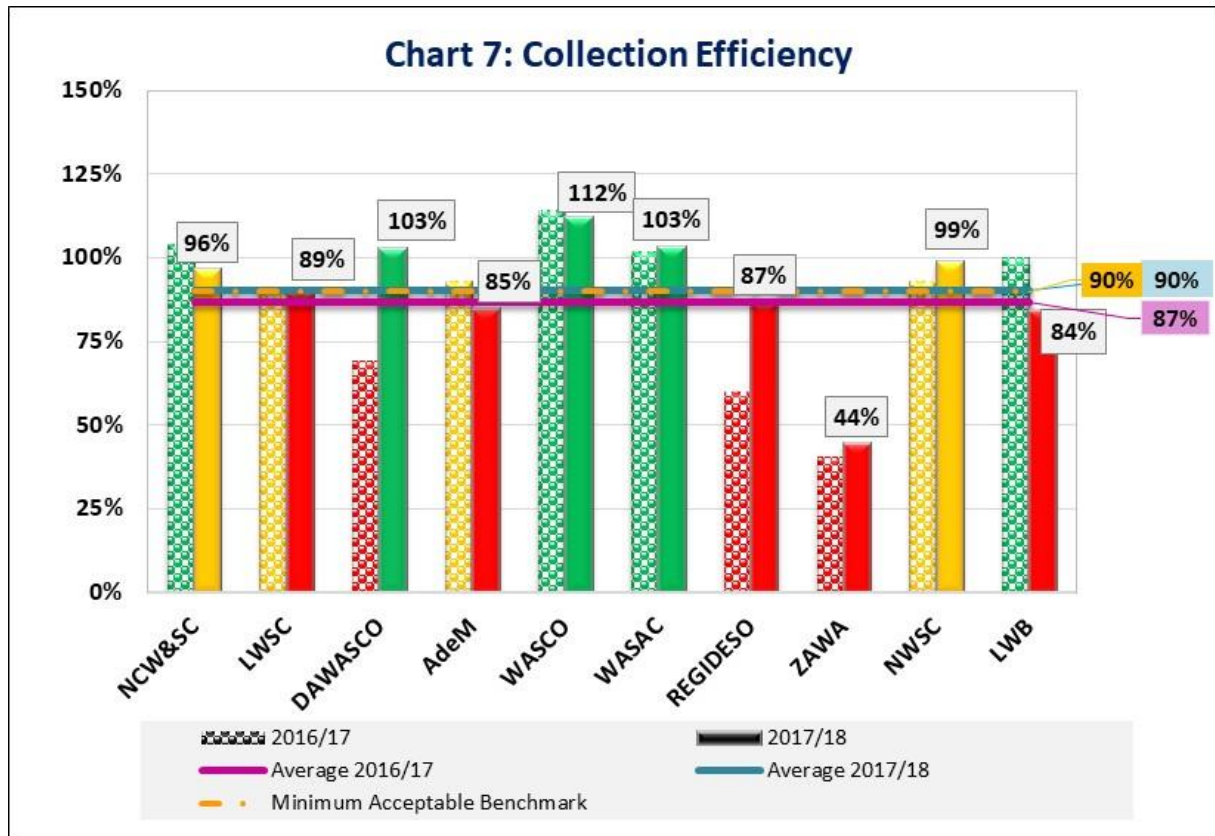
Operation and Maintenance (O&M) Cost Coverage is the extent to which internally generated funds through billing for water and sewerage services, cover the cost of running a utility. It is a measure of the financial sustainability of a Utility. It is desirable that Utilities achieve full cost coverage at some point. However, it is assumed that at 150% O&M Cost Coverage, a Utility is able to undertake some capital investments in addition to meeting its O&M costs.



From Chart 6, LWB impressively exceeded the good benchmark of 150% and was the only Utility to ever achieve this feat since the introduction of this regional benchmarking. The average O&M Cost Coverage by Billing also grew marginally to 118%, above the minimum acceptable benchmark of 100%. Nonetheless, NCW&SC, WASCO, REGIDESO and ZAWA still remained below the minimum acceptable benchmark. This was despite NCWS&C's efforts to reduce costs. On the other hand, WASCO's costs grew much higher than the revenue, while REGIDESO saw a reduction in revenue.

5.4.2.3. 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 90% are a key factor in sustaining financial performance of water and sanitation service Utilities.



In the period under review, the average collection efficiency was at the minimum acceptable benchmark of 90%. DAWASCO, WASCO and WASAC achieved collection efficiencies of over 100% implying they collected arrears from the previous period or advance payments, in addition to receipts from bills in the period under consideration. LWSC, AdeM, REGIDESO, ZAWA and LWB recorded collections below the acceptable benchmark.

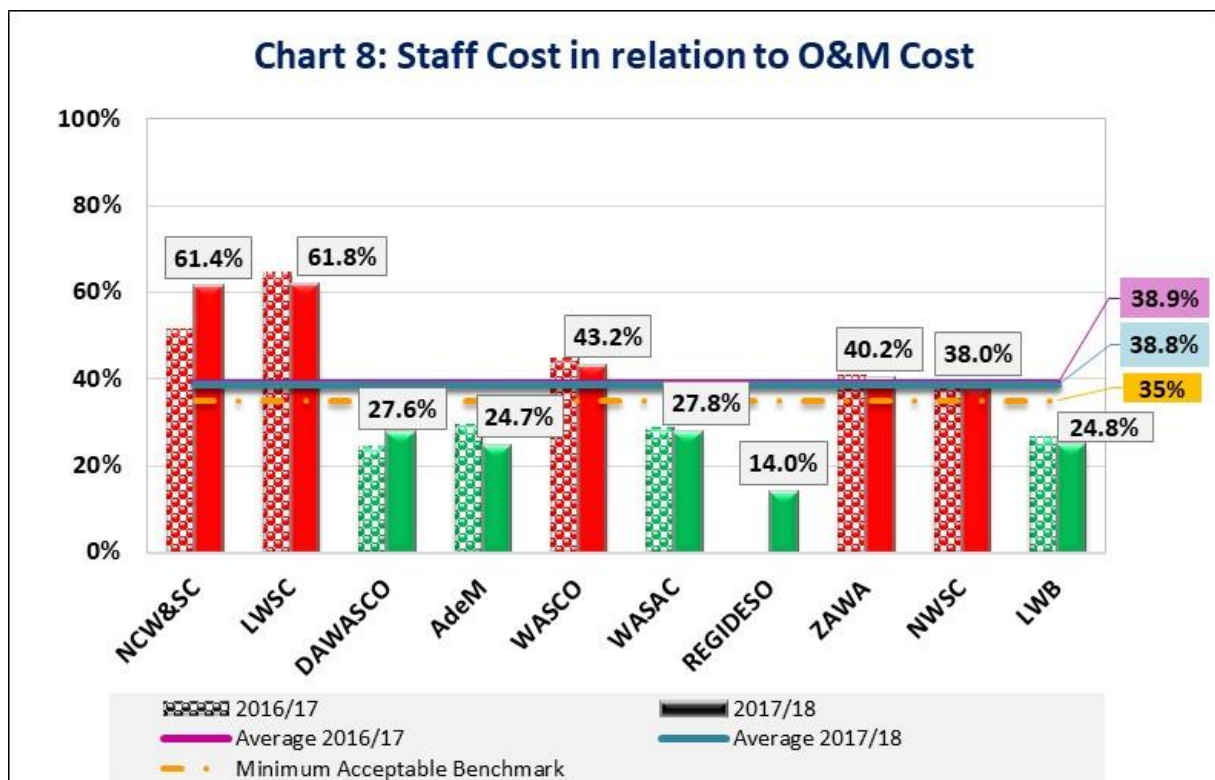
5.4.2.3. Staff Cost as a proportion of O&M Costs

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 11.

Table 11: Total Staff per Utility

Utility	Total Staff 2016/17	Total Staff 2017/18
NCWSC	3,511	3,554
LWSC	923	905
DAWASCO	1,055	1,060
AdeM	812	809
WASCO	603	555
WASAC	594	581
REGIDESO	591	569
ZAWA	606	602
NWSC	3,131	3,452
LWB	498	534

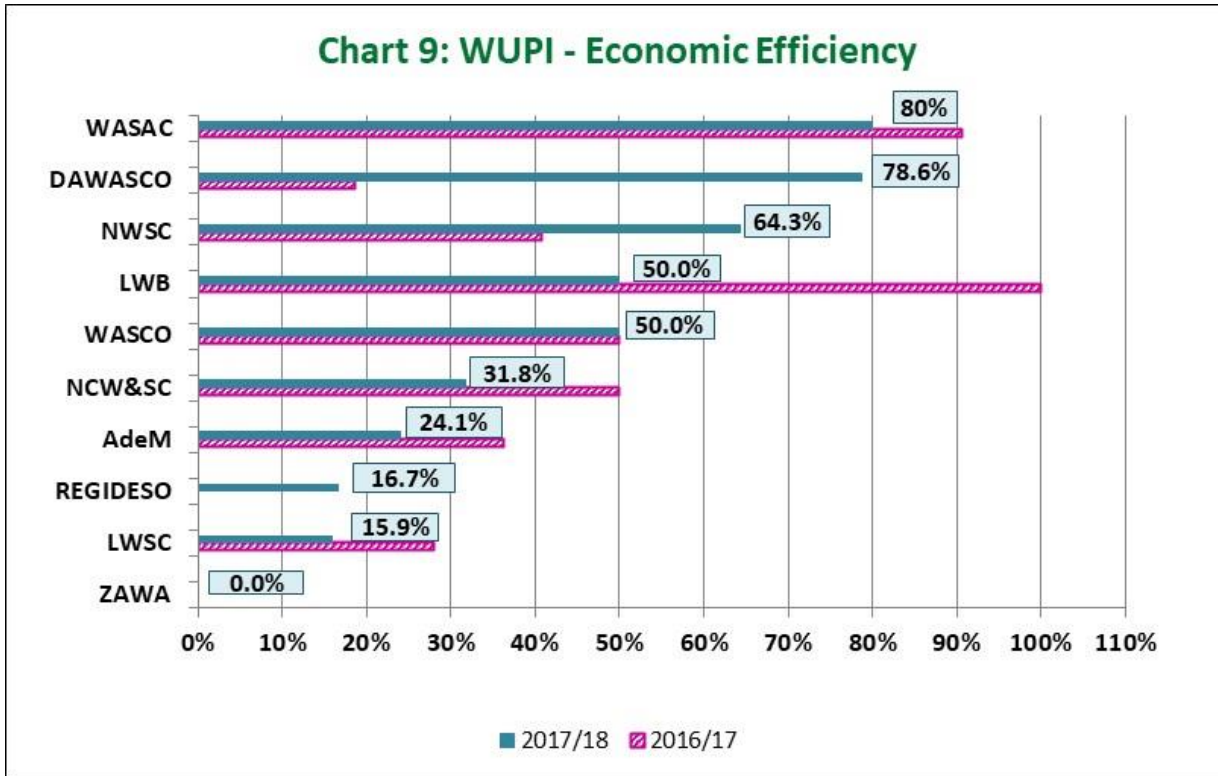
NWSC saw a drastic increase in the number of staff by over 300 employees from the previous period while WASCO recorded a significant reduction in the staff complement owing to separations.



Regarding staff costs versus O&M costs, five Utilities met the good benchmark, having achieved less than 30% proportions in staff costs. These were DAWASCO, AdeM, WASAC, REGIDESO and LWB. On the other hand, LWSC and NCWSC had the highest proportions of staff costs both at over 60% and way above the acceptable benchmark. At such high levels, there is a risk that other areas of operations, such as maintenance, may be compromised.

5.4.2.4. Integrated Performance –Economic Efficiency

The WUPI-economic efficiency, 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 and Staff Cost as a proportion of O&M Costs.



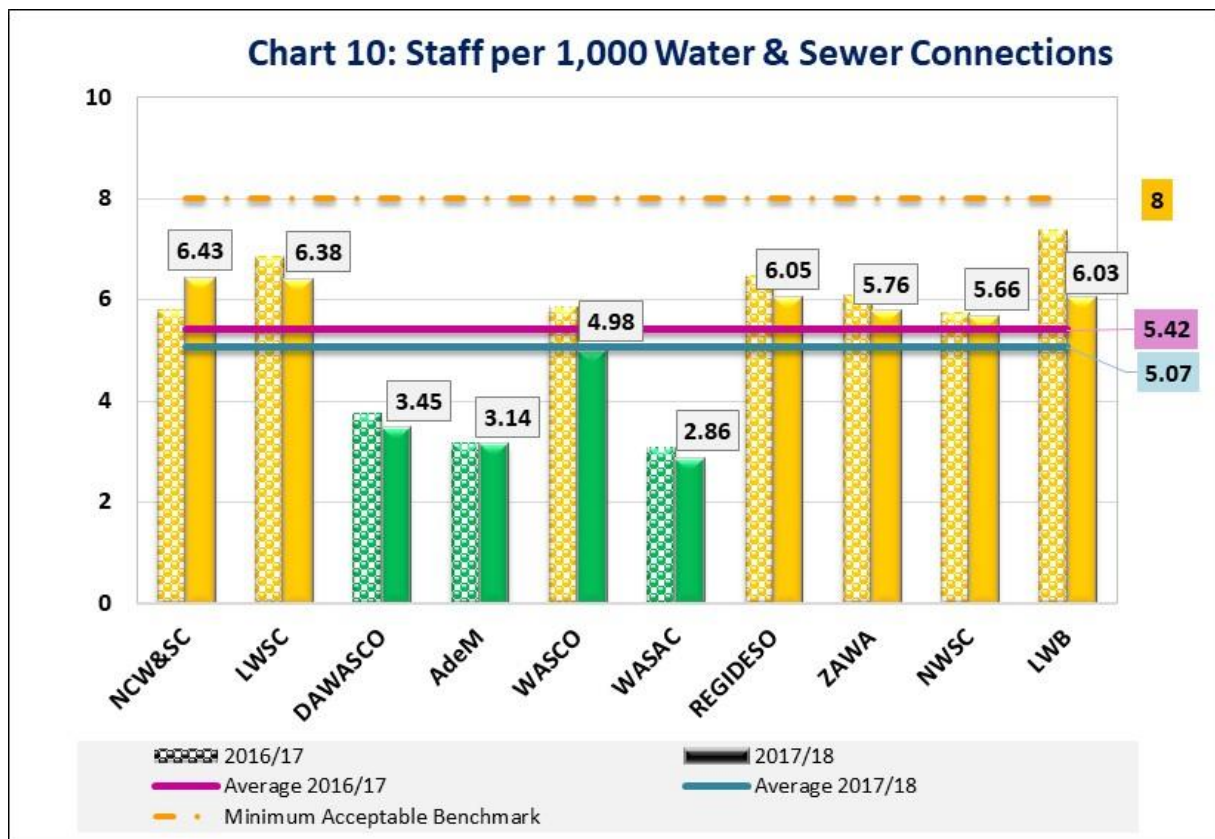
Despite a drop in the WUPI – Economic Efficiency score from 91% in previous period to 80% in the period under review, WASAC still maintained 1st position. DAWASCO made a significant improvement after only achieving 18.6% in the previous period. This performance was aided by improvements in O&M cost coverage and collection efficiency indicators. The WUPI – Economic Efficiency rating for NCW&SC, AdeM and LWSC significantly dropped after unfavourable performances in collection efficiency and staff costs in relation to O&M cost indicators. And yet again, ZAWA recorded the least score after failing to meet the acceptable benchmarks in all of the three indicators under consideration.

5.4.3 OPERATIONAL SUSTAINABILITY

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

5.4.3.1. Staff per 1,000 Water and Sewer Connections

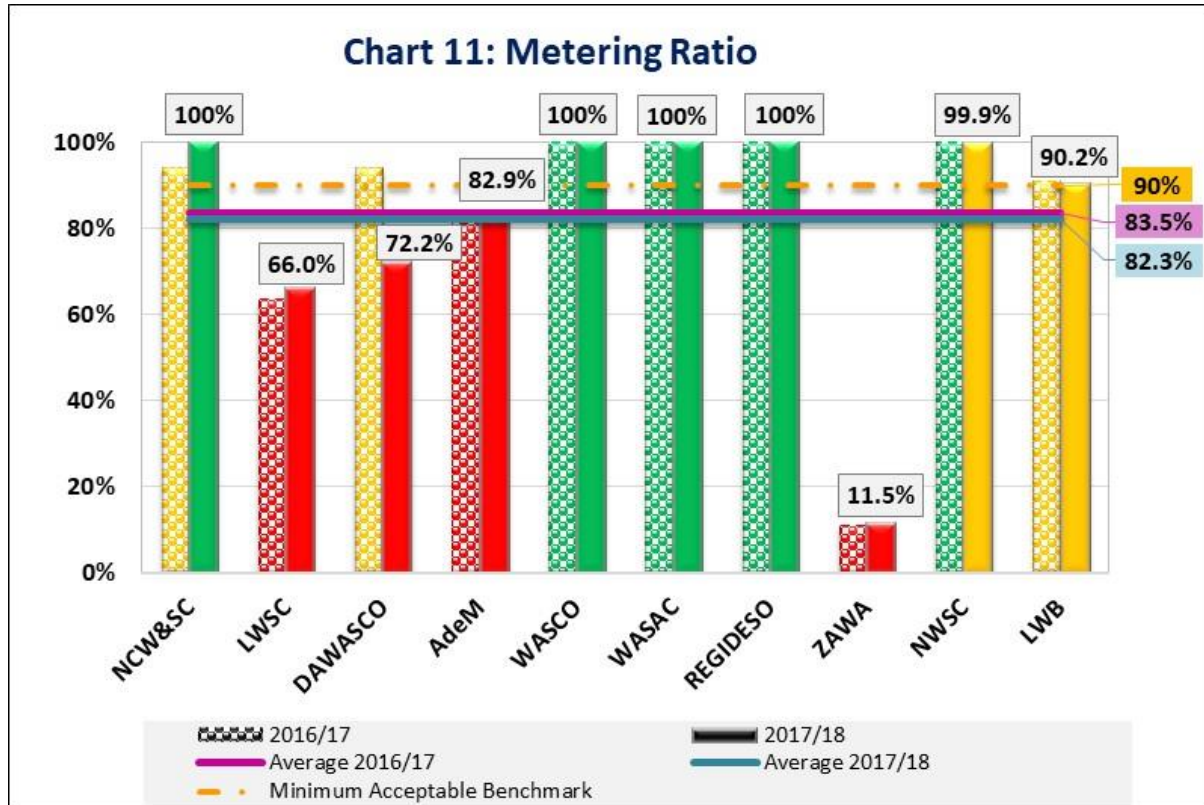
Staff per 1,000 Water and Sewer Connections, shown in Chart 10, indicates the number of employees servicing 1,000 connections. It measures the efficiency of Utilities in utilising their staff and hence a low figure is desirable. However this measure is affected by factors such as nature of human settlement,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



All the Utilities met the acceptable benchmark for staff per 1,000 water and sewer connections with all of them recording improvements except for NCW&SC. Correspondingly, the average performance improved from 5.42 to 5.07 in period under consideration. Furthermore, DAWASCO, AdeM and WASAC had maintained the status of having achieved the ‘good’ desired benchmark of 5 and were joined by WASCO who made a strong improvement from 5.85 to 4.98, largely aided by reduction in number of staff. Suffice to mention that AdeM and WASAC do not provide sewerage services.

5.4.3.2. 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.



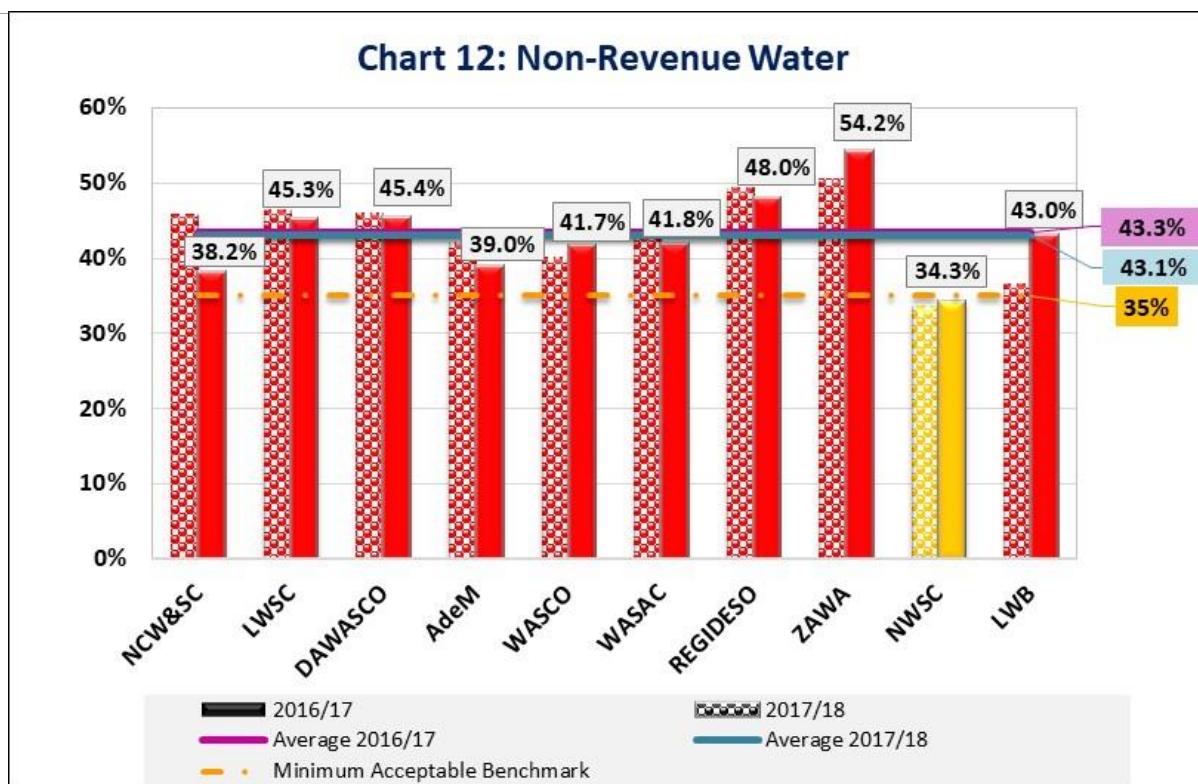
From Chart 11, WASCO, WASAC and REGIDESO maintained metering statuses of 100% and were matched on this achievement by NCW&SC who made an improvement from 94%. However, the average metering ratio declined slightly from 83.5% in the previous period to 82.3% and was still below the revised acceptable benchmark of 90%. This was largely driven by the decline in performance of DAWASCO on the indicator whose ratio decreased from 94% to 72%.

5.4.3.3. Water Losses

Non-Revenue Water (NRW) is water that has been placed in the distribution system but is either lost before reaching the customer or does not translate into revenue at a predetermined price. It measures the efficiency of a Utility in delivering the water it produces to customers' take-off points against the revenue generated. It is made up of technical losses (leakages) and 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.

Despite the efforts of most Utilities to reduce NRW as is shown in Chart 12, the average performance was almost stagnant at 43.1%, with almost all the Utilities above the acceptable

benchmark of 35%. With climate change impacts being experienced in parts of the region, this is an area that needs urgent prioritisation and concerted efforts by Utilities to reduce the scourge. Only NWSC was able to meet the acceptable benchmark despite seeing a marginal increase in its NRW.



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 12.

Table 12: Non Revenue Water in terms of Length of Network and Connections

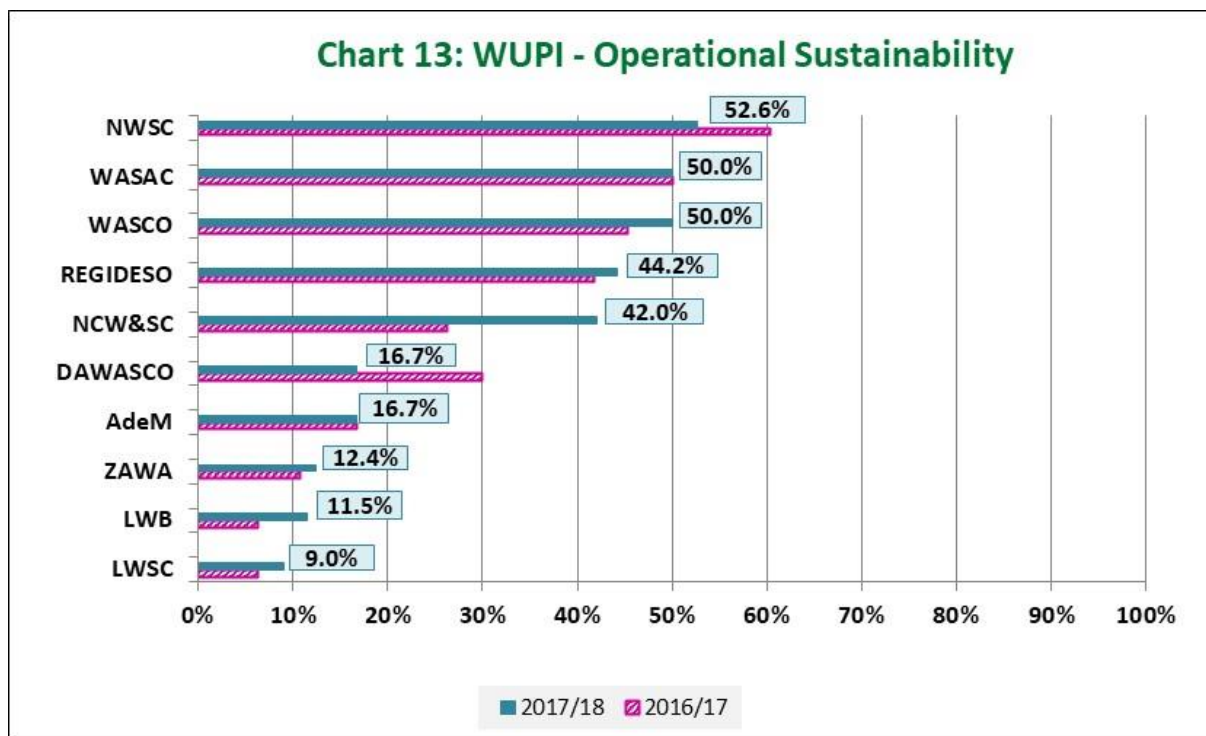
Utility	Length of Network (km)	Water Production (m ³)	Water Connections	Non-Revenue Water		
				%	m ³ /km/day	L/con/day
NCW&SC	N.D	172,880,959	308,612	38.2%	-	586.3
LWSC	1,946	84,695,302	109,454	45.3%	54.0	960.4
DAWASCO	2,507	149,225,271	286,115	45.4%	74.0	648.7
AdeM	3,000	61,901,100	258,030	39.0%	22.0	256.3
WASCO	2,197	22,424,706	104,000	41.7%	11.7	246.3
WASAC	11,490	48,082,378	203,070	41.8%	4.8	271.2
REDIGESO	50,187	51,057,090	89,058	48.0%	1.3	753.9
ZAWA	2,470	56,750,400	101,444	54.2%	34.1	830.7
NWSC	14,466.38	126,191,432	587,863	34.3%	8.2	201.7
LWB	1,806.55	36,917,799	88,575	43.01%	24.1	491.1

*N.D - no data was available

From Table 12, DAWASCO, LWSC and ZAWA had the highest NRW per kilometre length per day of 74, 54 and 34.1m³/km/day, respectively. In terms of litres per connection per day, LWSC had the highest NRW at 960 and was followed by ZAWA at 831 then REDIGESO at 754L/con/day. Despite the high loss per connection, REDIGESO had the lowest NRW per network length of only 1.3m³/km/day.

5.4.3.4. Integrated Performance – Operational Sustainability

The WUPI - Operational Sustainability 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. In this indicator, NWSC came out first and was followed by WASAC and WASCO, both in second place. NWSC’s position on WUPI Operational Sustainability was strengthened after exceptional performance in metering ratio and NRW indicators. Similarly, both WASAC and WASCO had performed well in metering ratio and staff per 1,000 connections indicators. On the other hand, ZAWA, LWB and LWSC had unsatisfactory performances on the WUPI Operational Sustainability after underwhelming performance on NRW and metering ratio indicators.



5.5 SUMMARY ANALYSIS

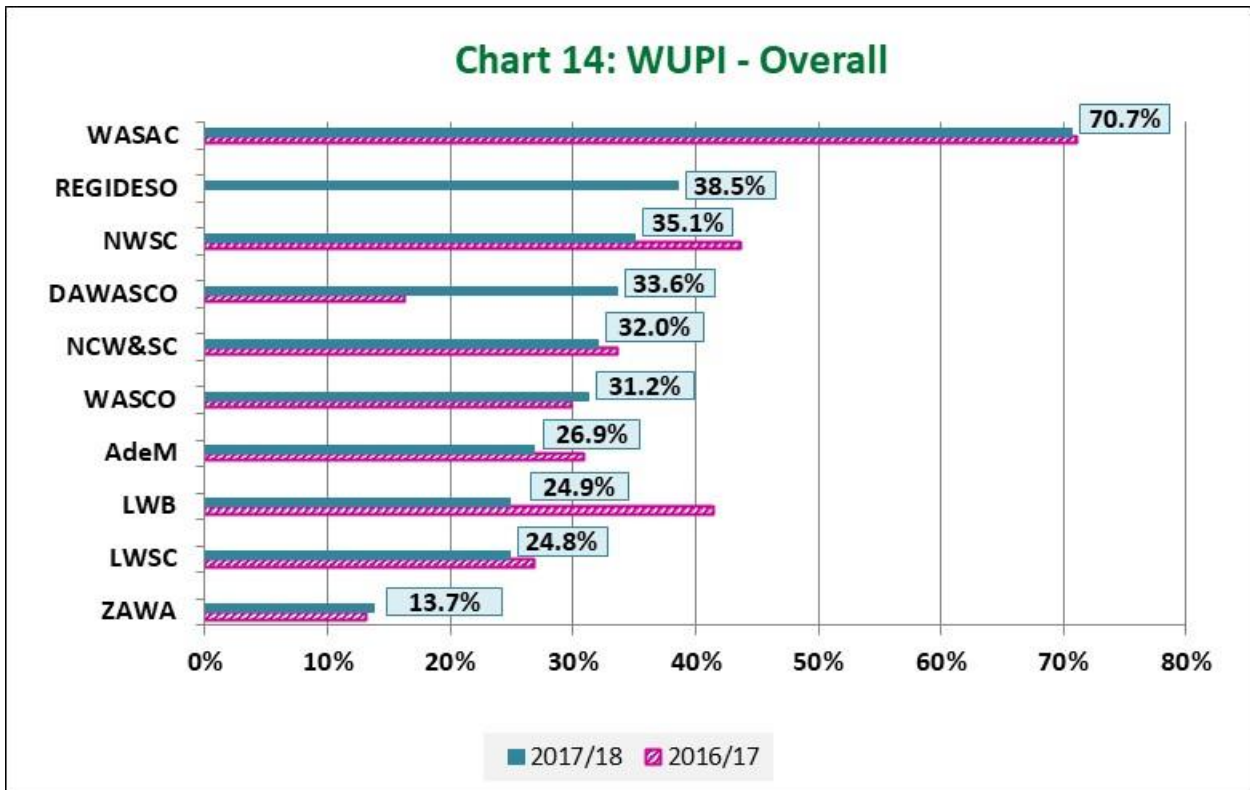
A summary of the Utilities' performance analyses is highlighted using the ten selected single KPIs in Table 13 and an Overall WUPI in Chart 14. The Overall WUPI is derived by aggregating the three WUPIs of Quality of Services, Economic Efficiency and Operational Sustainability.

Table 13: Summary of Utility Performance

KPI		NCW&SC	LWSC	DAWASCO	AdeM	WASCO	WASAC	REDIGESO	ZAWA	NWSC	LWB
Quality of Services	Water Coverage	79.8%	86.7%	75.0%	55.4%	58.9%	85.2%	83.0%	90.0%	74.3%	81.5%
	Sewerage Coverage	51.5%	16.1%	10.0%	-	5.4%	-	6.3%	9.8%	21.0%	-
	Water Quality	96.6%	98.2%	72.7%	100%	95.4%	99.9%	100%	90.2%	92.2%	91.72%
	Hours of Supply	6	17	21	10	18	22	15	10	18	18
Economic Efficiency	O&M Cost Coverage	97.3%	123.8%	118.0%	111.1%	83.0%	120.0%	63.6%	87.0%	132.0%	190.57%
	Collection Efficiency	96.4%	89.4%	102.9%	84.6%	112.1%	103.2%	86.6%	44.3%	98.6%	84%
	Staff Cost vs O&M Costs	61.4%	61.8%	27.6%	24.7%	43.2%	27.8%	14.0%	40.2%	38.0%	24.8%
Operational Sustainability	Staff/1,000 W&S Connections	6.43	6.38	3.45	3.14	4.98	2.86	6.05	5.76	5.66	6.03
	Metering Ratio	100.0%	66.0%	72.2%	82.9%	100%	100%	100%	11.5%	99.9%	90.16%
	NRW	38.2%	45.3%	45.4%	39.0%	41.7%	41.8%	48.0%	54.2%	34.3%	43.01%

The Utilities performed fairly well in water coverage, staff/1000 water and sewerage connections, and O&M cost coverage by billing indicators. This was also reflected in the average performance where the minimum acceptable benchmarks were met in the three indicators. On the other hand, they continued to fare poorly in non-revenue water and sewerage coverage.

From the Overall WUPI in Chart 14, WASAC of Rwanda retained the first position while the second position was taken by REGIDESO of Burundi. NWSC and DAWASCO took third and fourth positions respectively. A notable drop was seen in WASCO to sixth position and despite some improvements, ZAWA ranked the lowest on the overall WUPI indicator.



CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

Benchmarking spurs improvements in industry performance by revealing system weaknesses and providing opportunity for enhancing operational efficiencies. Thus, it is expected that Utilities benchmarked in this report will interrogate their own operations further, draw upon the inspiration of others and embrace good practices as they strive to make improvements.

As could be seen in preceding sections, the performance of the Utilities in the reporting period of 2017/2018 varied from one class of indicators to the other. Generally, there was little progress made in the 'Quality of Service' indicators as compared to the other categories. In brief, the performance by category of indicators is highlighted below:

- **Quality of Service** – a few Utilities made strides towards reaching the acceptable benchmark for water coverage. Notable was DAWASCO who made the biggest percentage leap to attain the minimum acceptable benchmark of 75%. On the other hand, the sewerage coverage indicator showed very little progression with most of the Utilities below 30% coverage. Only six Utilities met the good benchmark on water quality compared to seven in the previous period. On average hours of supply, the trend fluctuated; while DAWASCO and LWB recorded improvements, NCW&SC, AdeM and ZAWA stagnated in average hours of supply. Generally, the picture on 'Quality of Service' indicators calls for continued and sustained efforts if SDGs are to be realised.
- **Economic Efficiency** – There was a general improvement in collection efficiency and Staff Costs vs O&M cost and O&M cost coverage indicators in a number Utilities. However, if financial viability is to be achieved, Utilities have to ensure costs are contained further while also ensuring steady growth in revenue.
- **Operational Sustainability** – The Utilities continued to perform well in the staff efficiency indicator; Staff/1,000 water and sewerage connections. Metering ratio also showed an improving trend for most Utilities with only DAWASCO recording a significant drop from 98% to 72%. This pushed the averaged metering ration marginally down. However, NRW remained unacceptably high and continues to threaten sustainability of Utilities. It is hoped that with NRW being one of the focus areas of ESAWAS member countries, this indicator will begin to show improvements with planned interventions.

Thus, the following conclusions and recommendations can be drawn for each individual Utility:

- **NCW&SC:** the Kenyan Utility commendably increased metering ratio to 100%. It also increased sewerage coverage to over 51% and had the highest coverage among all Utilities. However, it had the lowest hours of supply and needs to concert efforts to improve in this aspect. It must also ensure it contains costs, particularly staff costs, to ensure recommended balance with respect to O&M costs.

- **LWSC:** the Zambian utility performed well in water quality monitoring compliance but ranked least in Operational Sustainability after performing poorly in metering ratio and non-revenue. It generally slipped on WUPI ratings and needs to focus efforts on controlling staff costs in relation to O&M costs, its NRW and further improve metering ratio. Furthermore, the company needs to improve its sewerage coverage.
- **DAWASCO:** the Tanzanian Utility improved hours of water supply and had very good collection efficiency and staff costs in relation to O&M costs. However, Utility must improve the low sewerage coverage, metering ratio as well as enhance water quality monitoring.
- **AdeM:** the Mozambican utility had very good staff costs in relation to O&M costs but generally stagnated in performance. It however, saw a decrease in the Economic Efficiency indicators attributed to lower collection efficiency. The Utility therefore, needs to focus efforts to improve water coverage, metering ratio, hours of supply and collection efficiency.
- **WASCO:** the Lesotho Utility's performance Overall WUPI improved slightly largely driven by Operational Sustainability indicators, metering ratio and staff per 1,000 water and sewerage connections. Nonetheless, they Utility needs to extend services and improve both the water and sewerage coverages as well as its NRW. The Utility also needs to improve its cost coverage.
- **WASAC:** Despite a slight reduction in the Overall WUPI, the Rwandese Utility maintained its high performance in the components of Quality of Services and Operational Sustainability. This was sufficient to retain the rank of best performing Utility. Nonetheless, there is scope for the Utility to further improve its water supply coverage and NRW.
- **REDIGESO:** the Burundian Utility made steady progress in all three categories of indicators and subsequently, improved its Overall WUPI rating. Nonetheless, concerted effort is required in improving both water and sewerage coverage, hours of water supply and NRW. The Utility also needs to improve its O&M cost coverage through revenue enhancement measures.
- **ZAWA:** the Zanzibari Utility made some improvements in the Quality of Services and Operational Sustainability indicators, however, this was not sufficient to see it rank the least overall. While improvement is required generally, the Utility needs to concert efforts at improving hours of supply, metering ratio, NRW and collection efficiency. The four indicators somewhat intertwine and can drag general Utility performance down, hence, the need for prioritization. Suffice to say that three of these four indicators may be capital intensive (being hours of supply, metering ratio and NRW) and may require significant capital injection by shareholders and other stakeholders.

- **NWSC:** the Ugandan Utility is the only service provider to have met the acceptable benchmark on NRW. It also improved on the Economic Efficiency indicator after commendable improvement in collection efficiency to almost 100%. However, its performance declined slightly on Quality of Services and Operational Sustainability indicators, leading to a slide on the Overall WUPI rating. This therefore, requires the Utility to improve both water and sewerage coverages, water quality compliance and as well as contain further the staff costs in relation to O&M costs.
- **LWB:** the Malawian Utility participated in the benchmarking process for the first time and fared relatively well. The Utility had the highest O&M cost coverage and also met the good benchmark for staff costs in relation to O&M costs. However, the Utility needs to concert efforts to reduce NRW to within acceptable limits, improve collection efficiency as well as increase water supply coverage.

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
AURA IP		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. DWASACO 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 6,012,819 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> <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>6,012,819</td> </tr> <tr> <td>Total Water Connections</td> <td>286,115</td> </tr> <tr> <td>Total Waste Water/Sanitation Connections</td> <td>20,803</td> </tr> <tr> <td>Total Production/year</td> <td>149,225,271m³</td> </tr> <tr> <td>Total Staff</td> <td>1,060</td> </tr> <tr> <td>Annual O&M Costs</td> <td>TZS 86,835,167,000</td> </tr> <tr> <td>Annual Water and Sewerage billing</td> <td>TZS 102,428,695,825</td> </tr> <tr> <td>Annual Water and Sewerage Collections</td> <td>TZS 105,359,238,134</td> </tr> </table>	Abbreviation	DAWASCO	Start of Operations	2005	Number of Towns in Operation Area	3	Total Population in Operation/Service Area	6,012,819	Total Water Connections	286,115	Total Waste Water/Sanitation Connections	20,803	Total Production/year	149,225,271m ³	Total Staff	1,060	Annual O&M Costs	TZS 86,835,167,000	Annual Water and Sewerage billing	TZS 102,428,695,825	Annual Water and Sewerage Collections	TZS 105,359,238,134
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Tariff Structure	<p><i>*Exchange Rate: TZS2,277.77 to 1US\$ (2017/18)</i></p> <table border="1"> <thead> <tr> <th colspan="3" style="background-color: #e0e0e0;">Water</th> </tr> <tr> <th style="background-color: #e0f0e0;">Tariff Band</th> <th style="background-color: #e0f0e0;">Domestic Institutional Commercial Industrial</th> <th style="background-color: #e0f0e0;">Kiosks</th> </tr> </thead> <tbody> <tr> <td style="background-color: #e0f0e0;">TZS/m³</td> <td style="background-color: #e0f0e0;">1,663</td> <td style="background-color: #e0f0e0;">1,106</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2" style="background-color: #e0e0e0;">Sewerage</th> </tr> <tr> <th style="background-color: #e0f0e0;"></th> <th style="background-color: #e0f0e0;">All Categories</th> </tr> </thead> <tbody> <tr> <td style="background-color: #e0f0e0;">TZS./m³</td> <td style="background-color: #e0f0e0;">386</td> </tr> </tbody> </table> <p>Note :</p> <ul style="list-style-type: none"> No approved flat rate tariff, in case of faulty meter customers are billed according to the assessed average water consumption based on previous meter reading 	Water			Tariff Band	Domestic Institutional Commercial Industrial	Kiosks	TZS/m ³	1,663	1,106	Sewerage			All Categories	TZS./m ³	386							
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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 a 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 2,313,078 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	2,336,419
Total Water Connections	258,030
Total Waste Water/Sanitation Connections	N.A
Total Production/year	61,901,100 m ³
Total Staff	809
Annual O&M Costs	MT 1,779,762,569
Annual Water Billing	MT 1,978,003,000
Annual Water Collections	MT 1,673,704,000

Tariff Structure

*Exchange Rate: MT64 to 1US\$ (2018)

DOMESTIC					
Tariff Band	Service Availability rate (Fixed rate)	0 -5 m ³ (Fixed value)	The first 5m ³	5m ³ - 10m ³	Above 10m ³
	MT/Month	MT/Month	MT/Month	MT/m ³	MT/m ³
	60.00	58.40	132.66	39.80	54.29

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	19.87	1,386.97	2,773.94	55.48

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 15% 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 3,917,873 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	3,917,873
Total Water Connections	203,070
Total Waste Water/Sanitation Connections	Not applicable
Total Production/year	48,082,378m ³
Total Staff	581
Annual O&M Costs	FRW14,425,714,062
Annual Water and Sewerage billing	FRW17,314,526,258
Annual Water and Sewerage Collections	FRW17,860,879,696

Tariff Structure

*Exchange Rate: FRW894.36 to 1US\$ (2017/18)

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 685,938 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	685,938
Total Water Connections	104,000
Total Waste Water/Sanitation Connections	7,463
Total Production/year	22,424,706 m ³
Total Staff	555
Annual O&M Costs	M240,175,000
Annual Water and Sewerage billing	M199,354,000
Annual Water and Sewerage Collections	M223,509,252

Tariff Structure

*Exchange Rate: M14.71 to 1US\$ (2018)

DOMESTIC					
Tariff Band	0-5kl	> 5-10kl	> 10-15kl	>15 kl	Standpipe
M./m ³	5.53 (fixed)	9.39	16.52	22.78	7.50 (flat rate)
Standing Charge	0	45.05			

NON-DOMESTIC			
Category	Institutions	Non-Domestic	Churches/Schools
M./m ³	15.03	15.03	14.90
Standing Charge	433.30	299.98	216.66

Note:

- Sewerage charged on 85% of water consumed at M9.70
- Water closet customers charged on 60% of water consumed at M9.70

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 4,332,858. 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	4,332,858
Total Water Connections	308,612
Total Waste Water/Sanitation Connections	244,095
Total Production/year	172,880,959 m ³
Total Staff	3,554
Annual O&M Costs	KSHS 8,709,903,550
Annual Water and Sewerage billing	KSHS 8,478,139,252
Annual Water and Sewerage Collections	KSHS 8,168,836,000

Tariff Structure

*Exchange Rate: KSHS101.99 to 1US\$ (2017/18)

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	30
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 1 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 Water Development, Sanitation and Environmental Protection has principal oversight of all WSS Utilities in Zambia.

The total population in the LWSC operation area is 2,587,512. The main sources of water are the Kafue River situated about 65km from Lusaka City, Chongwe River and Zambezi River and over 100 boreholes situated in various areas. About 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	2,587,512
Total Water Connections	109,454
Total Waste Water/Sanitation Connections	32,396
Total Production/year	84,695,302 m ³
Total Staff	905
Annual O&M Costs	ZMW246,052,561
Annual Water and Sewerage billing	ZMW304,653,566
Annual Water and Sewerage Collections	ZMW272,436,485

Tariff Structure

*Exchange Rate: ZMW12.89 to IUS\$ (2018)

DOMESTIC						
Tariff Band	0 - 6	6 - 30	30 - 100	100 - 170	+170	Kiosks/ Public Tap
Lusaka - K./m ³	5.65	6.79	7.69	9.04	11.08	5.00
Kafue, Chongwe, Luangwa- K./m ³	3.62	4.30	4.74	5.20	5.88	
Chirundu- K./m ³	3.62	5.43	6.48	8.60	8.60	

NON-DOMESTIC			
Tariff Band	0-30	30-170	+170
Lusaka - K./m ³	10.24	14.14	16.09
Kafue, Chongwe, Luangwa- K./m ³	7.73	11.49	13.12
*Chirundu- K./m ³	7.88	9.33	11.40

Note :

- Flat rates for non-metered customers vary per customer category (i.e High, Medium and Low).
- Standing/Fixed monthly meter charge is K8 for domestic and K25 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.

Régie de Production et de Distribution d'Eau et d'Électricité (REGIDESO) - BURUNDI

Water Utility

REGIDESO was established in 1962 after the independence of Burundi, to take care of drinking water supply and electricity. The period from 1992 to 2004 was marked by the socio-political crisis that caused the destruction of a significant part of REGIDESO's facilities. The company has had great difficulty rebuilding its infrastructure and coping with maintenance works especially after donors withdraw funding amid limited self-financing capacity. However, the human resources of this company have demonstrated their abilities in the restoration of water and electricity services in the difficult times. The period from 2005 to 2011 corresponded to a period of reconstruction and development of infrastructure. It was during this period that REGIDESO began to rehabilitate damaged or dilapidated infrastructure and extended the water and electricity supply networks in the new districts, the city of Bujumbura and the interior of the country.

The total population in the REGIDESO operation area is estimated at 5,500,000 people. The main source of water is the Tanganyika Lake, which is near Bujumbura City from which about 90% of water supplied to the city is produced.

General Data About Water Utility

Abbreviation	REGIDESO
Start of Operations	1962
Number of Towns in Operation Area	20
Total Population in Operation/Service Area	5,500,000
Total Water Connections	89,058
Total Waste Water/Sanitation Connections	5,000
Total Production/year	51,057,090 m ³
Total Staff	569
Annual O&M Costs	BIF25,699,538,798.40
Annual Water and Sewerage billing	BIF16,336,748,480.00
Annual Water and Sewerage Collections	BIF14,139,626,221.00

Tariff Structure

* Exchange Rate: 1,837.10 BIF to 1US\$ (2016/17)

Domestic			
Bands	Tariff	Fixed charges	Period
0-20 m ³	315	0	2 months
21-40 m ³	613	0	2 months
> 41 m ³	802	7274	2 months

Commercial and Industries			
	Tariff	Fixed charges	Period
Band	609	26,581	2 months

Standpipes			
	Tariff	Fixed charges	Period
Band	224	-	1 month

Administration			
	Tariff	Fixed charges	Period
Band	613	-	2 months

ZANZIBAR WATER AUTHORITY (ZAWA) - ZANZIBAR

Water Utility

The Zanzibar Water Authority (ZAWA) was established under Act. No. 4 of 2006, and is a semi-autonomous entity tasked to offer 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 1,579,873.

General Data About Water Utility

Abbreviation	ZAWA
Start of Operations	2006
Number of Towns in Operation Area	6
Total Population in Operation/Service Area	1,579,873
Total Water Connections	101,444
Total Waste Water/Sanitation Connections	3,000
Total Production/year	51,626,829 m ³
Total Staff	602
Annual O&M Costs	TSH8,134,286,697
Annual Water and Sewerage billing	TSH7,079,403,960
Annual Water and Sewerage Collections	TSH3,133,314,875

Tariff Structure

*Exchange Rate: TSH2,276 to 1US\$ (2017/18)

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

NON DOMESTIC		
Tariff Band	0-15	15-1000
Institutional TSH/m ³	924	2,259
Commercial TSH/m ³	0-15	15-100
	821	1,437

Note :

- Flat rate is TSH4,000 per month

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 law 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 14,247,466. NWSC has over 56 water treatment facilities and 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	218
Total Population in Operation/Service Area	14,247,466
Total Water Connections	587,863
Total Waste Water/Sanitation Connections	21,616
Total Production/year	126,191,432 m ³
Total Staff	3,452
Annual O&M Costs	UGX295,524,437,000
Annual Water and Sewerage billing	UGX390,197,372,295
Annual Water and Sewerage Collections	UGX384,656,992,716

Tariff Structure

**Exchange Rate: UGX3,659 to 1US\$ (2017/18)*

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

LILONGWE WATER BOARD (LWB) - MALAWI

Water Utility

The Lilongwe Water Board (LWB) is a Statutory Corporation established in 1947 and reconstituted by the Act of Parliament ‘Water Works Act’ No. 17 of 1995. As utility service provider, LWB is responsible for the provision of water supply services to the City of Lilongwe and surrounding areas to all categories of customers (domestic, institutional, industrial and commercial). The main source of water for the Board is Lilongwe River, over which two dams have been constructed; the Kamuzu Dam I and Kamuzu Dam II. Kamuzu Dam I has a storage capacity of 4.5mil m³ while Kamuzu Dam II has storage of 19.8mil m³. LWB operates two main water treatment plants and is not mandated to provide sewerage services, whose mandate lies with the Lilongwe Local Authority.

The total population in the LWB area of jurisdiction is 1,191,840.

General Data About Water Utility

Abbreviation	LWB
Start of Operations	1947
Number of Towns in Operation Area	1
Total Population in Operation/Service Area	1,191,840
Total Water Connections	88,575
Total Waste Water/Sanitation Connections	-
Total Production/year	36,917,799.00 m ³
Total Staff	534
Annual O&M Costs	MK11,058,585,380.00
Annual Water and Sewerage billing	MK21,074,893,839.00
Annual Water and Sewerage Collections	MK17,738,254,911.00

Tariff Structure

*Exchange Rate: MK730 to IUS\$ (2017/18)

DOMESTIC			
Tariff Band	0-5	6-10	>10
MK/m ³	1,727*	496	690

NON DOMESTIC			
Tariff Band	0-5	6-40	>40
Commercial/ Industrial MK/m ³	8,415*	1,849	2,011
Tariff Band	0-10	11-40	>40
Institutional MK/m ³	15,114*	1,690	1,810

Note :

- *Fixed amount for first bracket
- Kiosks have flat rates of K215 (Community built) and K239 (LWB), respectively.

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:

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

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

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 .