



**REGIONAL BENCHMARKING OF
WATER SUPPLY AND SANITATION UTILITIES
2018/2019 REPORT**

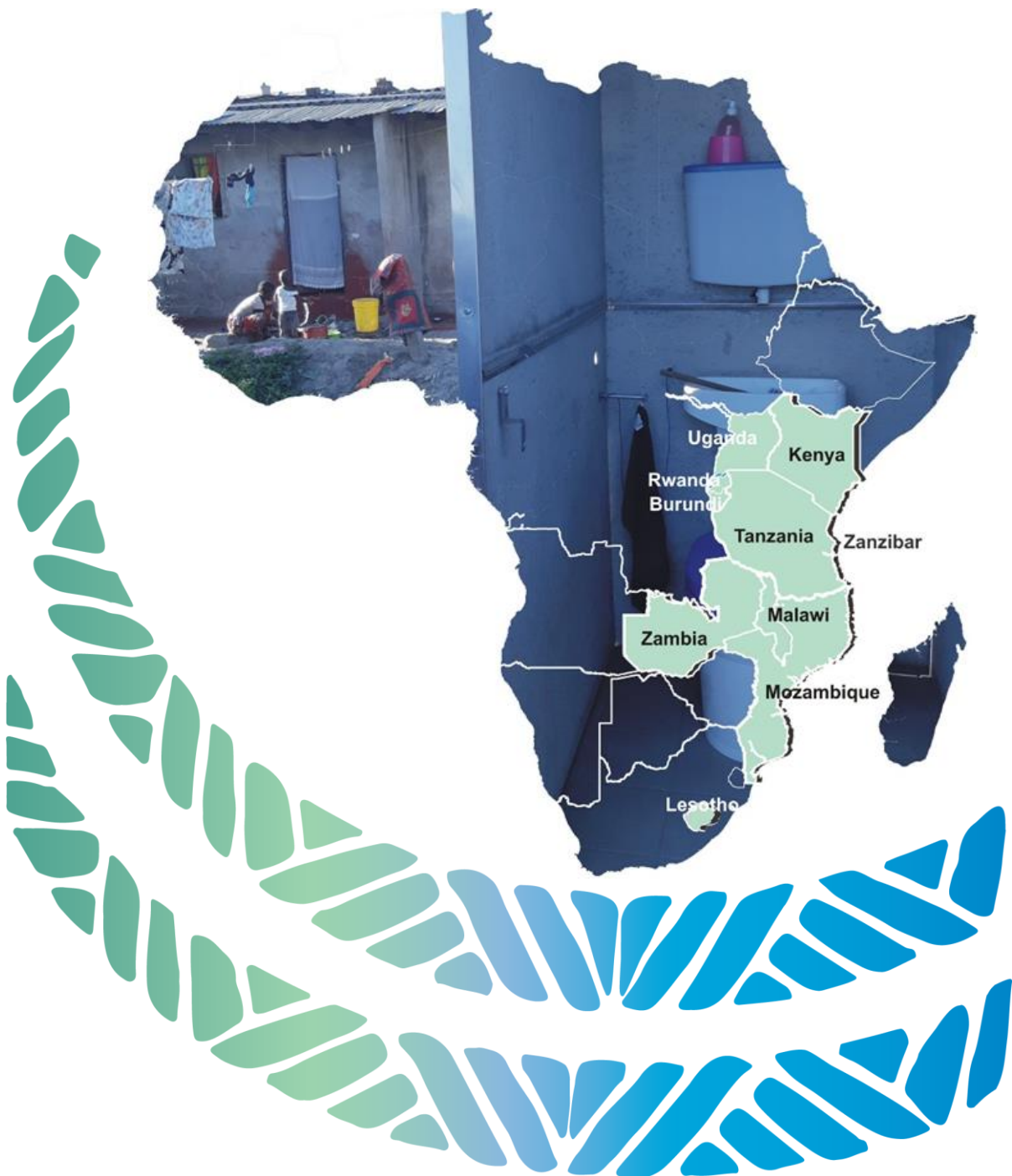


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FOREWORD

The Eastern and Southern Africa Water and Sanitation (ESAWAS) Regulators Association's 6th Benchmarking Report of selected regional water supply and sanitation Utilities covered the period 2018/2019. The number of Utilities that were considered for the benchmarking exercise remained ten from the previous period. However, REGIDESO of Burundi did not submit data. This exclusion slightly affected trends on average performance on some indicators. Nevertheless, the general performance was still reflective of the progress the region was making.

ESAWAS believes that benchmarking across and beyond the region strongly contributes to improvement in performance and provides the Utilities with a learning opportunity of good practices that others may be implementing. It also enhances regional cooperation and development by promoting formulation of harmonised standards and approaches. The Association will thus seek to expand its benchmarking exercise, both in number of Utilities and indicators being used.

The 2018/19 reporting period was the first year of implementation of ESAWAS' 3rd Strategic Plan covering the period 2019 to 2021. The plan focuses on four strategic objectives namely; Development of 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. In line with the strategic objectives, ESAWAS members actively began to incorporate onsite sanitation in their regulatory regimes in a quest to meet SDG 6 targets on sanitation. In this regard, the Association intends to broaden indicators used for benchmarking to reflect this new aspect, as well as continue to refine its regulatory tools and be the front runner in delivering quality regulation.

ABBREVIATIONS/ ACRONYMS

AdeM	Águas da Região de Maputo
ADERASA	Association of Regulators of Water and Sanitation of the Americas
AFUR	African Forum for Utility Regulators
AfWA	African Water Association
AGM	Annual General Meeting
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
BMGF	Bill and Melinda Gates Foundation
CBO	Community Based Organisations
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
IWA	International Water Association
KPI	Key Performance Indicators
LWSC	Lusaka Water and Sanitation Company
LEWA	Lesotho Electricity and Water Authority
NCW&SC	Nairobi City Water and Sewerage Company
NSS	Non-sewered Sanitation
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
RWSS	Rural Water Supply and Sanitation
RURA	Rwanda Utilities Regulatory Authority
SDGs	Sustainable Development Goals
TeCRI	Technical Committee on Regulation Issues
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
WSUP	Water and Sanitation for the Urban Poor
WUPI	Water Utility Performance Index
WURD	Water Utility Regulation Department
ZAWA	Zanzibar Water Authority
ZURA	Zanzibar Utilities Regulatory Authority

EXECUTIVE SUMMARY

The benchmarking exercise covered the period 2018/19 and involved ten Utilities (except that REGIDESO did not submit data). These were, Nairobi City Water and Sewerage Company (NCW&SC) of Kenya; Lusaka Water and Sanitation 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 during year one of implementing the third Strategic Plan (2019 to 2021), while Chapter 3 focuses on collaborations with partners. Chapter 4 describes the regional benchmarking framework and presents the various indicators that are used for benchmarking while Chapter 5 presents the comparative performance analysis of the Utilities on the various indicators. The report winds up with Chapter 6 which discusses the main conclusions and recommendations of the benchmarking exercise.

In summary, the Association made considerable progress in implementing year one activities of the 2019-2021 Strategic Plan. Notably, a regulatory strategy and framework for inclusive urban sanitation service provision was developed. Further, the Association continued to explore new frontiers of collaboration to broaden its reach. The African Water Association was engaged for mutual collaboration of capacity building and benchmarking, while the Instituto Regulador dos Serviços de Electricidade e de Água (IRSEA, a regulatory authority from Angola) was engaged on a membership drive. Regarding performance analysis, a number of Utilities showed noticeable progress in metering ratio and staff efficiency indicators. Further, almost all Utilities continued to grow their water connections as they strived to cover unserved customers. In the other indicators, the picture was more stagnated with non-revenue water (NRW) and sewerage coverage in particular, continuing to pose a challenge for nearly all the Utilities involved in the benchmarking exercise. With ongoing works on NSS, it is hoped the sanitation picture will drastically transform.

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 (WSS) 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 ten 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) and the Water Utility Regulation Department (WURD) of Uganda.

WURD became the tenth member after ratifying the ESAWAS constitution in March 2019. WASAMA and WURD are an association of water and sanitation Utilities and a department in the ministry responsible for water, respectively. As such, not being independent regulators, they are termed 'Associate Members' of ESAWAS.

An overview of the ESAWAS members is given in Table 1.

Table 1: Overview of ESAWAS Members

	Regulator	Established by	Year begun operations	Number of regulated 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
10	Water Utility Regulation Department (WURD) of Uganda	Cap 152 of the water Act	2009	7

The regulators have generally been mandated to undertake both economic and technical regulation of WSS service provision, ensuring a balance between the quality of 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 (QoSs).
- 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.

CHAPTER 2. PERFORMANCE ON YEAR ONE OF THE 2019 - 2021 STRATEGIC PLAN

The ESAWAS Regulators Association formulated its third Strategic Plan to cover the period 2019-2021 that sought to expand the realm of regulation to address emerging issues, particularly on on-site sanitation (OSS) and rural water supply and sanitation (RWSS) regulation. The Strategic Plan has the following 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.

2019 was the first year of implementing the Plan and considerable progress was already made towards attainment of the set objectives. Table 2 highlights the progress that was made on the Plan in the year under consideration.

Table 2: Performance on 2019-2021 Strategic Plan Objectives

Strategic Objective 1: Develop Harmonised Regulatory Approaches and Frameworks		
Key actions	Key Expected Results	Performance
1.1 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.	The Lilongwe Water Board of Malawi was brought on Board in 2019 to bring the total number to 10 utilities.
1.2 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.	Regulatory frameworks for on-site sanitation were developed and adopted by the Extra-ordinary General Meeting held in Tanzania. Furthermore, development of tools to support implementation of the frameworks, was underway.
1.3 Address regulation of WSS in the rural areas and small schemes.	A strategy and implementation framework for rural WSS regulation developed.	With the support of Climate Resilient Infrastructure Development Facility (CRIDF), individual member country statuses were analysed and a number of

		brainstorming workshops held in an effort to map out suitable service and regulatory models. Work on this aspect was ongoing with Kenya, Tanzania, Rwanda and Zambia taking a leading role and hoped to provide valuable learning points.
1.4 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.	The activity was deferred to 2020.
1.5 Promote equity in terms of 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.	A few gender-based indicators have been developed and will be reflected in subsequent reports. Other indicators will be reflected in guidelines to be developed pursuant to the Regulatory Frameworks.

Strategic Objective 2: Facilitate Experience and Knowledge Sharing		
Key actions	Key Expected Results	Performance
2.1 Document and share good practices in regulation.	Good practices shared among regulators.	Site specific studies were undertaken on Moshi, Nyeri and Maseru with a view of producing a handbook on good management of NRW. Works were ongoing and would be completed in 2020. Further, a study was commissioned on “Governments pay your water bills” with a view of disseminating a policy brief.
2.2 Undertake technical regulatory exchange programmes.	Working approaches in key regulatory aspects shared.	A technical exchange meeting was held with all legal counsels (except from WURD) in September 2019 in Zanzibar. The legal team explored and recommended how to best anchor proposed regulatory models on NSS and possible RWSS models. Also, Mozambique undertook an exchange visit to Zambia on pre-paid metering.

<p>2.3 Promote and support independent regulation within the region.</p>	<p>Working approaches in key regulatory aspects shared.</p>	<p>ESAWAS participated in a national conference in Malawi that was hosted by WASAMA (an Associate member) where advocacy was made for establishment of an autonomous regulator.</p> <p>Further, ESAWAS member states (Zambia and Kenya) continued to provide support to some Nigerian states on reforming their water sectors.</p> <p>A request was also received from Sierra Lone for support towards strengthening regulatory aspects of water and sanitation in the country. Discussions were ongoing.</p>
<p>2.4 Establish and strengthen partnerships with training organisations on regulation.</p>	<p>Improved awareness regarding the role of WSS regulators.</p>	<p>Discussions took place with the Public Utility Research Center (PURC) of the US for content development, joint publications and training, through the BMGF support. However, collaboration could not be successfully established and ESAWAS will explore establishment of its own training unit.</p> <p>Further, DELFT IHE of Netherlands were engaged on student attachment programmes that will commence in 2020.</p>

Strategic Objective 3: Undertake and Document Research in Emerging Regulatory Trends and Practices		
Key actions	Key Expected Results	Performance
<p>3.1 Promote climate resilient WSS services.</p>	<p>Tools developed to promote climate resilience disseminated and applied.</p>	<p>With the support of CRIDF, a number of brainstorming and mapping sessions were held with the Technical Committee on Regulatory Issues (TeCRI). Subsequently, a maturity matrix has been formulated to guide the full suite of tools to be developed. Activity will continue in 2020.</p>
<p>3.2 Improve performance with regard to NRW management.</p>	<p>Key case studies addressing both good and bad practice for NRW, captured and disseminated.</p>	<p>ESAWAS working in collaboration with CRIDF, identified three case studies that were then assessed in detail. These were Moshi in Tanzania, Nyeri in Kenya and Maseru in Lesotho. Subsequently, a</p>

		dissemination workshop was held with various stakeholders in October 2019. Final reports with lessons learnt and recommendations for possible adoption by members have been compiled and disseminated.
3.3 Identify new technologies and processes that can significantly enhance regulation.	Technologies for enhanced regulation documented and shared.	Using a technical assistance approach, ESAWAS initiated the development of an investment planning decision making tool called Citywide Inclusive Sanitation Service Assessment and Planning (CWIS SAP). Once completed, the tool will be piloted in Kenya and Zambia before being up-scaled to other countries.

Strategic Objective 4: Improve Operations of ESAWAS Regulators Association		
Key actions	Key Expected Results	Performance
4.1 Hold Annual General Meeting (AGM)	Issues deliberated upon improve performance of ESAWAS Regulators Association.	An AGM was held in Bujumbura, Burundi and among key considerations made were establishment of a fully-fledged, independent secretariat and having a continent-wide focus.
4.2 Enhance profile of ESAWAS Regulators Association	Number of members increased.	The Association participated and hosted sessions at international fora such as the AfriSan/FSM5 conference in Cape Town, the Stockholm World Water Week, and the Sanitation Summit that was held in Lusaka. Further participation was at the AFUR conference in Cairo and the International Water Association (IWA) Congress in Sri Lanka, where presentations were made on climate resilience and OSS, respectively.
4.3 Establish/strengthen strategic partnerships with other like-minded WSS sector organisations.	Visibility increased at regional, Africa and international events through active participation (presentations given, hosting breakaway sessions etc.)	ESAWAS continues to collaborate with its traditional partners; AMCOW, CRIDF, AFUR, WIN and WSUP through mutual participation in activities. New partnerships were also explored with AfWA and ADERASA and would be formalised in 2020.

4.4 Strengthen gender inclusiveness.	Female participation at decision-making level at ESAWAS events and meetings increased.	The TeCRI was recomposed at the Extra Ordinary General (EGM) in March 2019 to enhance women participation. Gradually, the desired threshold of 30% will be attained.
4.5 Strengthen capacity and sustainability of Secretariat.	Secretariat can successfully handle increased activities. Increased revenue for core activities.	Detailed studies on beefing up secretariat and exploring alternative revenue streams have been planned for 2020.

As can be seen above, considerable progress was made towards attainment of the year’s expected results. Activities that were not concluded in the period under consideration were carried over to the subsequent year.

CHAPTER 3. COLLABORATION WITH PARTNERS

Collaboration among organisations is essential to create synergies and leverage on each other in pursuit of common goals. It is also recognised as a central pillar to achievement of Sustainable Development Goals (SDGs) as espoused by SDG 17 that calls for cross-sectoral and cross-national partnerships to achieve the goals. As such, the ESAWAS Regulators Association values partnerships in its quest to realise its long term objectives and continued to strengthen working ties with its partners, while also exploring new collaborative opportunities.

3.1 ONGOING COLLABORATIONS

In the period under review, the Association continued to collaborate with its partners as follows:

- **Water and Sanitation for the Urban Poor (WSUP)** – the organization assisted ESAWAS with delivery of webinars on non-revenue water with participants being staff from both regulators and regulated utilities.

Similarly, ESAWAS participated in WSUP’s masterclass sessions in Maputo, Mozambique, where lessons were shared on pro-poor aspects of regulation and ring-fencing of funds, among others.

- **Climate Resilient Infrastructure Development Facility (CRIDF)** – the organization supported ESAWAS with case study investigations of good practices of non-revenue water that culminated in production of a synthesis report and dissemination of results to various stakeholders. The organization also supported with preliminary evaluations of the status of regulating rural water supply and sanitation in member countries that set base for further works, with a view of developing adaptable frameworks for service provision and regulation. Furthermore, CRIDF and ESAWAS continued to work on a suite of tools aimed at enhancing climate resilience of the sector.
- **African Minister’s Council on Water (AMCOW)** – ESAWAS continued to support AMCOW’s initiative of developing the African Sanitation Policy Guidelines through task team input and expert review. The guidelines aim to provide guidance to policy makers and stakeholders involved in policy development on review, revision and development of sanitation policies and strategies for their implementation.

3.2 PURSUIT OF NEW PARTNERSHIPS AND MEMBERSHIP DRIVE

The ESAWAS Regulators Association also sought to pursue new partnerships for collaboration and increase its membership portfolio;

- **African Water Association (AfWA)** – collaboration was explored on capacity building, performance monitoring and benchmarking, information and knowledge exchanges. The engagement culminated in drafting of a memorandum of understanding to be officially signed in 2020.
- **Instituto Regulador dos Serviços de Electricidade e de Água (IRSEA)** – the Association re-engaged the Angolan multi-sector regulator with a view of participation in benchmarking exercises and a membership drive. The Association showcased its vision and works under implementation to demonstrate how IRSEA could mutually benefit from the initiative. Further engagements were planned for 2020.

ESAWAS will continue to leverage its efforts with both traditional and potential partners in its quest to ensure effective regulation within and beyond the region. The Association will also endeavor to exploit synergies on learning and knowledge exchanges for optimized results.

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, ESAWAS developed a regional benchmarking framework in 2015 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 or 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 a 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 weaknesses 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 IP, as described hereunder.

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

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 3 shows the framework used for regional benchmarking.

Table 3: Regional Benchmarking KPIs and Performance Measurements

	INDICATOR	DEFINITION	CALCULATION	ACCEPTABLE BOUNDARIES	WEIGHT
QUALITY OF SERVICE					
1	Water Coverage	% of total population with access to improved water supply: individual household connection, kiosk, public standposts, communal/shared tap	[Total Population Served/Total Population in the Service Area]	75-90%	10
2	Sewerage Coverage	% of total population with access to sewerage services (no septic tanks)	[Total Population Served/Total Population in the Service Area]	40-70%	5
3	Water Quality • 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.

The number of Utilities participating in the benchmarking exercise remained at ten in the period under review (2018/2019). However, Régie de Production et de Distribution d'Eau et d'électricité (REGIDESO) did not submit data, which resulted in some distortions in comparing performance over a two-year period.

This section therefore, focuses on the analysis of the performance of the 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, ZURA and WASAMA
- April- March for LEWA
- January –December for AURA, NWASCO and AREEN

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 4, while a detailed profile is presented in Annex 2. All the Utilities are publicly owned companies.

Table 4: General Profile of Benchmarked Utilities

Utility	Abbreviation	Country	Areas of operation	Year Established
Nairobi City Water and Sewerage Company	NCW&SC	Kenya	City of Nairobi	2003
Lusaka Water and Sanitation 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 5.

Table 5: Basic operational data on benchmarked Utilities

Utility	Population in the Service Area 2017/18	Number of Water Connections 2017/18	Annual Water Production (mil m ³ /yr) 2017/18	Population in the Service Area 2018/19	Number of Water Connections 2018/19	Annual Water Production (mil m ³ /yr) 2018/19
NCW&SC, Kenya	4.33 Million	308,612	172.881	4.64 Million	311,242	180.157
LWSC, Zambia	2.59 Million	109,454	84.695	2.72 Million	115,871	78.108
DAWASCO, Tanzania	6.01 Million	286,115	149.225	6.55 Million	261,294	146.438
AdeM, Mozambique	2.34 Million	258,030	61.901	2.40 Million	256,839	78.767
WASCO, Lesotho	0.69 Million	104,000	22.425	0.74 Million	104,586	21.051
WASAC, Rwanda	3.92 Million	203,070	48.082	5.99 Million	213,706	52.400
REGIDESO, Burundi	5.50 Million	89,058	51.057	-	-	-
ZAWA, Zanzibar	1.58 Million	101,444	56.750	1.63 Million	108,694	65.112
NWSC, Uganda	14.25 Million	587,863	126.191	14.75 Million	659,157	134.920
LWB, Malawi	1.19 Million	88,575	36.918	1.03 Million	90,658	36.338

The population under WASAC's jurisdiction drastically increased after inclusion of rural schemes as part of the Utility's service areas. Conversely, the population in the service areas of LWB declined slightly after reconciliation of figures with a recent national census.

Generally, the number of water connections continued to grow in almost all Utilities. NWSC continued to have the highest number of water connections of 659,157, over double that of the second highest, NCW&SC. On the other hand, AdeM reported a reduction in number of water connections after a database clean-up exercise.

Regarding water production, AdeM saw the biggest margin of increase, from about 62mil m³ to 78.8mil m³ of water. On the other hand, LWSC saw a significant drop in water production attributed to electricity supply challenges the utility experienced at its production sites.

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 6.

The KPIs boundaries established by ESAWAS are not fixed and could be revised as trends progress towards the benchmarks.

Table 6: KPIs and Performance boundaries

Component	KPI	Good	Acceptable	Poor
Quality of Service	Water Coverage	>90	90-75	< 75
	Sewerage Coverage	>70	70-40	< 40
	Water Quality	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

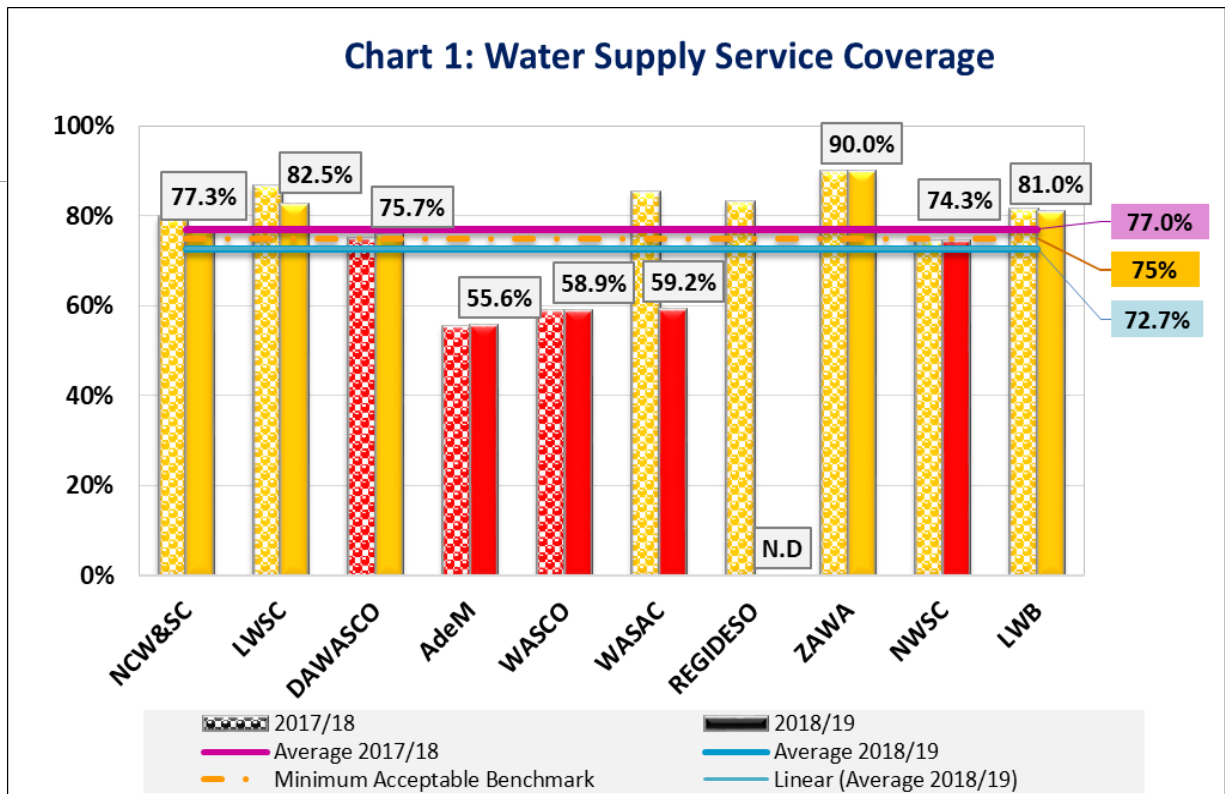
Water supply coverage considers the domestic population served through individual household connections, public standpipes and water kiosks. Table 7 shows the number of domestic water connections per Utility. For water coverage to grow, there must essentially be a corresponding growth in domestic connections against population increases. However, it must also be noted that public taps tend to serve large populations.

Table 7: Domestic Water Connections

Utility	Domestic Connections 2017/18	Domestic Connections 2018/19
NCW&SC	313,937	290,096
LWSC	99,912	105,063
DAWASCO	211,043	254,018
AdeM	244,332	242,995
WASCO	94,363	94,949
WASAC	192,301	192,958
REGIDESO	88,939	-
ZAWA	97,386	105,612
NWSC	479,429	535,532
LWB	73,791	84,910

All the Utilities had increases in the number of domestic water connections, except for NCW&SC and AdeM, which had reductions owing to database clean ups that removed duplicated accounts. NWSC and DAWASCO made the most connections of 56,103 and 42,975, respectively.

Chart 1 shows the water supply service coverage per Utility. Only DAWASCO and AdeM recorded minor increases in water coverage, with other Utilities recording either stagnations or declines. This led to a general decline in the average service coverage to 72%, below the minimum acceptable benchmark of 75%. The biggest drop in coverage was recorded by WASAC, owing to the drastic increase in population after inclusion of more service areas to the jurisdiction of the Utility.



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 8 while service coverage is depicted in Chart 2.

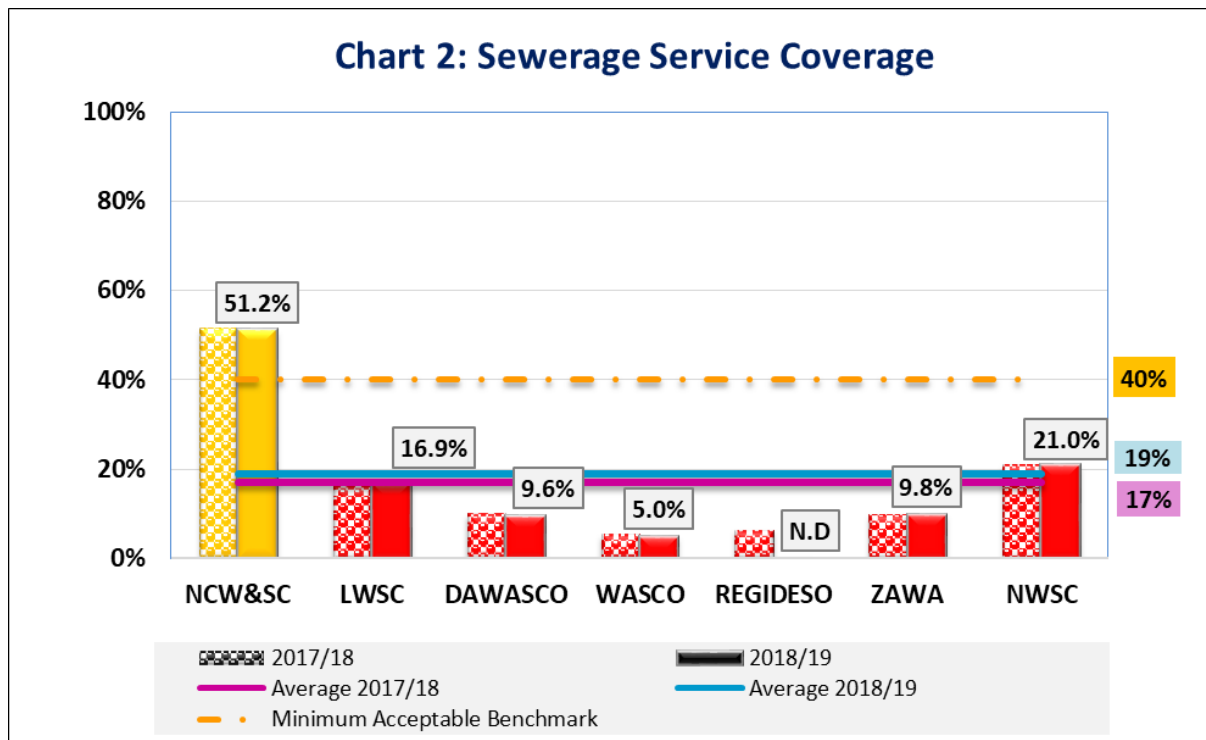
From Table 8, most of the Utilities recorded increases in the number of sewerage connections except for DAWASCO and ZAWA, who recorded a decline and stagnation, respectively. Yet again, NCW&SC made the most sewerage connections, having added over 4,800 customers.

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 8: Sewerage Connections per Utility

Utility	Sewerage Connections 2017/18	Sewerage Connections 2018/19
NCW&SC	244,095	248,912
LWSC	32,396	36,117
DAWASCO	20,803	19,806
WASCO	7,463	7,593
REGIDESO	5,000	-
NWSC	21,072	22,606
ZAWA	3,000	3,000

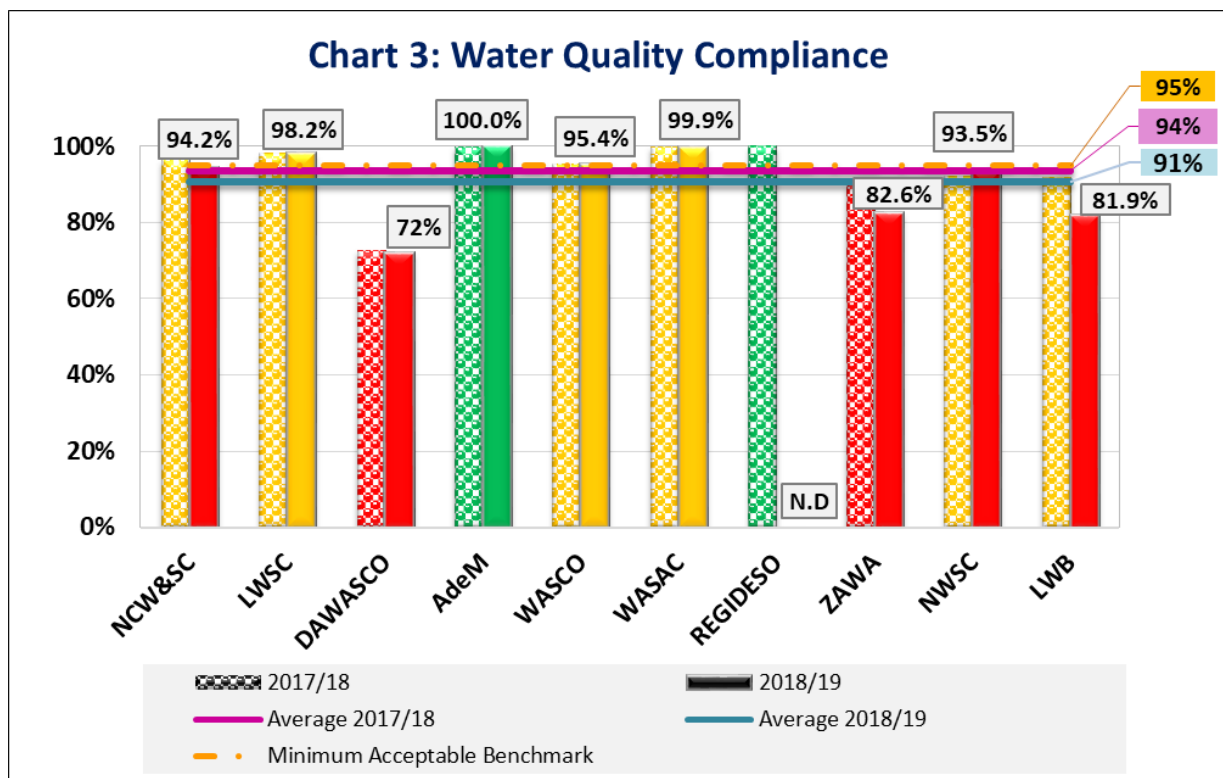
Although the average sewerage coverage increased marginally from 17% to 19%, it remained significantly below the minimum acceptable benchmark as can be seen in Chart 2. Only NCW&SC met the acceptable benchmark, having continued to make the most sewerage connections. With such low coverage figures, the vast majority of city dwellers presumably rely on onsite sanitation facilities or other unregulated options.



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.

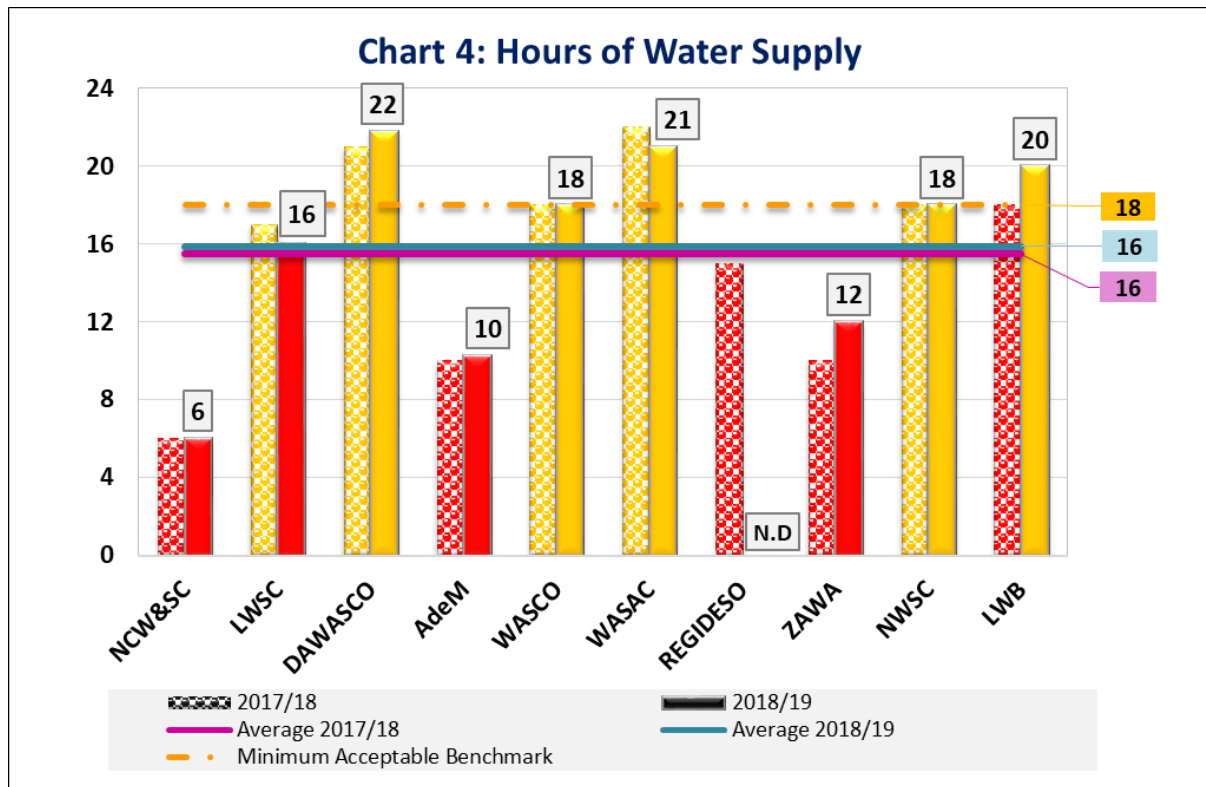


As can be seen from Chart 3, LWSC, AdeM, WASCO and WASAC met the acceptable benchmark on water quality compliance. However, the average compliance declined to 91% from 94%, below the set benchmark of 95%. The decline was majorly attributed to drop in performance by ZAWA, NWSC and LWB on the indicator. DAWASCO continued to perform poorly on the water quality indicator.

In addition to conducting less chlorine residual tests than required, ZAWA also recorded significant failures in both bacteriological and chlorine residual results. Similarly, both NWSC and LWB conducted less tests than required in both chlorine residual and microbiological parameters.

5.4.1.4. Hours of Water Supply

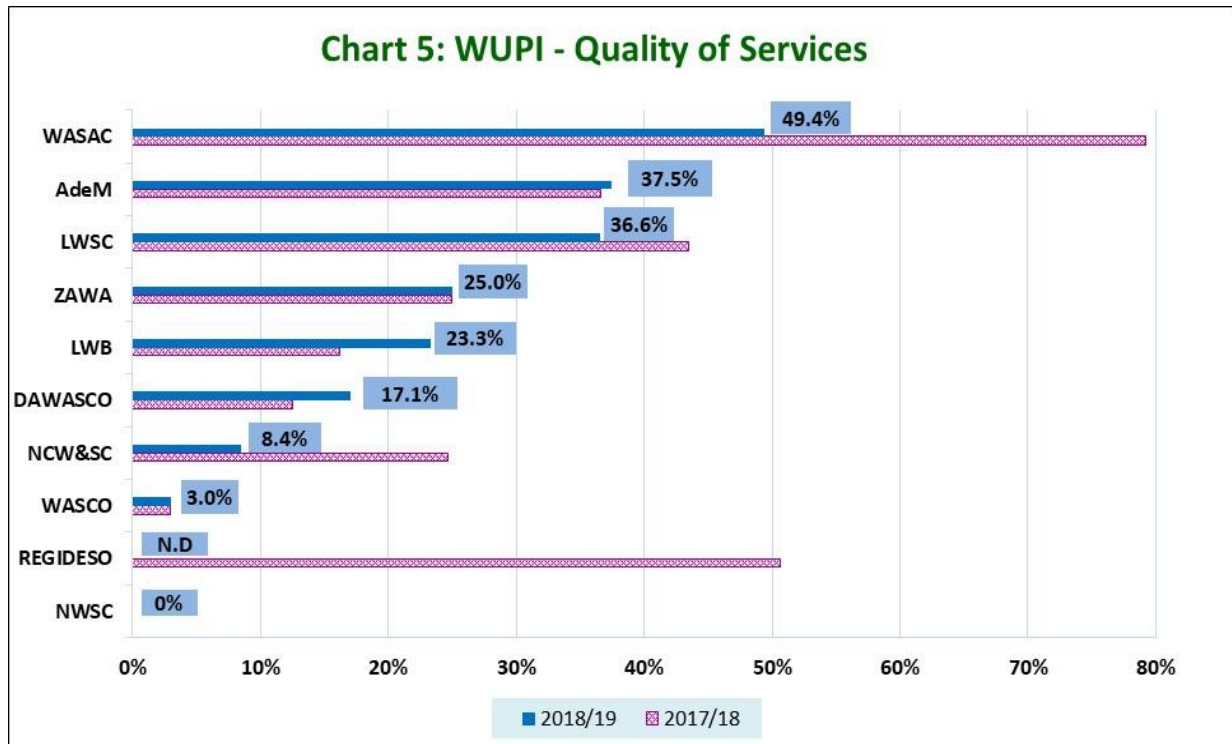
Hours of Supply refers to the average number of hours per day that a Utility provides water to its customers. It measures the continuity of services of a Utility and thus the availability of water to the customer. It is an important indicator of quality of service and shows the extent to which the Utility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



The average hours of supply remained the same at 16, slightly below the acceptable benchmark of 18. While DAWASCO, WASCO, WASAC, NWSC and LWB achieved the acceptable benchmark, LWSC recorded a reduction in average hours of supply. NCW&SC, AdEM and ZAWA continued to record average hours significantly below the acceptable benchmark.

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 a noticeable drop attributed to poor performance in water service coverage, WASAC still maintained the best performance in the WUPI-Quality of Services. AdeM, who had made slight improvements in all indicators considered, recorded the second best WUPI-Quality of Services.

On the other hand, noticeable drops were observed from LWSC and NCW&SC on WUPI –quality of services, owing to poor performance in water service coverage and hours of supply.

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.

Utility performance on the economic efficiency indicators can to some extent be impacted by a country’s macro-economic performance. It is therefore important have this in mind as the indicators are assessed. In 2019, economic growth in sub-Saharan Africa was projected to remain

at 3.2% while average inflation was poised at 8.4%. However, countries that suffered droughts such as Kenya, Lesotho and Zambia were expected to experience a rise in inflation (IMF, 2019).²

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 9 is made using three criteria:

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

Table 9: Comparison of Residential Water Bill

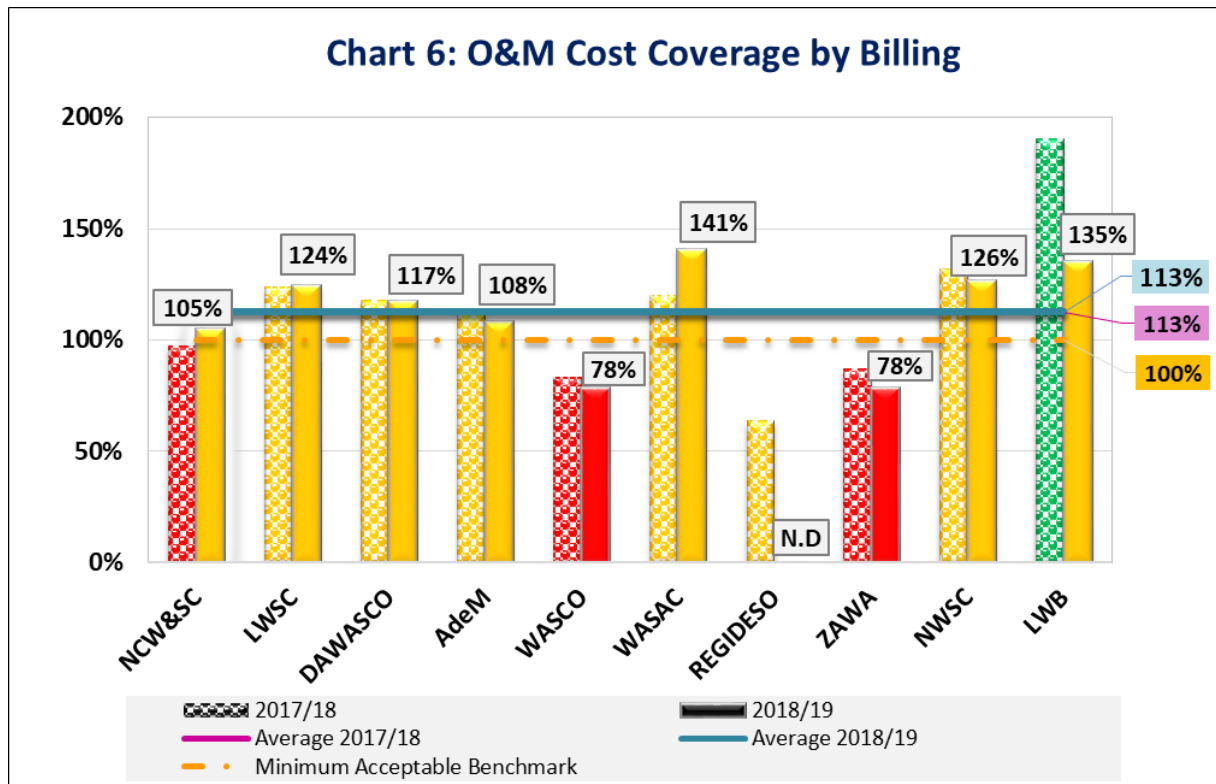
Utility	Lifeline Consumption at 5m ³ (\$)	Bill at 30m ³ (\$)	Average domestic bill (\$)
NCW&SC	2.00	14.47	12.48
LWSC	2.25	15.90	9.62
DAWASCO	2.42	20.57	11.85
AdeM	2.40	17.00	5.92
WASCO	1.83	35.90	5.83
WASAC	1.82	27.17	6.88
REGIDESO	-	-	-
ZAWA	1.89	14.10	2.23
NWSC	5.93	35.59	7.89
LWB	2.25	24.75	21.16

Table 9 shows that NWSC had the highest charge for lifeline consumption pegged at 5m³, which was over twice the amount charged by the second highest Utility, DAWASCO. WASCO, WASAC and ZAWA had the lowest charges at the life line consumption of less than US\$2. At an assumed consumption of 30m³, WASCO and NWSC had the highest bills of over US\$35. Generally, the average domestic bill was between consumptions of 5m³ and 30m³.

² Regional economic outlook. Sub-Saharan Africa: navigating uncertainty, International Monetary Fund, 2019.

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.

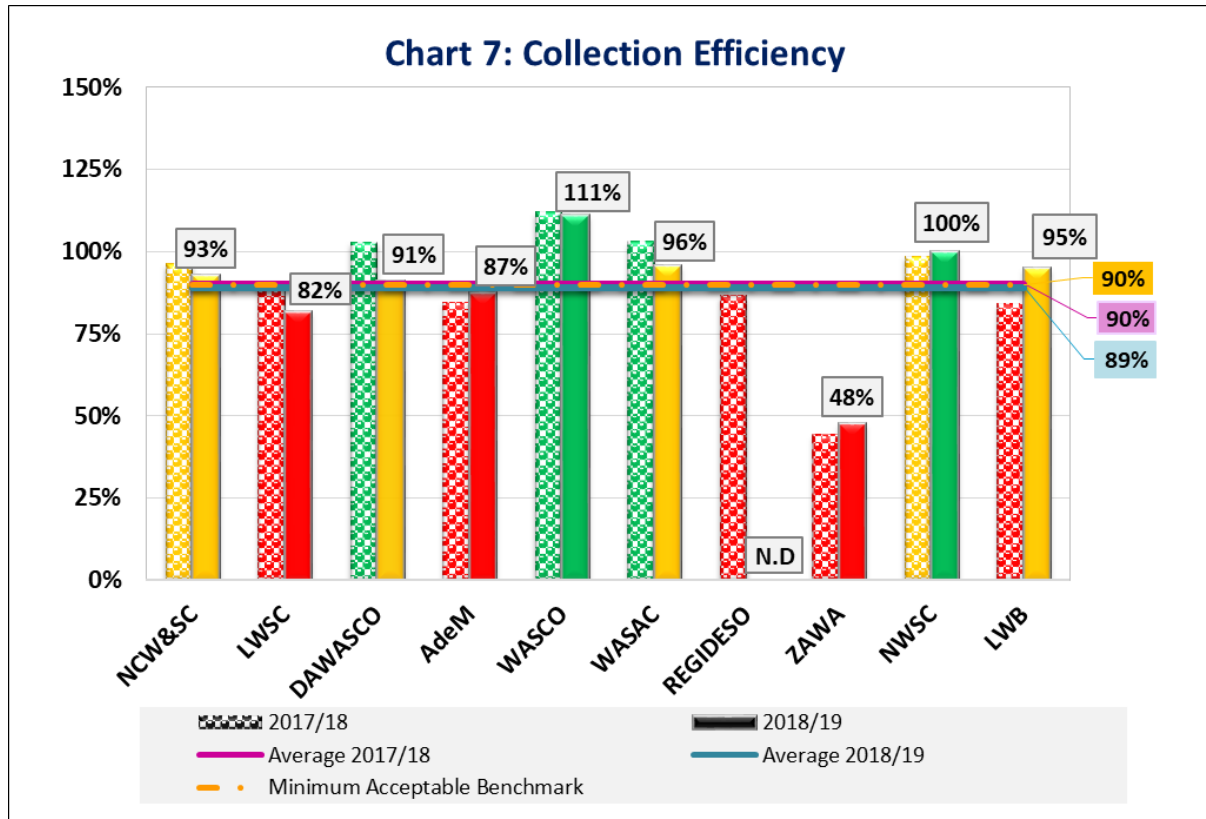


The average O&M Cost Coverage by Billing remained the same at 113%, with seven Utilities being above the minimum acceptable benchmark of 100%. Only ZAWA and WASCO had cost coverage ratios below the minimum acceptable benchmark.

While WASAC recorded a significant increase by 21%, LWB, NWSC, ZAWA and AdeM recorded decreases in cost coverage ratios. The erosion was primarily due to operating expenses growing at a higher rate than that of revenues.

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.



The average collection efficiency dropped slightly below the acceptable benchmark in the period under consideration, after five Utilities recorded declines in the collection ratio. Only LWB posted significant progress in collections by about 10% that saw them achieve the acceptable benchmark for first time since joining the benchmarking system.

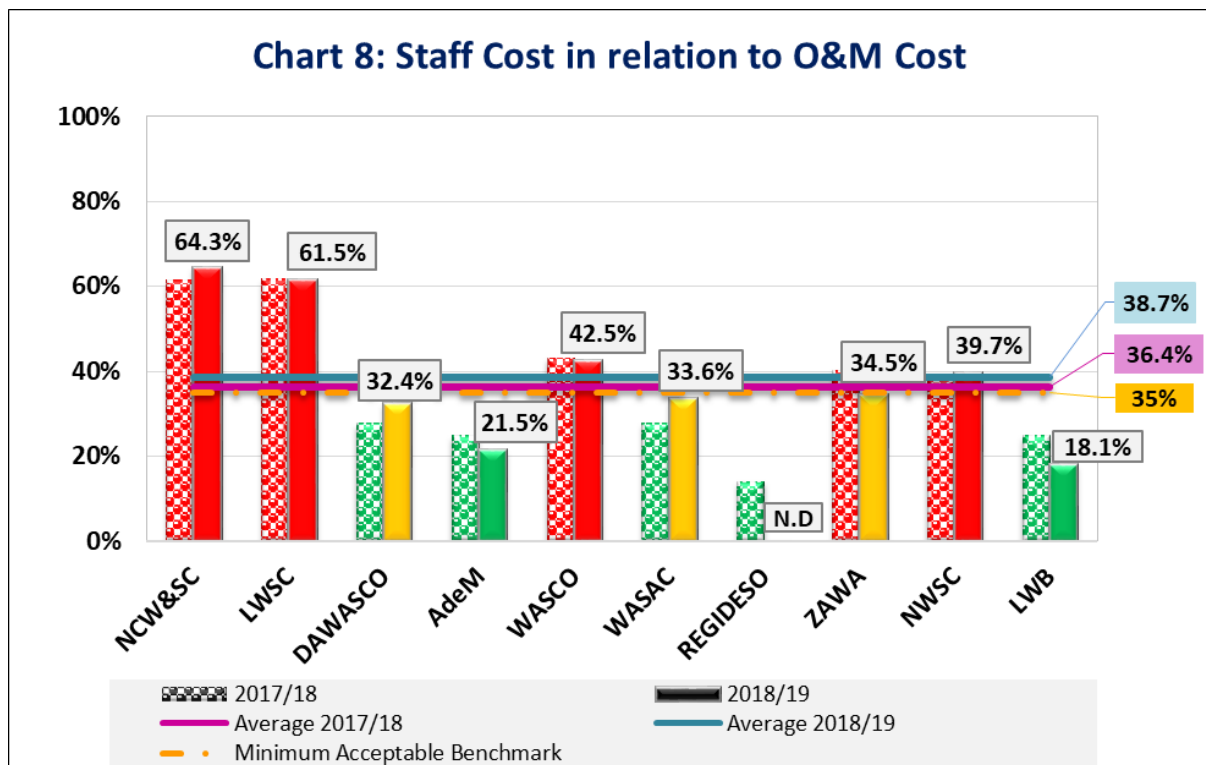
5.4.2.3. Staff Cost as a proportion of O&M Costs

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 2017/18	Total Staff 2018/19
NCW&SC	3,554	3,440
LWSC	905	888
DAWASCO	1,060	1,113
AdeM	809	832
WASCO	555	605
WASAC	581	1,376
REGIDESO	569	-
ZAWA	602	571
NWSC	3,452	3,778
LWB	534	581

WASAC doubled its staff that affected its staff costs in relation to O&M costs. Similarly, NWSC and DAWASCO saw significant growth in their workforce by about 10%. On the other hand, NCW&SC and ZAWA saw telling reductions in number staff owing to separations.

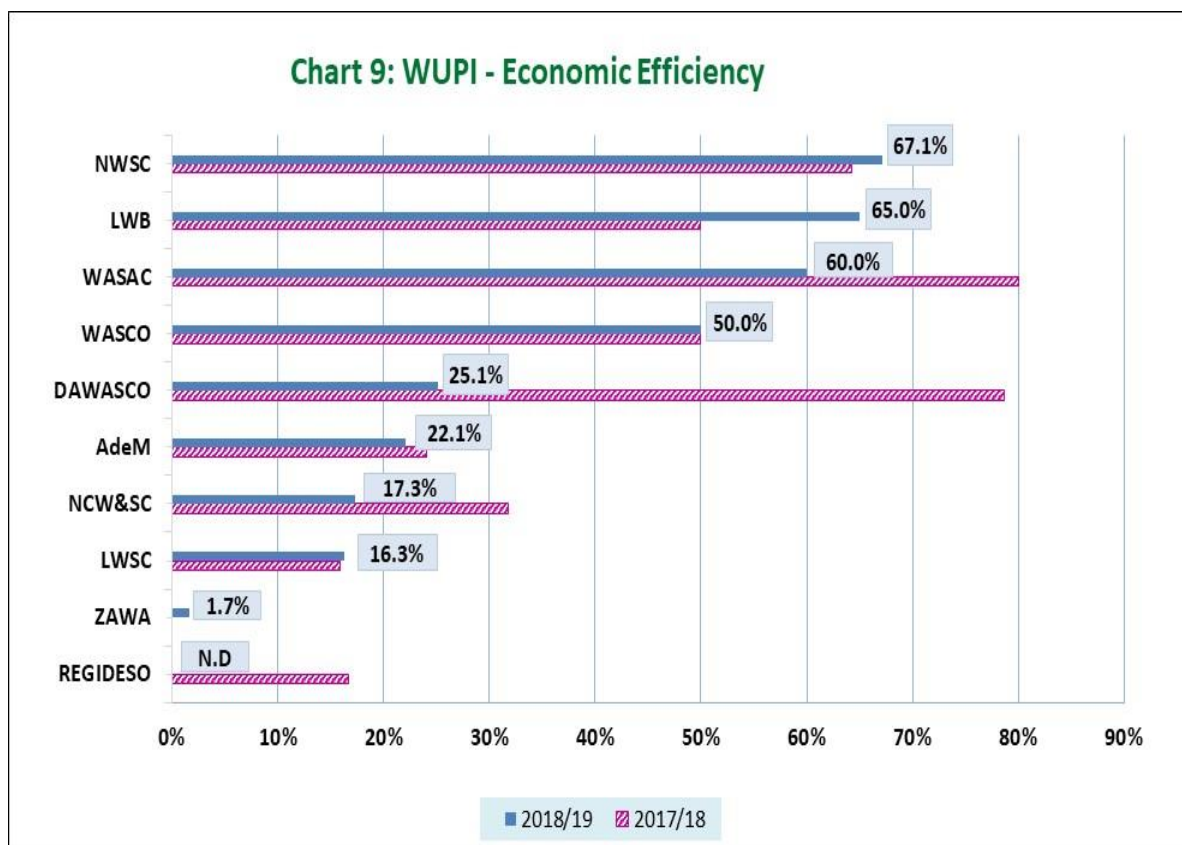


Two Utilities, AdeM and LWB, met the good benchmark (below 30% ratio) on staff costs versus O&M costs while three Utilities (DAWASCO, WASAC, ZAWA) achieved the acceptable benchmark (ratio between 30% and 35%)

On the other hand, the average staff costs to O&M costs ratio deteriorated to 38.7% owing to increases in the ratios of NCWSC, DAWASCO, WASAC and NWSC. NCWSC and LWSC continued to have very high ratios of over 60% and way above the acceptable benchmark. This could undermine effectiveness of other operations of the business.

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.



The NWSC recorded the highest score in the WUPI – Economic Efficiency of 67.1%. This performance was aided by an improvement in collection efficiency to the good benchmark. LWB also made impressive progress that saw it rank second on the WUPI after improvements in collection efficiency and staff cost in relation to O&M cost indicators. The most significant drops were seen in WASAC from 80% to 60% and DAWASCO from 78.6% to 25.1%. This placed the two Utilities in 3rd and 6th places respectively. Similarly, NCW&SC recorded a drop on the WUPI –

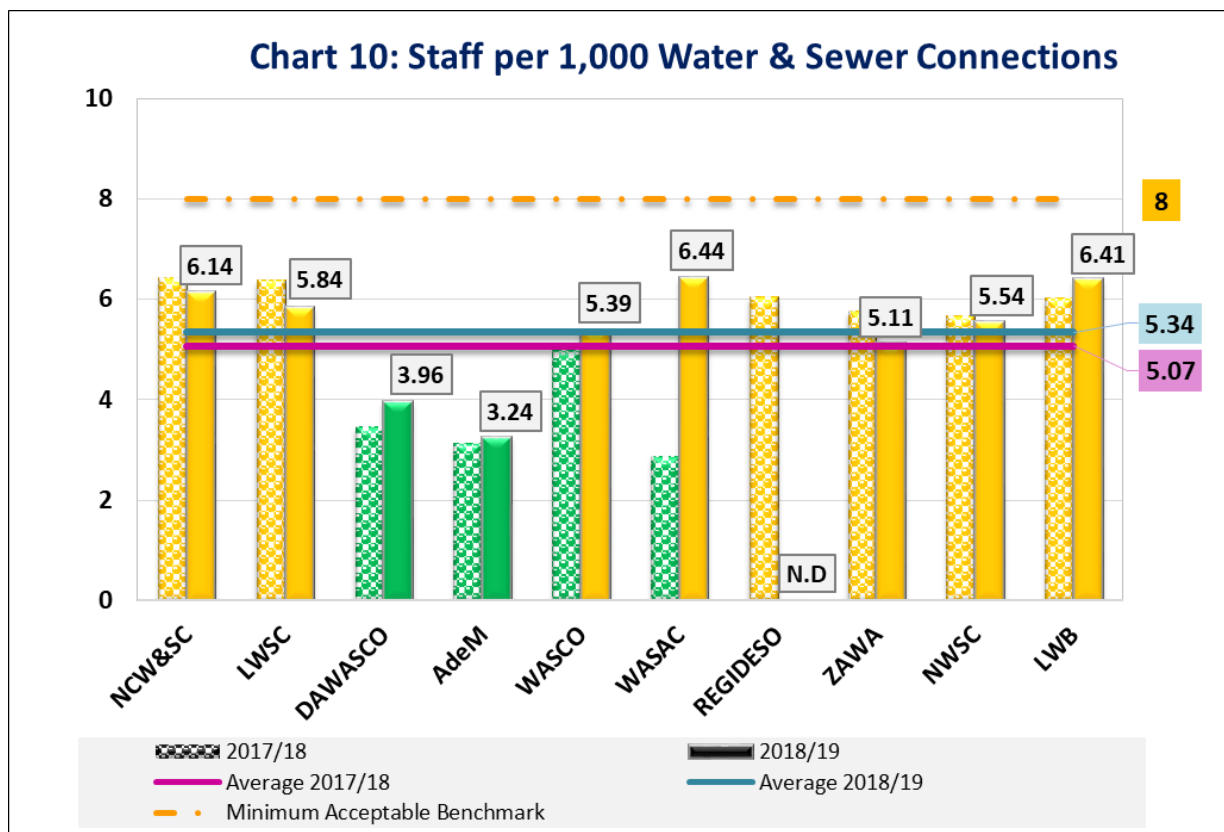
Economic Efficiency from 31.8% in previous period to 17.3% in period under review. This was attributed to considerable increase in staff costs in relation to O&M costs.

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

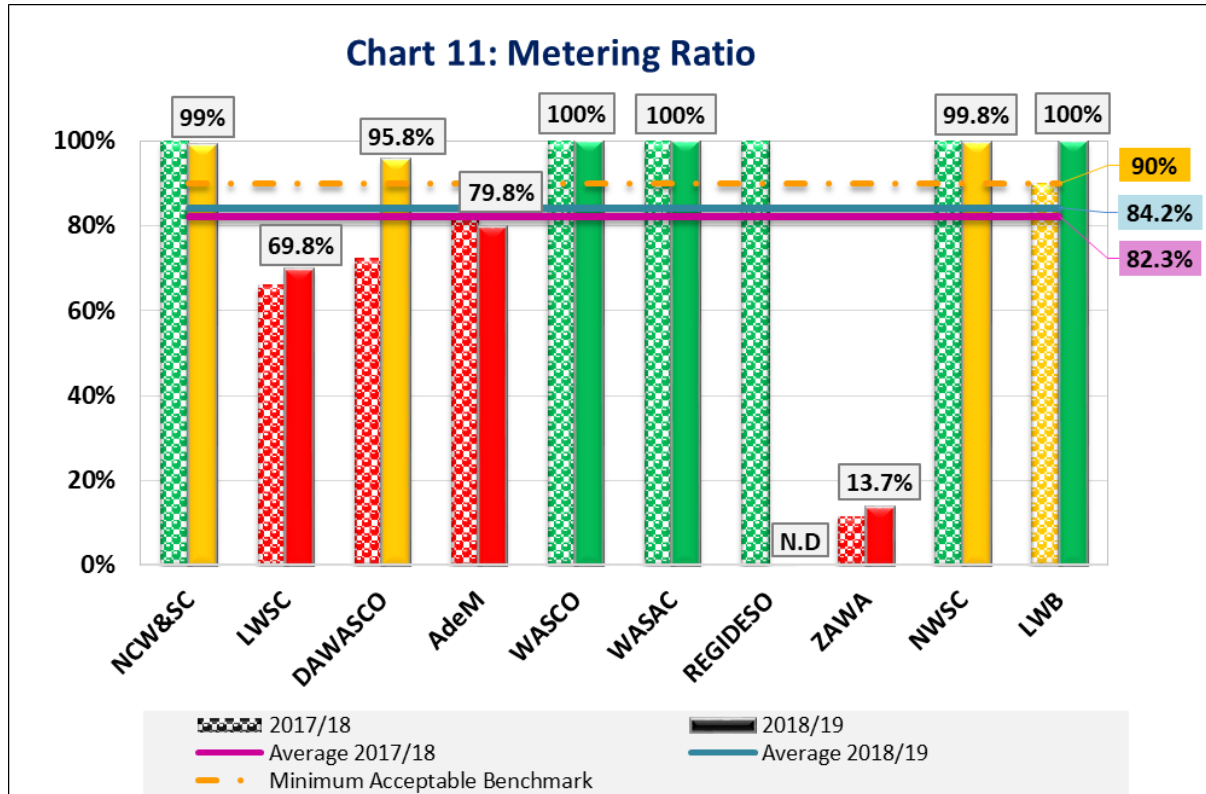
Staff per 1,000 Water and Sewer Connections, shown in Chart 10, indicates the number of employees servicing 1,000 connections. It measures the efficiency of Utilities in utilising their staff and hence a low figure is desirable. However, this measure is affected by factors such as nature of human settlements,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



Despite a marginal increase in the average of the staff per 1,000 water and sewer connections indicators, all the Utilities met the acceptable benchmark of 8. DAWASCO, WASAC and LWB showed deterioration on the indicator after considerable increases in the number of staff. Nonetheless, DAWASCO still met the good benchmark of 5 as did AdeM, which does 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.

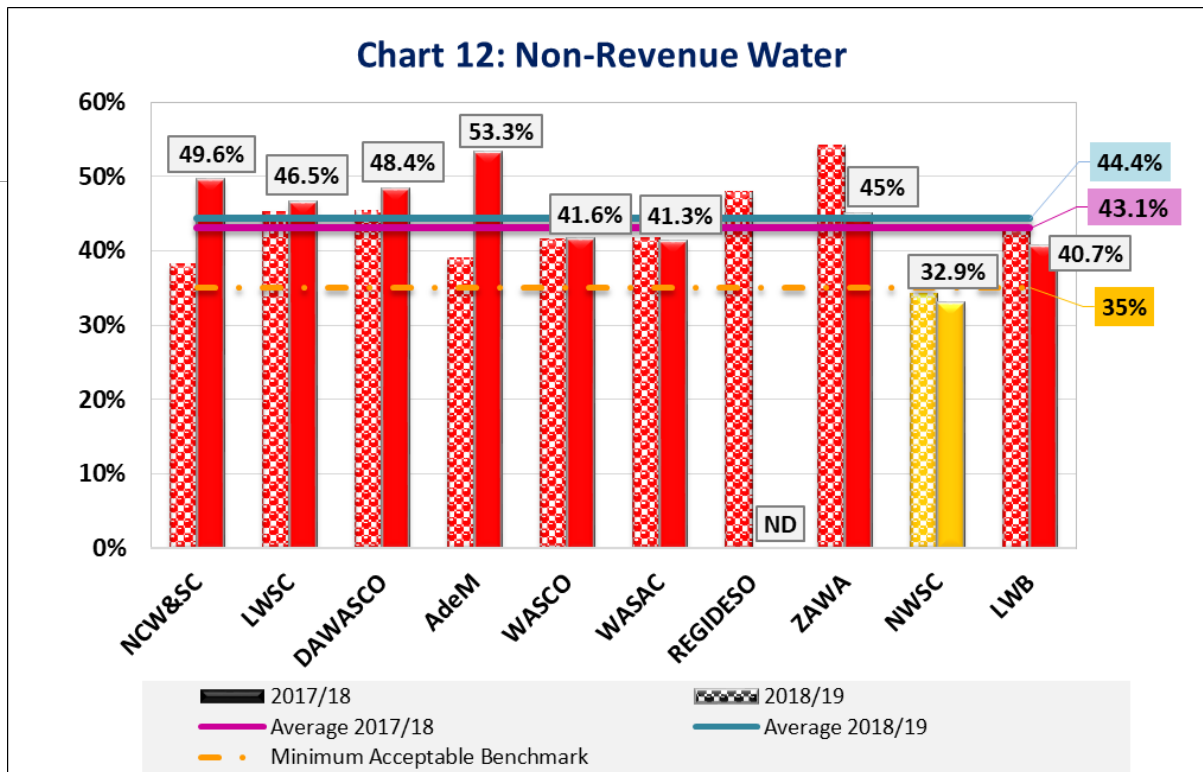


The average metering ratio in the period under review increased from 82.3% to 84.2% after improvements by DAWASCO and LWB. LWB in particular, improved its ratio to 100% and joined WASCO and WASAC on this status. Generally, all Utilities improved their metering ratios save for AdeM and NCW&SC which recorded marginal decreases.

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.

NRW continues to pose a challenge to almost all the Utilities, with the average performance in the period being at 44.4% against an acceptable benchmark of 35%. Only NWSC continued to meet the acceptable benchmark having recorded an impressive 32.9%.



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 performing better 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 (mil m ³)	Water Connections	Non-Revenue Water		
				%	m ³ /km/day	L/con/day
NCW&SC	5,776	180.16	311,242	49.6%	42.4	786.6
LWSC	2,279	78.11	115,871	46.5%	43.7	858.8
DAWASCO	3,220	146.44	261,294	48.4%	60.3	743.1
AdeM	3,000	78.77	256,839	53.3%	38.3	447.8
WASCO	2,197	21.05	104,586	41.6%	10.9	229.4
WASAC	13,921	52.40	213,706	41.3%	4.3	277.4
REDIGESO	-	-	-	-	-	-
ZAWA	1,928	65.11	108,694	45%	41.6	738.5
NWSC	17,556	134.92	659,157	32.9%	6.9	184.5
LWB	1,929	36.34	90,658	40.7%	21.0	447.0

* - means no data was available

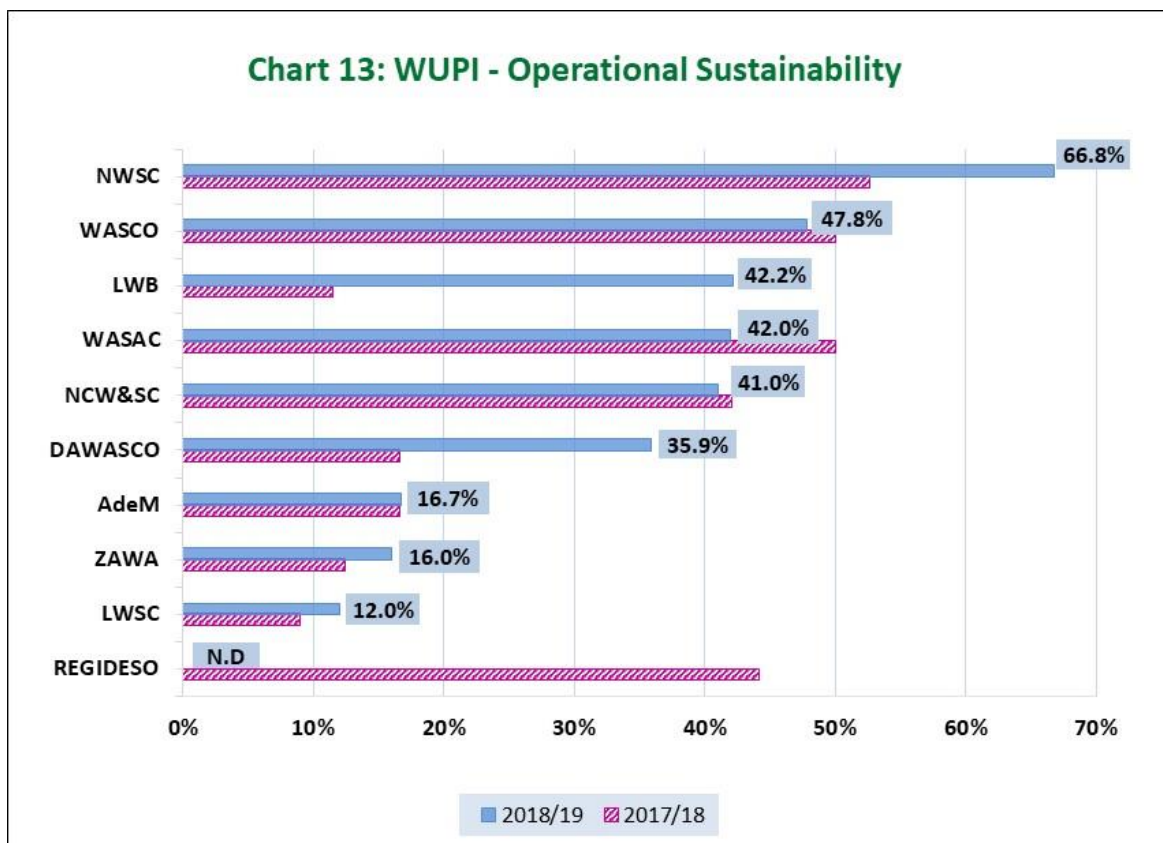
As seen in Table 12, except for WASAC and NWSC, Utilities with high water production and vast networks tended to have more losses per kilometer per day. This was the case for DAWASCO, LWSC and NCW&SC who recorded losses of 60.3, 43.7 and 42.4m³/km/day, respectively.

In an ideal case, the more the number of connections, the lesser the losses per connection. This was the case with NWSC who recorded the lowest loss 184.5L/con/day. It should be borne in mind that NWSC had the lowest NRW in the period. The notion however, did not stand for Utilities such as NCW&SC and DAWASCO who recorded losses of 786.6 and 743.1L/con/day, respectively. This was attributed in part to extremely high water losses in percentage terms that were almost at 50%.

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.

NWSC ranked first on the aggregated indicator after improved performances in NRW and staff per 1,000 water and sewer connections. Despite a slight drop on the WUPI performance attributed to a deterioration in staff per 1,000 water and sewer connections, WASCO still maintained second position. The biggest leap in performance on the WUPI – Operational Sustainability was by LWB after improved performance in metering ratio and NRW indicators.



5.5 SUMMARY ANALYSIS

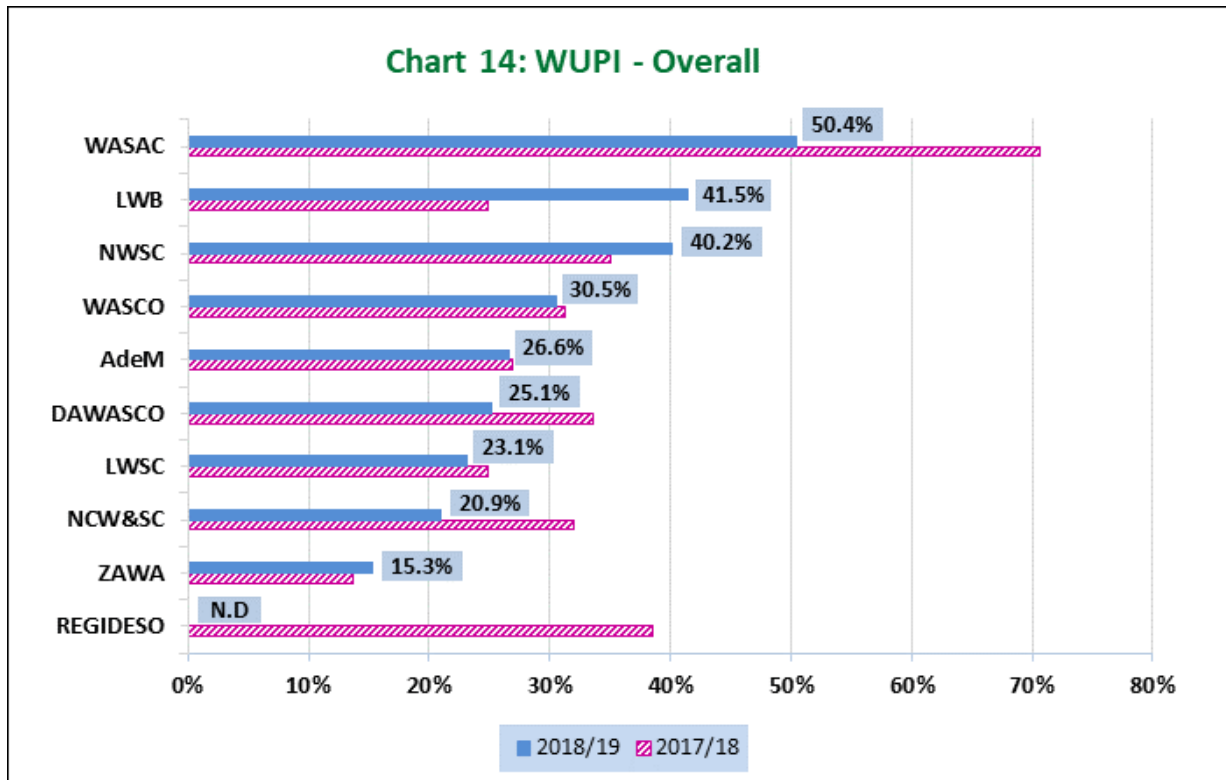
The performance analysis of the Utilities on the ten selected single KPIs is summarized in Table 13 and an Overall WUPI is shown in Chart 14. The Overall WUPI is derived by aggregating the three WUPIs of Quality of Services, Economic Efficiency and Operational Sustainability.

Table 13: Summary of Utility Performance

KPI		NCW&SC	LWSC	DAWASCO	AdeM	WASCO	WASAC	REDIGESO	ZAWA	NWSC	LWB
Quality of Services	Water Coverage	77.3%	82.5%	75.7%	55.6%	58.9%	59.2%	N.D	90.0%	74.3%	81.0%
	Sewerage Coverage	51.2%	16.9%	9.6%	-	5.0%	-	N.D	9.8%	21.0%	-
	Water Quality	94.2%	98.2%	71.9%	100%	95.4%	99.9%	N.D	82.6%	93.5%	81.9%
	Hours of Supply	6	16	22	10	18	21	N.D	12	18	20
Economic Efficiency	O&M Cost Coverage	104.8%	124.5%	117.2%	108.2%	78.3%	140.8%	N.D	78.1%	126.5%	135.2%
	Collection Efficiency	92.8%	81.6%	91.0%	87.4%	111.0%	95.7%	N.D	47.8%	99.9%	95%
	Staff Cost vs O&M Costs	64.3%	61.5%	32.4%	21.5%	42.5%	33.6%	N.D	34.5%	39.7%	18.1%
Operational Sustainability	Staff/1,000 W&S Connections	6.14	5.84	3.96	3.24	5.39	6.44	N.D	5.11	5.54	6.41
	Metering Ratio	99.2%	69.8%	95.8%	79.8%	100%	100%	N.D	13.7%	99.8%	100%
	NRW	49.6%	46.5%	48.4%	53.3%	41.6%	41.3%	N.D	45.0%	32.9%	40.7%

From Table 13, the Utilities showed favourable performance in staff/1000 water & sewerage connections and O&M cost coverage by billing indicators. In the two indicators, the average performance met the minimum acceptable benchmarks. Conversely, the Utilities performed poorly in non-revenue water, water quality and sewerage coverage indicators.

As regards the Overall WUPI in Chart 14, WASAC of Rwanda retained the first position despite a massive drop in comparison to previous performance, while LWB took second position after general improvement in performance. NWSC returned third position and was only one of three Utilities to record improvement on the WUPI-Overall.



CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

Undoubtedly, benchmarking can be a powerful tool to stimulate performance improvements in industry through revealing system weaknesses and providing opportunity for enhancing operational efficiencies. Thus, Utilities benchmarked in this report should interrogate their own operations further, draw upon the inspiration of others and embrace good practices as they strive to make improvements.

In the reporting period, the average performance trends of some indicators were slightly affected by the non-submission of data by the Burundi utility, REDIGESO. While individual Utilities had varying performance from one indicator to the other, the general picture showed stagnation in performance across all classes of indicators. This aggregated performance is summarised below:

- **Quality of Service** – despite the overall picture showing declining to stagnated trend, a few Utilities made strides to remain above the acceptable benchmark for water coverage. ZAWA in particular, upheld a high water coverage at 90%. Similarly, the average sewerage coverage indicator increased marginally. NCW&SC still recorded the highest sewerage coverage at 51%, above the acceptable benchmark of 40%. Regarding water quality, LWSC, AdeM, WASCO and WASAC maintained their statuses as having met the acceptable benchmark. This was a decline compared to six Utilities who met the acceptable benchmark in the previous period. On average hours of supply, only DAWASCO, ZAWA and LWB recorded improvements while the others showed a fluctuating trend.

Overall, more effort is required to improve the outlook of this category of indicators to improve service provision to customers.

- **Economic Efficiency** – Despite a somewhat stagnated outlook in this category, seven Utilities were above the acceptable benchmark in the O&M cost coverage indicators. On the other hand, only four Utilities recorded improvements in collection efficiency as was also the case with staff costs in relation to O&M indicator. Likewise, more effort is required to contain costs and systematically increase revenue for financial viability to be achieved.
- **Operational Sustainability** – Apart from the NRW water indicator, a good number of Utilities showed some progress in metering ratio and staff efficiency indicators resulting in a positive outlook in this set of indicators. All the Utilities met the acceptable benchmark in Staff/1,000 water and sewerage connections indicator. NRW on the other hand, continues to be a scourge that requires more strategic and concerted action to be brought within acceptable limits.

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

- **NCW&SC:** the Kenyan utility maintained the highest sewerage coverage among all the utilities at 51% and maintained fairly high metering ratio at almost 100%. However, it needs to improve hours of supply as they were way below the acceptable benchmark and also staff cost versus O&M costs ratio.
- **LWSC:** the Zambian utility maintained water quality compliance above the acceptable benchmark. However, it needs to improve its collection efficiency and staff costs versus O&M costs to within acceptable benchmarks if it is going to be financially viable.
- **DAWASCO:** the Tanzanian utility improved hours of water supply close to the ultimate benchmark and had very good staff costs in relation to O&M costs. However, the Utility must improve water quality compliance and non-revenue water.
- **AdeM:** the Mozambican utility maintained water quality compliance at 100%, however, it needs to improve hours of supply, collection efficiency and metering ratio.
- **WASCO:** the Lesotho utility maintained good collection efficiency at over 100%. However, the utility must improve water coverage and O&M cost coverage by billing.
- **WASAC:** Despite a significant reduction in the Overall WUPI, the Rwandese Utility maintained first position, largely driven by good performance in Quality of Services indicators, particularly water quality compliance and hours of supply. The utility also improved O&M cost coverage by billing to 141%. However, the utility needs to improve water coverage and NRW, like most Utilities.
- **REDIGESO:** the Burundian utility did not submit data for the reporting period. Generally, it needs to improve data management.
- **ZAWA:** the Zanzibari utility improved hours of supply despite still being below the acceptable benchmark and generally made slight improvements on the Overall WUPI. These improvements however, were not sufficient and the Utility ranked last. Thus, it needs to improve on a number of indicators, especially collection efficiency, metering ratio and NRW.
- **NWSC:** the Ugandan Utility performed well in Economic Efficiency and Operational Sustainability categories and thus improved its performance on the Overall WUPI to rank third. It remains the only utility to have met the acceptable benchmark on NRW and also maintained very high collection efficiency. However, it needs to improve water and sewerage coverage.
- **LWB:** the Malawian utility improved its performance in metering ratio to 100%, collection efficiency to 95% and hours of supply to over the acceptable benchmark. This significantly improved its rating on the Overall WUPI to propel it into second place. However, the utility needs to improve its water quality compliance and NRW management.

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 6,553,952 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 and eight (8) waste water stabilization ponds.</p>																						
General Data About Water Utility	<table border="0"> <tr> <td>Abbreviation</td> <td>DAWASCO</td> </tr> <tr> <td>Start of Operations</td> <td>2005</td> </tr> <tr> <td>Number of Towns in Operation Area</td> <td>3</td> </tr> <tr> <td>Total Population in Operation/Service Area</td> <td>6,553,952</td> </tr> <tr> <td>Total Water Connections</td> <td>261,294</td> </tr> <tr> <td>Total Waste Water/Sanitation Connections</td> <td>19,806</td> </tr> <tr> <td>Total Production/year</td> <td>146,437,533m³</td> </tr> <tr> <td>Total Staff</td> <td>1,113</td> </tr> <tr> <td>Annual O&M Costs</td> <td>TZS 113,837,400,000</td> </tr> <tr> <td>Annual Water and Sewerage billing</td> <td>TZS 133,411,921,451</td> </tr> <tr> <td>Annual Water and Sewerage Collections</td> <td>TZS 121,389,286,372</td> </tr> </table>	Abbreviation	DAWASCO	Start of Operations	2005	Number of Towns in Operation Area	3	Total Population in Operation/Service Area	6,553,952	Total Water Connections	261,294	Total Waste Water/Sanitation Connections	19,806	Total Production/year	146,437,533m ³	Total Staff	1,113	Annual O&M Costs	TZS 113,837,400,000	Annual Water and Sewerage billing	TZS 133,411,921,451	Annual Water and Sewerage Collections	TZS 121,389,286,372
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Tariff Structure	<p><i>*Exchange Rate: TZS2,297.61 to 1US\$ (2018/19)</i></p> <table border="1" style="margin-bottom: 20px;"> <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="text-align: center;">1,663</td> <td style="text-align: center;">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="text-align: center;">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 2,395,347 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	2,395,347
Total Water Connections	256,839
Total Waste Water/Sanitation Connections	N.A
Total Production/year	78,766,500 m ³
Total Staff	832
Annual O&M Costs	MT 2,044,532,420
Annual Water Billing	MT 2,211,751,770
Annual Water Collections	MT 1,933,057,025

Tariff Structure

*Exchange Rate: MT64 to 1US\$ (2019)

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 tariff 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 5,993,280 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	5,993,280
Total Water Connections	203,070
Total Waste Water/Sanitation Connections	Not applicable
Total Production/year	52,399,534m ³
Total Staff	1,376
Annual O&M Costs	FRW 15,303,589,930
Annual Water and Sewerage billing	FRW 21,546,371,309
Annual Water and Sewerage Collections	FRW 20,614,907,653

Tariff Structure

*Exchange Rate: FRW911.50 to 1US\$ (2018/19)

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 since there is 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 740,813 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	740,813
Total Water Connections	104,586
Total Waste Water/Sanitation Connections	7,593
Total Production/year	21,050,588 m ³
Total Staff	555
Annual O&M Costs	LSL 250,784,000
Annual Water and Sewerage billing	LSL 196,256,000
Annual Water and Sewerage Collections	LSL 217,822,590

Tariff Structure

*Exchange Rate: LSL15.56 to 1US\$ (2019)

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 LSL9.70
- Water closet customers charged on 60% of water consumed at LSL9.70

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 4,640,674. 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	4,640,674
Total Water Connections	311,242
Total Waste Water/Sanitation Connections	248,912
Total Production/year	180,157,371 m ³
Total Staff	3,440
Annual O&M Costs	KSHS 8,872,197,147
Annual Water and Sewerage billing	KSHS 9,299,430,988
Annual Water and Sewerage Collections	KSHS 8,632,095,360

Tariff Structure

*Exchange Rate: KSHS101.99 to 1US\$ (2018/19)

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 SANITATION COMPANY(LWSC) - ZAMBIA

Water Utility

Lusaka Water and Sanitation 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 2,716,780. 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	2,716,780
Total Water Connections	115,871
Total Waste Water/Sanitation Connections	36,117
Total Production/year	78,108,180 m ³
Total Staff	888
Annual O&M Costs	ZMW275,459,788
Annual Water and Sewerage billing	ZMW342,893,111
Annual Water and Sewerage Collections	ZMW279,691,358

Tariff Structure

*Exchange Rate: ZMW14.38 to 1US\$ (2019)

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 withdrew 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 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 to 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 Lake Tanganyika, 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 began operating in 2015 and brought ZAWA under regulation.

The total population in the ZAWA operation area is 1,625,605.

General Data About Water Utility

Abbreviation	ZAWA
Start of Operations	2006
Number of Towns in Operation Area	6
Total Population in Operation/Service Area	1,625,605
Total Water Connections	108,694
Total Waste Water/Sanitation Connections	3,000
Total Production/year	65,111,709.00 m ³
Total Staff	571
Annual O&M Costs	TSH11,797,589,598
Annual Water and Sewerage billing	TSH9,215,363,893
Annual Water and Sewerage Collections	TSH4,400,515,393

Tariff Structure

*Exchange Rate: TSH2,297.61 to 1US\$ (2018/19)

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 14,746,127. 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	14,746,127
Total Water Connections	659,157
Total Waste Water/ Sanitation Connections	22,606
Total Production/ year	134,920,002 m ³
Total Staff	3,778
Annual O&M Costs	UGX345,856,705,000
Annual Water and Sewerage billing	UGX437,420,103,499
Annual Water and Sewerage Collections	UGX436,971,646,297

Tariff Structure

**Exchange Rate: UGX3,704.50 to 1US\$ (2018/19)*

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, which mandate lies with the Lilongwe Local Authority.

The total population in the LWB area of jurisdiction is 1,026,912.

General Data About Water Utility

Abbreviation	LWB
Start of Operations	1947
Number of Towns in Operation Area	1
Total Population in Operation/Service Area	1,026,912
Total Water Connections	90,658
Total Waste Water/Sanitation Connections	-
Total Production/year	36,338,345.84 m ³
Total Staff	581
Annual O&M Costs	MK18,245,827,061.81
Annual Water and Sewerage billing	MK24,671,536,143.71
Annual Water and Sewerage Collections	MK23,428,624,884.07

Tariff Structure

**Exchange Rate: MK725.16 to 1US\$ (2018/19)*

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 in 2012. The WUPI used by CRA (now AURA IP) was harmonized for regional comparison. The WUPI allows measurement of 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 normalisation of the KPIs. The aim of the KPI normalization is to convert 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 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, the minimum and maximum threshold values for each indicator to perform the indicator normalisation were pre-established (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:

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

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

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

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

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 .