

**REGIONAL BENCHMARKING OF
WATER SUPPLY AND SANITATION UTILITIES
2016/2017 REPORT**

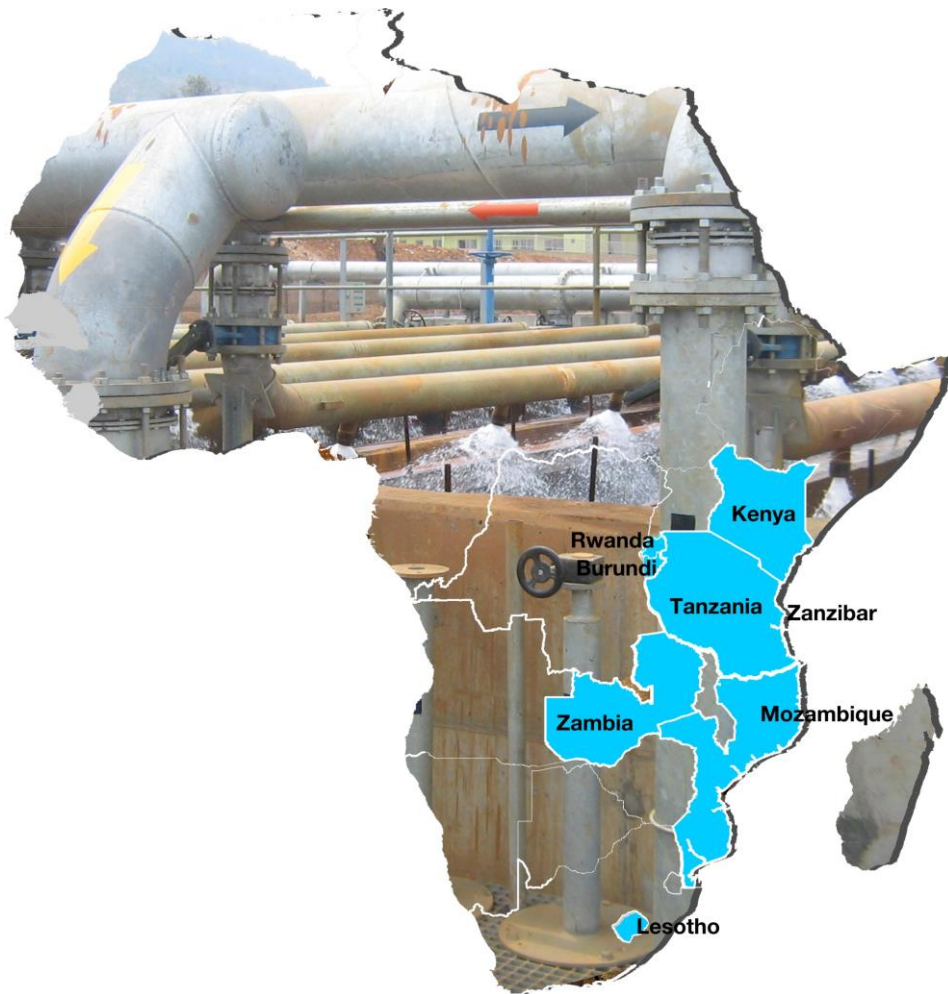


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FOREWORD

The 2016/17 reporting period marked ten years since the first informal meeting of the Eastern and Southern African Water and Sanitation (ESAWAS) Regulators Association in 2007. It has been gratifying to note that that first meeting in Lusaka, Zambia culminated into a formal cooperation that has seen regulation strengthened among the Members through knowledge and information exchange, as well as capacity building. The regional cooperation has also grown from five Members to eight and with a potential for more growth. In 2017, ESAWAS also saw increased calls for collaboration with regional and Africa-wide entities such as the African Ministers' Council on Water (AMCOW), the African Forum for Utility Regulators (AFUR), the Climate Resilient Infrastructure Development Facility (CRIDF) and Water and Sanitation for the Urban Poor (WSUP). These partnerships will raise the profile and impact of ESAWAS activities and will be incorporated in the third ESAWAS Strategic Plan under development for the period 2019-2021.

This fourth regional benchmarking report has seen the inclusion of the Burundi water supply and sanitation Utility bringing the total reported Utilities to nine. Despite data gaps, the regulator AREEM has initiated the process of benchmarking the Utility, which is a laudable step, in a bid to better assess the performance of the national Utility. This is in line with the ESAWAS Strategic Plan objectives to extend the exercise to the rest of the region and thereby spur improvements in water supply and sanitation service delivery through comparative reporting.

The responsibility for monitoring and reporting on the progressive realisation of Sustainable Development Goal 6 on availability and sustainable management of supply and safely managed sanitation services is vested in the water and sanitation regulatory agencies of the respective countries. Hence, the WSS regulators are keen to see service delivery improve through effective regulation. In recognition of that fact that regulation is dynamic and must respond to a changing environment, ESAWAS will continue to explore and identify good practices and mechanisms to improve regulation amongst Members to ensure increased access and improved service delivery for all. While there is no 'one-size' fits all approach, there is a 'best-fit' approach that ESAWAS uses to outline good practices for replication and adaptation. In addition, issues of gender and social inclusion, climate change adaptation, the human right to water etc can no longer be ignored in formulating effective regulation. Ultimately, it is every Member's vision to leave no one behind.

ESAWAS continues to pay due recognition to its Members for dedicating staff and time to the benchmarking process. Without reliable and accurate data, regulation becomes ineffectual. Hence the data in this report have been verified and drawn from country-level reports by the regulators. Also, ESAWAS pays gratitude to entities, such as AFUR, IBNET and IWA, that have disseminated this report further through their respective sharing platforms. ESAWAS activities are premised on an African proverb that says 'If you want to go fast, go alone. If you want to go far, go together'. ESAWAS goes together.

ABBREVIATIONS/ACRONYMS

AdeM	Águas da Região de Maputo
AFUR	African Forum for Utility Regulators
AMCOW	African Ministers' Council on Water
AREEM	Agence de Régulation des secteurs de l'Eau potable, de l'Electricité et des Mines
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
MDGs	Millenium Development Goals
NCW&SC	Nairobi City Water and Sewerage Company
NWASCO	National Water Supply and Sanitation Council
NWSC	National Water and Sewerage Corporation
QoSSS	Quality of Supply and Service Standards
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 2016/17 regional benchmarking report of water supply and sanitation Utilities marks the fourth annual consecutive report produced by the ESAWAS Regulators Association. The number of Utilities benchmarked has continued to grow from six at inception, to nine as more regulatory entities participate in the exercise.

This fourth report presents an analysis of the performance of water and sewerage Utilities in nine countries of the Eastern and Southern African region for the period 2016/2017. The largest or single Utilities in each country selected for benchmarking 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 Ltd (WASAC) of Rwanda; Régie de Production et de Distribution d'Eau et d'électricité (REGIDESO) of Burundi; Zanzibar Water Authority (ZAWA) of Zanzibar; and National Water and Sewerage Corporation (NWSC) of Uganda;

The analysis of the performance was done against ten key performance indicators grouped according to similarity in the components of Quality of Service, Economic Efficiency and Operational Sustainability. Finally the performance of the Utilities was ranked using an integrated measurement of performance in the aforementioned components, called the Water Utility Performance Index. The best performing KPI was Staff/1,000 W&S Connections where all the Utilities met the acceptable benchmark. The worst performing KPIs remained the same over three years, which were Sewerage Coverage and NRW where only one Utility met the acceptable benchmark.

The report recommends the need for innovative and pragmatic approaches that take a holistic view of service delivery, with particular emphasis on increasing access to safely managed sanitation services and reducing NRW, which have continued to be unimproved and below acceptable benchmarks.

This report introduces two new dimensions on the (i) status of national coverage as well as (ii) profiling the best performers in a country that may not necessarily be the largest Utility. The status of national coverage tracks country progression towards the SDG targets for SDG 6 on water and sanitation.

This report is organised as follows: the first chapter gives an overview of the ESAWAS Regulators Association; the second chapter chronicles ESAWAS' journey in 10 years of operation, Chapter 3 tracks the status of national WSS coverage. Chapter 4 describes the regional benchmarking framework while Chapter 5 presents the comparative performance analysis and Chapter 6 discusses the main conclusions and recommendations of the benchmarking exercise. The report concludes with Chapter 7 which profiles the best performers in a country.

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 which began informally in 2007, was officially formed in 2009 by a Memorandum of Understanding and gained legal personality in 2012 as a registered society under Cap 119 of the Laws of 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 eight members that are: Water Services Regulatory Board (WASREB) of Kenya; the Conselho de Regulação de Águas (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 Agence de Régulation des secteurs de l'Eau potable, de l'Electricité et des Mines (AREEM) of Burundi; and the Zanzibar Utilities Regulatory Authority (ZURA) of Zanzibar. The overview of the regulators is given in Table 1.

Table 1: Overview of ESAWAS Members

	Regulator	Established by	Year begun operations	Number of regulated Urban WSS Utilities
1	National Water Supply and Sanitation Council (NWASCO), Zambia	Water Supply and Sanitation Act No. 28 of 1997	2000	18
2	Conselho de Regulação de Águas (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	Agence de Régulation des secteurs de l'Eau potable, de l'Electricité et des Mines (AREEM), Burundi	Decree No. 100/320 of 2011	2015	1
8	Zanzibar Utilities Regulatory Authority (ZURA), Zanzibar	Act No. 7/2013	2015	1

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

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

- Licensing: All WSS providers are required to operate under a license issued by the regulator except in Mozambique where the regulator, CRA, signs a regulatory agreement/contract with the provider that defines the regulatory framework.
- Development and Enforcement of Guidelines, Regulations, Rules and Standards: Various guidelines, regulations, rules and standards have been developed and enforced to ensure compliance to the governing water supply and sanitation legislation. Some key regulations, guidelines and standards include: Minimum Service Level, Business

Planning, Corporate Governance, Reporting and Quality of Supply and Service Standards (QoSSS).

- Tariff Setting: All WSS providers are required to submit tariff applications to the regulator for analysis and approval.
- Performance Monitoring and Quality Control: The regulators undertake regular inspections of utility infrastructure and operations. Areas of non-compliance are addressed through written directives and orders.
- Sector Performance Reporting and Information Dissemination: The regulators have in place systems for data collection on the performance of the Utilities that is used for sector reporting. All the regulators produce annual reports on the performance of the sector which is published and disseminated to the public.

1.2 IMPLEMENTATION OF ESAWAS STRATEGIC PLAN

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

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

On overall, about 87% of the Strategic Plan was executed successfully. Major activities undertaken in the year under the three objectives and key focus areas were as outlined in Table 2.



11th ESAWAS Annual Conference, Livingstone-Zambia.

Table 2: Implementation Performance for 2017 Strategic Plan activities

OBJECTIVE 1: STRENGTHEN REGULATORY CAPACITY AMONG MEMBERS AND WITHIN THE REGION	
Key Focus Area	Performance
Undertake Peer Review of Regulators	<p>The fifth regulatory Peer Review was successfully conducted for LEWA, Lesotho from 13th – 18th August 2017 by a 14-person Peer Review Team composed of CEOs and senior personnel from the Members.</p> <p>The team lauded the good governance arrangements in place and the notable progress made by the regulator to put key regulatory tools in place in less than 5 years of regulation. Major recommendations were centred on the need to consolidate various legislation in place, prepare missing regulatory tools, strengthen enforcement and improve stakeholder engagements.</p>
Extend benchmarking exercise for large utilities in the region	<p>The third regional benchmarking report for the period 2015/16 was published by end of June 2017 and disseminated to a wide audience beyond ESAWAS Members by AFUR, IBNET and IWA.</p> <p>The main results showed that the best performing KPIs were Water Quality, Hours of Supply, O& M Cost Coverage and Staff/1,000 W&S Connections while the worst performing KPIs continued to be Sewerage Coverage and NRW.</p>
Provide support to WSS regulators newly established or under formation in the region	<p>The ESAWAS Technical Committee supported ZURA, Zanzibar through a 1.5-day workshop covering all the different facets of WSS regulation. The visit also included a session with the Zanzibar Water Authority, ZAWA (the WSS Utility) to promote the benefits of regulation.</p>



Regulatory Peer Review of LEWA, Lesotho- 2017

Table 2 cont'd: Implementation Performance for 2017 Strategic Plan activities

OBJECTIVE 2: FACILITATE EXPERIENCE AND KNOWLEDGE TRANSFER	
Key Focus Area	Performance
Document and share good practices in regulation	Expert presentations on designing appropriate regulation to incorporate Water Integrity in achieving the SDGs were made at the ESAWAS 11 th Annual Conference.
Undertake technical regulatory exchange programmes	ESAWAS facilitated a two-week study visit to NWASCO, Zambia for an officer from LEWA, Lesotho in technical regulation.
Establish/Strengthen partnership with other WSS sector associations	<ul style="list-style-type: none"> • The African Forum for Utility Regulators (AFUR) made a presentation on projects to address Corporate Governance and the impacts of climate change on water quality and sanitation at the ESAWAS 11th Annual Conference • ESAWAS participated in the AFUR Executive Committee meeting to discuss a formal collaboration and hence reduce duplication of projects in the region, as well as, the 14th AFUR Annual Conference held in Kigali, Rwanda. • ESAWAS requested the African Ministers' Council on Water (AMCOW) for partnership to consolidate efforts in water supply and sanitation in the region. An AMCOW representative made a presentation at the ESAWAS 11th Annual Conference.
OBJECTIVE 3: IMPROVE OPERATIONS OF ESAWAS REGULATORS ASSOCIATION	
Focus Area	Performance
Hold Annual General Meeting (AGM)	The 11 th Annual Conference and AGM was held in Livingstone, Zambia under the theme 'Water Integrity and SDG6– <i>designing appropriate regulation</i> ' in collaboration with the Water Integrity Network (WIN) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Zambia. The Conference drew over 80 participants from 45 different institutions. Key issues from the conference included the need for water integrity teams/committees within institutions; change management to foster integrity; collaboration among regulators, utilities, consumer associations and other enforcement agencies such as anti-corruption and auditor general; and monitoring Utilities through appropriate indicators for integrity and governance.
Update Website	The website was updated periodically with activities undertaken by ESAWAS.

CHAPTER 2. CHRONICLING 10 YEARS OF ESAWAS

2.1 FORMATION AND GROWTH

The ESAWAS Regulators Association began in 2007 as an informal meeting in Zambia supported by GIZ, and held among five WSS Regulators from different countries in the Eastern and Southern African region to exchange experiences and knowledge on WSS regulation. These were the Water Regulatory Council (CRA) of Mozambique; the Energy and Water Utilities Regulatory Authority (EWURA) of Tanzania; the National Water Supply and Sanitation Council (NWASCO) of Zambia; the Rwanda Utilities Regulatory Authority (RURA) of Rwanda; and the Water Services Regulatory Board (WASREB) of Kenya.



1st Regulators Meeting, Zambia- 2007

In recognising the need for the development of an effective WSS regulatory framework, and taking into account the different legal and regulatory responsibilities and environments in which each regulator operates, the five regulators resolved to establish a network of Eastern and Southern Africa Water and Sanitation Regulators for regional cooperation on issues of mutual concern and interest in the areas of water and sanitation regulation. Subsequently, in 2009 a Memorandum of Understanding (MoU) was signed among the five regulators that set out the framework for cooperation.

In 2010, a Constitution was ratified among the regulators that formalised the cooperation, gave the Association a legal personality and named it the ESAWAS Regulators Association. In 2012, the Lesotho Electricity and Water Authority (LEWA) of Lesotho ratified the Constitution to become the sixth member of the Association. In 2016, the Zanzibar Utilities Regulatory Authority (ZURA) of Zanzibar became the seventh member and the Agency for Regulation of Water, Electricity, and Mines Sectors (AREEM) of Burundi formally ratified the Constitution in 2017 to become the eighth member.

Institutions with a WSS regulatory function that have participated as observers at ESAWAS conferences include the Water Utilities Regulatory Department (WURD) of Uganda; the Water Services Association (WASAMA) of Malawi; the Ministry of Land Management, Water and Sanitation Services of Botswana; Ministry of Electricity, Dams, Irrigation and Water Resources of South Sudan; and Water, Sanitation & Hygiene (WASH) Sector National Coordination Unit of Zimbabwe.

2.2 MAJOR ACTIVITIES UNDERTAKEN

ESAWAS activities have been guided by a Strategic Plan since 2013. Prior to that, ESAWAS activities mainly focussed on holding annual meetings for knowledge and experience exchange on topical regulatory issues. So far, two Strategic Plans have been implemented covering a period of three years each. The major activities that have been executed to-date include:

a) Annual General Conferences

The ESAWAS Regulators Association holds a three-day Annual General Conference and Meeting to deliberate various aspects of regulation around a specific theme in order to build/enhance regulatory effectiveness. Some issues deliberated on during the annual conference would then form action points for follow-up/execution by ESAWAS. Since 2007, the annual conferences have been held under the following themes:

- 
- 2007 - *'Regulatory Exchange on Water Sector Reforms and Regulation'* held in Lusaka & Livingstone, Zambia
 - 2008 - *'Sharing experiences and knowledge on regulation'* held in Bagamoyo, Tanzania.
 - 2009 - *'Better Service through Monitoring and Benchmarking'* held in Maputo, Mozambique.
 - 2010 - *'Responding to the Changing Environment'* held in Mombasa, Kenya.
 - 2011 - *'Beyond Conventional Regulation'* held in Lusaka, Zambia
 - 2012 - *'Strengthening the Regulator'* held in Kigali, Rwanda.
 - 2013 - *'Regulation through Innovation'* held in Maseru, Lesotho.
 - 2014 - *'Enhancing Regulatory Governance'*, held in Maputo, Mozambique.
 - 2015 - *'Enhancing Regulatory Substance'*, held in Nairobi, Kenya.
 - 2016 - *'Regulating for the Future- Incorporating SDGs'*, held in Dar-es-salaam, Tanzania.
 - 2017 - *'Water Integrity and SDG6– designing appropriate regulation'*, held in Livingstone, Zambia.

b) Regulatory Peer Reviews

The ESAWAS Regulators Association undertakes peer-reviews of each Member's regulatory systems and practices. The peer-review, conducted in a one week period, is structured as a hands-on approach of regulatory systems interrogation with an aim to learn and share best practices on what works, what can be improved and what can be

adapted. A Peer Review Team composed of Chief Executive Officers and senior officers from respective ESAWAS Member institutions, is led by an independent Consultant, creating a collegial basis for mutual learning. The peer review focuses on the three primary areas of regulatory systems which are:

- Regulatory governance – also referred to as the “how” of regulation, is concerned with the institutional and legal arrangements that provide for decision making independence and the processes that enhance its credibility and legitimacy;
- Regulatory substance- also referred to as the “what” of regulation, is concerned with the intellectual and technical context of regulators’ decisions; and
- Regulatory impact – the outcome of the interplay between regulatory governance and regulatory substance is regulatory impact.

ESAWAS Members have opened up and allowed their regulatory systems and practices to be interrogated, as a means of receiving direct feedback on areas for strengthening. So far, five peer reviews have been undertaken for EWURA, Tanzania in 2013, WASREB, Kenya in 2014, NWASCO, Zambia in 2015, CRA, Mozambique in 2016 and LEWA, Lesotho in 2017.

Among the key recommendations that was consistent from all the peer reviews was the need for the regulators to improve sanitation regulation, reduce Non-Revenue Water (NRW) and get involved in rural water supply and sanitation regulation. The good practices identified among the Members will be compiled into a handbook that can be used to enhance existing regulation or to assist regulators under formation to implement good practices from inception.

c) Regional Benchmarking of WSS Utilities

ESAWAS produces an annual regional benchmarking report of WSS Utilities selected from each Member’s country. The report presents the platform by which large utilities can be compared to similar sized utilities within the region. While the operating environment may differ, by benchmarking against similar sized utilities, lessons can be drawn on how to improve performance for both the regulator and the utility.

In 2013, the Water Regulatory Council started an initiative to benchmark the performance of the water utility for Maputo against similar sized utilities in the region among ESAWAS countries. This followed concerns from the large utilities that are often resistant to having their performance benchmarked against ‘smaller’ utilities as they perceive their own required effort to improve as far greater in view of the size of area being serviced.

In recognising the value of the results, the 8th ESAWAS Annual General Meeting established a Technical Task Team to develop a framework for regional benchmarking of WSS utilities. The first report was produced for the period 2013/14 and covered the

performance of six large Utilities in ten key performance indicators. The report also introduced a performance ranking of the utilities using an integrated measurement of performance called the Water Utility Performance Index. Finally based on the analysis of the main strengths and weaknesses of each utility, the report also presents recommendations for the utilities to improve their performance and the quality of the services provided.

Other activities that have been undertaken include technical regulatory exchanges to bring specific regulatory expertise in a particular subject together in order to identify good practices; regulatory support for Members or regulators under formation for capacity building purposes and constant information dissemination in various areas of mutual interest.

2.3 IMPACT OF REGULATORY COOPERATION

Regional regulatory cooperation has yielded positive impacts on the Members that can be highlighted as follows:

a) NWASCO

- Developed the MyWatSan Quickfix Complaints Platform adapted from WASREB's MajiVoice;
- Upgraded the NWASCO Information System into a web-based version adapted from the functionality of WASREB's WARIS and EWURA's Majis;
- Review of main water supply and sanitation act incorporated good practices obtained during peer reviews from Members' legislation; and
- As a result of recommendations from NWASCO peer review
 - Developed regulation strategies for urban onsite sanitation and rural WSS service provision;
 - Produced public tariff determination document; and
 - Split costs for water and sewer to improve tariff determination.

b) WASREB

- Developed the information system (WARIS) data input forms adapted from NWASCO's information system;
- Established Water Action Groups based on NWASCO's Water Watch Groups. These have now been transformed into a partnership with Community Based Organisation (CBOs) and WASREB's role was revised from direct control to guided partnership;
- KPIs in use benchmarked from NWASCO; and
- Recommendations from peer review fed into the new Water Act 2016.

c) RURA

- Developed KPIs based on reviews from Members' benchmarking frameworks; and
- Developed water supply regulations based on Minimum Service Levels established by EWURA, WASREB and NWASCO.

d) EWURA

- Developed the information system (MAJIs) data input forms adapted from NWASCO's information system;
- KPIs in use benchmarked from NWASCO; and
- Recommendations from peer review implemented, particularly relating to the improvement of the tariff determination processes and procedures.

e) CRA

- Enhanced its benchmarking framework to compare the performance of the Maputo Utility with others in the region. This was the basis of ESAWAS beginning regional benchmarking;
- Recommendations from peer review assisted the regulator to improve the guidelines for tariff setting; and
- Instituted CORAL, which are part-time inspectors in following with a concept from NWASCO to improve regulatory presence on the ground.

f) LEWA

- KPIs in use adopted from ESAWAS regional benchmarking framework;
- In the process of establishing Community Based Organisations for consumer feedback from the ground; and
- The Quality of Supply Service Standards adapted through reviews from Members.

ZURA and AREEM, although being new members, have benefited through peer reviews, and technical/learning exchanges to establish regulatory tools by adapting existing tools from Members rather than reinventing the wheel.

CHAPTER 3: NATIONAL STATUS OF URBAN WSS PER MEMBER COUNTRY

3.1 BACKGROUND

Access to safe drinking water and adequate sanitation remains a key developmental agenda for Governments world-over. It was in this vein that the eight Millennium Development Goals (MDGs), developed from the Millennium Declaration signed in September 2000, included a specific target under goal 7C 'Ensuring Environmental Sustainability' which was 'to halve by 2015 the proportion of the population without sustainable access to safe drinking water and basic sanitation'. At the close of the MDGs period in 2015, the final assessment by the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) showed that while some progress had been made, particularly on water supply, most countries missed their targets for sanitation. The assessment of the ESAWAS Member countries from the UN Progress on Sanitation and Drinking Water- 2015 Update and MDG Assessment Report in Table 3 shows that none of the ESAWAS Member countries met either of their targets.

Table 3: Performance of ESAWAS Member Countries against WSS MDG targets

Country	Water Supply Progress towards MDG target	Proportion of the 2015 population that gained access since 1990 (%)	Sanitation Progress towards MDG target	Proportion of the 2015 population that gained access since 1990 (%)
Burundi	Moderate progress	40	Limited or no progress	26
Kenya	Good progress	42	Limited or no progress	18
Lesotho	Moderate progress	23	Limited or no progress	-
Mozambique	Moderate progress	33	Limited or no progress	15
Rwanda	Good progress	42	Good progress	42
Tanzania	Limited or no progress	29	Limited or no progress	12
Zambia	Moderate progress	41	Limited or no progress	23

Following the progress made under the MDGs, 17 Sustainable Development Goals (SDGs), were thus formulated as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. Unlike the MDGs, the SDGs are interconnected which means that the key to success on one will involve tackling issues more commonly associated with another. According to the SDGs, 'Water and sanitation are at the very core of sustainable development, critical to the survival of people and the planet'. Goal 6 of the SDGs on 'Clean

Water and Sanitation’ is to ‘Ensure availability and sustainable management of water and sanitation for all’. The SDGs came into effect in 2016 with targets set for 2030.

3.2. NATIONAL STATUS OF WSS FOR 2016/17 REPORTING PERIOD

The respective Governments of the eight ESAWAS Member countries, who are all member states of the United Nations, adopted the 2030 global agenda on sustainable development (the SDGs) with each government setting its own national targets by taking into account its national circumstances. The responsibility for monitoring and reporting on the progressive realisation of Goal 6 on availability and sustainable management of supply and safely managed sanitation services is vested in the water and sanitation regulatory agencies of the respective countries.

Table 4 shows the national urban services coverage for water supply and sanitation by sewer network for the 2016/17 period.

Table 4: Urban service coverage by ESAWAS Member Countries

	Total Urban Population	Water Supply Service Coverage	Sewerage Service Coverage
Burundi	800,732	83%	N/A
Kenya	20,138,579	55%	16%
Lesotho	685,938	58.9%	5.4%
Mozambique	6,337,702	57.2%	N/A
Rwanda	3,406,846	85.2%	N/A
Tanzania	17,141,210	63%	4.2%
Zanzibar	1,505,232	90%	10.3%
Zambia	6,696,266	85.1%	27.4%
TOTAL	56,712,505	64.4%	10.5%

All countries had water supply service coverage above 50% while sewerage service coverage was a marginal 10.5% on average. These figures underscore the fact that access to adequate sanitation services continues to lag far behind. Attaining the SDG target for universal access will not be realised without massive investments in sewerage infrastructure versus limited available funding. Recognising that the largest proportion of the population in the urban areas of the member countries depend on non-sewered (onsite) sanitation, achieving the 2030 target of safely managed sanitation services requires a pragmatic approach for inclusive urban sanitation that combines both sewerred and non-sewerred sanitation services.

The major challenge to improving non-sewerred sanitation service delivery in the member countries is the absence of a regulatory framework to address the full value chain of onsite sanitation. ESAWAS Members therefore need to actively put in place measures to regulate inclusive urban sanitation service provision to ensure that faecal matter generated in onsite sanitation facilities is effectively contained, collected, transported, treated and disposed of/reused in a safe manner to protect public health and the environment while delivering sustainable and affordable quality services.

3.3 FORECASTING TO 2030

With the SDGs already in effect, all stakeholders need to collaborate to ensure that the 2030 targets are not missed, unlike in the case of the MDGs. In this regard, countries need to take an inclusive and innovative approach, as is the spirit of the SDGs, to realise respective targets. Regulators, governments, utilities and supporting partners need to take into consideration issues of gender, disability, technology, climate change adaptation and social accountability in a holistic manner to meeting SDG6.

ESAWAS will support its Members through the development of appropriate applicable regulatory frameworks and tools to facilitate the holistic approach required. ESAWAS will further leverage on partnerships forged with various entities such as the African Ministers' Council on Water to develop model policies and share knowledge and good practices. This approach would facilitate faster progress in the adoption and replication of practices that improve regulation and ultimately, service delivery with a view to meeting national targets and the SDGs.

CHAPTER 4: REGIONAL BENCHMARKING FRAMEWORK

4.1 RATIONALE FOR REGIONAL BENCHMARKING

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

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

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

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

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

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

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 CRA as described hereunder.

- **IBNET:** The IBNET Toolkit provides a set of financial, technical and process indicators (mainly capturing the institutional context in which the Utilities are operating) for the assessment of utility performance in the provision of water and sewerage services. This set of indicators provides the basis for cross-utility and cross-country comparisons. IBNET caters for a large number of indicators in different categories such 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 benchmark among the countries. The weights were arrived at by a process of normalisation of the various weights defined by the different regulators. Table 5 shows the framework used for regional benchmarking.

Table 5: Regional Benchmarking KPIs and Performance Measurements

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

CHAPTER 5. PERFORMANCE ANALYSIS

The data used for performance benchmarking is obtained and verified through the WSS regulator. In the 2016/17 period, nine Utilities participated in the exercise from Burundi, Kenya, Tanzania, Zambia, Mozambique, Rwanda, Lesotho, Zanzibar and Uganda.

Although Uganda does not yet have an autonomous regulator, it was able to participate through the Water Utility Regulation Department (WURD) which has the regulatory function under the Ministry of Water and Environment. WURD is mandated to regulate the water authorities managing piped water systems by performance contract, as enshrined in Cap 152 of the Water Act. The respective water authorities are NWSC, Regional Umbrella Organisations (as Regional Utilities) and Local Governments being urban centres like town councils, sub-counties and rural growth centres. Over the last two years, the department realised the need to strengthen regional performance monitoring by placing regulation staff at the existing Water and Sanitation Development Facilities in the Northern, Central, Eastern, and South- West regions.

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

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

This section focuses on the analysis of the performance of the nine 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 NWASCO, CRA and AREEM

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

5.2 OVERVIEW OF BENCHMARKED UTILITIES

Only the largest or single Utilities in each country were selected for benchmarking. These are: Nairobi City Water and Sewerage Company (NCW&SC) of Kenya; 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; and National Water and Sewerage Corporation (NWSC) of Uganda.

The general profile about the Utilities is shown in Table 6, while a detailed profile is presented in Annex 2. All the Utilities are publicly owned companies.

Table 6: 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	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

Most of the Utilities have maintained the same mandate as at the time of their establishment except for LWSC, WASAC and NWSC:

- LWSC, Zambia was established in 1989 for the sole purpose of providing services to the capital city, Lusaka. However, in 2008 the mandate of the Utility was extended to cover the entire Lusaka Province.
- WASAC, Rwanda has been in existence since 1976 operating as ELECTROGAZ until 2010 when the national parastatals charged with water and electricity distribution were merged into the Energy, Water and Sanitation Authority. The 2010 law was repealed in 2014 to split the functions of electricity and water, and hence the establishment of WASAC.
- NWSC, Uganda was established in 1972 to operate in three major towns. A revision of the law in 1995 saw an extension of the mandate of NWSC to cover more towns. In 2017, WURD was granted authority to manage selected rural growth centres. During the reporting period, NWSC's geographical coverage increased from 170 to 218 towns.

REGIDESO, Burundi despite being the oldest, suffered a setback in operations in the late 90s. REGIDESO was created in 1962 after the independence of Burundi with the responsibility for supply of drinking water and electricity. From 1962 to 1992, REGIDESO focussed on setting-up the foundation of the company and building a network of infrastructure to increase production and distribution capacity. From 1992 to 2004, the country suffered a socio-political crisis that caused the destruction of a significant part of REGIDESO facilities. From 2005, the company has been rehabilitating damaged or dilapidated infrastructure and extending the water and electricity supply networks in the new districts of both the city of Bujumbura and the interior of the country.

The key background data about the Utilities is shown in Table 7.

Table 7: Key background data on Benchmarked Utilities

Utility	Population in the Service Area 2015/16	Number of Water Connections 2015/16	Annual Water Production (m ³ /yr) 2015/16	Population in the Service Area 2016/17	Number of Water Connections 2016/17	Annual Water Production (m ³ /yr) 2016/17
NCW&SC, Kenya	4.07 Million	333,326	200,352,109	4.25 Million	365,026	181,363,932
LWSC, Zambia	2.33 Million	97,008	84,330,000	2.40 Million	102,320	85,577,003
DAWASCO, Tanzania	5.19 Million	156,059	103,982,762	5.78 Million	262,476	123,696,270
AdeM, Mozambique	2.22 Million	255,202	73,151,000	2.31 Million	256,706	63,645,000
WASCO, Lesotho	0.61 Million	90,544	23,858,512	0.69 Million	95,571	22,162,517
WASAC, Rwanda	2.65 Million	175,646	42,187,531	3.41 Million	192,969	47,709,233
REGIDESO, Burundi	0.75 Million	84,530	48,519,433	0.80 Million	91,241	49,856,795
ZAWA, Zanzibar	1.54 Million	85,525	60,000,000	1.51 Million	96,644	51,626,829
NWSC, Uganda	7.50 Million	472,193	102,775,678	9.12 Million	524,657	120,736,647

From Table 7, NWSC had the highest population in its service area and total number of water connections. NCW&SC had the highest volume of water produced (more than double of most of the Utilities).

DAWASCO had an increase in production of 18.5% from the completion of Upper Ruvu water treatment plant expansion from 82,000m³/day to 196,000m³/day. The scope of works included the rehabilitation and expansion of intake works and raw water transmission system at Ruvu river.

NWSC had an increase in water production attributed to the expansion and refurbishment of water production facilities under the Water Supply Stabilisation Programme (WSSP) and takeover of 48 more towns.

NCW&SC, WASCO and AdeM had a drop in production due to drought experienced in the respective countries. For AdeM, the drought in Maputo has recurred for 4 years. From January to March in particular, low water levels in the Pequenos Libombos dam at Umbeluzi River reduced production to 80%.

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 8.

The KPIs boundaries established by ESAWAS are constrained to the current scenario but will be revised in the subsequent report due to shifts in trends.

Table 8: KPIs and Performance boundaries

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

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 service coverage considers the domestic population served through individual household connections, public standpipes and water kiosks. Table 9 shows the number of domestic water connections per Utility, while Chart 1 shows the service coverage.

All Utilities increased connections with the highest additions recorded by NCW&SC, DAWASCO, WASAC and NWSC.

Table 9: Domestic Water Connections

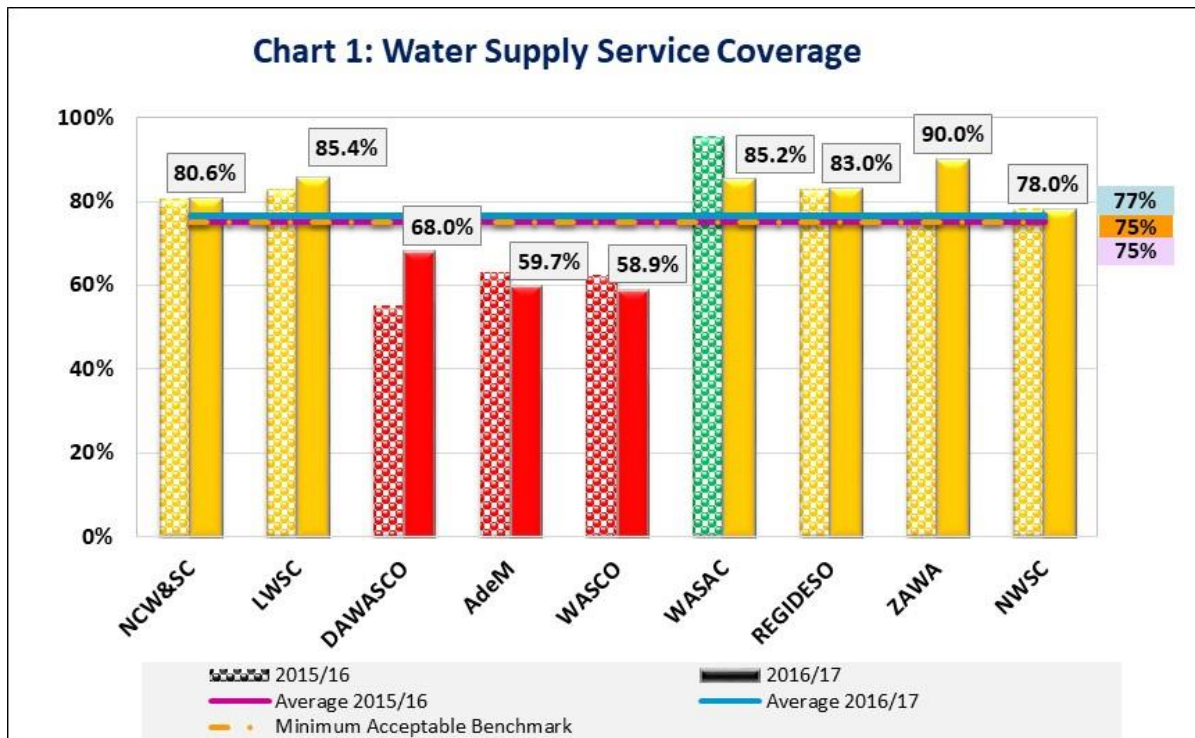
Utility	Domestic Connections 2015/16	Domestic Connections 2016/17
NCW&SC	309,629	342,879
LWSC	89,042	93,417
DAWASCO	150,778	256,290
AdeM	241,965	243,143
WASCO	76,442	84,554
WASAC	169,123	182,938
REGIDESO	84,530	91,241
ZAWA	82,971	92,907
NWSC	382,874	430,463

DAWASCO had the highest increase in water connections of just over 105,000 which includes 39,068 new water connections and the rest being activated connections.

WASAC increased connection as a result of performance contracts signed for all branch managers that include a target for new connections, particularly in new development areas. In addition, the regulator, RURA, has instituted deliberate efforts to eliminate public stand taps in preference for individual household connections.

For NWSC, the growth in total connections included connections taken over in the new towns (11,752) and new connections.

In terms of water supply service coverage, Chart 1 shows that the average increased to 77% which was above the acceptable benchmark of 75%.



Six Utilities were above the acceptable benchmark of 75%. In line with the significant increase in domestic connections, DAWASCO had the highest increase in water supply coverage.

Three Utilities suffered a drop in water supply coverage. For Adem, the drop was due to deactivation of 102 standpipes, which tend to serve more people than individual connections. WASCO did not have a corresponding increase in population served against the total population despite an increase in connections. The drop by WASAC was attributed to the increase in service area.

5.4.1.2. Sewerage Service Coverage

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

Due to the unreliability of data regarding septic tanks, only the sewerage services by network were considered. The number of sewerage connections are shown in Table 10 while service coverage is depicted in Chart 2.

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

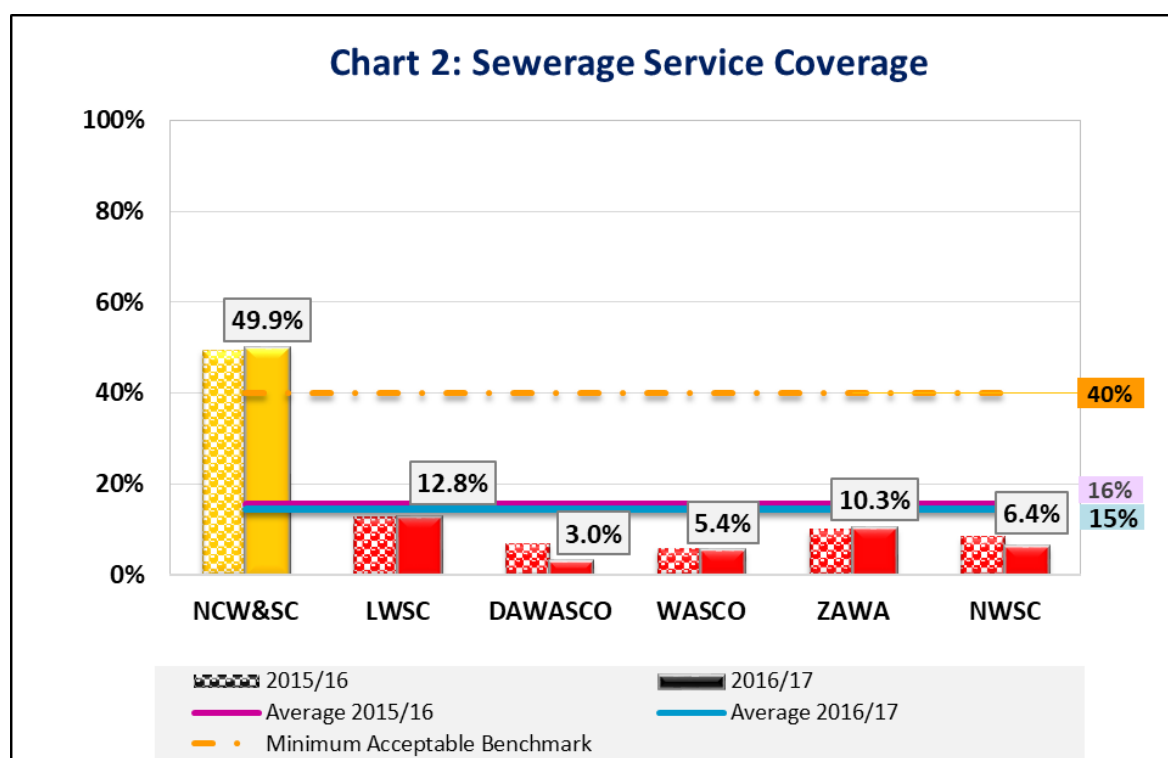
Kigali does not have a centralised sewer system and the private operator providing sewer services is not under regulation

Table 10: Sewerage Connections per Utility

Utility	Sewerage Connections 2015/16	Sewerage Connections 2016/17
NCW&SC	228,998	239,623
LWSC	32,137	32,276
DAWASCO	18,643	19,111
WASCO	7,165	7,463
ZAWA	3,000	3,000
NWSC	20,355	21,072

Apart from NCW&SC which recorded a notable increase in connections from minor investments provided for in the tariff for sewerage connections, the rest of the Utilities recorded minor additions of sewerage connections.

The sewerage service coverage by network in Chart 2 shows a dismal picture at an average of 15%. Only NCW&SC met the acceptable benchmark of 40%. DAWASCO’s coverage decreased due to customer verification that resulted in data clean-up.



The low coverage by sewer network implies that the majority of the population is served by some form of onsite (non-sewered) sanitation service and raises a need for regulators to focus on regulating non-sewered sanitation provision which has so far been neglected. Governments must also direct efforts to infrastructure investment, examples of such projects include:

- Lusaka WSC, Zambia has a major sanitation infrastructure project for Lusaka city to improve treatment of wastewater and faecal sludge.
- Rwanda is in the process of constructing the first wastewater treatment plant for Kigali. In tandem, RURA began the licensing of sewage collectors.

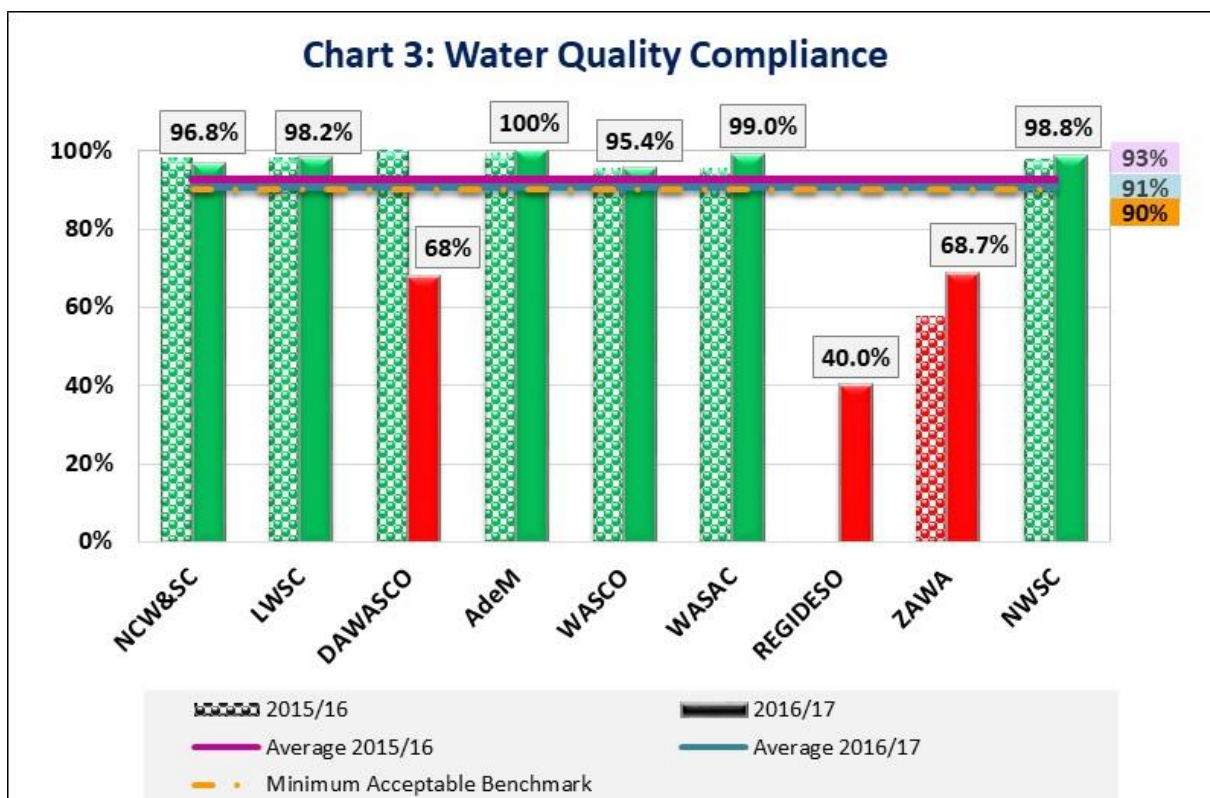
It is imperative that such projects include connections up to the last mile for full service delivery.

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 in conformity with the national standards.

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

The average water quality compliance, as shown in Chart 3, dropped to 91% but remained above the acceptable benchmark of 90%. Apart from DAWASCO, REGIDESO and ZAWA, all the Utilities met the good benchmark of 95%.



DAWASCO conducted less than half of the required number of tests. The Burundi regulator, AREEM, has not yet developed guides for water quality compliance hence REGIDESO was only

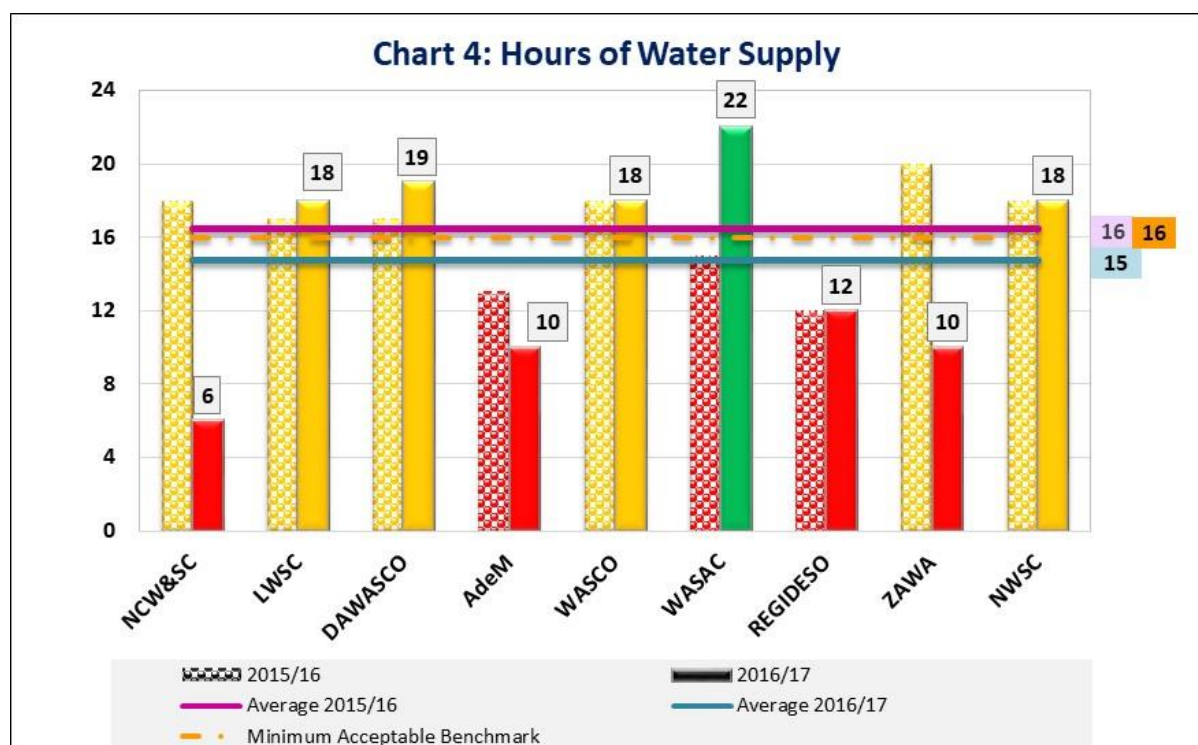
measured on compliance to residual chlorine standards. ZAWA conducted less than the required number of tests and a number of samples did not meet the standards.

For Lusaka WSC, the water quality analysis in the country sector report is lower due to a change in the water quality assessment by NWASCO in line with ISO/IEC 17025:2005 standard to encompass the credibility of the whole water quality monitoring chain. The Members of ESAWAS will gradually adapt the same approach.

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 shown in Chart 4, the average hours of supply dropped below the minimum acceptable benchmark of 16 hours. However, DAWASCO and WASAC significantly increase hours of supply as a result of the increased production capacity.



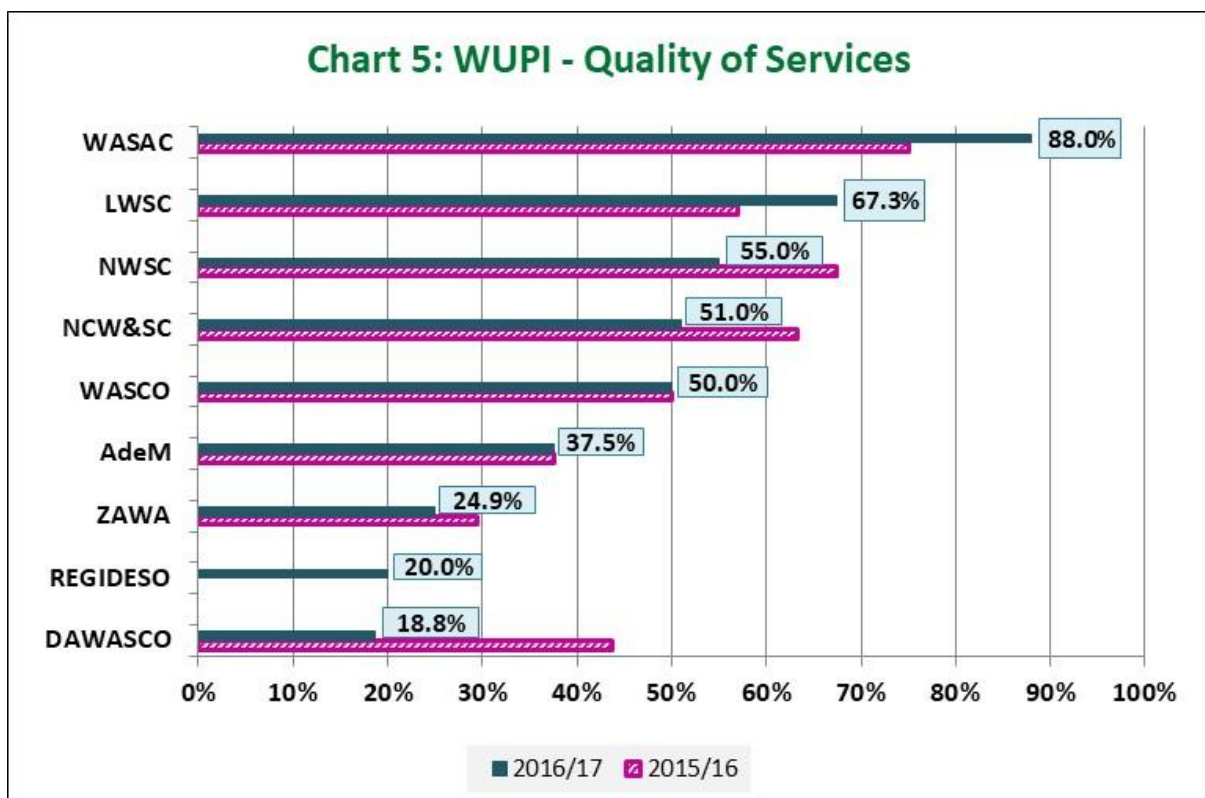
Four Utilities were below the minimum acceptable benchmark. NCW&SC & AdeM introduced rationing due to the reduced production capacity as a result of the drought experienced.

Reduction in water resources has become a key challenge for a number of countries due to climate variability and anthropogenic activities. The recent water shortages in Maputo, Nairobi and CapeTown should serve as a wake-up call to all stakeholders. Sustainable alternative water

sources, as well as adequate storage facility coupled with climate change management is becoming a key focus for regulators to safeguard water supply service delivery. Regulators need to develop policies for water storage and flood control, review resilience of water supply systems and manage water supply against competing demands with reduction in water wastage.

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.



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

LWSC and NWSC moved from 3rd and 4th positions to 2nd and 3rd, respectively as a result of largely maintained performance in all four indicators. NWSC overall performance dropped due to lower sewerage service coverage.

NCW&SC dropped from 2nd to 4th position, affected by a significant drop in hours of water supply.

WASCO maintained the same position, while AdeM moved up from 7th to 6th position as a result of DAWASCO falling to last position due to declining performance in water quality compliance and sewerage service coverage. REGIDESO entered the ranking at 8th position with data gaps.

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.

5.4.2.1 Comparison of Residential Water Bill and Cost of Connection

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

The comparison of a residential water bill in Table 11 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 11: Comparison of Residential Water Bill and Cost of Connection

Utility	Lifeline Consumption at 5m ³ (\$)	Bill at 30m ³ (\$)	Average domestic bill (\$)	Average Cost of Domestic Connection (\$)
NCW&SC	2.03	14.70	6.85	25
LWSC	2.56	17.82	12.44	80
DAWASCO	3.79	22.74	10.68	125
AdeM	2.04	20.29	5.32	69
WASCO	3.02	30.34	5.70	109
WASAC	1.89	14.52	7.17	67
REGIDESO	0.95	7.51	N/A	Not Available
ZAWA	1.49	15.70	1.86	
NWSC	4.94	27.20	7.44	

From Table 11, NWSC and DAWASCO had the highest charges for the lifeline consumption bill while REGIDESO and WASAC charged less than US\$2. However, for the bill at 30m³, WASCO and REGIDESO charged the highest and least, respectively.

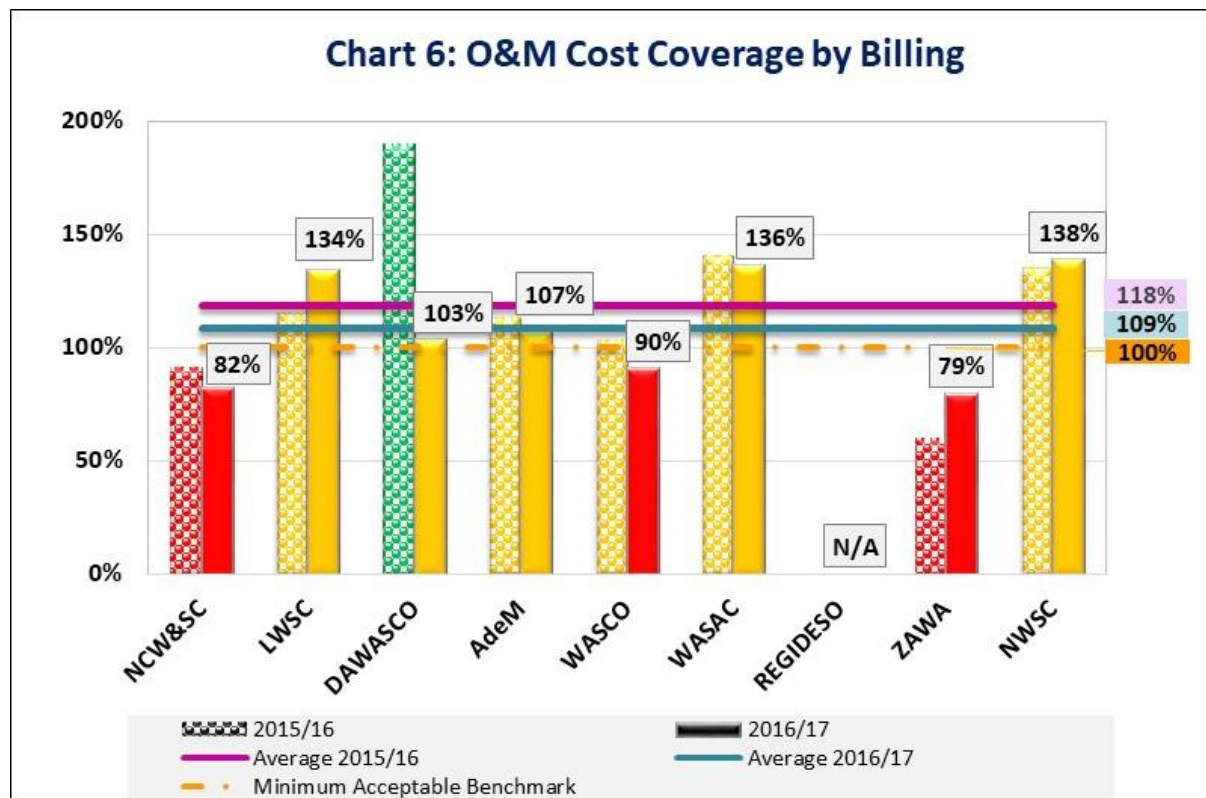
The average domestic bill for all Utilities was far less than the charge for 30m³, indicating that the average water consumption from the Utilities is less than 30m³ per month. This should prompt the Utilities to review the design of the tariff structure. The average domestic bill for NCW&SC dropped by almost half from \$11.70 in the previous period due to reduced consumption during the rationing period.

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

5.4.2.2 Operation and Maintenance Cost Coverage by Billing

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

In the reporting period, the average O&M Cost Coverage by Billing dropped to 109%, but remained above the minimum acceptable benchmark of 100%. NCW&SC, WASCO and ZAWA were the only Utilities below the acceptable benchmark.



The improved cost coverage by LWSC and ZAWA was from a reduction in operational expenses.

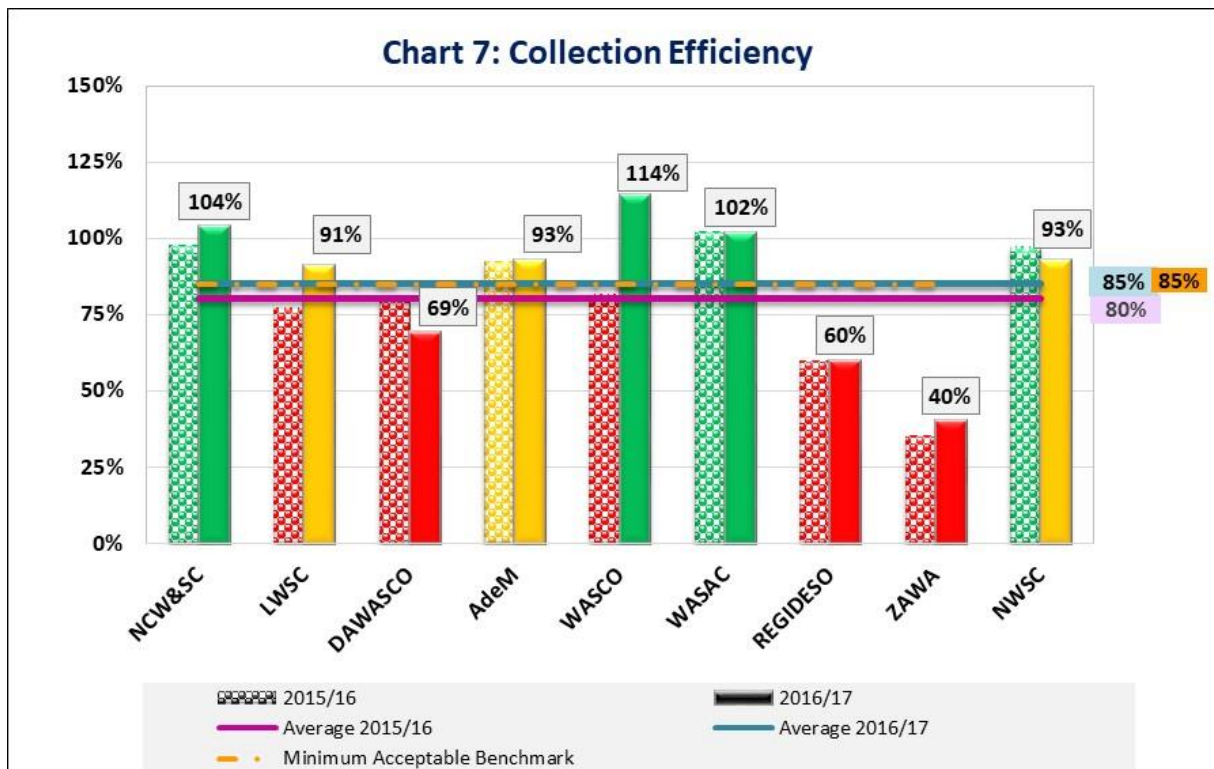
The significant drop in cost coverage by DAWASCO was due to expenses that more than doubled despite an increase in revenues. NCW&SC and WASCO also had notable drops in cost coverage as a consequence of a higher increase in expenses than revenues.

REGIDESO had data gaps due to the challenge of splitting operational costs for water & sewer from the business of electricity.

5.4.2.3. Collection Efficiency

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

Chart 7 shows that the average Collection Efficiency ratio was at par with the minimum acceptable benchmark of 85%. Only three Utilities (DAWASCO, REGIDESO and ZAWA) remained below the minimum acceptable benchmark.



LWSC and WASCO had notable improvements in collections. WASCO engaged a private debt collector to assist with dismantling the debt while LWSC stabilised in service delivery from the previous period.

DAWASCO had a significant increase in revenues against a marginal increase in collections, hence the drop in efficiency. NWSC with an extended mandate also experienced a drop in efficiency.

The collections for ZAWA though improving, remained critically low for sustainability. This implies that the Utility would have to depend on subsidies for viability.

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

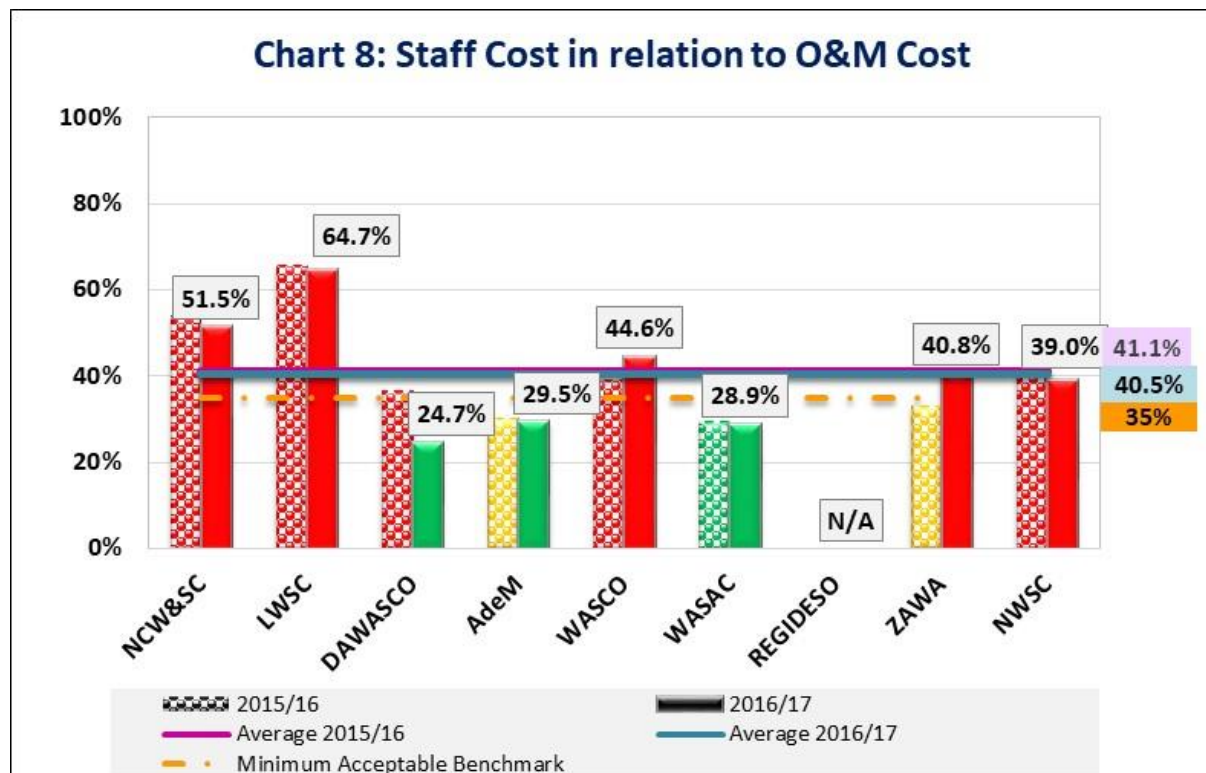
The staff cost is analysed against the O&M costs of the utility and presented in Chart 8. The internationally accepted “bottom line” for the staff cost is 30% of the total cost.

To put the cost proportion in perspective, the number of staff per Utility is shown in Table 12. NCW&SC and NWSC had the highest complement of staff, at three times more than any of the other Utilities.

Table 12: Total Staff per Utility

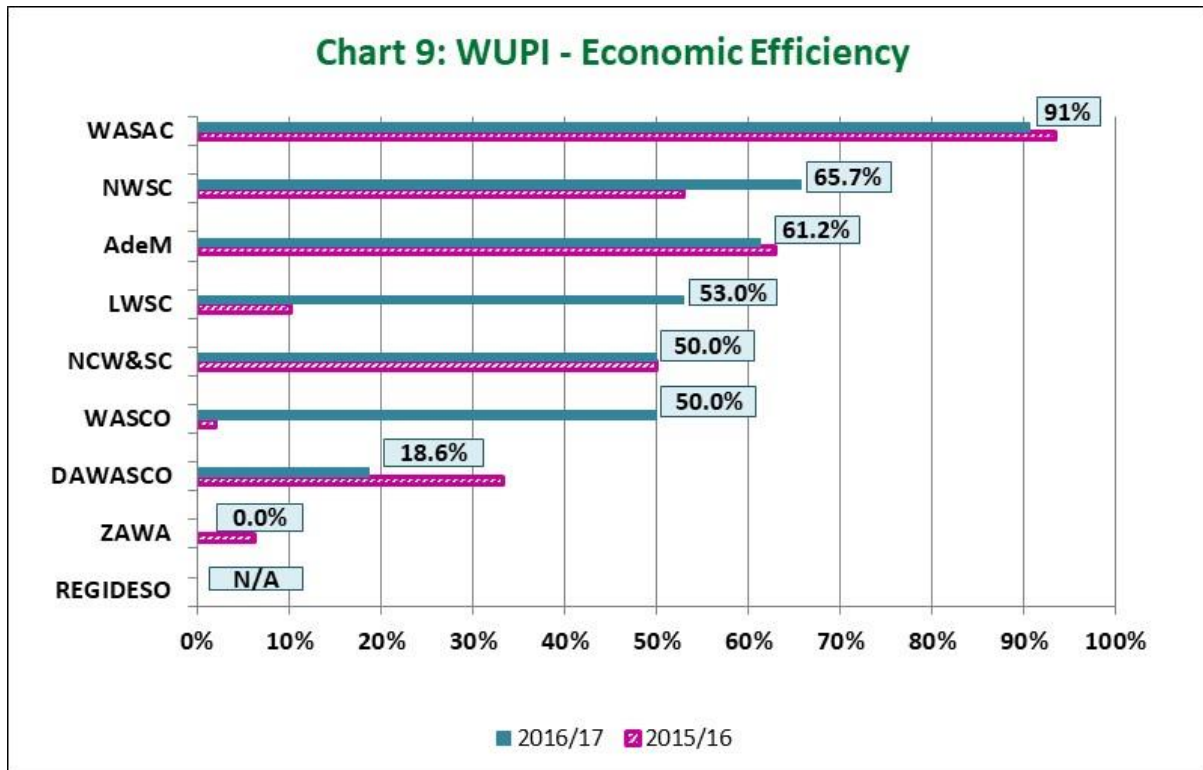
Utility	Total Staff 2015/16	Total Staff 2016/17
NCW&SC	3,506	3,511
LWSC	899	923
DAWASCO	906	1,055
AdeM	842	812
WASCO	543	603
WASAC	734	594
REGIDESO	560	591
ZAWA	687	606
NWSC	2,860	3,131

Chart 8 shows that the average proportion for staff costs against O&M costs did not meet the acceptable benchmark. Only DAWASCO, AdeM and WASAC were within the good benchmark.



5.4.2.5. Integrated Performance –Economic Efficiency

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



WASAC maintained a high performance in the Economic Efficiency component as evidenced by the good performance in all three KPIs.

NWSC and AdeM maintained 2nd and 3rd positions, respectively.

LWSC moved from 6th to 4th position due to improved performance in collection efficiency and O&M cost coverage, and pushed NCW&SC, which maintained its performance, into 5th position.

WASCO moved from last position to 6th due to significant improvement in collection efficiency.

DAWASCO dropped from 5th to 7th position as a result of declining performance in all three indicators.

ZAWA scored 0, as it was below the acceptable benchmarks for all three indicators while REGIDESO could not be ranked due to data gaps.

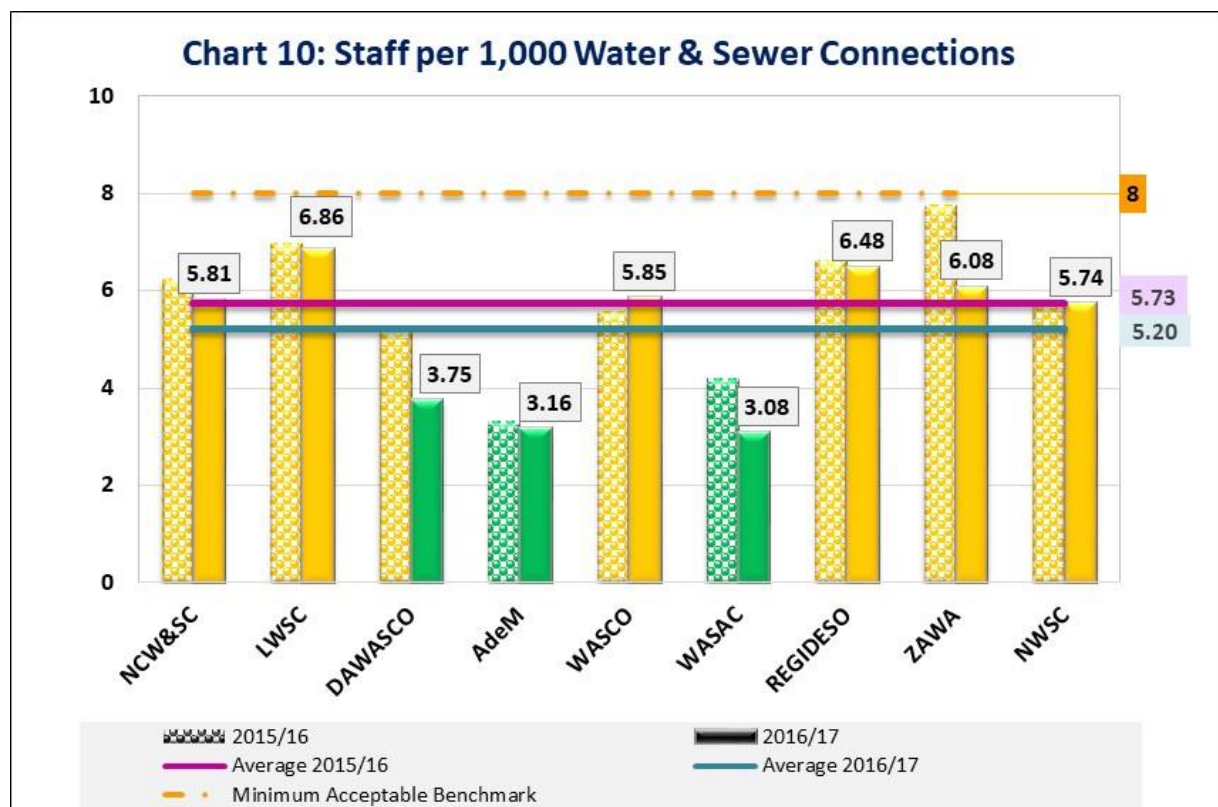
5.4.3 OPERATIONAL SUSTAINABILITY

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

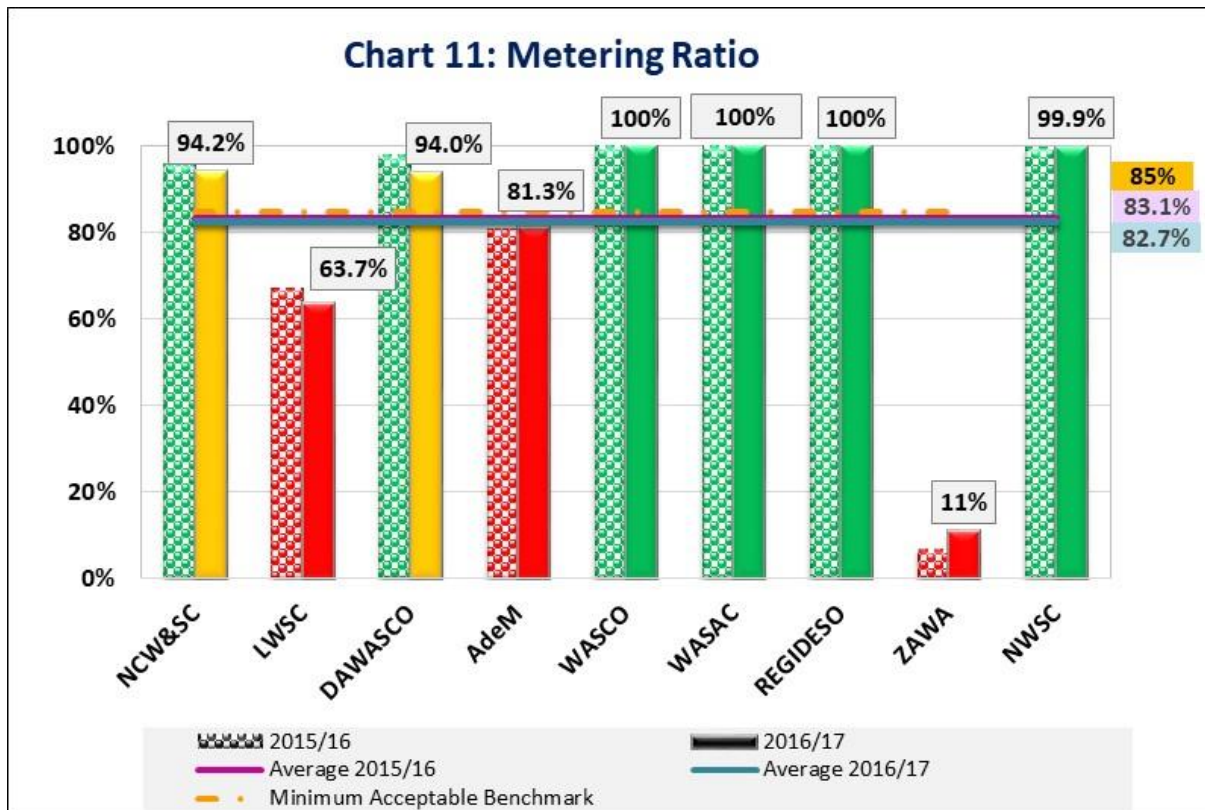
The average Staff per 1,000 Connections improved further below the minimum acceptable benchmark of 8 as shown in Chart 10. All the Utilities met the acceptable benchmark while DAWASCO, AdeM and WASAC met the good benchmark. DAWASCO and WASAC had significant increases in connections. ZAWA improved due to a reduction in staff and an increase in connections.



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, the average metering ratio was still below the minimum acceptable benchmark of 85%. Four Utilities, met the good benchmark of 95%. WASAC, WASCO and REGIDESO maintained the good benchmark of 100% metering despite an increase in connections. This is the ideal approach for the sector that all Utilities must emulate.



DAWASCO, despite the significant increase in connections (over 105,000), made considerable efforts to meter and came close to maintaining the metering ratio.

LWSC, AdeM and ZAWA remained below the acceptable benchmark. LWSC added new connections without meters while a number of stuck meters were removed from the system. In addition, as a result of high meter failures, particularly prepaid, the Utility concerted efforts on replacements with post-paid meters. NCW&SC increased connections without corresponding increase in metering.

5.4.3.3. Water Losses

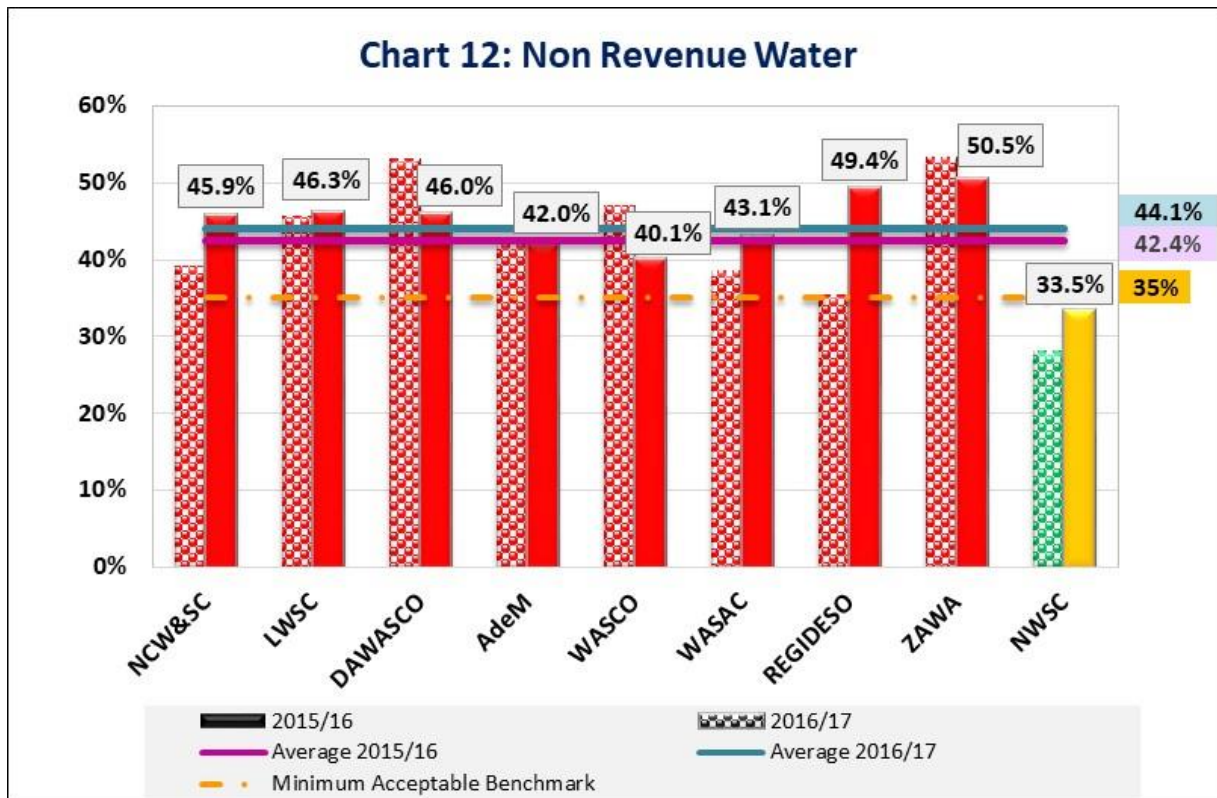
Non-Revenue Water is water that has been placed in the distribution system but lost before reaching the customer, that is, water produced but not sold. It measures the efficiency of a Utility in delivering the water it produces to customers' take-off points. It is made up of

technical losses (leakages), commercial losses (illegal connections/water theft, metering errors and unbilled authorised consumption). Water losses imply revenue loss and becomes a key area for Utilities to address urgently.

As shown in Chart 12, the average NRW continued worsening against the minimum acceptable benchmark of 35%. Only NWSC met the acceptable benchmark although with declining performance.

Only DAWASCO, WASCO and ZAWA improved NRW. WASCO undertook a project to replace some of the aging infrastructure.

The increase in NRW by WASAC was attributed to the increase in production coupled with a weakening of the pipelines from intermittent supply. NCW&SC had intermittent supply which resulted in weakening of the pipelines and appurtenances hence increasing water losses



There are, however, 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 13.

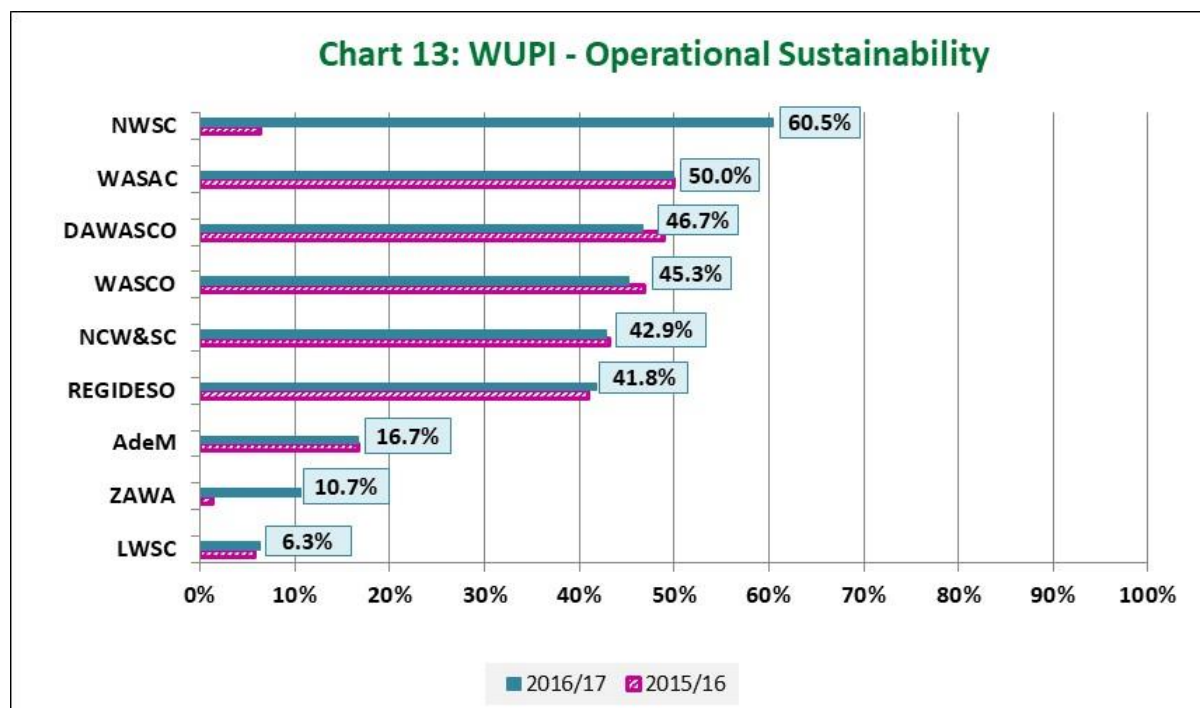
Table 13: Non Revenue Water in terms of Length of Network and Connections

Utility	Length of Network	Water Production	Connections	Non Revenue Water		
				%	m ³ /km/day	m ³ /conn/day
NCW&SC	3,000	181,363,932	365,026	45.89%	166	1.36
LWSC	1,946	85,577,003	102,320	46.32%	120	2.29
DAWASCO	2,884	123,700,000	262,476	46.00%	118	1.29
AdeM	3,000	65,645,506	256,706	42.05%	60	0.70
WASCO	2,081	22,162,517	95,571	40.09%	29	0.64
WASAC	7,814	47,709,233	192,969	43.11%	17	0.68
REGIDESO	-	49,856,795.00	91,241	49.36%	N/A	1.50
ZAWA	2,402	51,626,829.00	96,644	50.50%	59	1.46
NWSC	12,093.9	120,736,647	524,657	33.54%	27	0.63

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

5.4.3.4. Integrated Performance – Operational Sustainability

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



NWSC had the strongest performance, largely driven by having the best performance in NRW. All the Utilities maintained the same positions and level of performance as in the previous period except LWSC that dropped to last position from 7th while REGIDESO entered the ranking at 6th position which pushed AdeM and ZAWA down.

5.5 SUMMARY OF PERFORMANCE

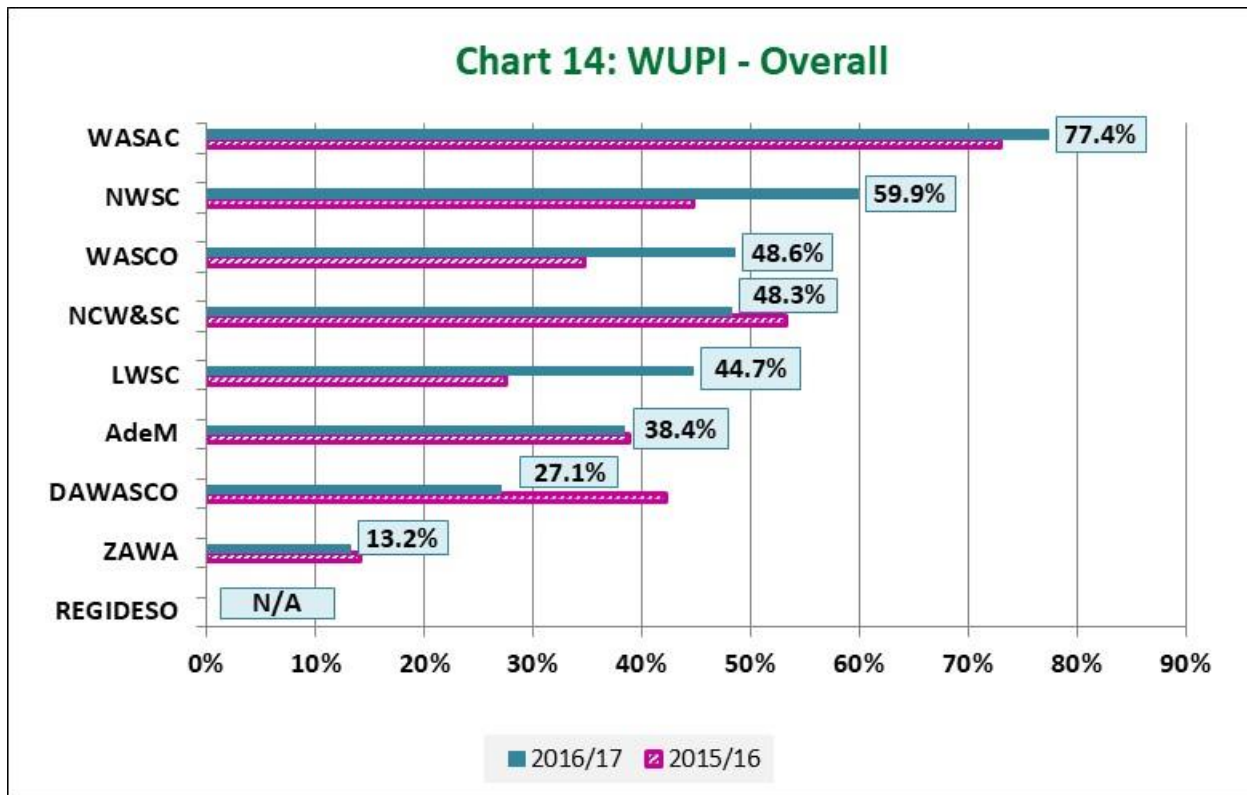
This section summarises the performance in the single KPIs (Table 14) and the overall WUPI (Chart 14) which aggregates the three components of Quality of Services, Economic Efficiency and Operational Efficiency.

Table 14: Summary of Utility Performance

	Quality of Services				Economic Efficiency			Operational Sustainability		
	Water coverage	Sewerage coverage	Water Quality	Hours of Supply	O&M Cost coverage	Collection Efficiency	Staff Cost vs O&M Costs	Staff/1,000 W&S Connections	NRW	Metering Ratio
	%	%	%	Hours/day	%	Ratio	%	Ratio	%	%
NCWSC	80.6%	49.9%	96.8%	6	81.6%	103.9%	51.5%	5.81	45.9%	94.2%
LWSC	85.4%	12.8%	98.2%	18	133.9%	91.1%	64.7%	6.86	46.3%	63.7%
DAWASCO	68.0%	3.0%	68.0%	19	102.9%	69.2%	24.7%	3.75	46.0%	94.0%
AdeM	59.7%	N/A	100%	10	106.6%	93.0%	29.5%	3.16	42.0%	81.3%
WASCO	58.9%	5.4%	95.4%	18	90.4%	114.1%	44.6%	5.85	40.1%	100%
WASAC	85.2%	N/A	99.0%	22	135.9%	101.8%	28.9%	3.08	43.1%	100%
REGIDESO	83.0%	N/A	40.0%	12	N/A	60.0%	N/A	6.48	49.4%	100%
ZAWA	90.0%	10.3%	68.7%	10	79.5%	40.2%	40.8%	6.08	50.5%	11.1%
NWSC	78.0%	6.4%	98.8%	18	138.2%	93.1%	39.0%	5.74	33.5%	99.9%

The best performing KPI was Staff/1,000 W&S Connections where all the Utilities met the acceptable benchmark. The worst performing KPIs remained the same over three years which were Sewerage Coverage and NRW where only one Utility met the acceptable benchmark.

From Chart 14 which shows the overall performance, WASAC, Rwanda emerged as the best performer in all the three components aggregated for the third year running with consistency in improvements.



NWSC, Uganda maintained the second position while WASCO, Lesotho moved from 6th to 3rd position and pushed NCW&SC, Kenya down to 4th position from 3rd.

LWSC, Zambia moved up from 7th to 5th position which pushed AdeM, Mozambique down to 6th position from 5th.

DAWASCO, Tanzania dropped from 4th to 7th position while ZAWA still trailed bottom.

REGIDESO could not be ranked due to information gaps.

CHAPTER 6. SUMMARY ANALYSIS AND RECOMMENDATIONS

In the 2016/17 reporting period, the general picture of performance can be summarised in the three components as follows:

- **Quality of Service** – there was barely any change in the average performance in all four indicators under this component. However, the Utilities can be lauded for maintaining Water Quality Compliance above the minimum acceptable benchmark. If the SDGs are to be met, it is critical that stakeholders focus on concerting efforts and investments into accelerating access to safely managed water supply and sanitation services. This will require innovative and pragmatic approaches that take a holistic view of service delivery.
- **Economic Efficiency** – there was marginal change in the averages for all three indicators under this component. Most disconcerting was the drop in cost coverage despite increased revenue for all Utilities. This calls for prudence in cost management by the Utilities in order to attain full cost coverage to undertake significant capital projects.
- **Operational Sustainability** – Only Staff per 1,000 Connections improved from the three indicators under this component. The two key indicators for metering ratio and NRW remained below the acceptable benchmarks and worsening. It is imperative that Utilities and regulators establish mechanisms to decisively manage NRW to within acceptable loss and maintain metering at 100%, if Utilities are to operate efficiently.

By analysing the performance of the Utilities in the three components of Quality of Services, Economic Efficiency and Operational Sustainability, the following are the conclusions and recommendations made for the individual Utilities:

- **NCW&SC:** the Kenyan utility presented medium performance in all the three components. The Utility met the good benchmark in Water Quality and Collection Efficiency and was the only Utility above the acceptable benchmark for Sewerage Service Coverage. NCW&SC needs to concert efforts to increasing access to sanitation services, improve hours of supply and contain costs.
- **LWSC:** the Zambian utility showed improved but medium performance in the Quality of Services and the Economic Efficiency components but continued low performance in the Operational Sustainability component. The Utility met the good benchmark in Water Quality only. LWSC needs to direct investments to increasing access to sanitation services and metering. Staff costs were the highest at over 60% of O&M costs, and need to be reduced to within acceptable limits.
- **DAWASCO:** the Tanzanian utility had a declining performance in all three components with medium performance in the Operational Sustainability component and low performance in the Quality of Services and Economic Efficiency components. This was

despite the huge leap in Water Service Coverage. The Utility met the good benchmark in the staff efficiency and productivity indicators. DAWASCO needs to invest in increasing access to sanitation and water supply services, as well as improving water quality compliance and collections.

- **AdeM:** the Mozambican utility continued to have almost static performance for three years in a row, with good though declining performance in Economic Efficiency component but low performance in both the Operational Sustainability and Quality of Services components. The Utility met the good benchmark in Water Quality and staff efficiency & productivity indicators. AdeM needs to explore sustainable climate change adaptation solutions for improving hours of water supply in view of persistent drought affecting the raw water source coupled with high NRW. More efforts also need to be directed to increase metering and water supply service coverage.
- **WASCO:** the Lesotho utility's performance was medium in all three components but with significant improvement in the Economic Efficiency component. The Utility met the good benchmarks in Water Quality, Collection Efficiency and Metering ratio. WASCO needs to direct efforts towards investments in increasing access water supply and sanitation services which are among the lowest among the utilities. Improving cost coverage must also become a key concern for raising financial viability.
- **WASAC:** the Rwandese utility maintained similar performance as in the previous period with high performance in the components of Quality of Services and Economic Efficiency but medium static performance in Operational Sustainability. The Utility met the good benchmark in six indicators and was only below the benchmark in NRW. WASAC continued to demonstrate exemplary performance but needs to arrest declining trends in order to maintain its positive gains.
- **ZAWA:** the Zanzibari utility had low performance in all three components with declining performance in Quality of Services and Economic Efficiency while Operational Sustainability improved. The Utility met the acceptable benchmarks in only two indicators. While there is gradual improvement in a number of indicators, there remains urgent need to direct investments and efforts to improving all KPIs for ZAWA to become viable.
- **NWSC:** the Ugandan utility had medium performance in all three components with a significant leap in Operational Sustainability and improvement in Economic Efficiency but declining trend Quality of Services. The Utility met the good benchmark in Water Quality and Metering Ratio. NWSC needs to increase access to sanitation services especially in view of its expanded mandate.
- **REGIDESO:** the Burundi utility had a few information gaps which hampered full assessment of performance. Nevertheless, the Utility had low performance in Quality of Services and medium performance in Operational Sustainability. REGIDESO met the good benchmark in metering. The regulator AREEM needs to put in place regulatory

tools to improve data collection for performance reporting from REGIDESO and water quality monitoring.

All the Utilities need to concert efforts to reducing NRW which has remained high despite various interventions and capacity building on the same. There is need for regulators and utilities to establish model case studies from which to replicate successful NRW reduction strategies for implementation.

In view of improvements made in certain indicators, the framework for regional benchmarking will be revised to raise the bar for performance boundaries amongst the Utilities. The proposed changes to be implemented in the next reporting period are in Table 15.

Table 15: Revision of KPI 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

Further indicators, such as for non-sewered (onsite) sanitation services, will also be introduced to give a holistic picture of service delivery.

It ESAWAS’s intention that through performance comparison, Utilities and stakeholders will be spurred to meet national targets by 2030 and thus achieve the SDGs.

CHAPTER 7: PROFILING THE BEST PERFORMING UTILITIES IN THE REGION

7.1 INTRODUCTION

In countries where there is more than one WSS service provider, regulators rank their performance to establish the best performer against certain KPIs. This section has been therefore been introduced in recognition that there may be good practice lessons to be learnt from best performers within a country that can be replicated by other Utilities. In addition, this section provides a platform for the best among the large Utilities to compare itself against other best performers, and also for the best within a country to compare its performance against similarly ranked Utilities.

7.2 PROFILE OF BEST PERFORMERS

In establishing best performance, the aspect of size is eliminated. Five Utilities have been considered for ranking of the best performers. Rwanda, Lesotho, Zanzibar, Burundi and Uganda are exceptions as they only have national Utilities. However, WASAC of Rwanda being the best of the largest Utilities (Chapter 4), has been considered alongside the best in each country. The four Utilities ranked as best in their countries in the 2016/17 period are Nyeri Water Service Provider of Kenya, Southern Water and Sewerage Company of Zambia, Moshi WSSA of Tanzania and Inhambane of Mozambique.

The profile of the Utilities is shown in Table 16

Table 16: Profile of Best Performers

Utility	Year of Establishment	Areas of Operation	Population in the Service Area 2016/17	Number of Water Connections 2016/17	Annual Water Production (m ³ /yr) 2016/17
NYERI WSP, Kenya	1998	Nyeri Sub-County and its environs	159,287	33,072	6,366,337
SOUTHERN WSC, Zambia	2000	Southern Province (21 Towns)	475,808	53,496	21,659,999
MOSHI WSSA Tanzania	1998	Moshi Municipality and Himo Town	226,022	30,324	11,890,000
INHAMBANE, Mozambique	1999	Inhambane	92,681	15,430	3,534,000
WASAC, Rwanda	2014	Kigali + all urban centres in the country	3,406,846	192,969	47,709,233

7.3 PERFORMANCE RANKING OF THE BEST PERFORMERS

The performance of the best performers was ranked using the ESAWAS regional benchmarking framework in the ten KPIs and three components of Quality of Services, Economic Efficiency and Operational Sustainability.

7.3.1 Overview of Performance against KPIs

The overview of performance in the ten KPIs is shown in Table 17.

Table 17: Performance in individual KPIs

	Quality of Services				Economic Efficiency			Operational Sustainability		
	Water Coverage	Sewerage Coverage	Water Quality	Hours of Supply	O&M Coverage	Collection Efficiency	Staff Cost	Staff Productivity	NRW	Metering
	%	%	%	Hours/day	%	Ratio	%	Ratio	%	%
NYERI, Kenya	92.7%	24.1%	100%	24	100.0%	93.6%	32.2%	2.92	17.6%	82.96%
SOUTHERN, Zambia	88.0%	18.4%	98.2%	22	103.9%	103.1%	58.0%	6.64	35.3%	78.00%
MOSHI, Tanzania	97.6%	28.0%	99.0%	24	105.7%	96.7%	44.1%	5.92	23.1%	100%
INHAMBANE, Mozambique	92.2%	N/A	81.8%	20	88.8%	97.2%	40.7%	6.35	38.0%	100%
WASAC, Rwanda	85.2%	N/A	99.0%	22	135.9%	101.8%	28.9%	3.08	43.1%	100%

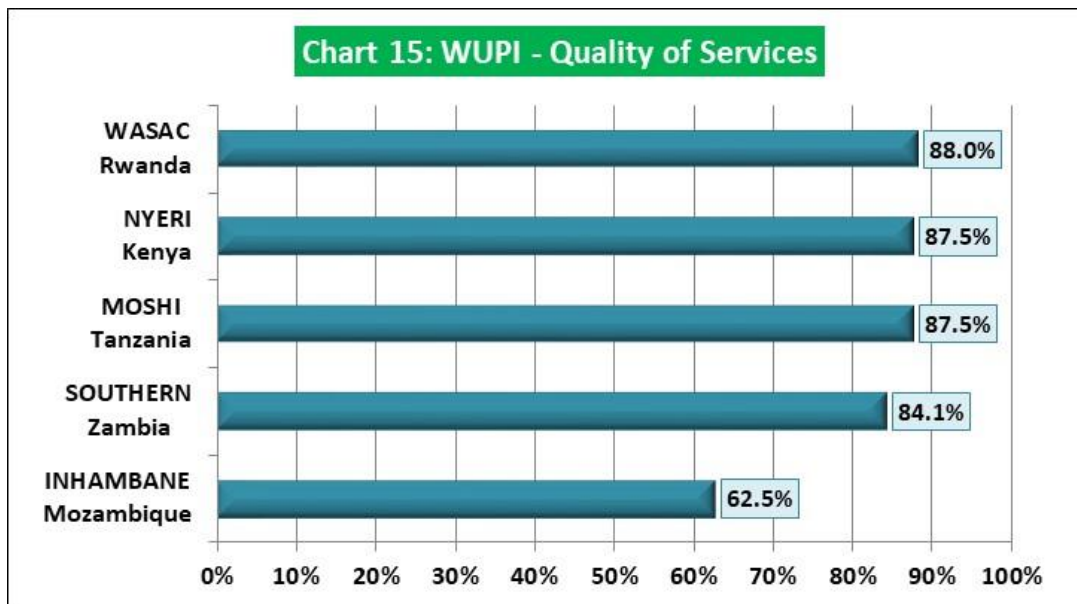
The best performing KPIs where all the Utilities met the acceptable benchmarks were Water Coverage, Hours of Supply, Collection Efficiency and Staff Productivity.

The worst performing KPIs where at least three Utilities were below the acceptable benchmarks were Sewerage Coverage, Staff Cost and NRW.

7.3.2 Performance Ranking using WUPI

i. Quality of Services

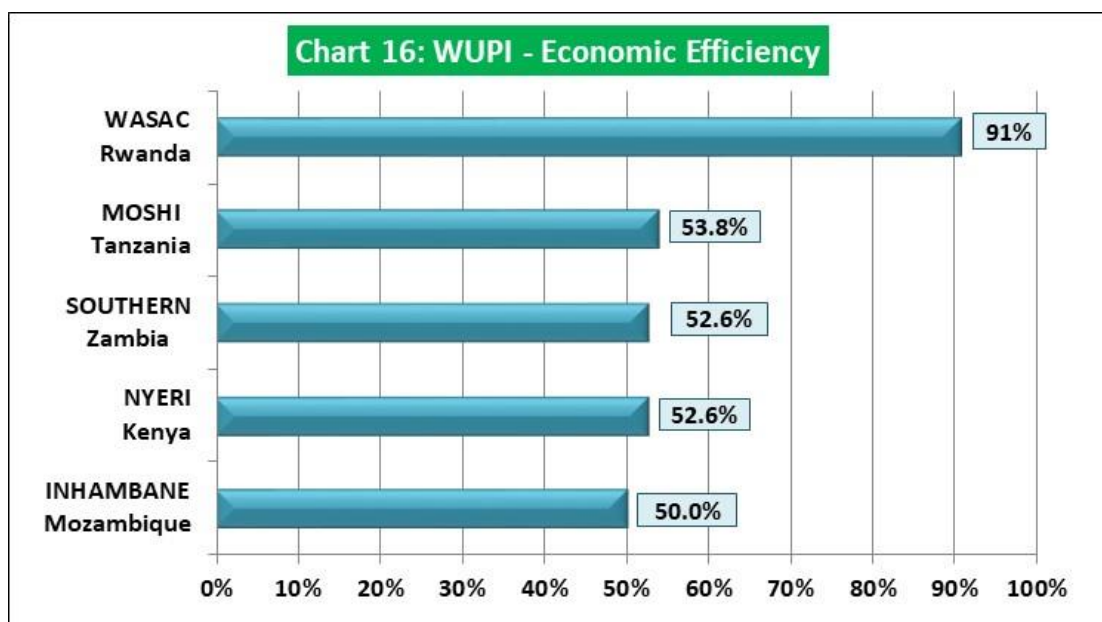
The performance of the Utilities in the Quality of Service component is shown in Chart 15 using Water Coverage, Sewerage Coverage, Water Quality and Hours of Supply.



WASAC was the best performer in Quality of Services, while Inhambane trailed last due to unacceptable performance in Water Quality.

ii. Economic Efficiency

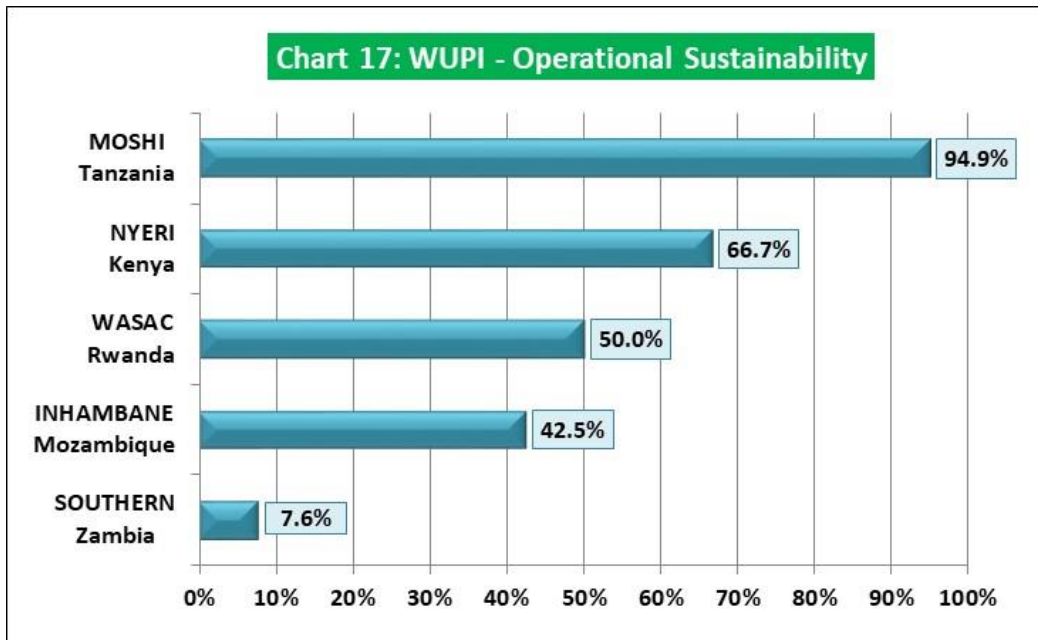
The performance of the Utilities in the Economic Efficiency component is shown in Chart 16 using O&M Cost Coverage, Collection Efficiency and Staff Cost.



WASAC had the best performance in Economic Efficiency while Inhambane trailed last due to unacceptable performance in O&M Cost coverage and Staff Cost.

iii. Operational Sustainability

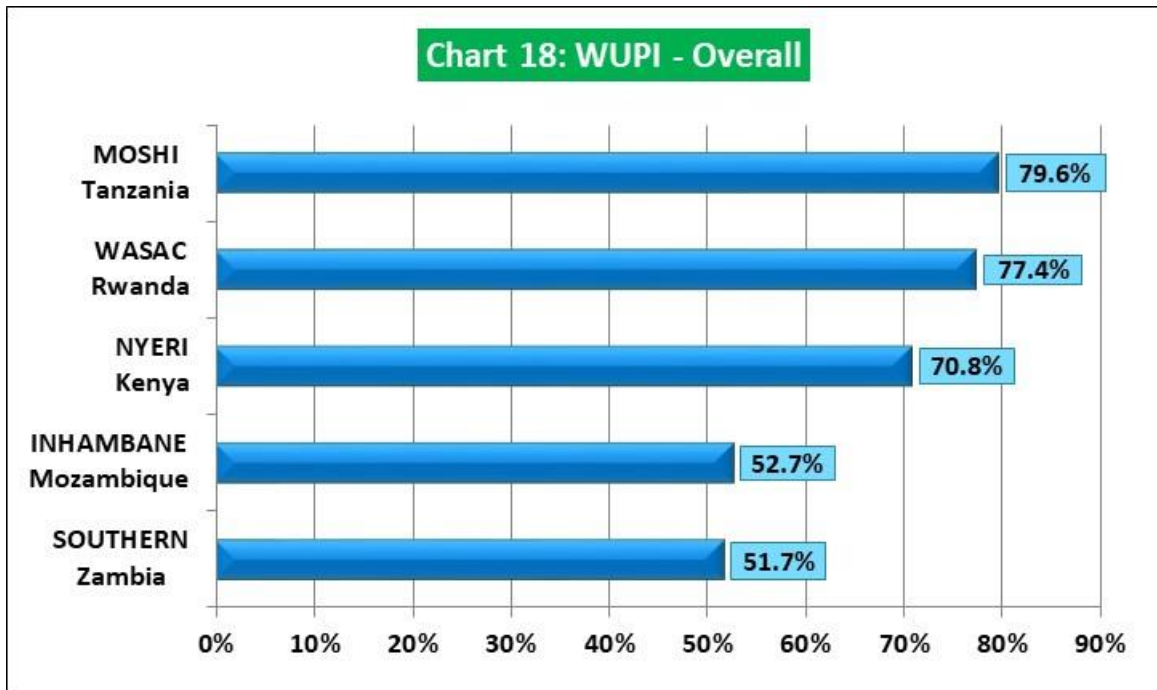
The performance of the Utilities in the Operational Sustainability component is shown in Chart 17 using Staff Productivity, NRW and Metering



Moshi was the best performer in the Operational Sustainability component while Southern trailed last due to unacceptable performance in NRW and Metering Ratio.

iv. WUPI Overall

The best of the best performers was ranked by combining the three WUPI Components.



The overall best performer for 2016/17 was Moshi WSSA of Tanzania.

Annex 1: COMMON KPIS WITH BENCHMARKS SET BY EACH REGULATOR

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

*Mozambique and Rwanda have separate entities providing sewerage services.

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

Annex 2. DETAILED PROFILES OF UTILITIES

DAR ES SALAAM WATER AND SEWERAGE CORPORATION (DAWASCO) - TANZANIA																							
Water Utility	<p>The DAWASA Act 2001 established Dar es Salaam Water and Sewerage Authority (DAWASA) as the asset owner responsible for capital investment. DAWASCO has entered into a two-year lease contract with DAWASA starting from 1st July 2016 responsible for overall operation and management of water supply and sanitation services to the capital Dar es Salaam City and parts of Kibaha and Bagamoyo in Coast Region. DAWASA/DAWASCO reports functionally to the Ministry of Water and Irrigation.</p> <p>The total population in the DAWASCO operation area is 5,781,557 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>																						
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ÁGUAS DA REGIÃO DE MAPUTO (ADEM)- MOZAMBIQUE

Water Utility

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

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

The total population in the AdeM operation area is 2,313,078 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	2,313,078
Total Water Connections	256,706
Total Waste Water/Sanitation Connections	N.A
Total Production/year	65,645,506m ³
Total Staff	812
Annual O&M Costs	MT 1,435,551,182
Annual Water Billing	MT 1,529,688,879
Annual Water Collections	MT 1,423,152,239

Tariff Structure

*Exchange Rate: MT65.37 to 1US\$ (2017)

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

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

Note :

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

RWANDA WATER AND SANITATION CORPORATION (WASAC)- RWANDA

Water Utility

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

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

The total population in the WASAC operation area is 3,406,846 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	3,406,846
Total Water Connections	192,969
Total Waste Water/Sanitation Connections	Not applicable
Total Production/year	47,709,233
Total Staff	594
Annual O&M Costs	FRW12,551,793,523
Annual Water and Sewerage billing	FRW17,061,110,601
Annual Water and Sewerage Collections	FRW17,371,183,005

Tariff Structure

*Exchange Rate: FRW853.19 to 1US\$ (2016/17)

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	<p>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.</p> <p>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.</p> <p>The total population in the WASCO operation area is 685,938 people.</p> <p>Industries and commercial premises, particularly in Maseru, use about 64% of the water produced, and domestic customers consume 36%.</p>																																								
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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 4,249,604. 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	4,249,604.
Total Water Connections	365,026
Total Waste Water/Sanitation Connections	239,623
Total Production/year	181,363,932 m ³
Total Staff	3,511
Annual O&M Costs	KSHS 9,971,909,660
Annual Water and Sewerage billing	KSHS 8,140,878,525
Annual Water and Sewerage Collections	KSHS 8,462,163,000

Tariff Structure

*Exchange Rate: KSHS101.99 to 1US\$ (2016/17)

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

Note :

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

LUSAKA WATER AND SEWERAGE COMPANY(LWSC) - ZAMBIA

Water Utility

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

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

The total population in the LWSC operation area is 2,395,736. The main sources of water are the Kafue River situated about 65km from Lusaka town, Chongwe River and Zambezi River and over 100 boreholes situated in various areas. 60% of the water for Lusaka city is produced from the boreholes. The utility has a sewerage system with two mechanised treatment plants and about six sewage ponds.

General Data About Water Utility

Abbreviation	LWSC
Start of Operations	1989
Number of Towns in Operation Area	6
Total Population in Operation/Service Area	2,395,736
Total Water Connections	102,320
Total Waste Water/Sanitation Connections	32,276
Total Production/year	85,577,003 m ³
Total Staff	923
Annual O&M Costs	ZMW201,344,326
Annual Water and Sewerage billing	ZMW269,520,860
Annual Water and Sewerage Collections	ZMW245,467,055

Tariff Structure

*Exchange Rate: ZMW9.60 to 1US\$ (2017)

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

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

Note :

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

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

Water Utility

REGIDESO was established 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 facilities. The company has had great difficulty rebuilding its infrastructure and coping with maintenance and maintenance work because the funding has dried up following the withdrawal of donors while it does not have a self-financing capacity. However, the human resources of this company have demonstrated their abilities in the restoration of the water and electricity service at these difficult times. The period from 2005 to 2011 corresponds to the period of reconstruction and development of infrastructures. It was during this period that REGIDESO began to rehabilitate damaged or dilapidated infrastructure and extend the water and electricity supply networks in the new districts of both the city of Bujumbura and the interior of the country.

Indeed, the total population in the REGIDESO operation area is estimated to 800 733. The main source of water is the Tanganyika Lake, which is near Bujumbura town with about 90% of water 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	800,733
Total Water Connections	91,241
Total Waste Water/Sanitation Connections	-
Total Production/year	49,856,795m ³
Total Staff	591
Annual O&M Costs	N/A
Annual Water and Sewerage billing	N/A
Annual Water and Sewerage Collections	N/A

Tariff Structure

* Exchange Rate: 1760 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) which was established under Act. No. 4 of 2006, is a semi-autonomous entity with the overall management of water supply services and Water Resources management in Zanzibar. ZAWA has the responsibility of providing clean, reliable and good quality water supplies through the operation and maintenance of water infrastructure, and development of new waterworks in the urban and rural areas of Unguja and Pemba islands. It is also responsible for the management and regulation of water resources and effluent discharges in Zanzibar

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

The total population in the ZAWA operation area is 1,505,232.

General Data About Water Utility

Abbreviation	ZAWA
Start of Operations	2006
Number of Towns in Operation Area	6
Total Population in Operation/Service Area	1,505,232
Total Water Connections	96,644
Total Waste Water/Sanitation Connections	3,000
Total Production/year	51,626,829 m ³
Total Staff	606
Annual O&M Costs	TSH7,960,874,780
Annual Water and Sewerage billing	TSH6,327,556,596
Annual Water and Sewerage Collections	TSH2,543,767,272

Tariff Structure

**Exchange Rate: TSH2,230 to 1US\$ (2016/16*

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

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

Note :

- Flat rate is TSH4,000 per month

NATIONAL WATER AND SEWERAGE CORPORATION (NWSC) - UGANDA

Water Utility

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

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

The total population in the NWSC operation area is 9,119,032. 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	9,119,032
Total Water Connections	524,657
Total Waste Water/Sanitation Connections	21,072
Total Production/year	120,736,647 m ³
Total Staff	3,131
Annual O&M Costs	UGX250,940,410,000
Annual Water and Sewerage billing	UGX346,806,804,508
Annual Water and Sewerage Collections	UGX322,724,890,000

Tariff Structure

**Exchange Rate: UGX3,600 to 1US\$ (2016/17)*

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

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:

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

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

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

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

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

ANNEX 4: COMPOSITION OF ESAWAS TECHNICAL COMMITTEE FOR BENCHMARKING

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