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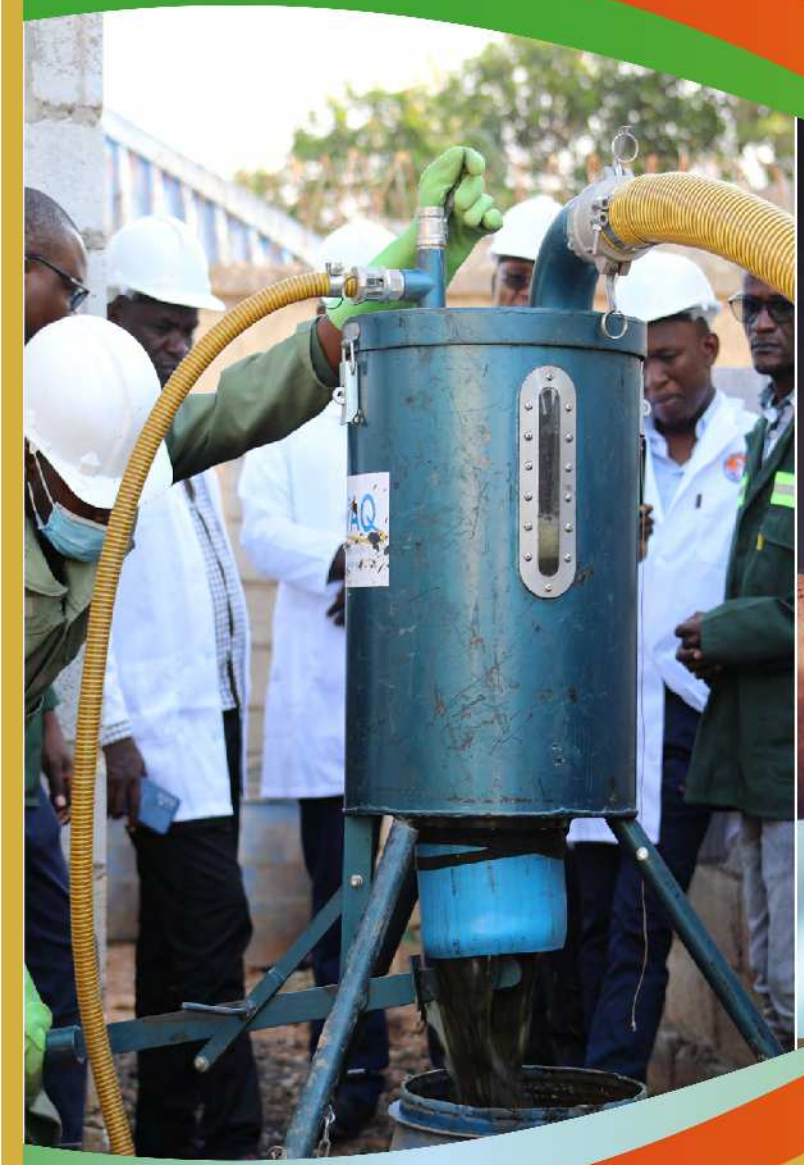
NATIONAL WATER SUPPLY AND SANITATION COUNCIL

WATER SUPPLY AND SANITATION

SECTOR REPORT | 2023



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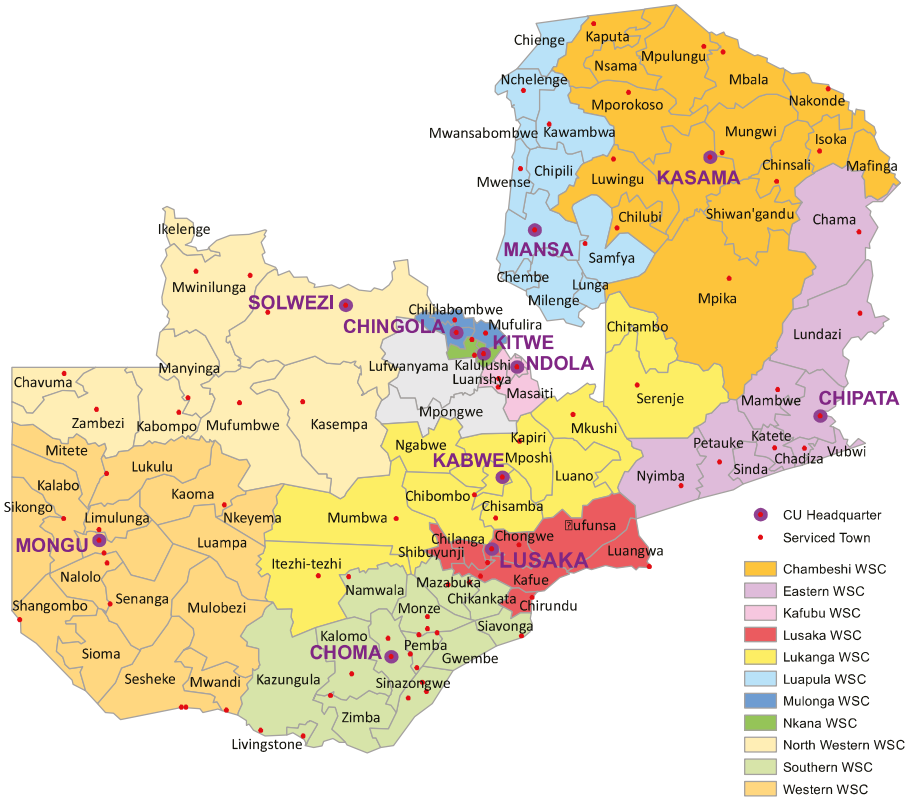

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TABLE OF ACRONYMS/ABBREVIATIONS

CHWSC - Chambeshi Water and Sanitation Company
CWIS - City wide inclusive Sanitation
CU - Commercial Utility
ESAWAS - Eastern and Southern Africa Water and Sanitation
EWSC - Eastern Water and Sanitation Company
FSM - Faecal Sludge Management
GIZ - Germany International Cooperation
KFW - Development Bank of Germany
KWSC - Kafubu Water and Sanitation Company
LA - Local Authority
LuWSI - Lusaka Water Security Initiative
LGWSC - Lukanga Water and Sanitation Company
LPWSC - Luapula Water and Sanitation Company
LWSC - Lusaka Water and Sanitation Company
MLGRD - Ministry of Local Government and Rural Development
MWSC - Mulonga Water and Sanitation Company
MWDS - Ministry of Water Development and Sanitation
NRW - Non-Revenue Water
NIS - NWASCO Information System
NUWSSP - National Urban Water Supply and Sanitation Programme
NWASCO - National Water Supply and Sanitation Council
NWSC - Nkana Water and Sanitation Company
NWWSC - North-Western Water and Sanitation Company
ODF - Open Defecation Free
O&M - Operation and Maintenance
OSS - Onsite Sanitation
PS - Private Scheme
PTI - Part-time Inspector
PWS - Piped Water Scheme
RWSS - Rural Water Supply and Sanitation
SDGs - Sustainable Development Goals
SI - Service Indicator
SLA - Service Level Agreement
SLG - Service Level Guarantee
SWSC - Southern Water and Sanitation Company
WASH - Water, Sanitation and Hygiene
WARMA - Water Resources Management Authority
WSC - Water and Sanitation Company
WSS - Water Supply and Sanitation
WWG - Water Watch Group
WWSC - Western Water and Sanitation Company
ZABS - Zambia Bureau of Standards
ZAWAFE - Zambia Water Forum and Exhibition
ZSA - Zambia Statistics Agency
ZEMA - Zambia Environmental Management Agency
ZPPA - Zambia Public Procurement Authority

FOREWORD

The year 2023 was challenging and difficult not only for the water supply and sanitation sector but also for the country at large. The macro-economic indicators were generally not favourable with inflation, exchange and interest rates on the increase. The cost of service provision for the commercial utilities increased as there were spikes in prices of key inputs such as electricity, chemicals, labour and other operational consumables. On average, it costed the commercial utility companies K12.61 to provide water and sanitation services which were sold at an average of K7.9.

The ever-growing financing gap that the commercial utility have been grappling since 2020 has resulted in a compromise of water supply and sanitation service delivery. As such, there was very little or no progress in the performance of the commercial utilities in the year 2023. The sector recorded negative trends in collection efficiency and operation and maintenance cost coverage by collection.

That notwithstanding, commendable efforts were made in water and sanitation coverage with 249,193 and 274,714 more people accessing water and sanitation services respectively. This was as a result of the increase in the number of new domestic water supply and sanitation connections made in the year.

It is also worth noting that, in embracing Onsite sanitation (OSS) and Faecal Sludge Management (FSM), commercial utilities (CUs) continued to concert efforts towards collecting data on existing sanitation facilities. A total of 53,897 and 10,586 septic tanks and improved latrines were recorded, respectively.

The sector continued to receive support from Government through the Ministry of Water Development and Sanitation (MWDS) and the Cooperating Partners. The technical and financial support rendered was indeed laudable.

Non-Revenue Water (NRW) remained high although and even recorded a further increase in the year under review. The non-payment of water and sanitation bills by both domestic customers and Government institutions still requires attention.

With only 6 years to 2030, our resolve to accelerate the sector towards the attainment of the vision 2030 remains resonant as we anticipate a much more productive 2024 and the other years. Our focus will be to utilise practical solutions and leverage on collective efforts of all stakeholders in ensuring that sector performance is improved. We shall also continue to make efforts to foster service provision and regulation of Rural Water Supply and Sanitation (RWSS), Urban Onsite Sanitation (UOSS) and Faecal Sludge Management (FSM) in our quest to realise the Vision 2030 for universal water supply and sanitation coverage.

We are grateful for the commitment and dedication of all stakeholders in ensuring water supply and sanitation services reach everyone.

Kelvin Chitumbo

Director-NWASCO

EXECUTIVE SUMMARY

The Water Supply and Sanitation Sector Report elaborates the performance of the water supply and sanitation sector through the analysis of performance of the water supply and sanitation service providers and also discussing pertinent policy and related topics.

The 2023 edition of the Water Supply and Sanitation Sector Report has 10 Chapters. Chapter one provides a summary of the performance of the water supply and sanitation sector, with focus on the urban areas. It also shows the ranking of Commercial Utilities (CUs) using nine key performance indicators namely water coverage, sanitation coverage, water quality, non-revenue water, hours of supply, staff efficiency, collection efficiency and operation and maintenance cost coverage by collection. The chapter includes a recognition of water stewardship. Chapter two highlights the strides being made in the provision and regulation of onsite sanitation and faecal Sludge Management while chapter three discusses Rural Water Supply and Sanitation.

The key activities undertaken by NWASCO in discharging its mandate are reflected in chapter four. These include Strategic Plan implementation, monitoring of service providers, awareness creation and regulatory enhancement.

Chapter five discusses improving water supply and sanitation through technology focusing on, among others, the current trends and opportunities. Performance of the CUs on 10 indicators of the Service Level Guarantee (SLGs) and Service Level Agreements (SLAs) is reflected in chapter six.

The actual performance of the 11 Commercial Utilities with regard to Operational, Financial, Staff Efficiency, Service Level and Governance Indicators is detailed in Chapter 7. The performance of the private schemes is presented in chapter 8. Chapter 9 shows the performance of the large utilities drawn from the Eastern and Southern Water and Sanitation (ESAWAS) member regulators, comprising 10 Utilities while chapter 10 provides an outlook for the sector in view of the vision 2030.

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SUMMARY OF COMMERCIAL UTILITIES PERFORMANCE

This Chapter highlights the summary of the performance of Commercial Utilities (CUs) for the period 1st January to 31st December 2023. The detailed analysis is in Chapter Seven.

Most of the indicators in this Report are based on the Minimum Service Levels (MSLs) which are part of the licence conditions for the CUs.

1.1 NATIONAL URBAN WATER SUPPLY AND SANITATION COVERAGE

Commercial Utilities are the mandated providers of water supply and sanitation services in their areas of jurisdiction which include urban, peri urban and rural areas. Currently, WSS service provision by the CUs is concentrated in the urban and peri urban areas and therefore this chapter focuses on their performance in these areas. There are about 8.36million people living in the CUs' areas of concentration of which less than 1% are serviced by Private Schemes. These are companies that provide water supply and sanitation services primarily to their employees as a fringe benefit.

Table 1 depicts the National Urban Water Supply and Sanitation Coverage, which is a combination of coverage for the CUs and the Private Schemes. Although the overall water supply coverage slightly reduced from 88.2% to 87.7%, there was an additional population served with water in the year under review of 249,193. For sanitation, there was a marginal increase in coverage from 73.2% to 73.6% representing 274,714 additional people. This includes people served from newly captured septic tanks.

Of the served population, about 60.5% were supplied with water through household connections and the rest through public stand posts and kiosks. For sanitation 35% of the serviced population was served through sewer networks and 65% through septic tanks.

Table 1: National Urban Water Supply and Sanitation Coverage

	2022	2023
Total Urban Population	8,034,361	8,363,957
Total Urban Population Served with Water	7,085,076	7,334,269
Total Urban Population Served with Sanitation	5,881,560	6,156,274
National Urban Water Coverage	88.2%	87.7%
National Urban Sanitation Coverage	73.2%	73.6%

1.2 PROFILE OF COMMERCIAL UTILITIES

A general overview of each CU in terms of its age and size using various parameters, is presented in Table 2.

Table 2: Commercial Utility Profiles

OPERATING CONDITIONS OF COMMERCIAL UTILITIES

Commercial Utility	Abbreviation	Start of Operations	"No. of Towns serviced"	No. of Towns not serviced	Total Population in Service Area	No. of Connections	No. of Staff
Lusaka WSC	LWSC	1989	4	1	2,988,247	142,079	722
Nkana WSC	NWSC	2000	3	1	856,668	76,057	505
Kafubu WSC	KWSC	2000	3	1	827,579	72,649	563
Mulonga WSC	MWSC	2000	3	-	603,293	62,527	470
Lukanga WSC	LGWSC	2006	9	3	551,327	33,766	240
Southern WSC	SWSC	2000	14	-	598,312	70,142	425
Chambeshi WSC	CHWSC	2003	12	8	601,464	46,429	267
North Western WSC	NWWSC	2000	9	2	356,740	19,809	188
Eastern WSC	EWSC	2009	9	6	375,398	29,859	157
Western WSC	WWSC	2000	16	-	273,606	17,750	205
Luapula WSC	LPWSC	2009	5	7	331,323	17,412	83
			87	29	8,363,957	588,479	3,825

1.3 OVERVIEW OF SECTOR PERFORMANCE

Table 3 summarises the performance of the CUs in nine key performance indicators. It should be noted that the performance of a CU is compared to the previous year, against the benchmark and against the sector average.

Table 3: Overview of Sector Performance

	NRW [%]	Trend	Water Quality compliance		Metering Ratio [%]	Trend	Water Service Coverage [%]	Trend	Sanitation Coverage [%]	Trend	Hours of Supply	Trend	Staff Efficiency	Trend	Collection Efficiency [%]	Trend	O+M Cost Coverage by Collection capped at 100%	Trend				
LWSC	57	↓	B	↑	68.0	↑	94.8	↑	82.0	↑	17	↓	0.46	↓	92	↓	82.2	↓	1	7	1	0
NWSC	57	↑	A	→	80.6	↓	96.4	↓	74.6	↓	13	↓	0.58	↓	70	↓	74	↓	2	4	3	0
KWSC	69	↑	A	→	68.1	↑	80.5	↓	80.4	↑	21	↑	0.71	↓	94	↑	70	↑	3	1	5	0
MWSC	43	↑	A	↑	86.4	↑	94.6	↑	90.3	↑	14	↓	0.65	↓	82	↑	65	↑	2	3	4	0
LGWSC	58	↓	A	↑	82.2	↓	82.0	↓	63.3	↑	16	→	0.47	↑	100	↑	96	↑	2	3	4	0
SWSC	45	↑	A	↑	82.1	↑	95.0	↑	87.3	↑	21	↑	0.54	↑	98	↓	88	↑	5	4	0	0
CHWSC	58	↓	A	↑	86.4	↑	85.2	↑	75.0	↓	19	↑	0.74	↓	94	↑	63	↓	3	2	4	0
NWWSC	46	↓	B	↓	99.9	↑	61.7	↓	22.1	↑	15	→	1.11	↓	100	→	52	↓	1	3	5	0
WWSC	73	↓	B	↑	65.8	↓	47.2	↑	34.4	↑	15	↑	0.90	↑	100	↑	70	↑	1	1	7	0
EWSC	45	↑	A	→	100.0	→	91.8	↓	49.5	↓	21	↑	0.96	↓	100	→	62	↓	4	2	3	0
LPWSC	67	↑	A	↑	98	↑	49.7	↓	36.9	↑	19	↑	1.30	↓	96	↑	41	↑	3	1	5	0
Average	57.3	↑	N/A		79.0	↑	87.1	↓	73.0	↑	17.4	↑	0.59	↓	89.6	↓	74.99	↓				
Benchmark	25	W	95		100	W	95	W	85	W	18	W	0.4	W	90	W	100	W				
											16											

Worse than the relevant average and benchmark not achieved (1 point)
Better than the relevant average but benchmark not achieved (2 points)
At least "acceptable" benchmark achieved (3 points)

(W) Weighted average
(S) Simple average

The water quality compliance indicator is based on a new three-step assessment criteria (section 7.2.2. Water Quality)
Orange in the water quality column is part of the colour coding for the compliance and carries a weight of 2

1.4 COMMERCIAL UTILITY PERFORMANCE RANKING

Commercial Utilities are ranked according to indicators and respective weightings shown in Table 4. A higher weighting reflects how critical the indicator is to the quality of service and financial viability of the CU.

Table 4: Performance Indicators and their Weighting Factors

No.	Indicator	Weighting
1	Water Quality	20 points
2	Collection efficiency capped at 100%	20 points
3	Metering ratio	15 points
4	Hours of supply	15 points
5	O+M cost coverage by collection efficiency capped at 100%	15 points
6	NRW	15 points
7	Water coverage	15 points
8	Staff Efficiency	10 points
9	Sanitation coverage	10 points

To arrive at the ranking, the total score is derived by aggregating the result of;

[The indicator weighting in Table 4] x [the score against the average and benchmark (i.e 1, 2, and 3 in Table 3)] x [the CU performance]

The performance ranking of the CUs is shown in Table 5. In order to provide readers with the performance trends, the rankings for the previous four years have also been reflected. It must be noted that a CU moving down in the ranking does not necessarily mean that it performed worse than the previous period but it could also mean it was outperformed (see Table 3).

Table 5: Ranking of Commercial Utilities

Commercial Utility	Ranking 2023	Ranking 2022	Ranking 2021	Ranking 2020	Ranking 2019
SWSC	1	2	1	4	1
EWSC	2	1	2	2	4
CHWSC	3	6	6	9	7
LGWSC	4	10	7	3	9
KWSC	5	9	10	5	6
LWSC	6	3	3	6	3
LPWSC	7	8	8	10	10
NWSC	8	4	4	1	8
MWSC	9	7	9	8	2
NWWSC	10	5	5	7	5
WWSC	11	11	11	11	11

Congratulations to SWSC for reclaiming 1st position!!

1.5 RECOGNITION OF COMMERCIAL UTILITIES FOR EXEMPLARY PERFORMANCE

Commercial Utilities are recognised for exemplary performance in specific areas and indicators. The recognition is made in two categories namely; the best performer in an indicator, (category 1) and the most improved towards or above the benchmark, (category 2), provided the performance is above the average sector performance.

In this regard, the highest performing CU may not be recognised as the best performer if the performance is dropping more than a given threshold (acceptable tolerance limit) from the previous period. However, the most improved from the previous period may not be recognised if the performance is below the sector average. The best performer is excluded from Category 2, unless in very exceptional circumstances where the magnitude of improvement, far exceeds the rest.

Further, it is important to note that CU recognitions are looked at separately from the ranking. Table 6 shows the CU recognitions.

Table 6: Recognition of Commercial Utilities

Area of Recognition	CU	
Most improved Significance of improvement in all indicators collectively with minimum downward trend	Kafubu WSC	
Best Submitted Data Completeness and accuracy of data submitted in the NWASCO Information System and least queries raised for verification	Luapula WSC	
Area of Recognition	**Best CU**	**Most Improved**
Non-Revenue Water	N/A*	Southern WSC
Water Quality	Southern WSC	Western WSC
Metering Ratio	Eastern WSC	Chambeshi WSC
Water Service Coverage	Nkana WSC	Lusaka WSC
Sanitation Service Coverage	Mulonga WSC	Kafubu WSC
Hours of Supply	Southern WSC	Chambeshi WSC
Staff Efficiency	Lukanga WSC	-
Collection Efficiency	Lukanga WSC	-

** NRW is still very high. None of the CU is close to the benchmark hence not recognising the best*

*** All CUs were below 100% O&M cost coverage by collection*

1.6 WATER STEWARDSHIP RECOGNITION

The performance of CUs on water stewardship/ water safety planning for 2023 was conducted based on the selection criteria that was developed by NWASCO under the ambits of the Lusaka Water Security Initiative (LuWSI), with input from stakeholders such as the CUs, the World Wide Fund for Nature (WWF) and GIZ. The criteria was based on the six aspects as follows:

1.6.1 *Commercial Utility Commitment* –documentation incorporating principles and demonstrating the CU's commitment to Water Stewardship;

- The CEO has officially committed to water stewardship and the company has a budget towards water stewardship/ WSP and compliance

1.6.2 *Ecosystem protection*

- Identification of ecosystems, flora and fauna, hydrogeological,

- Identification of all catchment stakeholders,
- Have knowledge of catchment management plans are available e.g. from WARMA, water resource areas from WWF,
- Identified the challenges, threats, risks (physiological, social-economical),
- Documented control measures with M&E plan

1.6.3 *Pollution prevention* – Demonstratable participation in catchment governance

- Participatory stakeholder engagement for upstream and downstream stakeholders,
- Proof of compliance with ZEMA regulations (including effluents – discharge permits),
- Showcasing activities that the company has initiated or significantly supported
- Documented control measures with M&E plan

1.6.4 Energy Efficiency

- Energy reduction strategies and implementation

1.6.5 Catchment Governance and visibility

- Proactive in setting up participatory stakeholder platforms and engagement on Water stewardship, e.g. the Commercial Utility has the Water Safety Plan Team in place
- Documents and shares water security best practices/stories to the public through different platforms including social media, digital and print media.

1.6.6 *Demand management*

- Water demand assessment
- NRW reduction strategies and implementation

Water Stewardship Award	1st Position	2nd Position
	North Western WSC	Nkana WSC

1.7 SECTOR ACHIEVEMENTS AND CHALLENGES

1.7.1 Achievements

i. Increased population served with water supply and sanitation by 249,193 and 274,714 respectively;

ii. Increased the number of household connections by over 39,658;

iii. Increased total sewer connections by 7,546;

iv. Increased number of total metered connections by 51,506; and

v. Increased activity by the CUs on the new mandate of providing OSS and FSM services as per regulatory requirement.

1.7.2 Challenges/Concerns

The major challenges included:

i. High cost of service provision arising from increase in the cost of inputs which was not matched with increase in tariffs;

ii. Non-Revenue Water continued to be high;

iii. Vandalism and theft of water installations that included water meters.

iv. Increased equipment failures due to inadequate maintenance; and

v. Delays in making connections for paid up applicants.

1.8 COMMERCIAL UTILITIES OPERATING ENVIRONMENT AND COMMENTS ON PERFORMANCE

The CUs operate under varying conditions which may impact their performance. Therefore, the operating environment and comments highlighted hereunder should be taken into consideration when analysing the performance of CUs and making comparisons.

1.8.1 Lusaka WSC

Operating Environment

- Services the Capital City, Lusaka and four other Districts (Luangwa, Chongwe, Kafue and Chilanga Districts) in Lusaka Province;
- The Province includes Rufunsa District which was not yet serviced;
- High proportion of population in peri urban areas; and
- High economic activity in the City.

Comments

- Increased water connections by over 5%;
- Increased total sewer connections by 4,999 and constructed 5750 safely managed latrines;
- Installed 12,000 meters although the metering ratio still remained low;
- Recorded drops in nearly all the indicators;
- Needs to improve water supply in the entire Chongwe District;
- Needs to concert efforts to improve metering for both consumption and production points and reduce NRW; and
- Need to concert efforts to improve water quality particularly chlorine residue and bacteriological parameters.

1.8.2 Nkana WSC

Operating Environment

- Operates in three predominantly mining towns on the Copperbelt Province namely Kitwe, Kalulushi and Chambishi;
- The CU was yet to service Lufwanyama District;
- Major raw water sources are susceptible to industrial pollution;
- Fairly high economic activity;
- Part of the infrastructure is under major rehabilitation and expansion; and
- The area is susceptible to high levels of vandalism and theft.

Comments

- Maintained good water quality;
- Good data management;
- Recorded drops in all the indicators except water quality and NRW;
- Needs to address the sewer flooding challenges in most low cost areas;
- Needs to concert efforts towards improving billing efficiency;
- Needs to still improve supply in low income areas such as Luangwa, Chamboli P, Wusakile T and E sections in Kitwe City and parts of Chibuluma in Kalulushi District; and
- Needs to address the high NRW.

1.8.3 Kafubu WSC

Operating Environment

- Operates in three towns (Ndola, Masaiti and Luanshya) on the Copperbelt Province
- The CU's area of jurisdiction includes Mpongwe, which was yet to be serviced;
- Medium economic activity;
- The bulk of infrastructure has undergone major rehabilitation and expansion; and
- The area is susceptible to high levels of vandalism and theft.

Comments

- Improved hours of supply and collection efficiency;
- Improved metering ratio although still low;
- Needs to address the sewer flooding challenges in most low cost areas;

- Needs to attend to the high staff efficiency;
- Needs to concert efforts to improve hours of supply in Parts of upper Mushili in Ndola City and parts of Kamirenda in Luanshya District; and
- Needs to urgently address NRW which continued to be amongst the highest.

1.8.4 Mulonga WSC

Operating Environment

- Operates in three predominantly mining towns on the Copperbelt Province (Chingola, Chililabombwe and Mufulira);
- Major raw water sources susceptible to industrial pollution;
- Fairly high economic activity;
- Had about 1,510 stuck meters;
- The majority of infrastructure needs rehabilitation and expansion; and
- The area is susceptible to high levels of vandalism and theft.

Comments

- Improved metering ratio;
- Improved water quality although need to attend to the problematic areas in Chingola and Mufulira Districts where turbidity and colour levels were still high;
- Needs to attend to high staff efficiency;
- Needs to address NRW;
- Need to improve stakeholder management;
- Needs to improve service delivery in all areas particularly low income areas; and
- Need to concert efforts to stabilise water supply in Chingola and Mufulira Districts.

1.8.5 Lukanga WSC

Operating Environment

- Operates in eight towns in the Central Province namely Kabwe, Mumbwa, Serenje, Mkushi, Kapiri Mposhi, Chibombo, Chisamba, Itezhi-tezhi and Shibuyunji;
- Itezhi-tezti district was handed back to SWSC in December 2023;
- The Province includes three new districts of Luano, Ngabwe and Chitambo that were not yet serviced although incorporated on the operating licence;
- Medium economic activity; and
- Infrastructure in need of expansion in most of its towns.

Comments

- Increased water connections by over 5%;
- Had about 1,669 stuck meters;
- Increased collection, water quality, sanitation coverage and O&M costs coverage;
- Needs to address NRW;
- Needs to improve water quality in Mkushi and Serenje Districts; and
- Needs to improve stability in supply hours particularly in Kabwe District.

1.8.6 Southern WSC

Operating Environment

- Operates in 14 towns and 8 centres (22) – Choma (including Batoka, Chisekesi and Mbabala), Livingstone, Kalomo, Monze, Zimba, Kazungula, Pemba, Mazabuka (including Nega-Nega, Magoye and), Gwembe (including Munyumbwe), Namwala, Sinazongwe (including

Maamba and Sinazeze), Siavonga, Chikankata and Chirundu;

- Medium to low economic activity; and
- Fairly good but inadequate infrastructure.

Comments

- Increased water connections by over 7%;
- Increased number of metered connections by 11,000;
- Improved in all indicators save for collection efficiency;
- Had about 1,235 stuck meters;
- Needs to concert effort to reducing NRW;
- Needs to improve water quality in terms of turbidity particularly in Choma, Livingstone, Maamba Districts and;
- Needs to improve service hours in Maamba District, Highlands in Mazabuka District and parts of Livingstone District such as Airport.

1.8.7 Chambeshi WSC

Operating Environment

- Operates in 12 towns (Kasama, Mpika, Chinsali, Nakonde, Isoka, Mbala, Mpulungu, Luwingu, Mporokoso, Kaputa, Mungwi and Chilubi) in the Northern and Muchinga Provinces that are spread over a wide geographical area;
- Northern and Muchinga Provinces include new eight districts of Mafinga, Shiwan'gandu, Nsama Kanchibiya, Lupososhi, Senga Hill, Lavushimanda and Lunte that were not yet serviced;
- Low economic activity; and
- Fairly new infrastructure

Comments

- Increased number of water connections by 42%;
- Improved hours of supply and collection efficiency;
- Improved the integrity parameters for water quality;
- Increased metered connections about 17,000; and
- Needs to concert efforts towards improving billing efficiency.

1.8.8 North Western WSC

Operating Environment

- Operates in nine towns in North-Western Province namely Solwezi, Kasempa, Mwinilunga(including Lumwana mine area), Zambezi, Manyinga, Kabompo, Chavuma and Mufumbwe and Kalumbila;
- The Province includes two new districts of Ikelengi and Mushindamo that were not yet serviced; and
- Medium to low economic activity with potential for growth.

Comments

- Maintained 100% collection efficiency;
- Delayed connections of paid up customers;
- Needs to arrest the increasing NRW;
- Needs to continue increasing sanitation coverage;
- Needs to improve hours of supply particularly in Solwezi District; and
- Needs to improve governance and embrace transitional management of the CU.

1.8.9 Western WSC

Operating Environment

- Operates in 16 towns in the Western province (Kaoma, Mongu, Kalabo, Senanga, Lukulu, Sesheke, Mulobezi (Sichili only), Mwandi, Shang'ombo, Limulunga, Nalolo, Sikongo, Sioma; Luampa; Nkeyema and Mitete);

- Constructed 10 water schemes in the rural parts of Mongu, Limulunga, Nkeyema, Lwampa, Kaoma, Sioma, Nalolo, Shangombo, Mwandi and Mulobezi benefiting about 13,512 people; and
- Low economic activity.

Comments

- Improved collection efficiency;
- Improved integrity parameters of water quality;
- Improved hours of supply although still below the benchmark;
- Needs to improve metering ratio;
- Needs to improve both water and sanitation coverage; and
- Needs to urgently address the increasing NRW.

1.8.10 Eastern WSC

Operating Environment

- Operates in ten towns Nyimba, Chipata, Petauke, Katete, Chadiza, Mambwe, Lundazi, Vubwi, Chama and Sinda in the Eastern Province although in Vubwi service was not yet provided;
- The Province includes new districts namely Chasefu, Chimpangali, Kasenengwa, Lumezi and Lusangazi which were not part of the licence and were yet to be serviced;
- Fairly new infrastructure; and
- Seasonal, medium to low economic activity dependent on farming periods.

Comments

- Maintained metering ratio, hours of supply and collection efficiency of above 100%;
- Increased number of water connections by over 8%;
- Needs to address the sewage flooding challenges in Chipata District.
- Needs to address the high staff efficiency;
- Needs to improve hours of supply in Chipata District in areas such as Magazine and Eastride and Chaninda Boarder in Chadiza District and Old Airport in Lundazi District; and
- Needs to find a lasting solution to the high level of water hardness in Petauke District.

1.8.11 Luapula WSC

Operating Environment

- Operates in seven towns in Luapula Province (Mansa, Samfya, Nchelenge, Kawambwa, Mwense, Chiengi and Milengi), although in Chiengi and Milengi service was not yet provided;
- Extremely low economic activity;
- The Province includes four new districts of Chembe, Lunga, Chipili and Mwansabombwe which were not part of the licence and were yet to be serviced. Chifunabuli was being service by a private company called Access water Zambia which has signed a contract with the CU;
- Low customer base; and
- Fairly new infrastructure.

Comments

- Improved hours of supply, water quality and collection efficiency;
- Increased water connections by 47%;
- The suspension of the operating licence was lifted following improved performance;
- Improved NRW although it still remained high; and
- Needs to improve internal controls and general management.

2

ONSITE SANITATION AND FAECAL SLUDGE MANAGEMENT

2.1 INTRODUCTION

Improving sanitation is of paramount importance in reducing risks associated with outbreaks and the spread of waterborne diseases within and beyond the household. Improvements in sanitation provide positive externalities on the quality of public and environmental health and reduces expenditure on curative interventions. Government is committed to ensuring that its citizens are safeguarded from health issues associated with poor sanitation as espoused in the Zambia's Vision 2030 which advocates for adequate and safe sanitation. The Vision 2030 sanitation target of 90% coverage resonates with the United Nations Sustainable Development Goals (SDGs 2016-2030) Target 6.2, which aims to achieve access to adequate and equitable sanitation and hygiene for all, and end open defecation. Zambia is party to the SDGs and has been building on the successes of the Millennium Development Goals by committing to the SDGs agenda to ensure sustainable social and economic progress and eradicate extreme poverty.

Over the years, the Government has been implementing National Development Plans (NDPs) with specific targets on sanitation aimed at improving coverage in line with the Vision 2030. This is being supported through programmes such as the National Urban Water Supply and Sanitation Programme (2011-2030), National Urban and Peri-Urban Sanitation Strategy (2015-2030), Open Defecation Free Zambia Strategy (2018-2030), National Rural Water Supply and Sanitation Programme (2019-2030), and Zambia Water Investment Programme (2022-2030).

Some notable progress has been recorded towards attainment of these targets between 2015 and 2022 according to the 2022 Joint Monitoring Programme (JMP) report. For example, the proportion of households with access to basic sanitation increased from 63% to 68%. In urban areas, access to at least basic sanitation increased from 84% to 87%, while in rural areas access increased from 42% to 48%. Despite these gains, over 85% of the population relied on non-sewered sanitation such as septic tanks and pit latrines. This underscores the urgent need to focus on non-sewered sanitation service provision.

2.2 REGULATION OF ONSITE SANITATION AND FAECAL SLUDGE MANAGEMENT SERVICES

The Water Supply and Sanitation Act No. 28 of 1997 (as amended by Act No. 10 of 2005) mandates NWASCO to regulate the provision of sanitation services. The Act defines sanitation as the disposal, on-site or offsite, of human excreta that includes collection, treatment and end use. Despite the provision in the WSS Act, service provision and regulation were skewed towards offsite sanitation.

In 2018, NWASCO developed regulatory frameworks for OSS and FSM leading to the amendment of the operating licences for CUs to include onsite sanitation services. FSM services collectively consists of containment, emptying, transportation, treatment and disposal/ reuse of resulting faecal sludge from OSS facilities. CUs are at liberty to engage third parties to support the provision of sanitation services across chain, as provided in the framework.

Currently, CUs are at different levels of implementation with some having incorporated the service in their Strategic Plans while others have gone further and signed the management contracts with Private Operators to provide emptying and transportation of faecal sludge.

In their quest to provide FSM services, Four CUs namely LWSC, LGWSC, CHWSC and SWSC have developed business and service delivery models which were being implemented. The four CUs have identified, formalised and trained manual pit emptiers to provide pit emptying and transportation services. These CUs have also designated staff, with Job descriptions, to oversee FSM service delivery.

- LWSC has divided the City into three zones - Northern, Central and Southern Zone in ensuring efficiency in delivery of the pit latrine emptying and transportation services.
- In Each Zone, there are four contractors delivering the service on a competitive basis. Service providers are mandated to conduct their marketing activities, liaise with customers and also provide pit latrine emptying services. Contractors or private emptiers include;

i. Kanyama Water trust,
ii. Chanzanga Water Trust,
iii. Sterling General Dealers,
iv. Hanzway Scavengers,
v. Ever Tomorrow
vi. Nanditec Sanitation services
vii. Mima,
viii. Evergood Sanitation,
ix. Lunem Enterprises; and
x. Geochi services.

- To ensure safe service provision, protection of the public health and the environment, the inspection team of the FSM unit monitor and inspect operations of the service providers to ensure strict adhere to the standard operating procedures. Trucks for pit latrine emptying belong to LWSC and franchised to Private Operators. Vacuum Tanker services are provided by multiple private players at unregulated prices, however, LWSC is in the process of streaming services to align them to the zones as a pre-requisite for price regulation.
- As such, random physical inspections and customers satisfaction surveys are conducted. Further, the service providers are also expected to meet defined key performance indicators (KPIs) on occupation health and safety, customer management and public safety during emptying and transportation of faecal sludge.
- LGWSC has however, retained the provision of transporting, treatment and disposal of FS. The CU has no FSTP hence faecal sludge is desludged at the drying beds which were constructed with support from SNV. Vacuum tanker services are provided by LGWSC however, the CU has limited capacity to meet the demand. LGWSC has two types of pit emptying tariffs, that is, a one-off tariff which is paid on demand for the service and a monthly charge for emptying which is paid over time and entails that scheduled emptying services are provided. Both these tariffs have been approved by NWASCO.
- CHWSC has permitted by way of signing contracts, Jombolola, Mutanzwila Rapid Response, Chimbusa Busaka and Northern Emptiers private companies to provide pit emptying services in Nakonde, Mbala, Mpulungu and Kasama Districts while the CU is responsible for transportation, treatment and disposal. The transport for FS is provided by the CU and the CU is also expected to cover the cost of vehicle maintenance. The CU provides the vacuum tanker but has limited capacity. The CU has an FSTP in Mpulungu District which was constructed with support from SNV.
- SWSC identified individual pit emptiers who have been permitted in their individual capacities, through signing of contracts, to provide pit emptying services in Livingstone City. Desludging is done at an FSTP which was constructed with support from WSUP. Vacuum tanker services are provided by the CU.
- In our quest to ensure that all CUs provide FSM services, NWASCO has been providing support in form of capacity building and GIS mapping of sanitation facilities. During the period under review, NWASCO trained three CUs, i.e, KWSC, NWSC and EWSC on how they could structure their FSM businesses so as to promote inclusive, efficient and safe services.
- In order to guide CUs on the planning and effective implementation of sustainable safely managed sanitation services, NWASCO introduced the Citywide Inclusive Sanitation (CWIS) Planning and Service Provision Guidelines in 2022. Further, NWASCO developed a criteria to monitor and benchmark CUs' progress to attaining CWIS. The reporting template has six main parameters as shown in Table 7 and CUs are required to submit quarterly progress reports to NWASCO using a prescribed format.

Table: 7 NWASCO Criteria for CWIS Implementation Status in Commercial Utilities

No	Criteria	Indicator	Scoring	Expected score
1	Commercial Utility Commitment Documentation Incorporating Strategic Commitment to OSS/ FSM	The institution has officially committed to OSS/FSM service provision and the company has a budget towards the same	Budget in place for the year under review Strategic Plan with OSS/FSM aspects Organogram with person/s dedicated to OSS/FSM (1)	Official document/SP available = 1, else = 0 Budget from official document available = 1, other budget = 0.5, else = 0 Organogram available =1, else =0.5, non=0
2	Data management	Demonstrated efforts in establishing and maintaining GIS data base of OSS/FSM facilities	Mapping of sanitation facilities using GIS; Evidence of GIS data base of OSS/FSM facilities	At least one district mapped (1), non =0 Evidence of GIS data base and sharing of information available=1, else=0.5, non=0
3	**Stakeholder Engagement** Commercial Utility's demonstration of Stakeholder engagement	Documented CU engagements with Stakeholders	Evidence of engagement meetings with prospective OSS/FSM service providers	Evidence of stakeholder engagement meetings held = 1, else = 0
4	Commercial Utility efforts to pollution prevention, environmental and human protection	Availability of Shift Flow Diagram(s); Participatory stakeholder engagement for upstream and downstream stakeholders; and Proof of compliance with ZEMA regulations (including effluents – discharge permits).	Shit flow diagram available Evidence of documentation and sharing of At least two evidence of stakeholder engagement activities (0.25) ZEMA permits and effluent results meeting ZEMA standards (0.25)	Shit flow diagram in place = 1, not in place = 0 Percentage implementation of diagram x 1

No	Criteria	Indicator	Scoring	Expected score
5	**Service Level Guarantees and Agreements** Commercial Utility's commitment to adoption of the approved SLGs	The CU has demonstrated incorporation of OSS/FSM in their SLGs	Evidence of documentation display of SLGs (1)	Document displayed = 1, else = 0
6	Service Delivery	CU has documented contract agreements/MoU with service providers	Evidence of identification, engagement and signing of service delivery contracts/ MoUs (1)	Identification of service providers (0.5) Engagement of service providers (0.5) Signed MOU/Contract available (1)

In an effort to monitor and report progress that the country was making in attaining safely managed sanitation services, NWASCO also developed benchmarking indicators for OSS and FSM which will be used in ranking the CUs performance in providing emptying and transportation services of Faecal Sludge from OSS facilities.

Table 8: Indicators for Onsite Sanitation and Faecal Sludge Management

SN	Performance Indicator	Measurement	Data Requirements	Formula
1.	Desludged Septic tanks (%)	Percentage of septic tanks Desludged	i. Total number of septic tanks desludged; ii. Total planned number of septic tanks to be desludged in the area	i. (Number of septic tanks desludged)/(Number of septic tanks planned for desludging in the area) ii. (Number of septic tanks desludged)/(Total number of septic tanks in the area)
2.	Desludged Pit Latrines (%)	Percentage of Pit Latrines Desludged	i. Total number of Pit Latrines desludged; ii. Total planned number of Pit Latrines to be desludged in the area	i. (Number of pit latrines desludged)/(Number of pit latrines planned for desludging in the area) ii. (Number of pit latrines desludged)/(Total number of pit latrines in the area)

2.3 GEOGRAPHIC INFORMATION SYSTEM MAPPING OF ONSITE SANITATION FACILITIES

Onsite sanitation and faecal sludge management regulation and service provision requires data on the availability and state of OSS and Faecal Sludge treatment facilities. Comprehensive data collection on sanitation, analysis and packaging for decision making is critical. NWASCO and Cooperating Partners have been supporting utilities to map and collect necessary sanitation data using geographic information system based tools.

Between 2022 and 2023, mapping was undertaken in Kafubu, Nkana and Eastern WSCs with support from NWASCO. Figures 1 to 3 show the maps produced from the mapped data for Chipata, Kitwe and Ndola. The mapping exercises continued in Luapula with support from NWASCO but at the close of the reporting period, data was not available for publication.

Figure 1: Mapping of Chipata

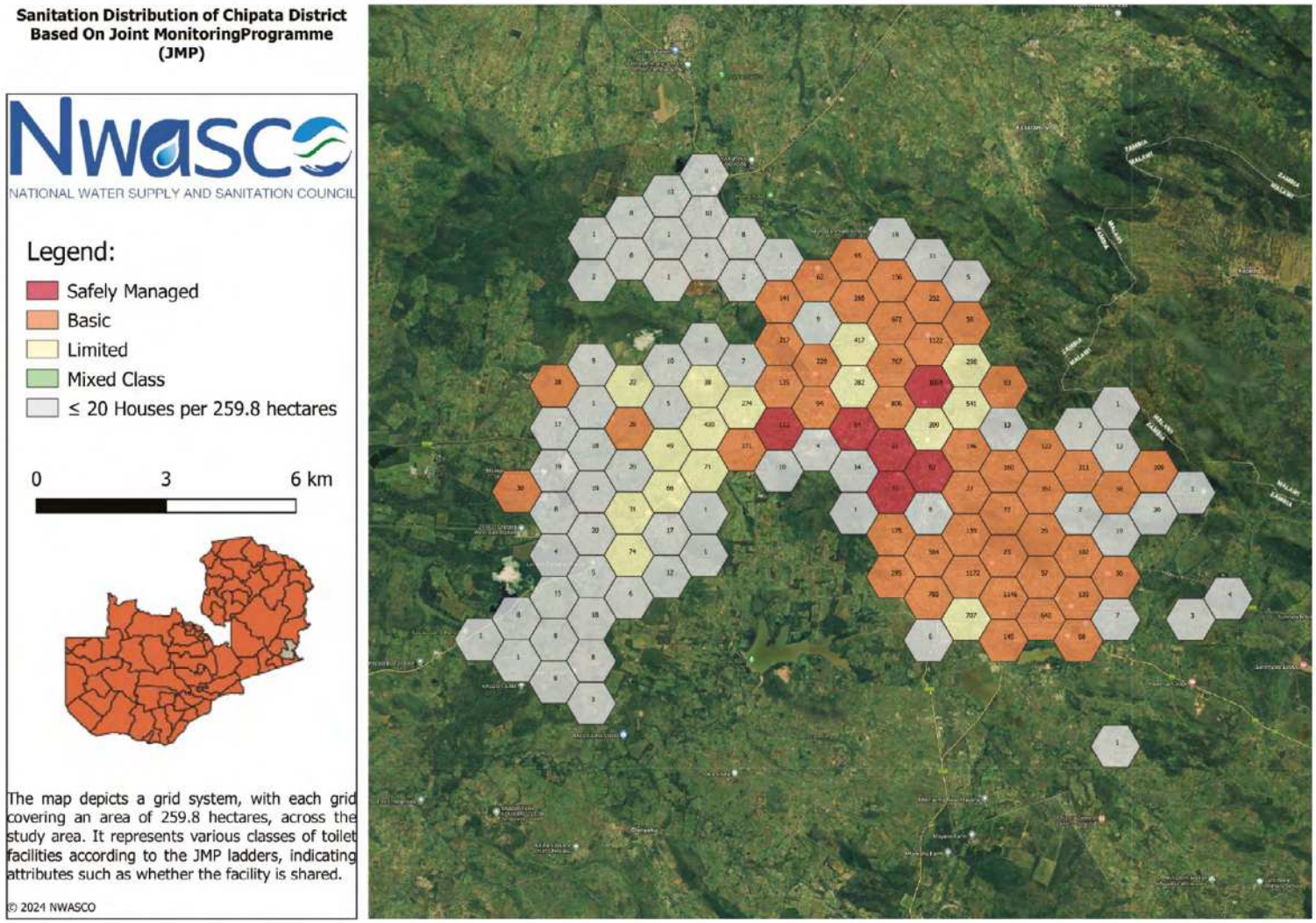


Figure 2: Mapping of Kitwe

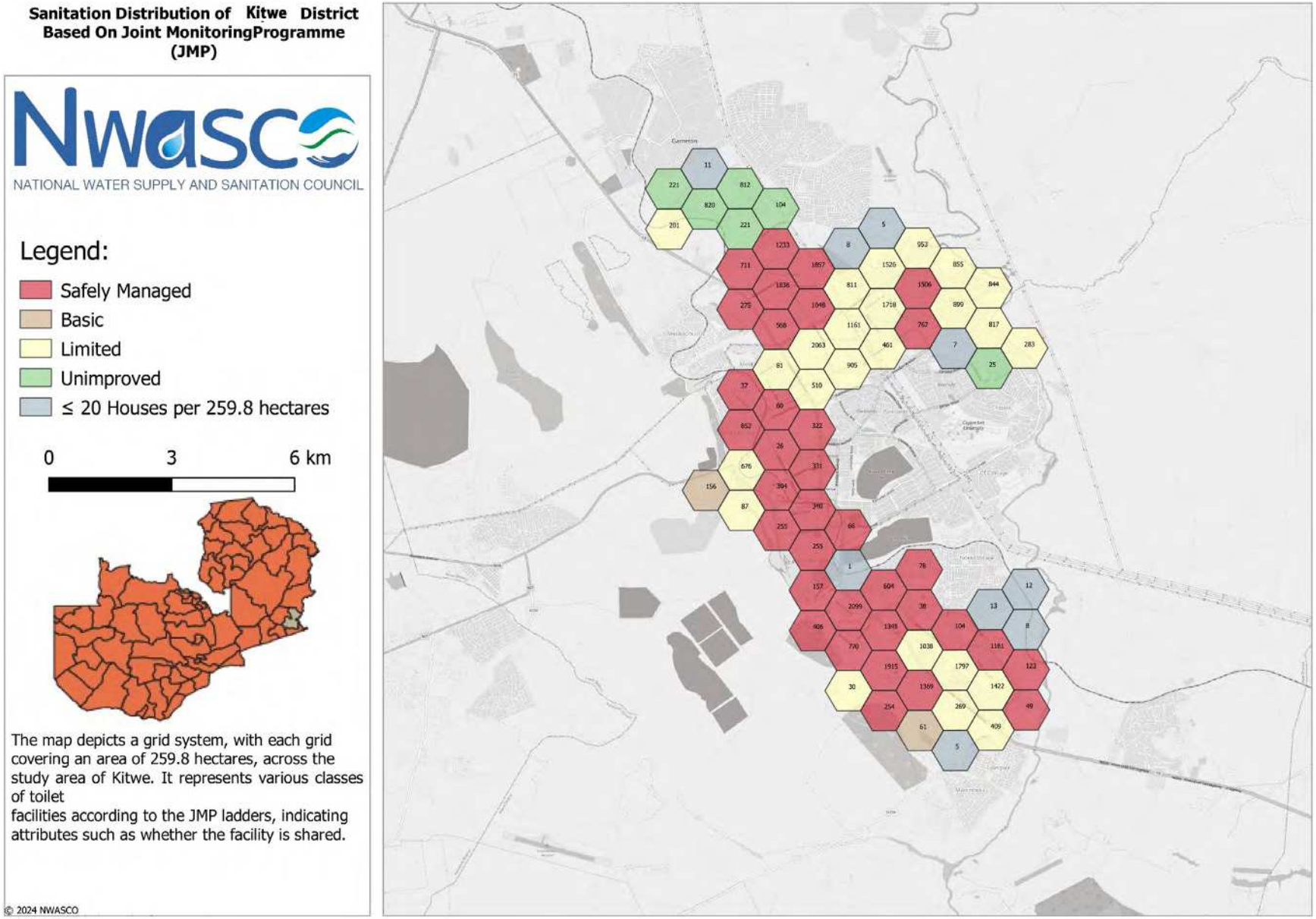
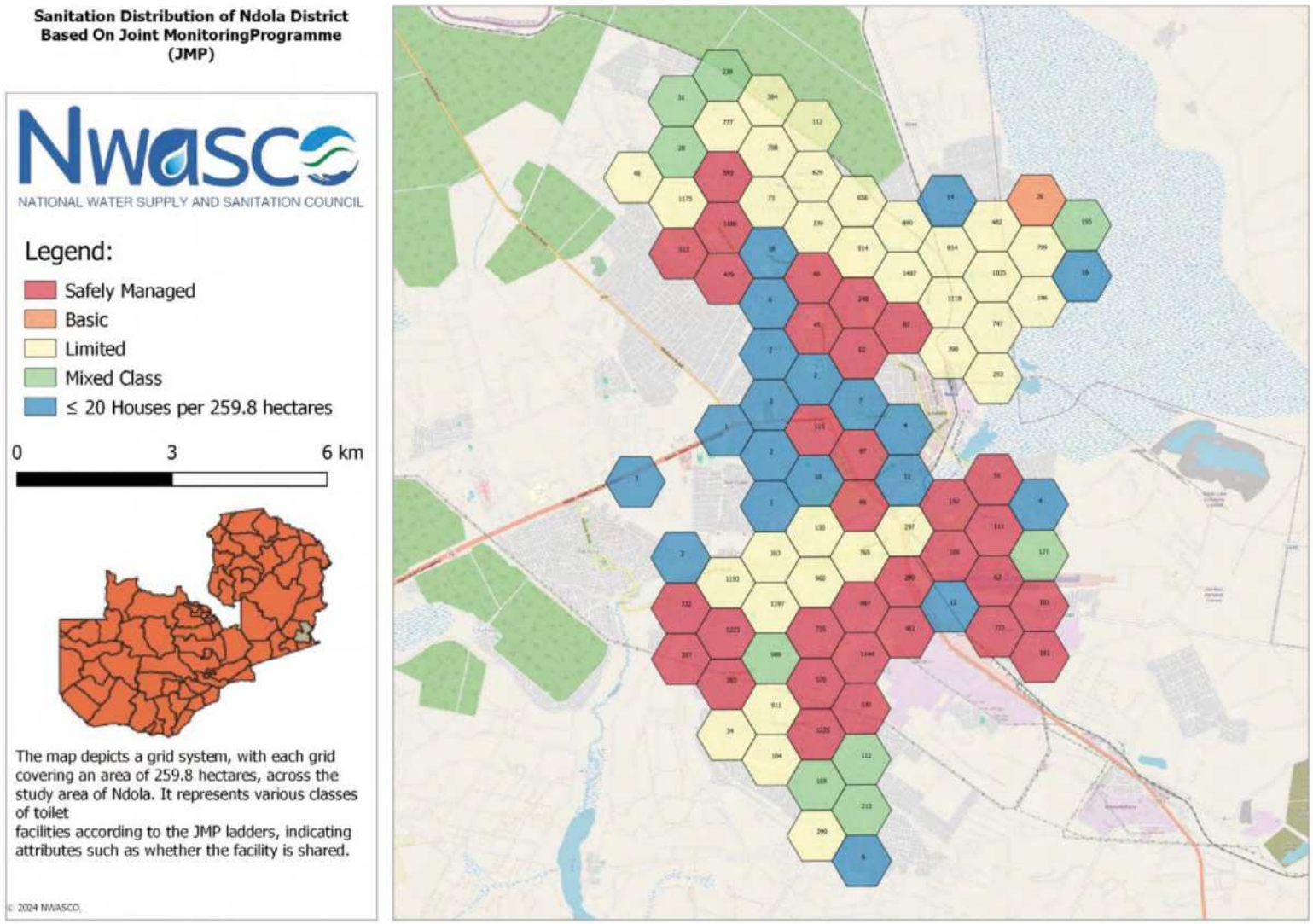


Figure 3: Mapping of Ndola



Crucial as it may be, comprehensive mapping across the country has been a challenge owing to significant financial requirement and limited technological capacities in the utilities. Efforts must therefore be concerted by all stakeholders to ensure mapping of all sanitation facilities in the country.

2.4 CHALLENGES OF FAECAL SLUDGE MANAGEMENT

There have been a number of challenges encountered by both the Service Providers and NWASCO in the provision and regulation of OSS/FSM services. These have aided the development of a number of tools and mechanisms to improve OSS/FSM regulation and services provision. Some of these challenges are highlighted below:

2.4.1 Service Providers

Commercial Utilities: Among the challenges encountered by the CUs include inadequate faecal sludge treatment plants, inadequate and improper emptying tools, affordability and willingness to pay for emptying services and failure by the staff of the private operators to adhere to standard operating procedures. In addition, CUs face challenges of lack of finances to support infrastructure investment in OSS and FSM.

Private Operators: For the private operator, the major challenges include high staff turnover, high immunisation costs and low demand for emptying service, high solid waste content in faecal sludge and unclear or unfair delegated management agreements between CUs and Private Operators. In addition, private operators face challenges of limited affordable sources of finance to support capital expenditure

2.4.2 Regulator

One of the major challenges that is faced by NWASCO in regulating FSM service delivery is the lack of data. The majority of the facilities in the country have not been mapped. Without data, it is difficult to institute price regulation among others. The failure by the CUs to zone their service areas and structure FSM service provision poses a huge challenge for NWASCO to institute regulation. Additionally there are unregulated tariffs for OSS/FSM services due to delayed engagement of Private Operators.

Poorly Constructed Pit Latrine

2.5 LESSONS LEARNT

Some of the key lessons learnt include the importance of having clear and fair agreements between CU's and third parties, the need for having baseline information on existing OSS facilitate for effective decision making, the importance of developing well-informed business and service delivery models. Other lessons learnt include the importance of building synergies with stakeholders involved in FSM services such as the Ministry of Health and Local Authorities, enhanced marketing of emptying services to create demand and the need to strengthen laws so as to make emptying of OSS facilities mandatory.

Pit emptying

3

RURAL WATER SUPPLY AND SANITATION

3.1 INTRODUCTION

NWASCO is mandated to regulate the provision of water supply and sanitation services for efficiency and sustainability. Following the sector reforms in the 1990s, eleven (11) CUs were established throughout the country. It is the role of NWASCO as per the Act to advise local authorities on commercially viable institutional arrangements for the provision of water supply and sanitation services. The establishment of an institutional and legal framework is integral to fostering a conducive environment. Both the MWDS and NWASCO have identified the necessity to review existing laws and develop new ones to ensure clarity in roles and responsibilities.

In 2018, NWASCO developed the Rural Water Supply and Sanitation Service (RWSS) Provision and Regulatory Framework which sets out the modalities for the provision of RWSS services by the CUs and other providers such as the local authorities (LAs) and defined the focus for regulation.

The development of frameworks followed a wide stakeholder consultation that led to the formulation of a comprehensive implementation plan. The Implementation plan stipulates activities and timelines by which regulation and service provision progress can be monitored. The focus for implementation of RWSS regulation and service provision is as follows;

- Strengthening Institutional and Legal Framework;
- Establishment of Data base for RWSS for regulation;
- Development of Regulatory Tools;
- Licensing and Service Level Guarantees and Agreements;
- Capacity Building of Regulator and CUs; and
- Monitoring of RWSS Service Provision.

NWASCO, in consultation with relevant stakeholders, identified and reviewed the necessary laws and policies to achieve clear institutional mandates and responsibilities. Regulatory tools and systems have been developed by NWASCO and are in place while licences for CUs have been revised from urban and peri urban to include rural; encompassing the entire district. While capacity building for NWASCO and CU staff continues, establishment of a data base of rural piped water schemes was embarked on with support from Cooperating Partners: UNICEF, GIZ and ESAWAS.

It is stated in the regulatory framework (3.3.3, Table 3), that piped water schemes should progressively be taken over by CU depending on the situation on the ground. Where piped schemes and water points are not taken over by the CU, they will enter into an agreement with a Local Authority or performance contract with a Private Operator/Community Based Organisation.

The framework is designed to ensure that RWSS services are provided equitably and efficiently to all parts of the country. It endeavours to outline a collaborative approach between the CUs and LAs, and emphasises the importance of effective regulation to ensure quality service provision. To clearly define the roles and responsibilities of all stakeholders involved in RWSS service delivery, the framework aims to promote transparency, accountability, and sustainability in the sector. However, there is a need to develop capacity in the CUs, LAs and NWASCO to effectively implement this framework.

The Ministry of Water Development and Sanitation is developing national guidelines for small-piped water schemes, aimed at enhancing and fortifying the delivery of rural water supply services with support from GIZ - SIWaS project. The finalization of this document will involve active participation from CUs, Local Authorities (LAs), and other key stakeholders.

The Water Supply and Sanitation Act (No. 28 of 1997) mandates both NWASCO and the CUs to regulate and provide water supply and sanitation services respectively, to all parts of the country. Mandated as service providers, CUs are tasked with the provision of RWSS or overseeing all stakeholders involved in WSS in rural areas, particularly those engaged in piped water schemes, either through management contracts or Memoranda of Understanding (MoUs).

3.2 OVERVIEW OF THE DATA COLLECTED

In rolling out water supply and sanitation service provision by CUs and regulation in rural areas, data is important in informing policy, resource planning and implementation. Data provides an opportunity to assess the capacity of RWSS assets and infrastructure in meeting service delivery demand.

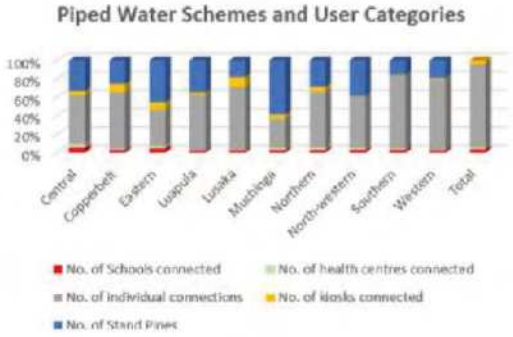
During the reporting period, NWASCO continued to collect data of PWSs in rural areas and user categories connected thereto. The other information collected was on sources of water for the schemes, water quality, infrastructure design, management models, existing tariff structures and operation and maintenance costs.

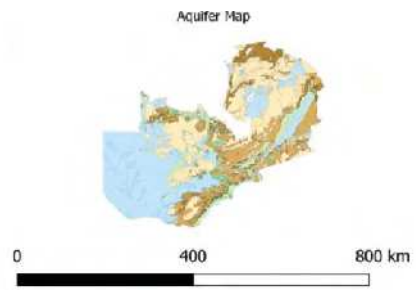
Since commencement of the data collection process in 2021, a total of 1,434 PWSs have been captured in districts of the 10 provinces of Zambia. From these a total of 674 schools and 335 health care centres are connected. The schemes also account for 15,850 individual connections, 747 kiosks and 6,874 public stand pipes. Data is yet to be collected from 4 districts of Southern Province, namely; Kalomo, Kazungula, Pemba and Namwala and 1 district on the Copperbelt province being Mufulira. Luano, Lusaka, Chavuma and Kasempa did not have any PWSs. Figure 4 and Charts 1 show the total number of schemes and the user categories of piped water schemes.

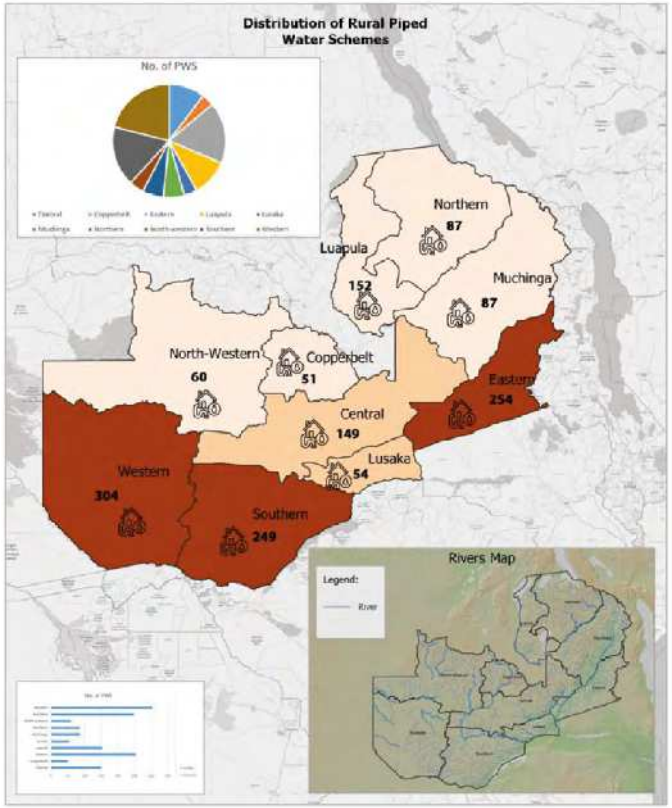
Figure 4

Rural Piped Water Schemes in Zambia

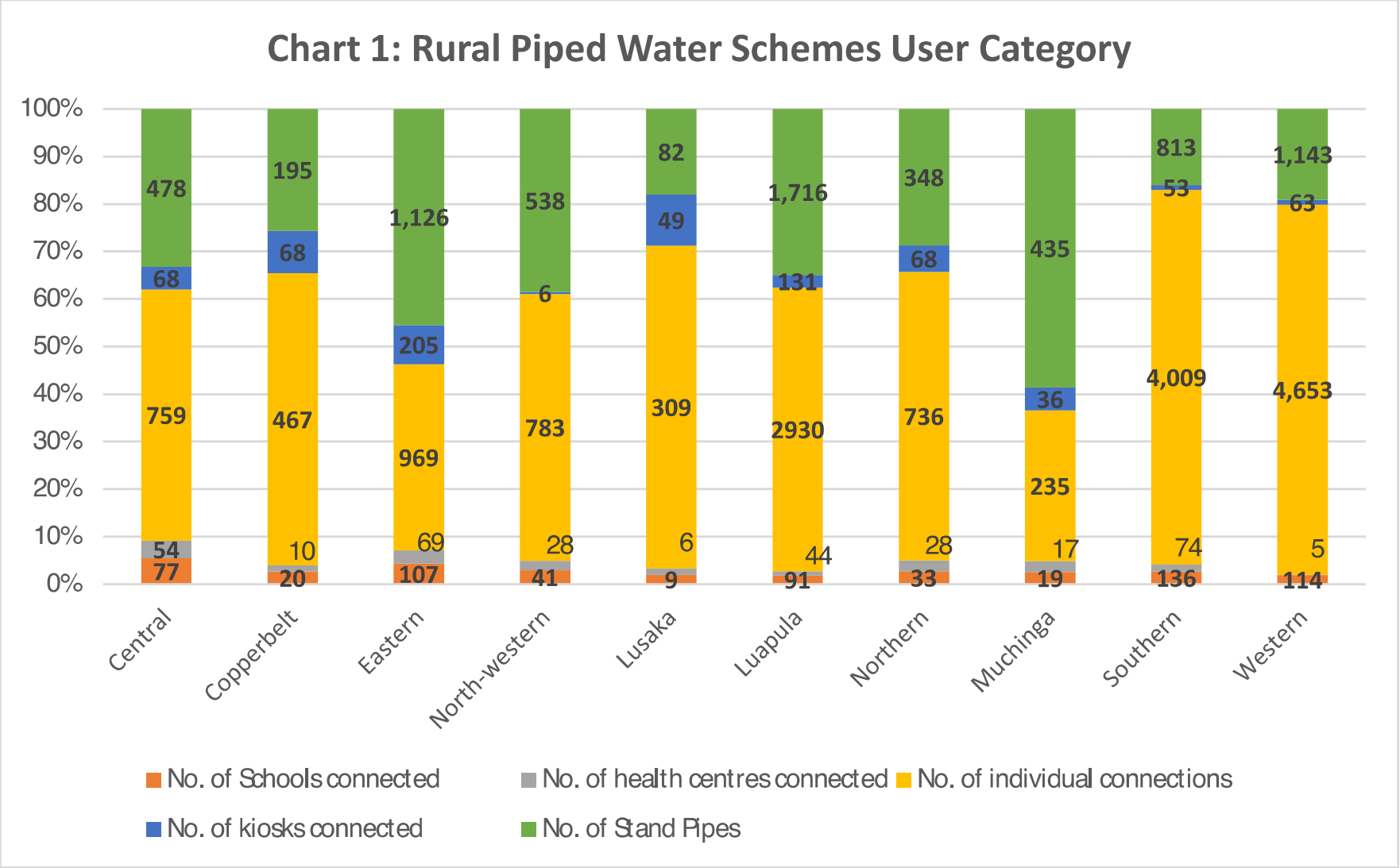
NWASCO
NATIONAL WATER SUPPLY AND SANITATION COUNCIL







The map illustrates NWASCO's current initiative to map rural piped water supply systems (PWSs). NWASCO is actively gathering data on PWSs in rural regions and the user demographics linked to these systems. The information collected encompasses the water sources used by the schemes, water quality, infrastructure design, management approaches, existing tariff structures, and the costs associated with operation and maintenance.



3.3 WATER QUALITY MONITORING

A summary of water quality monitoring findings in PWSs in all the 10 provinces of Zambia is presented in Table 9.

Table 9: Water Quality Monitoring Findings

PROVINCE	Tests done by		Test types done by count of PWSs						No Testing
	EHOs	Private/ CBE/CBO	Residual Chlorine	PH	Colour	Turbidity	Bacteriological	Heavy Metals	
Central	40	6	21	20	17	20	44	5	103
Copperbelt	27	0	15	15	16	16	27	5	24
Eastern	41	18	43	26	20	16	45	7	194
North-western	14	2	8	8	3	7	15	5	44
Lusaka	39	0	8	30	26	28	35	26	14
Luapula	18	40	51	45	17	40	55	43	94
Northern	21	0	21	14	4	11	16	4	60
Muchinga	7	1	5	5	4	4	7	3	79
Southern	48	9	22	33	5	3	37	0	190
Western	52	17	66	67	64	67	58	52	233
Total	307	93	260	263	176	212	339	150	1035

Central Province

Of the total number of PWSs in Central Province, only 46 were conducting water quality monitoring through Environmental Health Technologists (EHTs) from the Ministry of Health and/or Local Authorities as well as private service providers. Table 10 outlines the water quality monitoring in terms of the tests that are undertaken.

Table 10: Water Quality Monitoring in Central Province

District	Tests done by		Test types done by count of PWSs						No Testing
	EHOs	Private/ CBE/CBOs	Residual Chlorine	PH	Colour	Turbidity	Bacteriological	Heavy Metals	
Chibombo	6	0	1	5	4	4	6	0	18
Chisamba	6	1	4	3	3	3	7	0	9
Chitambo	8	0	7	1	0	0	8	0	1
Kabwe	5	3	6	4	4	7	7	3	16
Kapiri Mposhi	6	0	2	6	6	6	6	2	6
Mkushi	1	0	1	0	0	0	1	0	16

Mumbwa	7	0	0	0	0	0	7	0	31
Serenje	0	0	0	0	0	0	0	0	3
Shibuyunji	1	2	0	1	0	0	2	0	3
Total	40	6	21	20	17	20	44	5	103

Copperbelt Province

Of the total number of PWSs in Copperbelt Province, only 27 were conducting water quality monitoring through Environmental Health Technologists (EHTs) from the Ministry of Health and/or Local Authorities. Table 11 outlines the water quality monitoring in terms of the tests that are undertaken.

Table 11: Water Quality Monitoring in Copperbelt Province

District	Tests done by		Test types done by count of PWSs						No Testing
	EHOs	Private/ CBE/CBOs	Residual Chlorine	PH	Colour	Turbidity	Bacteriological	Heavy Metals	
Chingola	1	0	0	0	0	0	1	0	0
Kalulushi	8	0	5	0	1	1	8	1	1
Kitwe	9	0	8	9	9	9	9	0	0
Luanshya	3	0	0	0	0	0	3	0	6
Masaiti	3	0	1	3	3	3	3	3	2
Mpongwe	0	0	0	0	0	0	0	0	4
Ndola	3	0	1	3	3	3	3	1	11
Total	27	0	15	15	16	16	27	5	24

Eastern Province

Of the total number of PWSs in Eastern Province, only 59 were conducting water quality monitoring through Environmental Health Technologists (EHTs) from the Ministry of Health and/or Local Authorities as well as private service providers. Table 12 outlines the water quality monitoring in terms of the tests that are undertaken.

Table 12: Water Quality Monitoring

District	Tests done by		Test types done by count of PWSs						No Testing
	EHOs	Private/ CBE/CBOs	Residual Chlorine	PH	Colour	Turbidity	Bacteriological	Heavy Metals	
Chadiza	2	6	6	6	5	4	6	3	10
Chasefu	2	0	1	1	0	0	2	0	10
Chipangali	0	3	3	3	3	3	3	3	0
Chipata	1	5	6	6	6	6	6	0	1
Kasenengwa	0	2	2	2	2	2	2	0	20
Katete	13	0	3	4	3	0	13	0	13
Lumezi	0	0	0	0	0	0	0	0	2
Lundazi	1	0	1	0	0	0	1	0	3
Lusangazi	1	0	0	0	0	0	1	0	17
Mambwe	9	0	9	1	1	1	9	1	0
Nyimba	1	1	1	0	0	0	1	0	12
Patauke	0	0	0	0	0	0	0	0	42
Sinda	10	1	10	3	0	0	1	0	44
Vubwi	1	0	1	0	0	0	0	0	20
Total	41	18	43	26	20	16	45	7	194

North Western Province

Of the total number of PWSs in the Province, only 16 were conducting water quality monitoring through Environmental Health Technologists (EHTs) from the Ministry of Health and/or Local Authorities as well as private service providers. Table 13 outlines the water quality monitoring in terms of the tests that are undertaken.

Table 13: Water Quality Monitoring

District	Tests done by		Test types done by count of PWSs						No Testing
	EHOs	Private/ CBE/CBOs	Residual Chlorine	PH	Colour	Turbidity	Bacteriological	Heavy Metals	
Ikelenge	0	1	0	1	0	0	1	1	3
Kabompo	3	0	1	3	2	3	1	0	5
Kalumbila	0	1	1	1	1	1	1	1	6
Manyinga	6	0	3	3	0	3	7	3	1
Mufumbwe	5	0	3	0	0	0	5	0	0
Mushindamo	0	0	0	0	0	0	0	0	5
Mwinilunga	0	0	0	0	0	0	0	0	15
Solwezi	0	0	0	0	0	0	0	0	6
Zambezi	0	0	0	0	0	0	0	0	3
Total	14	2	8	8	3	7	15	5	44

Lusaka Province

Of the total number of PWSs in Lusaka Province, only 39 were conducting water quality monitoring through Environmental Health Technologists (EHTs) from the Ministry of Health and/or Local Authorities. Table 14 outlines the water quality monitoring in terms of the tests that are undertaken.

Table 14: Water Quality Monitoring

District	Tests done by		Test types done by count of PWSs						No Testing
	EHOs	Private/ CBE/CBOs	Residual Chlorine	PH	Colour	Turbidity	Bacteriological	Heavy Metals	
Chilanga	6	0	0	0	0	0	6	0	8
Chongwe	5	0	5	4	0	2	3	0	5
Kafue	25	0	0	26	26	26	26	26	0
Luangwa	0	0	0	0	0	0	0	0	1
Rufunsa	3	0	3	0	0	0	0	0	0
Total	39	0	8	30	26	28	35	26	14

Luapula Province

Of the total number of PWSs in Luapula Province, majority of 40 PWSs water quality monitoring is undertaken by private service providers while 18 were were monitoring through Environmental Health Technologists (EHTs) from the Ministry of Health and/or Local Authorities. Table 15 outlines the water quality monitoring in terms of the tests that are undertaken.

Table 15: Water Quality Monitoring

District	Tests done by		Test types done by count of PWSs						No Testing
	EHOs	Private/ CBE/CBOs	Residual Chlorine	PH	Colour	Turbidity	Bacteriological	Heavy Metals	
Chembe	8	0	5	5	1	3	8	0	0
Chiengi	0	0	0	0	0	0	0	0	9
Chifunabuli	0	18	18	18	18	18	18	18	0
Chipili	0	0	0	0	0	0	0	0	5
Kawambwa	1	0	0	0	0	0	1	0	33
Lunga	2	0	0	0	0	0	2	0	1
Mansa	6	0	6	3	0	0	6	6	0
Milenge	0	0	0	0	0	0	0	0	1
Mwansabombwe	1	2	2	2	0	1	3	2	20
Mwense	0	3	3	0		1	0	0	25
Samfya	0	17	17	17	17	17	17	17	0
Total	18	40	51	45	17	40	55	43	94

Northern Province

Of the total number of PWSs in Northern Province, only 21 were conducting water quality monitoring through Environmental Health Technologists (EHTs) from the Ministry of Health and/or Local Authorities. Table 16 outlines the water quality monitoring in terms of the tests that are undertaken.

Table 16: Water Quality Monitoring in Northern Province

District	Tests done by		Test types done by count of PWSs						No Testing
	EHOs	Private/ CBE/CBOs	Residual Chlorine	PH	Colour	Turbidity	Bacteriological	Heavy Metals	
Chilubi	10	0	10	10	0	7	9	0	1
Kaputa	0	0	0	0	0	0	0	0	5
Lunte	4	0	4	4	4	4	4	4	0
Lupososhi	0	0	0	0	0	0	0	0	7
Luwingu	0	0	0	0	0	0	0	0	8
Mbala	5	0	5	0	0	0	1	0	5
Mungwi	0	0	0	0	0	0	0	0	23
Nsama	0	0	0	0	0	0	0	0	6
Nsenga Hill	2	0	2	0	0	0	2	0	5
Total	21	0	21	14	4	11	16	4	60

Muchinga Province

Of the total number of PWSs in Muchinga Province, only 8 were conducting water quality monitoring through Environmental Health Technologists (EHTs) from the Ministry of Health and/or Local Authorities as well as private service providers. Table 17 outlines the water quality monitoring in terms of the tests that are undertaken.

Table 17: Water Quality Monitoring

District	Tests done by		Test types done by count of PWSs						No Testing
	EHOs	Private/ CBE/CBOs	Residual Chlorine	PH	Colour	Turbidity	Bacteriological	Heavy Metals	
Chinsali	1	0	1	0	0	0	0	0	1
Isoka	1	0	0	1	0	0	1	0	16
Kanchibiya	1	0	1	1	1	1	1	0	12
Lavushimanda	0	0	0	0	0	0	0	0	21
Mafinga	0	0	0	0	0	0	0	0	1
Mpika	0	0	0	0	0	0	0	0	26

District	Tests done by		Test types done by count of PWSs						No Testing
	EHOs	Private/ CBE/CBOs	Residual Chlorine	PH	Colour	Turbidity	Bacteriological	Heavy Metals	
Nakonde	1	0	0	0	0	0	1	0	0
Shiwang'andu	3	1	3	3	3	3	4	3	2
Total	7	1	5	5	4	4	7	3	79

Southern Province

Of the total number of PWSs in Southern Province, only 57 were conducting water quality monitoring through Environmental Health Technologists (EHTs) from the Ministry of Health and/or Local Authorities as well as private service providers. Table 18 outlines the water quality monitoring in terms of the tests that are undertaken.

Table 18: Water Quality Monitoring for Southern Province

District	Tests done by		Test types done by count of PWSs						No Testing
	EHOs	Private/ CBE/CBOs	Residual Chlorine	PH	Colour	Turbidity	Bacteriological	Heavy Metals	
Chikankata	7	3	4	0	0	0	7	0	32
Chirundu	1	0	0	1	1	1	1	0	5
Choma	12	1	7	12	3	2	6	0	23
Gwembe	15	3	3	17	1	0	16	0	40
Itezhi Tezhi	0	0	0	0	0	0	0	0	12
Livingstone	3	0	3	0	0	0	0	0	19
Mazabuka	3	0	3	3	0	0	0	0	7
Monze	5	2	1	0	0	0	6	0	4
Siavonga	0	0	0	0	0	0	0	0	11
Sinazongwe	1	0	0	0	0	0	1	0	33
Zimba	1	0	1	0	0	0	0	0	4
Total	48	9	22	33	5	3	37	0	190

Western Province

Of the total number of PWSs in Western Province, only 69 were conducting water quality monitoring through Environmental Health Technologists (EHTs) from the Ministry of Health and/or Local Authorities as well as private service providers. Table 19 outlines the water quality monitoring in terms of the tests that are undertaken.

Table 19: Water Quality Monitoring for Western Province

District	Tests done by		Test types done by count of PWSs						No Testing
	EHOs	Private/ CBE/CBOs	Residual Chlorine	PH	Colour	Turbidity	Bacteriological	Heavy Metals	
Kalabo	16	0	16	16	16	16	16	16	0
Kaoma	8	1	9	9	9	9	9	8	6
Limulunga	0	0	0	0	0	0	0	0	28
Luampa	1	0	0	1	1	1	1	0	4
Lukulu	0	1	1	1	1	1	1	1	17
Mitete	1	0	0	0	0	0	1	0	0
Mongu	3	12	15	15	15	15	15	15	0
Mulobezi	0	1	1	1	1	1	1	0	4
Mwandi	5	0	5	5	5	5	5	5	23
Nalolo	0	1	1	1	0	1	1	0	30
Nkeyema	0	0	0	0	0	0	0	0	65
Senanga	0	0	0	0	0	0	0	0	9
Sesheke	1	1	2	2	0	2	2	0	6
Shang'ombo	17	0	16	16	16	16	6	7	19
Sikongo	0	0	0	0	0	0	0	0	16
Sioma	0	0	0	0	0	0	0	0	6
Total	52	17	66	67	64	67	58	52	233

3.4 STATUS OF RURAL WATER SUPPLY AND SANITATION REGULATION

Regulation of rural water supply and sanitation will primarily focus on three main areas as follows:

- Service Coverage;
- Water Quality; and
- Tariff setting.

In order to effectively regulate RWSS service delivery, there is need for the service provision models stipulated in the Framework to be actualised. The service provision models are as follows:

- CU to directly manage a piped water system
- CU to enter into a Memorandum of Understanding with the Local Authority in areas where the CU is not directly doing so in the management of piped water systems; and
- CU to sign a contract with a private operator/NGO/FBO/CBE for the management of piped water systems.

The CUs have begun to make efforts to coordinate RWSS service provision in line with the frameworks. LPWSC has signed a contract with Access Water for Zambia, a private company, to construct and operate rural water schemes. Access Water is a private company operating under a third-party construction and service delivery contract with LPWSC which was signed with LPWSC on 12th December 2022.

Access Water currently operates 37 solar piped water schemes in 4 Districts under LPWSC namely Samfya, Chifunabuli, Mwansabombwe and Mansa serving 89,000 people with safe water supply. There are a total of 1,430 taps, all fitted with prepaid meters, the revenues from which cover operations and maintenance costs for the running of the systems. Of the 1,430 taps, 41 are at schools and 18 are at health centres. The Scheme is using a NWASCO approved tariff which is a single step volumetric tariff and is the same for all customer categories. To ensure improved institutional water supply, the private operator provides 3m^3 of water per month free of charge to schools and health care centres. However this is only triggered after purchase of water. Access Water has an investment plan in which stipulates that an additional 15 piped water systems will be constructed in Luapula Province to serve an additional 25,000 people. Implementation of the plan will be done in close collaboration with LPWSC and the Local Authorities.

LPWSC has also signed MOUs with Mwense Local Authority to oversee operations of Mulundu rural piped water scheme among others, which was facilitated by GIZ under the Reform of the Water Sector II Programme.

WWSC has taken up rural water schemes 10 water schemes in Mongu, Limulunga, Nkeyema, Lwampa, Kaoma, Sioma, Nalolo, Shangombo, Mwandi and Mulobezi benefiting about 13,512 people. The schemes were constructed by the Ministry of Water Development and Sanitation under the *'Improving Rural Livelihoods Project'. The CU is managing four schemes in Nkeyema, Luampa, Kaoma and Shang'*ombo. The four of the schemes in Mongu, Limulunga, Sioma and Mulobezi are managed by Local Authorities and the remaining two in Nalolo and Mwandi are managed by community based organisations. The schemes are using tariffs approved by NWASCO.

3.5 RURAL WATER SUPPLY AND SANITATION – CHALLENGES AND LESSONS LEARNT

The regulation and service delivery of RWSS is achievable with the right resources in place. There is clearly a need for continued engagement of all key stakeholders to provide optimal support in ensuring that this is achieved. The vision to revamp a special purpose vehicle to fund WSS projects in rural areas must be awakened. This would cure the funding inadequacies that exist in the delivery of services in the rural areas.

3.6 CONCLUSION

The data findings further affirms the need for regulating service provision in rural areas. This is because of the minimal water quality monitoring being undertaken. Furthermore, the water quality tests that are conducted are not

sufficient to account for safe access to water supply in the rural areas. As the sector thrives to attain equitable access to WSS services for all, CUs are urged to expedite the process of RWSS service delivery through the 3 recommended delivery models swiftly so as to leave no one behind.

To effectively implement the extended mandate of providing WSS services to rural areas, a clear and systematic strategy is imperative. With support from Cooperating Partners including the GIZ Strengthening Institutions of Water and Sanitation (SIWaS) project, the development of a comprehensive strategy is foreseen to delineate precise goals, objectives, a detailed timeline, and the requisite resources to support the endeavour. Such a strategy will empower CUs and relevant stakeholders to monitor progress and undertake corrective measures where necessary for sustainable service provision for all, leaving no one behind. One of the tools that NWASCO will continue to utilize for sustainable RWSS service provision is the *'Joint Implementation Teams'* (JITs) which comprise all relevant stakeholders. The JITs have been established to spearhead the implementation of the regulatory framework for RWSS and there is a need to strengthen and roll out the JITs in the remaining provinces.

NWASCO acknowledges the evolving nature of regulating RWSS, recognizing it as a novel area for the regulator. In response, NWASCO underscores the importance of capacity-building measures for institutional enhancement, tailored to identify needs. Such measures may encompass formal training programmes, study tours, and twinning arrangements with other regulators within and beyond the region, facilitating knowledge exchange and learning. NWASCO emphasizes the significance of partnerships and twinning arrangements in bolstering its regulatory and oversight role in the RWSS sector.

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THE NATIONAL WATER SUPPLY AND SANITATION COUNCIL

4.1 INTRODUCTION

The National Water Supply and Sanitation Council (NWASCO) was established under Section 3(1) of the Water Supply and Sanitation Act No. 28 of 1997 (as amended by Act No. 10 of 2005). NWASCO is a body corporate with perpetual succession and capable of suing and being sued in its name. In as much as the Act was promulgated in 1997, the Institution commenced its operations in the year 2000.

NWASCO has the mandate to regulate the provision of water supply and sanitation services in the entire country to ensure that there is efficiency and sustainability. The Institution's licensing framework is contained in Part IV of the Water Supply and Sanitation Act (under Sections 11 to 22 of the Act). In the year under consideration, NWASCO regulated the activities of (11) Commercial Utilities (CUs) and (6) Private Schemes. The Act contains various provisions relating to requirements which the service providers are expected to adhere to. The Water Supply and Sanitation Service Providers are reflected in detail under Chapters 1, 7 and 8 of this Report.

4.2 IMPLEMENTATION OF 2021-2025 NWASCO STRATEGIC PLAN

The year under review was the third year of implementation of the 2021-2025 Strategic Plan which has six key Strategic Objectives and covers a very critical period as the country progresses towards the attainment of the Zambia Vision 2030 that seeks to ensure universal coverage of WSS. The Strategic Objectives are as follows:

i. To strengthen the capacity of NWASCO in order to implement regulation for rural water supply and sanitation and urban onsite sanitation service delivery;

ii. To effectively regulate water supply and sanitation service delivery in order to ensure improved and inclusive service provision;

iii. To mobilise financial and other resources in order to facilitate for effective operations of NWASCO and ensure financial sustainability of the CUs;

iv. To promote good corporate governance in order to ensure that NWASCO and commercial utilities are accountable, transparent and efficient in their operations;

v. To enhance information management systems in order to ensure availability of up to date information for effective decision making; and

vi. To coordinate and undertake research and development in order to generate innovation and information for evidence based sector policy formulation and implementation.

Strides were made in implementing the Strategic Plan with an annual performance achievement of 77.5%.

4.3 MONITORING SERVICE PROVIDERS

4.3.1 Introduction

In monitoring service providers, NWASCO employs a number of methods which include inspections and assessing performance from various reports submitted by the providers. Further, monitoring is done with the involvement of customers through Water Watch Groups (WWGs) and various digital customer interactive platforms such as MyWatSan Quick fix, LinkedIn and Facebook. The main areas for monitoring are;

i. Compliance to licence conditions;

ii. Compliance to Service Level Guarantees and Agreements (SLGs/SLAs) and complaints procedures;

iii. Implementation and compliance to guidelines;

iv. Organisation and management development;

v. Information management; and

vi. Implementation of tariff conditions.

4.3.2 Renewal of SLGs/SLAs

It is a licence requirement that all licensed water and sanitation service providers sign an agreement with NWASCO regarding the service they can assure their clients called a Service Level Guarantee (SLG). And where the guarantee does not fulfill the benchmark or the stipulated minimum service level set by the Regulator, the providers sign a Service Level Agreement (SLAs) which outlines improvements they will make towards achieving the benchmark for the next three year period. 11 service indicators were chosen to define the minimum service level benchmarks based on the African experience and international best practices. The benchmarks could be revised upwards as Utilities make progress towards the eventual desirable targets. There were no SLAs and SLGs renewed in the year under review.

4.3.3 Guidelines

The Water Supply and Sanitation Act No. 28 of 1997 section 4 (2) (d) mandates NWASCO to develop sector guidelines for the provision of water supply and sanitation services. The guidelines are enforced through licence condition number 8 as provided for under section 16(e) of the Act.

During the period, two guidelines were revised and two new guidelines were through a consultative process with key stakeholders. The newly developed guidelines were the Occupational Health and Safety (OHS) and Information and Communication Technology (ICT) Guidelines whereas the revised were the Corporate Governance and the Climate Risk Screening.

4.3.4 Inspections

The Water Supply and Sanitation Act No. 28 of 1997 provides for NWASCO to appoint Inspectors to conduct inspections on any service provider to monitor compliance to the provisions of the Act. The Inspectors are empowered by law to check any aspect of operations and can do this either through comprehensive or target-specific inspections. In the period under review, NWASCO conducted inspections on all the 11 CUs and four Private Schemes. The key findings are presented below:

Commercial Utilities:

All the CUs continued to experience financial challenges owing to increased costs of inputs which were not matched by an upward tariff adjustment. It was also noted that CUs were delaying in making new Connections for paid up members and also resolution of complaints.

Other findings from the inspections were that the CUs were generally not taking proactive measures to reduce NRW. This was demonstrated by the high number of leakages and the billing lapses. The inspections also revealed some improvements in hours of supply particularly in CUs were water supply improvement projects were being implemented such as CHWSC, LPWSC and WWSC.

Private Schemes

- Private Schemes continued to adhere to their Service Level Guarantees on hours of supply in most of their service areas. Hours of supply were maintained at 24 in a number of areas supplied by Private Schemes and these included Victoria Falls station in Livingstone, all areas under Zambia Sugar and all areas under Kafue Sugar. For Kaleya Smallholders all areas were maintained at 24 hours save for Group 3-A and Group 3-B;
- Kafue Sugar did not comply with the Water Quality Monitoring Guidelines due to failure to report all required tests, specifically bacteriological tests; and
- Schemes such as Kaleya Smallholders made notable progress in water quality monitoring by engaging staff dedicated to water quality monitoring as well as procurement of testing equipment.

4.4 SPECIAL REGULATORY SUPERVISION

Special Regulatory Supervision (SRS) is one of the mechanisms used by NWASCO to correct CU's that contravene the provisions of the WSS Act No. 28 of 1997. It is an enforcement step before suspending or cancelling the operating licence of Water Supply and Sanitation Service Providers. A

CU is placed under SRS when its performance and corporate governance weaknesses result in a deterioration of service provision to unacceptable levels, resulting in non-compliance to regulatory requirements and threaten the sustainability of a CU.

A CU that is placed under SRS is given time-bound performance indicators whose implementation is frequently monitored by NWASCO to ensure improved performance. A CU that does not improve performance on SRS indicators risks having its licence suspended in accordance with section 21 of the Water Supply and Sanitation Act. This results in the dissolution of the CUs Board of Directors and removal of top management.

Lukanga WSC was placed under Special Regulatory Supervision (SRS) following significant non-compliance issues which were identified during the annual inspection of the CU. Particularly, the inspection revealed the CU's continuous failure to comply with regulatory requirements such as accounting, water quality monitoring and tariff setting guidelines resulting in weak internal controls and general lapses in finance and commercial management. The CU was placed under SRS for an initial period of six months. At the expiry of the SRS period, the CU did not perform according to expectation hence was given a one month period to show cause why the operating licence should not be suspended in accordance with section 21 (2) of Water Supply and Sanitation Act

4.5 LIFTING SUSPENSION OF LICENCE

The operating license for Luapula WSC was suspended in June 2022 following the CU's continuous failure to comply with the regulatory requirements. These included continued billing discrepancies, under/overbanking of collected revenues, non-reconciliation of bank accounts, procurement lapses, poor stores management, non-compliance to water quality monitoring guidelines as well as Service Level Guarantees and Agreements. Subsequently, the Minister of Water Development and Sanitation appointed the Statutory Manager (SM) in June 2022 for a period 6 month, in accordance with section 21(6) of the WSS Act No. 28 of 1997.

4.6 PROJECT IMPLEMENTATION

The CUs have been implementing water and sanitation projects as part of the country's Integrated National Urban WSS Programme that spans the period 2011 – 2030. The programme aims at improving livelihoods and public health for the country's urban population through *'universal'* coverage for water and at least 90% coverage for sanitation. The progress of implementation of the projects recorded in the year under review is presented in Table 20:

Construction of Water Infrasturcture.

Table 20: Main projects implemented in 2023 and their status

Implementing Utility	Project description and cost	Project period and coverage	Status
LWSC	· Lusaka Sanitation Programme – aimed at providing adequate sanitation facilities to all urban citizens of Lusaka Province. It intends to benefit over 1 million people with improved sanitation at a cost of about $300m.	· 2015-2025 (Extended), Lusaka City · 2016 – 2021, Lusaka City	· Construction of 16km sewer network in Kaunda Square has been completed, while the Western Interceptor Downstream (CSU 1) of 4.5km and Western interceptor Upstream (CSU 2) of 3.2km were at 97% completion rate. Further, sewer network expansions amounting to 54km in Matero were also completed.
NWSC	· The rescoped Nkana Water Supply and Sanitation Projects (from $200m to $60m) aim to improve service delivery to Kitwe, Kalulushi and Chambishi Towns.	· 2023 – 2026 (deadline reset), Chambishi, Kalulushi, Kitwe	· The rescoped projects will cover rehabilitation of Bulangililo and Nkana East Water Treatment Plants, construction of trunk mains, construction of water Distribution Centres at Chimwemwe, Garneton, Ndeke and Wusakile and construction of distribution networks.
KWSC	· The U$449m Kafulafuta Water Supply System project and involves construction of 139Mm^3 reservoir capacity dam, intake pump station, booster station, transmission lines and distribution systems.	· 2016 – 2024 (reset deadline), Ndola, Luanshya, Masaiti and Mpongwe.	· Most of the project components have been completed and harvesting of water in the dam has commenced. The overall project completion rate was 96% at close of December 2023.
MWSC	· The Zambia Water Supply and Sanitation Project is a €150m project that aimed at rehabilitating and expanding water supply and sanitation infrastructure, improving service to peri-urban areas, reducing Non-Revenue Water (NRW) and capacity building of the utility to enhance its operations.	· 2013 – 2025, Chililabombwe, Chingola, Mufulira	· The key components of the project that include construction and rehabilitation of treatment plants, reservoirs and trunk mains progressed to about 70% completion rates. Other components of the projects were well over 90%.

Implementing Utility	Project description and cost	Project period and coverage	Status
LGWSC	· Repair of breached embankment & rehabilitation at Chibila Dam at a cost of K7.27mil.	· 2020 – 2023, Mumbwa	· The project successful rehabilitated a collapsed embankment and also desilted the dam to increase storage. Works were at 100% completion rate at close of reporting period.
SWSC	· Kazungula water supply and sanitation project, phase 1at the cost of €5.99m	· 2022 – 2024, Kazungula	· The project aims at increasing water coverage through the supply of portable water and improving the quality of life for residents of Kazungula. It also aims at reducing NRW. At close of the period under review, progress was slow at only 51%. The projects are due to close in August 2024.
CHWSC	· The Integrated Small Towns Water Supply and Sanitation Programme aims to improve water and sanitation coverage, reduce non-revenue water as well as increase hours of supply, consequently, improve financial position of the Utility. The project cost is U$45.6m. · Construction of water supply system in Mpulungu at cost of K167.25m.	· 2020 – 2023, Kasama, Nakonde, Mbala, Mpika · 2016 – 2024, Mpulungu	· The construction of intake works, new water treatment plants in Kasama and Mbala, rehabilitation of water treatment plant in Nakonde, laying of trunk mains, construction of distribution centres in all towns, installation of household connections and sewerage works were completed and all works were in the defect liability period. · At close of period, two boreholes were drilled and equipped in Muzabwela. Construction of intake works were at 60% while a 4.5km raw water mains was constructed. Other works in progress included rehabilitation of a water treatment plant and laying of distribution network. Overall progress of works was at 45%.

Implementing Utility	Project description and cost	Project period and coverage	Status
NWWSC	· Kawiko Water Supply Project in Mwinilunga involves construction of a 300m³ reservoir, a rising main, a pump house and installation two booster pumps, at a cost K15m.	· 2022 - 2023	· The project involves construction of a pump house, installation of booster pump, installation of pipes for new rising main and associated fittings and construction of a 300m³ elevated. Overall progress of the project was 92%.
WWSC	· The Integrated Small Town Water Supply and Sanitation Program aims to improve access to clean and safe water supply and sanitation services at cost of U$41.8m. · Construction and rehabilitation of water supply and sanitation improvement at Limulunga Palace and surrounding areas in Limulunga District at the cost of K58.65m	· 2016 – 2023, Mongu, Kaoma, Senanga and Sesheke · 2023-2024, Limulunga	· The construction of a raw water intake in Mongu, treatment works, transmission lines and reservoirs as well as wastewater treatment works progressed to about 98% completion rate. Works in Kaoma involving development of a well field, treatment works and construction of distribution network were at 75%. Similar works in Shesheke progressed to 61% while works in Senanga significantly lagged behind at only 32% completion rate. This was largely due to land acquisition challenges experienced during project implementation. In all the four towns, non-revenue water related works were progressing slowly and only at about 50% completion. · The projects involve construction of a pump house, chlorination facility, distribution network and a 500m³ reservoir. At end of reporting period, overall progress was at about 95% completion. ·

Implementing Utility	Project description and cost	Project period and coverage	Status
EWSC	Sinda urban project (K15.46m)	· 2022 – 2024, Sinda	· The project aims at improving access to water and sanitation for the population of Sinda District. It involves drilling of five industrial boreholes, construction of a 500m^3 reservoir and 3 kiosks. Completion rate of the project was at about 85%.
LPWSC	· Integrated Small Towns Water Supply and Sanitation Programme at a total cost of approximately US$33.85 million.	· 2020 – 2023 Mansa, Samfya, Mwense and Kawambwa	· Progress of works in Lot 1 involving rehabilitation of networks, construction of water and wastewater treatment plants in Mansa and Samfya was about 99%. Under Lot 2, covering Mwense and Kawambwa and involving rehabilitation of water treatment plants, construction of reservoirs and distribution networks, progress was at a 100% completion. Lot 3 was also completed with only minor snags. Some completed segments of the project were already in use and under defect liability period.

4.7 SANITATION SURCHARGE

The sanitation surcharge is a levy that is charged on a water bill of a customer for selected CUs. Funds raised from the surcharge are used to implement sanitation projects approved by NWASCO including OSS and FSM. The surcharge is allowable to a maximum of 5% of a customer's monthly water bill and is awarded based on a CUs level of cost coverage. Currently, only 2.5% surcharge has been approved for all qualifying CUs. CUs are required to ring-fence funds collected from the surcharge in accordance with the Ring-Fencing Guideline, failure to which it can be suspended. CUs are required to submit sanitation proposals to NWASCO annually for approval prior to utilisation of funds.

Table 21: Status of Sanitation Surcharge Funds

CONSOLIDATED 2023 SANITATION SURCHARGE TABLE			
CU	Year Awarded	Total Amount Collected to-Date (ZMW)	Total Amount Spent To-Date (ZMW)
Lusaka WSC	2007	35,416,558	15,086,051
Nkana WSC	2010	24,787,444	21,306,869
Mulonga WSC	2011	21,976,779	7,761,908
Kafubu WSC	2014	15,566,640	6,123,515
Southern WSC	2015	14,357,563	6,070,988
Lukanga WSC	2015	7,274,158	3,900,438
North Western WSC	2016	5,627,418	1,766,954
Total		125,006,559	62,016,724

4.8 TARIFF APPROVALS

NWASCO approves comprehensive tariff adjustments for the CUs. Economic fundamentals such as inflation, exchange rate and interest rates are considered when setting the tariffs. Tariff adjustments are also necessitated by the increase in the cost of inputs involved in the provision of water supply and sanitation services such as electricity, Labour, chemicals and fuel. Multi-year tariffs adjustments for a three year period are approved whose implementation is subject to a “no objection” from NWASCO, subject to meeting the tariff conditions. There were no upwards tariff adjustments in the year under review.

4.9 REGULATION BY INCENTIVES

NWASCO was established and is mandated to regulate the service provision of water supply and sanitation. In the implementation of this function, NWASCO uses two types of regulation namely; command and control and incentive-based also referred to as Regulation by Incentives (RBI). The purpose of using an incentive based method of regulation is to assist service providers to improve their performance in selected indicators.

Incentive Regulation

Table 22: Performance of CUs on Regulation by Incentives

Three CUs, namely; Western, Luapula and Chambeshi WSSs were identified for performing poorly in selected indicators compared to other service providers and as such were placed on RBI in 2017 in an effort to assist them improve performance.

The RBI programme is carried out in six-month cycles in which the CUs are tasked with implementing agreed upon key performance indicators. Once targets are met in compliance with the signed agreements, the CUs receive an incentive. A summary of the CUs' performance is shown in Table 22.

No	Indicators	CU	Baseline	Target	Performance
	Increase billing efficiency	LPWSC	77%	95%	79%
		WWSC	88%	95%	86%
		CHWSC	82%	90%	73%
	Increase billing money	LPWSC	K896,000/month	K1.8mil/month	K1.4mill/month
		WWSC	K1.9mil/month	K1.95mil/month	K2.1mil/month
		CHWSC	K3.1mil/month	K3.3mil/month	K3.mil/month
	Increase collection efficiency	LPWSC	89%	95%	94%
		WWSC	95%	100%	91%
		CHWSC	94%	95%	102%
	Improve water quality monitoring (focusing on compliance to 10 points criteria, number of tests conducted and tests meeting the standard) rating of green	LPWSC			
		WWSC			
		CHWSC			
	Reduce NRW	LPWSC	78%	68%	63%
		WWSC	72%	71%	71%
		CHWSC	65%	41%	40%
	Implement maintenance management system	LPWSC	95%	95%	95%
		WWSC	10%	95%	N/A
		CHWSC	95%	100%	Below 100%
	Hours of supply	LPWSC	18hrs	20hrs	19hrs
		WWSC	15hrs	15hrs	18hrs
		CHWSC	17hrs	18hrs	17hrs

** Green means compliance to 10 points criteria*

4.4 SECTOR INTEGRATED MANAGEMENT INFORMATION SYSTEM

The Integrated Management Information System (IMIS), is an online web-based application solution crafted to enhance the efficiency and effectiveness of information management and operational processes. Its creation and deployment stand pivotal endeavors under the Eighth National Development Plan (8NDP).

With a primary focus on bolstering evidence-based decision-making, policy formulation, strategic planning, and budgetary management, MWDS has been diligently spearheading the development of the IMIS with support from NWASCO. Key components of the IMIS encompass:

- Project module;
- Water Supply and Sanitation module;
- Water Resources Development and Management module;
- Management and support module; and
- Reporting and Analytics module

Stakeholders are able to track specific indicators for reporting purposes and monitor on-going projects in the sector. In addition, MWDS is also able to track and monitor activities within their respective departments. The IMIS can also be accessed by the public and key stakeholders or partners through the public dashboard.

4.10 INCREASING AWARENESS AND ENGAGEMENT OF CONSUMERS

NWASCO under its consumer affairs mandate employed the following mechanisms to engage consumers and create awareness:

4.10.1 CONSUMER AFFAIRS

4.10.1.1 Introduction

Consumers are a key stakeholder for NWASCO because they play a crucial role in ensuring the effective and equitable provision of water and sanitation services. Continuous engagement of consumers and key stakeholders is therefore, critical. The following were some of the strategies implemented;

4.10.1.2 Complaints handling

NWASCO follows up unresolved water supply and sanitation complaints that are escalated by the consumers in line with the Customer Care Guidelines. CUs are expected to resolve complaints within specified timeframes as defined in the Guidelines. The resolution timeframes are standard and have been determined based on the type of complaint.

During the period under review, a total of 6,170 unresolved complaints were escalated to NWASCO out of which 4,538 were resolved, 1,529 were unresolved and 103 were pending bringing the resolution rates to about 74% resolved.

The escalated complaint types were categorised as billing, leakage, meter malfunctioning, service request, sewerage, water quality and water supply. A large number of the complaints received were from Lukanga WSC with the majority of complaints on water supply due to leakages.

4.11 ENGAGEMENT OF CONSUMERS

4.11.1 Social Media

NWASCO utilised Facebook, LinkedIn and Messenger to engage with stakeholders to sensitise and update them on matters pertaining to water supply and sanitation including topics on SLGs, highlights of the 2022 WSS Sector Report and regulatory decisions. At the close of 2023, a combined total of 40,391 accounts were reached via the NWASCO Facebook and LinkedIn pages with 14,636 followers on Facebook and 1,533 followers on LinkedIn.

4.11.2 Battle of the Brains

NWASCO launched the Battle of the Brains Inter Schools competition in 2019. This aims to create awareness on issues of water supply and sanitation and an eagerness among pupils, especially girls, to undertake careers in water supply and sanitation. Through initiation of progressive dialogue, awareness, sensitization and engagements on key water supply and sanitation issues

using public school debates. In 2023 NWASCO hosted the Battle of the Brains Inter Schools Debate Edition in collaboration with One Love Radio. The Debate Edition, the first of its kind after the 2019 and 2021 quizzes, is composed of 8 schools namely; Kabulonga Girls, The Kamwala, Chilenje South, Olympia Park, David Kaunda Technical National Stem, Highland, Lusaka Girls and Libala Secondary Schools from Lusaka. The debates are ongoing and winners will be announced in the first quarter of 2024

4.12 AWARENESS CREATION

4.12.1 National Events

In 2023, the institution commemorated the following events in line with its core function of information dissemination, to raise awareness and promote brand visibility.

4.12.1.1 Zambia Water Week and World Water Day

The nation observed the Zambia Water Week which began on 15th March and ended on World Water Day, 22nd March under the localised theme, "*Accelerating change in the Zambia Water Sector through cooperation and partnerships.*"

In line with the commemoration, NWASCO hosted a panel discussion which sought to highlight progress made by the different stakeholders toward achieving the water targets in the 8th National Development Plan, Zambia Vision 2030 and Sustainable Development Goal number 6. The panel included Ministry of Water Development and Sanitation, GIZ Zambia, Lusaka Water Supply & Sanitation Company and World Vision Zambia. The discussion was broadcast live on Mwebantu Facebook page and garnered viewership from about 3,600 accounts.

As a contribution to the commemoration, NWASCO sponsored the ministerial launch statement that was aired on the national television and further exhibited at the national commemoration which was held at Mponda Check Dam in Mumbwa District.

4.12.1.2 World Consumer Rights

The institution joined the rest of the world in commemorating World Consumer Rights Day under the theme, "*Empowering consumers through clean energy transitions*," on 15th March, 2023. As a contribution to the event, NWASCO sponsored the ministerial launch statement and also exhibited at the exhibitions held at the Levy Junction Mall in Lusaka. NWASCO exhibited the MyWatSan Quick Fix platform and also took time to interact with members of the public and sensitized them about its mandate.

4.12.1.3 Global Hand Washing Day

NWASCO in collaboration with the Ministry of Water Development and Sanitation and various water sector partners commemorated the Global Handwashing Day under the theme, "*Clean hands are within reach*." In line with the theme, the institution issued a press release on the importance of ensuring access to clean and safe drinking water and adequate sanitation for all through sustainable management, effective policies and efficient regulation of water supply and sanitation provision. In addition, NWASCO engaged the public by displaying the My WatSan Quick Fix application and spending time educating people about its mandate.

4.12.1.4 World Toilet Day

The 2023 National World Toilet Day commemoration was hosted by the Choma Municipal Council in Macha Chiefdom to celebrate the sustainable Open Defecation Free status that the chiefdom had achieved in all 108 villages on 17th November, 2023. World Toilet Day is observed on 19th November, annually and the theme of the 2023 observation was, "*Accelerating change*."

In line with the commemoration, NWASCO issued a press release which highlighted the significant strides that had been made to ensure sustainable and efficient regulation of sanitation in the country following the roll out of the Onsite Sanitation and Faecal Sludge Management Framework for Provision and Regulation in Zambia resulting in 22,055 new sewer connections across the country, as per the 2022 Water Supply and Sanitation Sector Report.

4.13 THE ZAMBIA WATER FORUM AND EXHIBITION

The 11th Zambia Water Forum and Exhibition (ZAWAFE) was held from the 12th to 14th of June, 2023 under the theme *'Accelerating Water Security and Sanitation Investments in Zambia: Towards Attainment of Agenda 2030 through the Zambia Water Investment Programme'*. The event was graced by Her Honour, The Vice President of the republic of Zambia who is the ZAWAFE matron, who was represented by the Minister of Water Development and Sanitation.

The theme was categorised into the following sub themes:

i. Water investments to support economic transformation;

ii. Enhancing resilience through water;

iii. Water and sanitation governance and institutional strengthening; and

iv. Application of the water-energy- food- ecosystem nexus in the Zambian context.

The event included presentations from experts in various fields, field trips and exhibitions. Additionally keynote presentations were made during the event on the following topics:

- Improving Sanitation Access for Children in Zambia: Update on WASH in schools in Zambia;
- *USAID support to the WASH sector and Engagement in Zambia*; and
- *Water Supply and Sanitation Sector Financing*.

The forum brought together over 300 participants from various institutions from within Zambia and abroad to share knowledge, exchange ideas and network with regard to water and sanitation. A total of 22 organizations exhibited their products and services at the event.

4.14 REGULATORY ENHANCEMENT

4.14.1 Training of NWASCO Board

One of the Board Committees of the National Water Supply and Sanitation Council (NWASCO) is called the Technical Advisory Committee (TAC) and its mandate is to provide advice to the Board on formulation of policies, standards, guidelines and regulations relating to service provision, among other technical matters. In conducting its business, the TAC endeavors to have firsthand appreciation of operations and situations in utilities and/or their service areas. Therefore, the TAC undertakes at least an annual visit to service areas of selected utilities based on challenges and need for solutions in those particular areas.

In 2023, the TAC earmarked the Western Province for excursions based on hotspots that were identified for monitoring and the improvement projects that were taking place. The focus areas included townships in Kaoma and Mongu Districts that were severely affected by poor water supplies. Thus, the TAC embarked on visits to selected service areas and project sites of Western WSC.

The objectives of the excursions to Western Province were to appreciate the service level challenges in townships of Kaoma and Mongu Towns and the interventions the utility was undertaking to improve the situation as well as appreciate the progress of water and sanitation projects in aforementioned towns including in Sesheke and Senanga.

The excursion involved a courtesy call on the provincial Permanent Secretary to get insights on how the leadership perceived the water supply and sanitation situation in the province, field visitations to various project sites and interactions with both project and utility staff. The excursion also employed random interactions with customers in selected townships.

After the executions, the TAC noted the progress that had been made on the project and awaited their full completion with the hope that significant improvements in both water supply and sanitation service provision would accrue to uplift lives of individuals as well as improve the outlook of the utility.

Nonetheless, the TAC made the following recommendations to the utility:

To engage the principle client of the projects, the Ministry of Water Development Sanitation, on the unresolved design issues such as the installation of aeration pumps in wastewater stabilization ponds and hoisting facilities at the Little Zambezi Intake facility.

That with the improvements in infrastructure, the utility needed to embrace technology to improve operations and capacitate staff to be well placed for the new advancements.

i. To safe guard the infrastructure by implementing sound maintenance management systems and also engage customers to curb vandalism.

ii. To put in place service delivery models that would ensure the entire sanitation value chain is covered owing to the construction of new sanitation infrastructure under the project.

iii. To engage customers and thoroughly sensitize them on the project and ensure their concerns, if any, are resolved.

iv. To demand quality works from the Consultants and Contractors in accordance with specifications.

v. To ensure land title is secured in all project sites and beyond. Furthermore, where necessary institute catchment protection measures.

vi. Apply liquidated damages on the project were failure or non-adherence to schedules was caused by the Contractors.

vii. To already identify potential new customers for extension of services as soon as projects were completed.

viii. Before project completion, institute stop-gap measures intended to improve service in poorly serviced areas.

4.14.2 Changes In Legal Framework

In the year under review, NWASCO continued with the reforms to its Principal legislation, the Water Supply and Sanitation Act and the development of subsidiary legislation on other parameters as follows:

4.14.2.1 Reforms to the Water Supply and Sanitation Act

The main focus in the year under review was the redrafting of the Water Supply and Sanitation Services Bill under the guidance of the Legislative Drafting Department in the Ministry of Justice.

Working closely with the Ministry of Water Development and Sanitation (MWDS), additional technical information and clarifications on the various contents of the Bill were made and submitted to the Ministry of Justice. The submissions were followed by face-to-face discussions and further refinements to the Bill.

At the close of the year, the process of redrafting the Water Supply and Sanitation Services Bill was ongoing at the Ministry of Justice.

4.14.2.2 Subsidiary Legislation on the Onsite Sanitation and Faecal Sludge Management

At the inception of the year, a draft Statutory Instrument on Onsite Sanitation (OSS) and Faecal Sludge Management (FSM) had been concluded. Due to the multi-sectoral nature of the Statutory Instrument, it was considered critical for nationwide stakeholder consultations to be undertaken so that the MWDS and NWASCO could obtain further input and clarify on the various roles, duties and responsibilities that were duly allocated in the clauses of the Statutory Instrument. Local Authorities (LAs), Government Ministries, Agencies and Departments (MDAs) as well as various Civil Society Organisations were among the key target groups in the consultative process.

Under a Technical Working Group that was duly constituted by the Ministry of Water Development and Sanitation, NWASCO provided technical and legal advisory to the consultative process that took place in all the provincial centres.

Under this process, the draft technical standards which were developed under the oversight of the Zambia Bureau of Standards (ZABS) were also disseminated to the stakeholders. The technical standards are expected to be an integral part of the Statutory Instrument by way of a Schedule. The feedback that was obtained from the consultative process culminated into a redrafting of the Statutory Instrument and further reviews to the technical standards. At the close of the year under review, the redrafting of the Statutory Instrument and refining the technical standards were ongoing.

4.14.3 Signing of Performance Contracts

In line with prevailing best corporate governance principles and practices insofar as enhancing the Board fiduciary duties and accountability, Performance Contracts between the Board of Directors of NWASCO (that is, the "Council") and the Minister of Water Development and Sanitation were signed. Other than establishing the Performance of the Board, performance assessment assists to identify areas in which the Board of Directors would require capacity-building both individually and severally.

In the year under consideration, a performance assessment of the NWASCO Board was made by the Minister of Water Development and Sanitation under which a performance rating of over 90% was given. The said assessment also informed the extent of the deliverables that the Board was expected to focus on in the year 2024. As at 31st December 2023, a Board Performance Contract for the year 2024 had been duly executed by the Parties. The NWASCO Board of Directors will undertake a self-assessment in the course of the year 2024 before a Ministerial assessment of performance is undertaken.

4.14.4 NWASCO Integrity Committee

The Integrity Committee (IC) Initiative has been one of the processes that the Government has embarked on to foster good governance and improved service delivery in the Ministries, Departments and Agencies (MDAs). The IC framework is anchored on the National Anti-Corruption Policy (NACP) of 2009 in which a provision has been made for a comprehensive and coordinated approach to corruption prevention.

The National Water Supply and Sanitation Council appointed the Integrity Committee. The cross functional in-house Committee was established to cultivate a culture of zero tolerance to corruption in NWASCO. The team is composed of representatives from Administration, Legal, Inspectorate, Finance and the Public Relations and Communications departments.

In the year under review, the NWASCO IC's focus was raising awareness within the Institution on corruption prevention mechanisms. In addition, the Institution undertook a Corruption Vulnerability Assessment (CVA) of the Institution's processes and procedures to inform the means in which some of the Institution's Policies and Procedures may need to be reviewed or revised so as to ensure that aspects of ethical or integrity breaches were mitigated therein. Review of the policies and procedures will be undertaken in accordance with the Annual Corruption Prevention Action Plan (ACPAP) that will be prepared for the year 2024.

4.14.5 Rural Water Schemes Data Validation Meeting with Stakeholder

NWASCO, with support from key stakeholders, undertook an exercise to collect data on rural piped water schemes in 2022 and 2023. The objective of the exercise was to establish a baseline to inform decision making on policy and resource planning. The data was collected by Water and Sanitation Coordinators from the Local Authorities in all the 10 provinces of the country. In order to ensure accuracy of the data, NWASCO, held a meeting with Provincial Water Supply and Sanitation Officers from all the 10 provinces of the country to validate the data on Rural Piped Water Schemes.

4.14.6 Engagement with CU staff responsible for Rural Water Supply and Sanitation

NWASCO held a meeting with the CUs on the 8th of September, 2023 to disseminate the RWSS service delivery and Regulatory framework, provide information on the status of regulation and service provision according to the NWASCO implementation plan. In addition, the meeting also aimed at sharing

the information on rural piped water schemes.

4.14.7 Review of the Rural Water Supply and Sanitation data collection Tool

In our quest to regulate RWSS service provision, the need for data cannot be overemphasised. Thus, NWASCO embarked on a process of developing a data collection application in consultation with MWDS and other key stakeholders. It is envisioned that the application will feed RWSS data into the NIS.

4.14.8 Geographical Information System

NWASCO recognises the vital role of Geographical Information System (GIS) in facilitating decision-making processes, not only within the water and sanitation sector but also across other key sectors. To bolster GIS capabilities within the water and sanitation sector, NWASCO embarked on an initiative to enhance GIS utilization. As part of this effort, NWASCO conducted an assessment to gauge the proficiency level in GIS skills and the extent of technology utilization within the sector. This assessment identified specific needs and gaps, prompting NWASCO to take action towards implementing a centralized GIS database.

The primary objective of this GIS database is to serve as a repository for GIS data from all CUs aimed at facilitating data preservation, analysis, and maintenance. NWASCO received support from BGR to augment GIS expertise within the sector. This collaboration led to the formation of the Digital Atlas Technical Team, comprising members from various entities including WARMA, NWASCO, LWSC, and Department Water Resources and Development (DWRD) under MWDS. To further this objective, BGR organised a training session for the team members.

4.15 RESOURCE CENTRE

The NWASCO Resource Centre was created in 2011 as a support structure for the CUs and the water and sanitation sector within and outside the country. The centre promotes efficiency in water supply and sanitation service delivery through knowledge management, capacity building, training and research and development. In the reporting period, the Resource Centre coordinated the following activities:

4.15.1 Leadership and Governance Training

NWASCO, in partnership with VEI and GIZ, held a 2 days Leadership and Governance training for the CUs targeting the Board Chairpersons and Managing Directors. The training took place on 16th and 17th October 2023 at David Livingstone Hotel in Livingstone and was officially opened by the Hon. Minister of Water Development and Sanitation. The training targeted the Board Chairpersons and the Managing Directors of all the 11 commercial utility companies. The participants also included the Board Chairperson of NWASCO and the Director Water Supply and Sanitation from the Ministry of Water Development and Sanitation. The objectives of the training were:

i. To sharpen the Leadership skills of the CU Board Chair Persons and Managing Directors with special focus on holding effective meetings, strategic planning and benchmarking;

ii. To create a forum for open interaction on issues of CU performance between the Board Chairpersons and Management; and

iii. To enhance the understanding of the Board Chairpersons on sector benchmarking and CU ranking.

Among the topics covered in the training were Governance Dilemmas, Roles and Responsibilities of the Board, Strategic Planning, Benchmarking, Effective Board Meetings, Time and Crisis Management.

Some key lessons from the training were that there are a number of factors that contribute to this among them leadership and good governance and certainly

there are a number of learning points. Leadership and good corporate governance are fundamental to high performance of the commercial utility companies. These should be demonstrated at all levels in the governance structures of the CUs particularly at the board level, headed by the chairperson.

4.15.2 Development of CWIS in-service training manuals

To ensure sustainability and expansion of sanitation service delivery, it was identified that there was a need to document and share lessons and experiences garnered by Lusaka Sanitation Programme (LSP) under LWSC. This would allow for knowledge exchange and capacity building amongst CUs.

Thus an In-Service Training Module and Program on Citywide Inclusive Sanitation (CWIS) was developed with support from consultant. The development process involved consultation with relevant stakeholders. The module was broken down into multiple courses that highlight fundamental features required to understand, promote and ensure CWIS. The module will ensure synchronization in implementation of CWIS.

4.15.3 Capacity building for Manual Pit Emptiers

NWASCO recognizes the importance of building capacity of manual pit emptiers as part of the efforts to bring them under regulation. To this effect, NWASCO facilitated a learning visit for manual pit emptiers from Nkana, Eastern, Kafubu and Lusaka WSCs. This training was held in Lusaka and was aimed at sharing information on the Regulatory Framework for Urban OSS/FSM, Occupational Health and Safety and Standard Operating Procedures (SOPs) in manual pit emptying.

As part of the training, the manual pit emptiers from Nkana, Kafubu and Eastern WSCs were given an opportunity to experience and appreciate manual emptying by the Kanyama Water Trust as well as witness procedure and processes carried out at Manchinchi Wastewater Treatment Plant.

4.15.4 Development of Service Delivery and Business Models

NWASCO developed guidelines on Citywide Inclusive Sanitation (CWIS) Planning and Service Delivery. As part of the requirements of the guidelines, CUs are to develop OSS and FSM Service Delivery Strategies, Business and Service Delivery Models.

A training was conducted for Nkana, Kafubu and Eastern WSCs on development of business models, sanitation service delivery models and sanitation service delivery strategies. A further training was held for Eastern WSC in collaboration with the Bremen Oversees Research and Development Association (BORDA) which included Southern WSC. The main aim was to give the two service providers a platform to exchange the necessary information and skills required to develop business models, sanitation service delivery models and sanitation service delivery strategies.

Following the training the service providers were expected to develop and operationalize business models and service delivery models for OSS and FSM.

4.15.5 Peer to Peer Learning Programme

NWASCO supported the implementation of a Peer to Peer Learning Programme which was launched in April 2023 financed by VEI and GIZ. This is a programme meant to support employees in CUs particularly those at operational level to learn new skills and knowledge from their peers in other CUs. Applications for this learning opportunity were being submitted to NWASCO through an online portal under the NWASCO Resource Centre. A total of 34 participants were supported and travelled to learn from their peers in selected CUs following approval of their applications by NWASCO.

The participants developed plans to implement the lessons learnt which will be monitored by NWASCO.

4.15.6 Research and Development on Sanitation

The National Water Supply and Sanitation Council (NWASCO) has been mandated by the Water Supply and Sanitation Act No. 28 of 1997 to regulate

water supply and sanitation services in the country and also to ensure that service providers are efficient in carrying out there mandate of service provision.

The provision of water supply and sanitation services (WSS) in both urban and rural areas has to be accelerated to meet the targets set under the National Development Plan, the Vision 2030 and the Sustainable Development Goals which all speak towards attaining universal access for WSS by 2030 and leaving no one behind. The water sector in Zambia needs ensure that the country is on track with the set targets for both water and sanitation services. There is therefore need to come up with appropriate technologies and interventions that will address some of the challenges faced by service providers and the policy makers in pushing the agenda of universal access.

According to WHO one of the inhibiting factors at attaining progress to access of clean water in developing countries is a lack of R&D to inform the development of appropriate technology and sustainable ways of providing clean water and sanitation services. There is a need for research in the water sector to guide the development of technologies, Innovations and establishment of best practices to improve efficiency of service providers.

An example is the impact of climate change on WSS which has posed a number of challenges on service provision there are a number of outlined impacts of climate change such as drying of water sources, compromised quality of raw water source, flooding and many other impacts, there is need for continuous research to come up with climate change resilient technologies that will support adaptation and mitigation of such impacts and ensure safety and availability of water resource.

Stakeholders within and outside the water sector had called for concerted efforts to improve service delivery and accelerate service provision. Research and Development has the potential to emanate solutions that will help in addressing the many challenges faced by the sector which require both local and adopted initiatives and innovation. During the period under review NWASCO supported students from the University of Zambia to undertake research in selected areas of the Sanitation service chain to inform possible interventions and solutions for the 11 water utilities. It is expected that once finalised information for decision making will be available. It is against this background that NWASCO in its Strategic Plan 2021- 2025 has set a Strategic objective to enhance the role of R&D in improving service delivery.

4.15.7 Training for Private Schemes

NWASCO through the Resource Centre in March 2023 conducted a two (2) days training for all private water supply and sanitation Schemes under its regulation, the participants included staff from Zambia Sugar PLC, Zesco Limited all the regions, Kaleya Small Holders, Kafue Sugar, Kafue Gorge and Kafue Gorge lower. The training targeted staff working in water supply and sanitation services in order to improve service delivery but also to ensure that the set standards were followed. NWASCO organised this training to enhance understanding of the water quality guidelines to improve compliance on standards. The main objective of the training was to improve water quality monitoring for all private water supply schemes. The training therefore, aimed at assisting participants to among other develop a practical understanding of their day to day work, acquire knowledge in water quality monitoring and standards and to help theme demonstrate an understanding on the regulations, standards and compliance Assessments for portable water systems. The training also introduced water and sanitation safety planning, all participants were taken through the process of Sanitation safety planning and were expected produce plans by the set date as an outcome of the training. The participants appreciated the training and requested that it should be held annually going forward.

4.15.8 Learning visits and Water Operators Partnership

The National Water Supply and Sanitation Council provides a platform for other water sector country organizations to learn from its operations. In the report period, NWASCO hosted delegations from the Lesotho's Water and Electricity Regulator, the Ethiopian Water and Energy Ministry, the Tanzania's EWURA regulator responsible for Water and Sanitation Regulation and AREEN, the multi sectorial regulatory body from Burundi that regulates Water, Energy and Sanitation. The institutions undertook the learning visits in order to learn

and appreciate the different facets of effective regulation of water supply and sanitation in Zambia.

The National Water Supply and Sanitation Council, in 2022, got into a Water Operators Partnership (WOP) with AREEN, a multi sectorial body in Burundi that regulates Water, Energy and Sanitation. The objective of the partnership is to build the capacity of AREEN in areas of regulation that are NWASCO's strength. This partnership continued during the report period. NWASCO undertook a visit to Burundi to train AREEN on developing a tariff setting framework and tariff setting model.

4.15.9 Fora

Human Resource Forum

The National Water Supply and Sanitation Council (NWASCO) organizes multiple forums and workshops focused on developing the capacity of Commercial Utilities (CUs) staff on existing and new regulatory and policy developments that may have an impact on the water supply and sanitation sector. This assists in ensuring that CUs are aware of sector guidelines and strive towards remaining or becoming compliant with the aim of achieving national targets.

The 2023 Human Resource Forum hosted by NWASCO was held on 25th August 2023 in Lusaka under the theme **'Embracing Change-The Role of Human Resource in Improving Operational Efficiencies'**. The forum focused on a number of matters among them being the impact of the Emoluments Commission Act, harmonization of conditions of service and driving organizational transformation.

The main objectives of this forum where to

- To understand the role of HR in the implementation of the harmonization of conditions of service;
- To understand the role of HR in improving all operational efficiencies; and
- To understand the role of HR in driving organizational change.

Public Relations Forum

The National Water Supply and Sanitation Council held the Public Relations and Communications Forum on 13th April 2023 at the Radisson Blu Hotel in Lusaka. The event brought together Public Relations and Communications practitioners from the Lusaka, Kafubu, Mulonga, Nkana, North Western, Western, Southern, Eastern, Lukanga, Luapula and Chambeshi Water Supply and Sanitation Companies. Financial Insight Zambia was contracted to provide training for PR professionals in Interpretation of Financial Statements. Through being versed in the most important concepts and instruments of finance, the PR practitioner will not only have a more efficient dialogue with stakeholders but would also contribute to increase the company's overall value, especially the bottom line. The Forum provides the PR specialists an opportunity to exchange knowledge and best practices on how PR can enhance its role in the attainment of an organization's corporate objectives through stakeholder mapping and engagement, internal and external communication as well as brand reputation management.

Internal Auditors Forum

The WSS Act no. 28 of 1997 gives NWASCO the authority to carry out any other activities relating to the regulation of water supply or sanitation services which are necessary or conducive to the better performance of its functions. One of the activities identified to achieve this is the continued need to strengthen the human resource capacity of CU's. To actualise this, NWASCO holds different forums annually that provide a platform to discuss key sector matters with different stakeholders.

In this regard, NWASCO held an internal auditor's forum under the theme, *"an effective internal audit unit key to improved regulatory compliance."* The forum was attended by CU internal audit staff, NWASCO and a representative from the Institute of Internal Audit (IIA). Amongst the topics discussed were matters of corporate governance that highlighted the WSS sector setup and tenants of good corporate governance. Other issues discussed were to do with

financial and commercial aspects, internal audits role in project management and technical matters focusing on NRW, maintenance management systems and water quality monitoring.

To ensure compliance to best internal audit practice, the forum also gave participants an opportunity to engage with the IIA representative on salient internal audit matters such as how to develop an internal audit charter and a risk-based audit plan.

4.15.10 Skills Advisory Group for Water Supply and Sanitation

The Skills Advisory Group for Water Supply and Sanitation is a government driven multifaceted committee that was formed in 2020. The SAG-WSS coordinated skills demanded for by industry and skills offered by training institutions. The SAG-WSS is co-chaired by the Ministry of Technology and Science and the Ministry of Water Development and Sanitation. The SAG-WSS comprises of membership from the Commercial Utilities, regulators, Non-Governmental Organisations, Vocational Training Institutions, professional bodies, associations, Cooperating Partners and the private sector.

From inception, the SAG-WSS with support from its members has continued to promote skills development in the Water Supply and Sanitation sector through the following interventions that were undertaken in 2023:

Awarding best performing students

In order to encourage and motivate female students who are pursuing water and water related courses, the SAG-WSS awarded four female students from Lusaka Business and Technical College and Lusaka Vocational and Technical College and Olympia Secondary School. The awards were in material and financial form which included internship placements, tuition fee and tool boxes.

Input to the Labour Law

The International Labor Organization (ILO) in conjunction with the Ministry of Labor and Social Security held a four (4) days' workshop to Review Section 3.5 of the Employment Code Act. No. 3 of 2019 at Lake Safari Lodge in Siavonga, Southern Province. The workshop was attended by stakeholders, from Government, industry and tripartite structures and cooperating partners including the SAG-WSS were invited to participate at the review process. The SAG-WSS shared its experience for purposes of the creation of Sector Advisory Groups (SAG) as well as a national skills committee to inform the International Labor Organization (ILO) and the Ministry of Labour.

The objective of the workshop was to come up with a comprehensive legal framework that will effectively promote skills development in Zambia. The following are some of the recommendations that were made during the workshop:

- Creation of sectorial skills bodies with ideas from the clusters of the National Development Plan composition and functions
- Make recommendations to relevant training institutions to ensure qualifications, curriculum and learning materials reflect the occupational standards
- Develop sector skills strategies, including funding recommendations and the formation of Public Private Partnerships and feed into national and regional TEVET strategies
- **Support to Students and Capacity Building**
  - **Internship Programme**

    The SAG-WSS supports graduates from Vocational Training Institutions pursuing water and water related courses by facilitating for their internship placement at Commercial Utilities. A total of 55 interns have been placed on internship across different CUs with support from Water for Water (WfW) and GIZ under the THRIVE program.

    The SAG-WSS participated during the 11th ZAWAFE that was held at Mulungushi International Conference Centre on 12th June, 2023 to 14th June, 2023. During a session hosted by the SAG-WSS that focused on sharing experiences from the Internship Program. The SAG-WSS Secretariat shared a documentary on the Internship Program. During a

plenary session that included key players in the program from the National Water Supply and Sanitation Council (NWASCO), Lusaka Water and Sanitation Company (LWSC), African Women Sanitation Professionals Network-Zambia Chapter (AWSPN-ZC) and an intern attached to Lusaka Water and Sanitation Company.

- **Mentorship**

  In order to build capacity in young water professionals, the SAG-WSS with AWSPN-ZC has been coordinating a mentorship program for the interns who have been attached to CUs. A total of 58 interns have participated in the program. Additionally, over 70 pupils were mentored during the Girls Takeover events that have been held in the past years.

- **Guest Lectures**

  Promoting Water Supply and Sanitation skills standards and careers is of importance to the SAG-WSS as well as offering support to students in technical fields and internships in the WSS sector. The SAG-WSS has been working collaboratively with Vocational and Training Institutions (VTIs) to raise awareness about the SAG-WSS. The SAG-WSS has conducted guest lectures at Livingstone Institute of Business and Engineering Studies, Lusaka Vocational and Technical College, Lusaka Business and Technical, Natural Resources Development Centre and Kabwe Institute of Technology.

- **Girls Takeover WASH' event**

  The SAG-WSS held a Girls Takeover WASH event that allowed selected pupils from selected secondary schools in Lusaka Province to take over some operations at Lusaka Water Supply and Sanitation Company. The event was aimed at arousing interest in the pupils to pursue water and water related courses after completing their secondary education.

Girls take over event at LWSC

4.16 LUSAKA WATER SECURITY INITIATIVE

4.16.1 Introduction

Water security is a crucial issue that affects not only the well-being of our communities but also the sustainable development of our cities. Recognizing the urgency and significance of this challenge, the Lusaka Water Security Initiative (LuWSI) brings together a diverse group of experts, practitioners and stakeholders in a dynamic multi-stakeholder partnership to assess the threats and mobilise action towards enhancing water security. This has enabled the partners to collaborate and synergize efforts to model partnerships and leverage capacities and resources towards promoting a water secure future.

4.16.2 Milestones

For the year 2023, LuWSI's efforts and footprint transcended beyond Water, Sanitation and Hygiene (WASH) and groundwater protection to building capacities among Commercial Utilities, manufacturing companies, grassroots organisations and communities on some of the topical issues including solid waste management, water stewardship and governance, thereby strengthening, among other things, local participation of the various actors. Some of the notable milestones achieved under the collaborative platform included the following:

- **Governance**
  LuWSI held its 4th General Assembly in November during which a review of the strategic performance of the Initiative was undertaken as well as ushering in of a new set of Board Members. The new Board includes members from Zambia Breweries, BORDA - Zambia, the Worldwide Fund for Nature (WWF), Zambia WASH Advocacy Network (ZWAN), WaterAid Zambia, Coca-Cola Beverages Africa – Zambia (CCBAZ), Zambia Environmental Management Agency (ZEMA), The University of Zambia (UNZA), Plant a Million (PAM), Women for Change, Lusaka City Council (LCC), Lusaka Water Supply and Sanitation Company (LWSC) and the National Water Supply and Sanitation Council (NWASCO).

Mponda Check dam in Mumbwa

Knowledge and Advocacy

i. A Digital Atlas, an online information management platform was developed and scaled up to a National Water and Sanitation Digital Atlas with support from BGR, GIZ, NWASCO, CCBAZ, LCC, LWSC, ZEMA, the Water Resources Management Authority (WARMA), the Ministry of Water Development and Sanitation through the Department of Water Resources Development (DWRD) and the Ministry of Lands and Natural Resources (MLNR). The Atlas contains report-based as well as graphical information on water, sanitation, environment, climate change and other related subjects.

ii. LuWSI partners influenced and contributed to policy dialogue during the development and/ or implementation of the 8th NDP, the draft National Water Policy of 2023, the promotion of Extended Producer Responsibility (EPR), and the CDF policy to include water security and need for multi-stakeholder collaboration.

iii. Knowledge sharing and awareness campaigns were undertaken in selected schools and grassroots communities on WASH, Water Stewardship, Non-Revenue Water and Solid Waste Management among other topics.

Projects and Partnerships

The year 2023 witnessed a number of partnerships and relationships strengthened in an attempt to achieve water security for Lusaka and beyond. These projects and activities included:

i. ***Water and Environmental Stewardship*** – As a way of promoting sustainable initiatives that enhance stewardship among Commercial Utilities and private sector companies, LuWSI partners embarked on a water stewardship activity for private sector and Commercial Utilities – a program aimed at fostering sustainable management and protection of water resources as well as water use efficiency. The activity culminated in the awarding of Zambian Breweries in the private sector category and Eastern Water and Sanitation Company in the utility category.

ii. ***The Dance for WASH project*** – was implemented in five schools in Lusaka District and was a partnership among LCC, GIZ, Lusaka District Health Office (LDHO) and the District Education Board Secretary's office. The project was aimed at promoting hand washing among learners through art and dance. The project reached approximately 2,000 learners.

iii. ***Solid Waste Management Program*** – a program that included the promotion of a circular economy through various knowledge sharing platforms including discussion forums and awareness campaigns. Resulting from the forum was a recommendation to establish a Producer Responsibility Organization (PRO) whose role would be to ensure compliance to the Extended Producer Responsibility and administer financial resources for various circular economy initiatives.

iv. ***Kafue Flats Joint Action Group*** - LuWSI continued to support the coordination of activities under the Kafue Flats Joint Action Group (KFJAG) – an initiative anchored on the protection and conservation of the Kafue Flats and biodiversity within and around it. Activities embarked on during the year included tree planting along the Magoye River banks to support the Magoye Restoration Program, community sensitizations in Mwanachingwala village, and touring of the Magoye River source area to understand some of the challenges faced that contribute to the drying of the river and devising solutions to protect the catchment area.

Membership Drive

LuWSI's value and significance continued to be reflected through its increase in membership. Since 2022, LuWSI's membership grew from 33 to 40 partners with new members being the Lusaka Integrated Solid Waste Management Company (LISWMC), Chilanga Cement, Capacity Development (CaDev),

Vision Outreach Zambia (VOZ), the Sustainable Development Goals Center for Africa (SDGCA), British American Tobacco (BAT) and Focal Tech Zambia all working towards ensuring water security for Lusaka City and beyond.

Commemoration

LuWSI and its partners took part in commemorating various events throughout the year aimed at creating awareness and demonstrating the importance of collaboration and stewardship. The forums included; World Water Day, the Zambia Water Forum and Exhibition (ZAWAFE), World Toilet Day and Global Hand Washing Day. During the Global Hand Washing Day commemoration, LuWSI and its partners showcased how dance and football could be applied in creating awareness for hand washing among learners.

Water Treatment Facility

Global Handwashing Day

5

IMPROVING WATER SUPPLY AND SANITATION SERVICE PROVISION THROUGH TECHNOLOGY

5.1 INTRODUCTION

Safe water and sanitation are basic needs for health and wellbeing. In the quest for enhanced service delivery, the integration of technology has emerged as a powerful catalyst. NWASCO recognises the pivotal role information and communication technology (ICT) plays in shaping the water supply and sanitation (WSS) sector. As such, this chapter explores the transformative impact of technology on water supply and sanitation services in Zambia, examining current trends, opportunities, and the future outlook for this dynamic sector.

5.2 CURRENT TRENDS

In recent years, the worldwide ICT landscape has experienced remarkable expansion, particularly in the aftermath of the global COVID-19 pandemic. The adoption of ICT has played a pivotal role in shaping service sectors such as the Water Supply and Sanitation sector. According to the comprehensive gap analysis conducted by ZICTA, as at December 2022, Zambia achieved a notable milestone of 92% population coverage of mobile communication. This extensive coverage has facilitated the provision of diverse services, including smart metering, electronic billing, cashless transactions, Geographic Information System (GIS) and digital complaints handling services.

5.2.1 Water Meter Reading Application

A water meter reading application is a technology that can be used by meter readers to record water usage and transit the data to a central server for analysis and billing in real time. The development and deployment of a meter reading application has revolutionised the billing process by providing real-time data on water consumption patterns.

In Zambia, such an initiative was piloted by Southern WSC. However, the first home grown application was developed and implemented by Lukanga WSC. This technology is designed to address and overcome billing challenges linked to precise meter reading. The technology aids monitoring of consumption and also fosters speedy reconciliation of billing queries thereby enabling accurate billing.

With support from Cooperating Partners such as VEI and AfDB and through internally generated resources, a number of CUs namely NWSC, SWSC, MWSC, CHWSC, EWSC and LPWSC have embraced the technology and have since began to implement it.

5.2.2 Geographic Information System

Geographic Information Systems, are computer-based tools used to capture, store, visualise, analyse and interpret geographic data. GIS plays a crucial role in optimizing resource allocation and infrastructure planning. GIS enhances the efficiency of water supply and sanitation systems by mapping water supply networks, sanitation facilities, identifying vulnerable areas, and streamlining distribution routes.

While the utilisation of GIS applications to address water and sanitation operational challenges, such as non-revenue water, maintenance and billing faced by water supply and sanitation service providers is not novel, its use often presents significant challenges.

These challenges are often rooted in the scarcity of human capital and infrastructure within water supply and sanitation service providers, hindering the effective execution of GIS operations and its seamless integration into their daily activities. Addressing this gap in expertise and infrastructure is crucial for unlocking the full potential of GIS in optimising water supply and sanitation operations.

NWASCO conducted a comprehensive needs assessment in 2015 to identify gaps in the utilisation of GIS across the CUs. Among gaps identified were; lack of hardware and software infrastructure, inadequate skills and lack of uniformity in data packaging among others.

In direct response to these gaps, NWASCO undertook the following interventions:

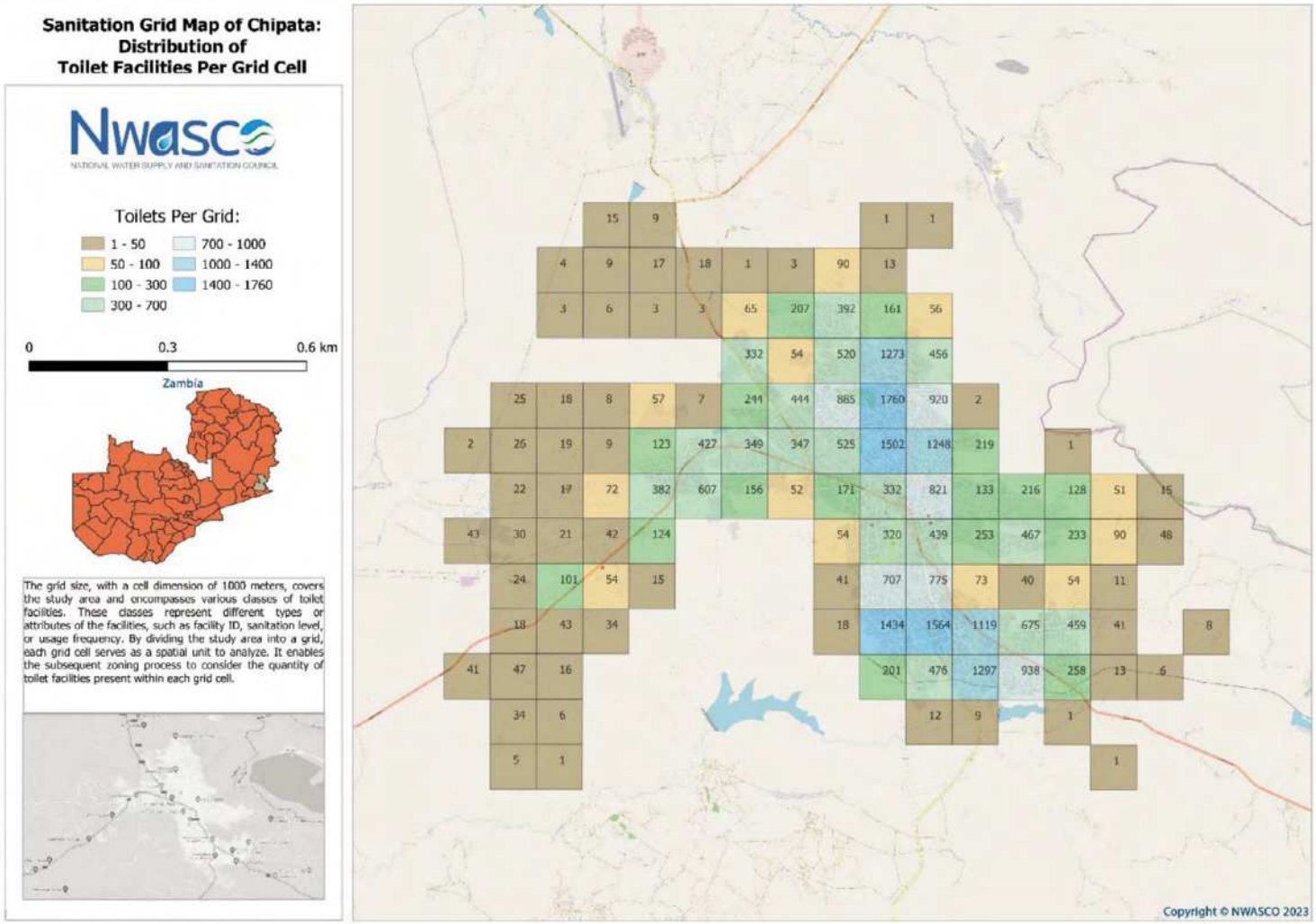
- Developed guidelines for GIS operations;

- Undertook training of trainers;
- Facilitated for training of CU staff;
- Procured Arc GIS package and mobile data collection devices;
- Standardised layout for data collection and layout maps; and
- Supported the mapping of WSS facilities in selected CUs.

Further, NWASCO set up a centralized geo database and developed a geo portal to store, process and report the data from the mapping exercises across the country and other data sources. All the 11 CUs are utilising GIS although at varying levels.

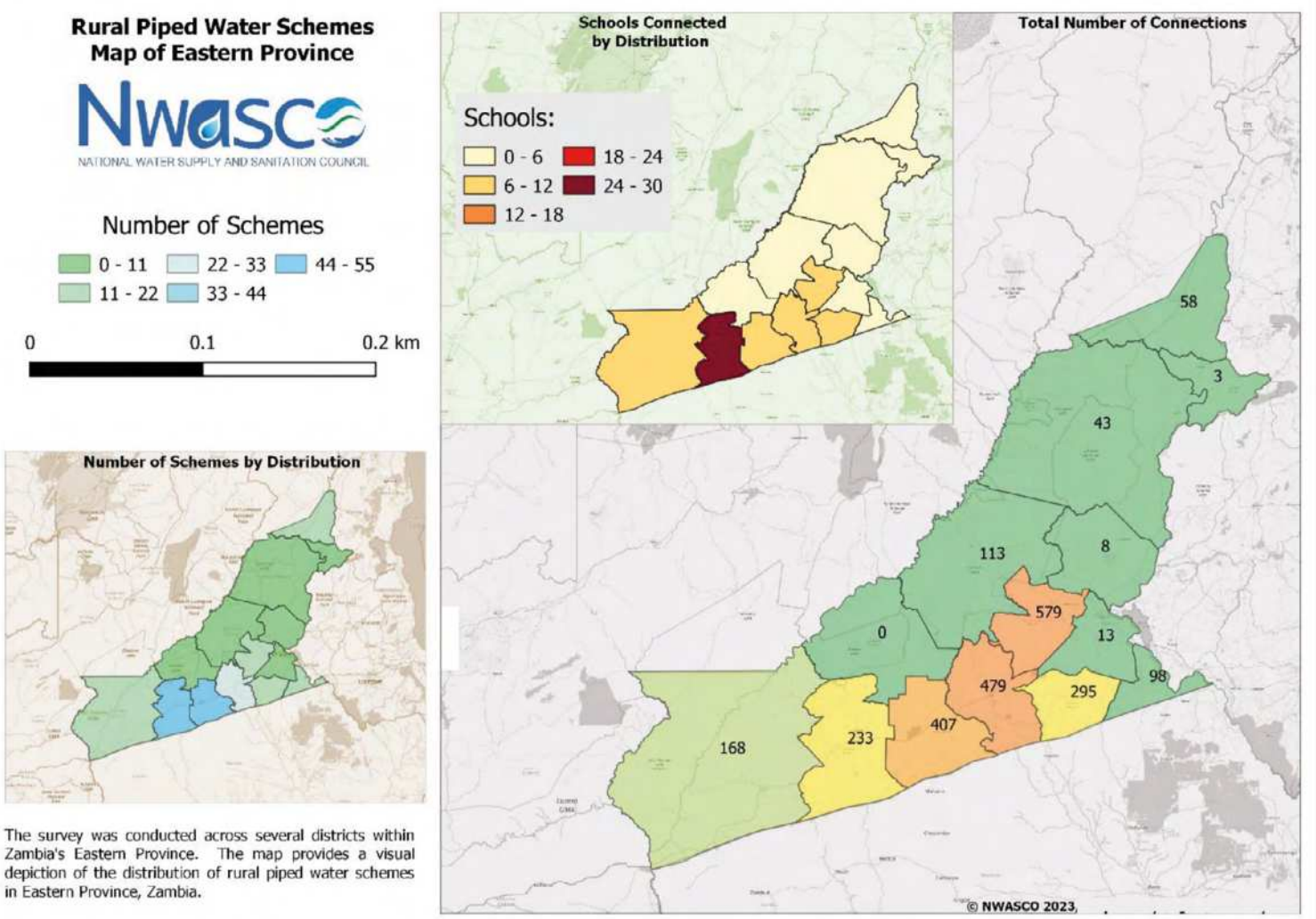
Between 2020 and 2023, NWASCO supported GIS mapping of WSS in KWSC, NWSC, EWSC and LPWSC. Other CUs such as LWSC, SWSC and LGWSC have implemented GIS mapping internally. Arising from this, data has been collected, processed and packaged into maps to aid decision making. Figure 5 is an example of packaged data on sanitation facilities for Chipata District.

Figure 5: Sanitation Distribution in Chipata District



NWASCO crafted this map as a guiding instrument to inform the zoning process, specifically tailored for planning FSM services in Chipata. Similar maps have been developed for Ndola and Kitwe. Further NWASCO mapped rural piped water schemes across the country with the aim to collect comprehensive information on their technical, operational, and financial aspects. Figure 6 is an example of packaged data on rural water schemes in Eastern Province.

Figure 6: Rural Piped Schemes in Eastern Province



The survey was conducted across several districts within Zambia's Eastern Province. The map provides a visual depiction of the distribution of rural piped water schemes in Eastern Province, Zambia.

The data-driven insights provided by GIS not only enhance operational efficiency but also allow for informed choices that positively impact WSS service delivery.

5.2.3 Electronic Billing Systems

Electronic Billing System is a digital solution that facilitates the electronic generation, dispatch and tracking of invoices. It eliminates the need for traditional paper based billing methods and enables electronic billing (e-billing), which not only contributes to substantial cost savings and promotes environmental sustainability. Electronic billing provides multiple modes of sending bills such as emails, SMS, WhatsApp and online through web browser.

Almost all the CUs in Zambia utilise e-billing and transmit monthly water and sanitation bills via emails, text messages, mobile applications and through web based platforms such as MyWatSan Quick Fix. This reduces the time taken to deliver bills, thus allowing customers to make payments in good time.

5.2.4 Electronic Payment Systems

Electronic payment systems (e-payment) allow consumers to pay for goods and services without using cash or cheques. With accelerated digitisation brought about by the aftermath of the COVID-19 pandemic, water and sanitation service

providers are increasingly adopting cashless payment methods which have been embraced by consumers. The introduction of mobile payment options, digital wallets and online platforms have notably enhanced the efficiency and transparency of financial transactions in the sector. For the customer, it is more convenient as it reduces waiting time and makes it easy for payments to be made. For the CU, it reduces costs associated to human resource, mitigates the risk of errors and theft during cash handling and receipting and reduces paperwork.

All CUs have been using some form of cashless payment methods such as mobile money services, debit or credit cards and electronic transfer. Only SWSC and LWSC have completely migrated to cashless payment systems. Some CUs have developed specific mobile applications to enhance the use of their cashless payments.

Despite the commendable strides, some CUs encounter challenges linked to network or system failures, presenting occasional obstacles to the seamless operation of these payment platforms. Efforts to address and mitigate these challenges are ongoing, as the WSS sector continues to adapt to the evolving landscape of digital payment methods.

5.2.5 Complaints Handling Systems

This is a software or platform designed to help organisations effectively manage and resolve customer complaints. It typically has the following features;

- Complaints Lodging;
- Tracking and monitoring;
- Notifications and alerts;
- Resolution workflow;
- Reporting and analytics;
- Integration with other systems; and
- Feedback collection.

NWASCO developed a complaints handing platform dubbed MyWatSan QuickFix in 2017. The application allows customers to lodge in complaints and check the status of the complaints. The complaints once lodged in are escalated automatically within the CU's resolution workflow to NWASCO. For CUs whose billing systems have been integrated with MyWatSan, customers are able to check their bills and payment status. This endeavor centers on enhancing information management systems to ensure the availability of accurate and timely data for informed and efficient decision-making.

NWASCO has ensured that all CUs without a complaints platform, as well as those opting to use the platform independently, have successfully integrated it into their operations.

5.2.6 Other Technological initiatives

5.2.6.1 Resource Centre Application

This is a one stop online document management hub that hosts WSS sector information. It is intended for the general public to view and download WSS sector and related documents. NWASCO established the resource centre in 2011 which is a library for WSS and other related sector information. The centre is stocked with hard copy documents. Recognising that paper storage requires significant physical space and has limitations in access, the application was developed in 2023 to provide greater control, enhance access and process efficiency for sharing of information. Links to other information sources within the institution have been embedded in the resource centre application for ease of access.

5.2.6.2 Peer to Peer application

NWASCO's Peer-to-Peer Online application is a strategic initiative aimed at enhancing the performance of water utilities through knowledge exchange. This online platform facilitates staff members from various CUs to apply for exchange learning visits, fostering collaborative knowledge-sharing.

The platform is open to all staff members employed by the 11 CUs and particularly operatives. The objective is to provide them with an opportunity to

learn from their counterparts in other water utilities, promoting a dynamic and cooperative approach to advancing skills and knowledge within the sector. So far about 43 staff have participated in peer to peer learning visits.

5.3 DATA SECURITY

Data security is the practice of protecting digital information from unauthorized access, corruption or theft. As reliance on digital systems grows, safeguarding water-related data becomes crucial. Robust cybersecurity measures are essential for protecting sensitive information and secure data sharing among stakeholders. Issues of data security have been elaborated in the Data Protection Act, No. 3 of 2021. In order to ensure compliance to the provisions of Act, NWASCO has developed the ICT guidelines for the sector to provide a framework for data protection, maintenance, and sharing.

5.4 FUTURE OUTLOOK

The evolution of water supply and sanitation services hinges on the continued integration of cutting-edge technologies.

Zambia presents promising prospects for advancing infrastructure within the WSS sector. Specifically, there are opportunities for the modernization of water treatment plants, distribution networks, and storage facilities by integrating Internet of Things (IoT) technologies. Incorporating IoT would facilitate the automation of the water system, streamlining network management and contributing to the reduction of Non-Revenue Water (NRW). This innovative approach not only enhances operational efficiency but also diminishes the dependency on human capital for network maintenance, thereby optimizing costs.

Artificial intelligence, machine learning, and automation are poised to assume increasingly pivotal roles in optimizing resource management, curbing wastage, and elevating overall service delivery. The convergence of these technologies, coupled with ongoing innovation, holds the potential to establish robust, sustainable, and technologically advanced water supply and sanitation systems for the welfare of consumers.

By delving into innovative solutions, such as harnessing solar power for water treatment and distribution, these companies can significantly contribute to sustainability objectives. Moreover, there is untapped potential in harnessing kinetic energy generated as water flows through pipelines, presenting an intriguing opportunity for investors interested in exploring novel ways to integrate renewable energy into the water supply infrastructure. This strategic integration of renewable energy sources not only aligns with sustainability goals but also has the transformative potential to render an IoT water supply system self-reliant. By incorporating solar power and tapping into the kinetic energy generated during water transportation, the water supply infrastructure gains a degree of autonomy, reducing reliance on external power sources. This self-reliance enhances the resilience and efficiency of the IoT system, ensuring uninterrupted and eco-friendly water supply operations.

In the face of mounting challenges related to water scarcity and climate change in Zambia, the adoption of state-of-the-art technologies becomes not just beneficial but imperative to tackle these intricate issues and ensure a sustainable future. While acknowledging the inherent costs associated with implementing these technologies, Zambia must adopt a deliberate approach, recognising that the investment is a crucial step toward securing a fruitful and resilient future for the water supply and sanitation sector.

6

PROGRESS ON MEETING SERVICE LEVEL AGREEMENTS AND ADHERENCE TO SERVICE LEVEL GUARANTEES

6.1 INTRODUCTION

To ensure that CUs give a progressively better service to their customers, NWASCO has formulated guidelines on Minimum Service Levels (MSL). MSLs are simply standards which define the acceptable minimum level of service which providers must achieve over a specified timeframe. The guidelines have eleven indicators (shown in Table 23) used to set Service Level Guarantees (SLGs) and Service Level Agreements (SLAs). SLGs compel CUs to provide a certain agreed-upon minimum level of service to their customers at any given time while SLAs set-out stepwise interventions that a CU will undertake to attain the desirable sector benchmarks of service provision. It is a requirement that SLGs are displayed at all customer service points for the information of the public.

As a license condition issued under the WSS Act No. 28 of 1997, all water and sanitation service providers are required to formulate and maintain SLGs and SLAs which NWASCO monitors.

The service indicators have timeframes (measured from commencement of operations of a particular Utility) within which they are to be attained and it is thus important to determine the progress made by the CUs towards attaining the acceptable benchmarks. The eleventh indicator is support to institutions which is not measurable.

Table23: Service Level Indicators (SI)

	SERVICE INDICATOR	MEASUREMENT
SI 1	**Coverage of the Service Area**	% of population served with drinking water and sanitation.
SI 2	**Drinking Water Quality**	No. of tests carried out and test results within the national standards for drinking water.
SI 3	**Service Hours**	Water supply hours per day and hours to attend to customers per week.
SI 4	**Billing for Services**	Billing, meter reading sequences, conditions for payment of bills by the customer.
SI 5	**Client Contacts**	Complaints from clients, the response time on any other contacts with customers.
SI 6	**Interruption of Water Supply and Blockage of Sewer**	Unplanned interruption of supply or sewer evacuation due to maintenance and repair work
SI 7	**Pressure in the Network and Minimum Flow Rate at the Customer Point for Water Supply**	Minimum flow rate of 7 litres/min required at customer connection
SI 8	**Unjustified Disconnections**	No. of unjustified disconnections and the compensation to be paid by the provider to the customer
SI 9	**Sewage Flooding**	The number of times sewage floods a connection per year < 5
SI 10	**Quality of Discharged Sewage**	In terms of BOD_5, COD, Nitrates, Phosphorous, etc
SI 11	**Support to Public Institutions to Curb Wastage and Settle Bills Promptly**	Activities put in place by the water and sanitation providers.

6.2 PROGRESS MADE IN ACHIEVING SERVICE LEVEL AGREEMENTS AND ADHERENCE TO SERVICE LEVEL GUARANTEES

Service Level Agreements/ Guarantees are signed for specific towns under each CU. Every town has its own target for the three-year period in the SLA that enables the CU progress towards the acceptable benchmark. The analysis therefore considers achievement of individual targets such that failure in one town may translate into overall non-achievement of the Service Indicator.

Key: √ Achieved x Not achieved

SI 1 Service Coverage – Proportion of population serviced with water

	LWSC	NWSC	KWSC	MWSC	LGWSC	SWSC	CHWSC	NWWSC	WWSC	EWSC	LPWSC
SLG	√	√	x	x	x	x	x	x	x	x	x
SLA	√	√	x	x	x	x	x	x	x	x	x

Water service coverage is influenced by the growth in number of domestic connections and population in the service areas.

Although all CUs increased number of domestic connections, only LWSC met both the SLG and SLA targets.

KWSC planned to meet their targets through network extensions under Kafulafuta Water System Project which however was still not completed. MWSC did not meet their target for Chingola and expect improvement once the Chingola South water network extension project is completed. Further, NWSC like KWSC, decommissioned some kiosks that were non-functional thus reducing the number of people served. Generally, CUs lacked resources for network extensions to unserved areas. The Integrated Small Town Water Supply and Sanitation Projects in Western, LPWSC and CHWSCs will greatly improve coverage as

SI 2 Drinking Water Quality – Assessment through compliance to Water Quality Monitoring Guideline

Due to its impact on the health of consumers, CUs are required to guarantee their customers an overall compliance of 95%. This indicator focuses on the number of tests conducted and compliance to the standards for drinking water.

	LWSC	NWSC	KWSC	MWSC	LGWSC	SWSC	CHWSC	NWWSC	WWSC	EWSC	LPWSC
SLG	x	√	√	√	√	√	√	x	x	√	√
SLA	x	√	√	√	√	√	√	x	x	√	√

All CUs were able to conduct all the required tests. However, three CUs namely LWSC, NWWSC and WWSC did not fully comply with the standards for drinking water. LWSC recorded significant failures in chlorine residual and bacteriological parameters. NWWSC and WWSC also recorded chlorine failures because of breakdowns of their dosing equipment.

SI 3 Service Hours- water supply hours per day and hours to attend to customers per week

This service indicator depicts the average duration of water supply at the customer connection and is specific to an area. In addition, CUs are also expected to have offices accessible to customers for a minimum number of hours per week.

	LWSC	NWSC	KWSC	MWSC	LGWSC	SWSC	CHWSC	NWWSC	WWSC	EWSC	LPWSC
SLG	x	x	x	x	x	√	√	x	x	x	√
SLA	x	x	x	x	x	x	x	x	x	x	x

The average supply hours for the sector hardly changed. Most CUs recorded reductions in supply hours due to the interruptions instituted to pave way for maintenance works.

None of the CUs managed to achieve targets enshrined in their SLAs.

SI 4 Billing for Services – Billing, meter reading sequences, conditions for payment of bills by the customer, metering ratio

The billing for services indicator specifies the frequency at which CUs should read customer meters and distribute bills, the conditions related to payments of bills by customers and the number of customers with water meters.

	LWSC	NWSC	KWSC	MWSC	LGWSC	SWSC	CHWSC	NWWSC	WWSC	EWSC	LPWSC
SLG	x	x	x	√	x	√	√	x	x	√	x
SLA	x	x	x	x	x	x	x	x	x	√	x

As all CUs have already met the indicators related to billing and payment conditions, the analysis in this section focuses on metering.

CHWSC and SWSC made significant increases in their metering ratio owing to ISTWSSP and government procured meters respectively. Previously 100% metered, NWWSC and LPWSC lost that status due for failure to replace faulty meters and connecting new customers without meters. Limited of financial resources to procure meters caused the other CUs to fail to meet their targets under this service indicator.

SI 5 Client Contacts - Complaints from clients, the response time on any other contacts with customers

This service indicator specifies the timeframes CUs are expected to take to respond to customer complaints or any other contacts with customers.

	LWSC	NWSC	KWSC	MWSC	LGWSC	SWSC	CHWSC	NWWSC	WWSC	EWSC	LPWSC
SLG	√	√	√	√	x	√	√	x	√	x	√
SLA	√	√	√	√	x	√	√	x	√	x	√

Most CUs managed to resolve complaints presented to them within the stipulated timeframes save for NWWSC and EWSC. The majority of complaints reported in the period related to leakages, billing, water supply interruptions and time taken to connect new customers.

SI 6 Interruption of Water Supply & Blockage of Sewer - Unplanned interruption of water supply or sewer diversion due to maintenance or repair

The service indicator reflects the proportion of the population in the CUs' service area that is subjected to interruptions in water supply or blockage of sewer for a specified duration.

	LWSC	NWSC	KWSC	MWSC	LGWSC	SWSC	CHWSC	NWWSC	WWSC	EWSC	LPWSC
SLG	x	√	√	x	x	√	x	x	x	√	x
SLA	x	x	x	x	x	x	x	x	x	x	x

CUs experienced unplanned interruptions of water supply and blockage of sewer lasting more than 20 hours for various reasons as detailed in Section 7.2.2.2.2

SI 7 Pressure & Flow in the Network for Water – Minimum flow rate of 7 litres/min required at customer connection

Pressure and flow in the network for water service indicator specifies the maximum acceptable proportion (<5%) of connections in a service area with water flow rate of less than 7 litres per minute.

	LWSC	NWSC	KWSC	MWSC	LGWSC	SWSC	CHWSC	NWWSC	WWSC	EWSC	LPWSC
SLG	√	√	√	√	√	√	√	√	√	√	√
SLA	√	√	√	√	√	√	√	√	√	√	√

In the reporting period, the pressure challenges encountered were within the acceptable limit.

SI 8 Unjustified Disconnections – No. of unjustified disconnections and the compensation paid by the provider to the customer

This service indicator specifies the maximum acceptable proportion of the total connections for a CU that should be subjected to unjustifiable disconnections which is less than 0.2% of the customer base.

	LWSC	NWSC	KWSC	MWSC	LGWSC	SWSC	CHWSC	NWWSC	WWSC	EWSC	LPWSC
SLG	√	√	√	√	√	√	√	√	√	√	√
SLA	√	√	√	√	√	√	√	√	√	√	√

Consumers who are unjustifiably disconnected from their water and sanitation services are entitled to a written apology and/ or compensation equivalent to one month's billing. Consumers have the right to be heard and explained to in case they have misunderstandings with their billing. There were no significant numbers of unjustifiable disconnections reported in the period.

SI 9 Sewage Flooding – The number of times sewage floods a connection per year < 5

The Sewage Flooding service indicator specifies the maximum acceptable proportion of connections that can be flooded with sewage in a year which is less than 0.5% of the total connections.

	LWSC	NWSC	KWSC	MWSC	LGWSC	SWSC	CHWSC	NWWSC	WWSC	EWSC	LPWSC
SLG	x	√	√	x	√	√	√	√	√	√	√
SLA	x	√	√	x	√	√	√	√	√	√	√

LWSC and MWSC experienced flooding in a number of areas owing the increased flow while the sizes of the sewers remained the same, aging infrastructure, illegal dumping of solid waste in sewers and vandalism of sanitation facilities such as manhole covers.

SI 10 Quality of Discharged Sewage – In terms of BOD_5, COD, Nitrates, phosphorus, and others.

CUs are expected to treat sewage to meet the ZABS regulations for effluent discharge in terms of number of tests conducted and compliance to the standards.

	LWSC	NWSC	KWSC	MWSC	LGWSC	SWSC	CHWSC	NWWSC	WWSC	EWSC	LPWSC
SLG	x	x	√	x	√	√	**N.R**	**x**	N.R	√	N.R
SLA	x	x	√	x	√	√	**N.R**	**x**	N.R	√	N.R

Non-compliance to sewage effluent discharge into the aquatic environment is considered using a number of factors and these include the quality of receiving waters, the volume of discharge and adherence to the standards (limits) of effluents and waste water as per ZEMA regulations. This section asses the CUs' compliance to the later.

LWSC, NWSC, MWSC and NWWSC were non-compliant to the standards for sewage effluent discharges as required by ZEMA.

6.3 CONCLUSION

Service Level Guarantees and Agreements play an important role in aiding the provision of checks and balances on the quality of service by CUs. In the period under review, CUs did not perform were in Service Indicators of water coverage, drinking water quality, hours of supply and billing for services. Liquidity challenges coupled with poor maintenance practices were some of the contributing factors to this performance.

7

COMPARATIVE PERFORMANCE OF COMMERCIAL UTILITIES

7.1 OVERVIEW

The comparative performance of Commercial Utilities (CUs) during the period, 1st January to 31st December, 2023 is presented in this chapter.

Performance analysis is undertaken 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 benchmarks).

Comparative performance is necessary to induce competition as CUs operate as monopolies in their respective areas. Each CU is thus, motivated to improve on its previous performance, as well as, outperform others.

The comparative information can be used by consumers and other key stakeholders to appreciate the performance and challenges of their respective service providers. Other key stakeholders such as Government and Cooperating Partners may also use the information to plan appropriate interventions.

7.1.1 Total Population in the Service Areas of Commercial Utilities

There are 11 licenced Commercial Utilities (CUs) operating in Zambia. Each CU services an entire province except for the Copperbelt Province which has three CUs while Muchinga and Northern Provinces are serviced by a single CU. A CU is mandated to operate in the entire district for which they are licenced. However, this chapter only covers urban and peri-urban areas within the district.

The total population in the urban and peri areas which are serviced by the CUs was estimated at 8.4million for the reporting period. This may differ from that reported by the Zambia Statistics Agency (ZamStats) because of the difference in the delineation of rural and urban areas for some CUs. For example, ZamStats classifies districts such as Manyinga in North-Western Province, Masaiti on the Copperbelt Province and Mwense in Luapula Province as almost entirely rural, yet these are part of the CUs' serviced areas. The populations of the CUs were aligned to the Zambia Statistics Agency; *'2022 Census of Population and Housing Preliminary Report'*.

Out of the 8.4 million estimated urban population, less than 1% reside in areas serviced by four Private Schemes which are business entities that provide WSS services as a fringe benefit to their employees namely ZESCO, Zambia Sugar, Kaleya Small holders and Kafue Sugar.

7.1.2 Clustering of Commercial Utilities

CUs are clustered according to size, based on the water production volumes and number of connections in the licenced areas as shown in Table 24. Clustering allows the performance of CUs to be compared in the context of similar sized Utilities.

CUs with more than 50,000 connections and water production above 50million m^3 per year are placed in Cluster 1. CUs with connections between 20,000 and 50,000 and water production between 10million and 50million m^3 per year are in Cluster 2. CUs with connections less than 20,000 and production less than 10million m^3 per year are in Cluster 3. As the CUs grow in size, the limits set for the cluster could be revised. MWSC having been producing water below 50,000m^3 for the past 3 years has been reclassified to Cluster 2.

Manual Pit Emptying

Table 24: Clustering of CUs

Cluster	CU	Total Population in Service Area	No. of water connections	Water Production (Million m3)
1	LWSC	2,988,247	142,079	115.0
	NWSC	856,668	76,057	51.5
	KWSC	827,579	72,649	56.1
2	MWSC	603,293	62,527	25.9
	LGWSC	551,327	33,766	14.2
	SWSC	598,312	70,142	22.9
	CHWSC	601,464	46,429	19.5
3	NWWSC	356,740	19,809	7.4
	EWSC	375,398	29,859	6.8
	WWSC	273,606	17,750	10.8
	LPWSC	331,323	17,412	5.0
TOTAL	11 CUs	8,363,957	588,479	335

7.2 PERFORMANCE ANALYSIS

CU performance is measured in the following five broad categories of indicators:

i. Operational;

ii. Service Level;

iii. Financial;

iv. Staff Efficiency; and

v. Corporate Governance and Management.

7.2.1 Operational Indicators

The effectiveness and efficiency of a CU in providing water and sanitation services is assessed using operational indicators. These comprise Water and Sanitation Coverage, Non-Revenue Water (NRW), Metering Ratio, Energy Efficiency and Maintenance Efficiency. The primary data used in calculating operational indicators include number of connections, population, water production figures, energy usage and maintenance works.

7.2.1.1 Total Water Connections

The total number of water connections increased by 40,695 in the reporting period. The bulk of this increase was attributed to domestic connections which increased by 39,658 while non-domestic increased by 1,037.

The highest increase in the number of connections was by CHWSC with 13,708. Other CUs that made notable new connections were LWSC, LPWSC and SWSC with 7,272, 5,576 and 4,660, respectively. For CHWSC and LPWSC, the increase was attributed to the Integrated Small Towns Water Supply and Sanitation Programme financed by the AfDB. LWSC made a number of connections in areas such as Mtendere and Kanyama. SWSC made new connections in Monze under the VEI project and in Livingstone using own resources among others. Further the take-over of Chirundu District from LWSC resulted in an additional 1,422 connections. The total number of water connections split into domestic and non-domestic are shown in Table 25.

Table 25: Total Water Connections

	Total Domestic Water 2023	Total Non-Domestic Water 2023	Total Water Connections 2023	Total Water Connections 2022
LWSC	126,826	15,253	142,079	134,807
NWSC	72,322	3,735	76,057	74,882
KWSC	69,603	3,046	72,649	70,915
MWSC	58,637	3,890	62,527	61,197
LGWSC	31,699	2,067	33,766	32,126
SWSC	66,776	3,366	70,142	65,482
CHWSC	44,065	2,364	46,429	32,721
NWWSC	18,429	1,380	19,809	19,220
WWSC	16,028	1,722	17,750	16,982
EWSC	27,791	2,068	29,859	27,616
LPWSC	16,625	787	17,412	11,836
Total	**548,801**	**39,678**	**588,479**	**547,784**

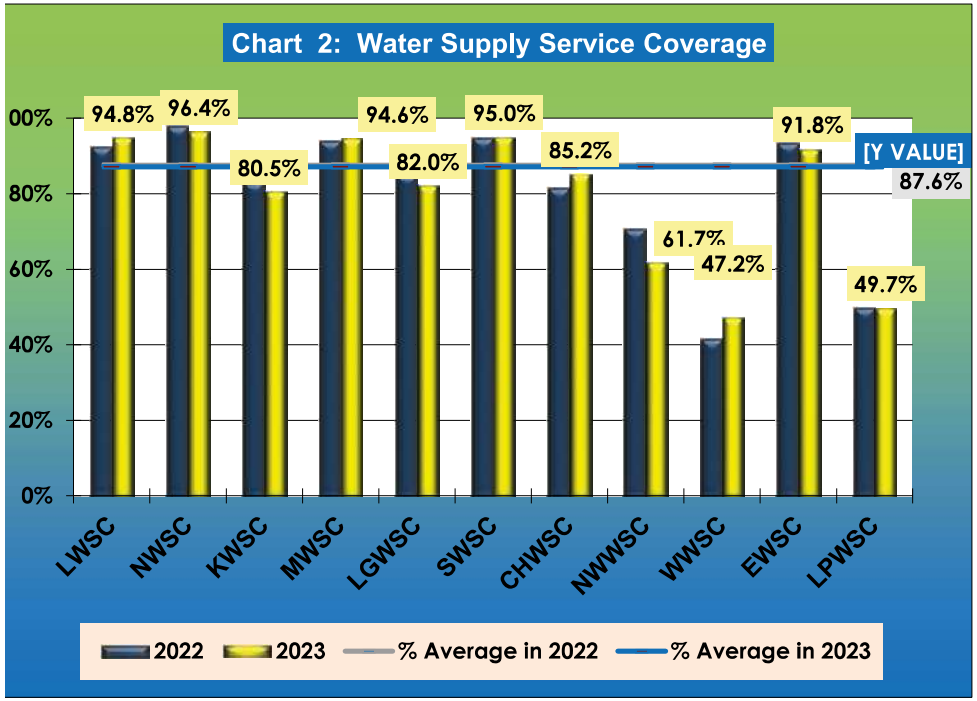
7.2.1.2 Water Supply Coverage

Water coverage represents the proportion of population serviced by domestic connections through individual household connections, kiosks, public stand posts and shared taps

Chart 2 and Table 25 show the water supply coverage in percentage and absolute terms, respectively.

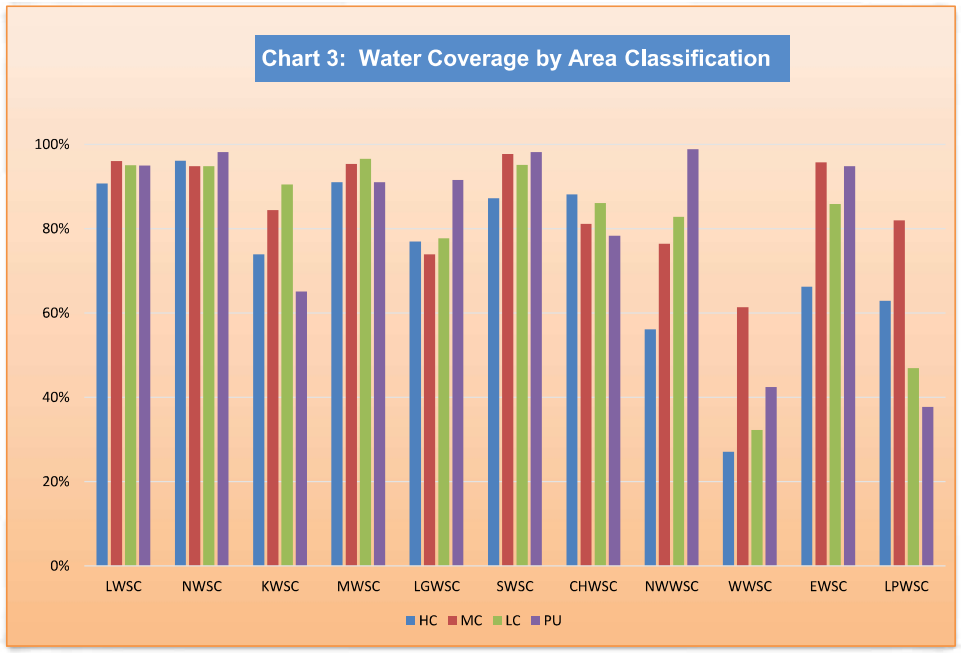
Benchmark for water supply coverage	Good	100%
	Acceptable	95% - 99%
	Unacceptable	<95%

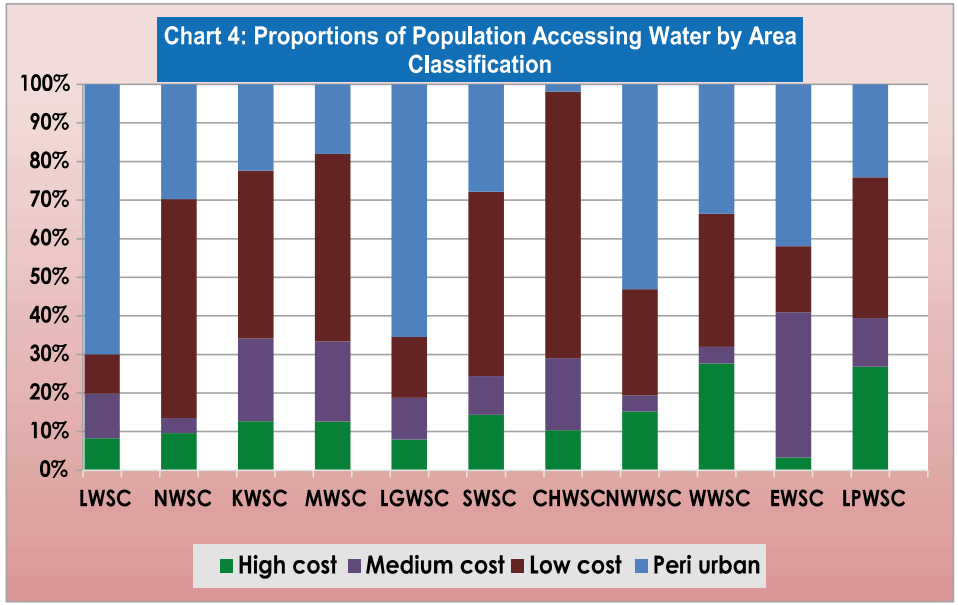
The acceptable benchmark for water coverage for the period 2021-2025 is 95%. This will be adjusted to 100% for the period beyond 2025 in order to align to the national aspirations of universal coverage for water supply.



Over 39,000 household connections were made serving an additional 248,231 people. However, there was a slight decrease in the percentage coverage as the population increase outstripped the increase in the number of people served. The increase recorded for CHWSC was due to the high number of connections made under the Integrated Small Towns Water Supply and Sanitation Project. NWSC and KWSC decommissioned kiosks that were non-functional thus reducing the number of people served.

The service areas of the CUs are divided into four main categories namely Peri Urban, Low Cost, Medium Cost and High Cost. In order to appreciate the coverage in each of the categories highlighted above, the coverage depicted in Chart 2 has been broken-down as shown in Chart 3 while the proportion of the population served per category is depicted in Chart 4.





Of the population served in Chart 4, LWSC and LGWSC had the highest served in peri urban areas. CHWSC and NWSC had the highest proportion from low cost areas in Chart 4. LPWSC and WWSC had the lowest coverage in the low cost category in Chart 3.

Charts 3 and 4 helps to reflect service coverage in marginalised communities, that is, Peri urban and low cost areas.

7.2.1.3 Water Coverage Ratio of Household Connections to Kiosks/ Public Stand Posts

It is desirable that CUs serve the population through individual connections. Kiosks/public stand posts should ideally be a stop-gap measure in consideration of affordability of individual connections. They are also used as an alternative mode of service provision where it is not feasible to lay a network for individual connections such as unplanned, high density (peri-urban) areas.

According to WHO/UNICEF JMP, water coverage is categorised into 5 ladders as depicted below:

Table 26: The New JMP ladder for Water Services

Service level	Definition
Safely managed	Drinking water from an improved water source that is located on premises, available when needed and free from faecal and priority chemical contamination.
Basis service	Drinking water from an improved source, provided collection time is not more than 30 minutes for a round trip, including queuing.
Limited service	Drinking water from an improved source for which collection time exceeds 30 minutes for a round trip, including queuing.
Unimproved	Drinking water from an unprotected dug well or unprotected spring.
Surface water	Drinking water directly from a river, dam, lake, pond, stream, canal or irrigation canal.
Note: Improved sources include: piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater, and packaged or delivered water.	

NB: Distance of 250m is used when information on 30 minutes is not available

The proportions of persons served by individual household connections to that of kiosks and/ public stand posts increased marginally in the period under consideration as shown in Table 27.

The water supply coverage depicted in Chart 1 has been broken down to reflect access to the low income households which are predominately served through kiosks/public stand taps. Table 27 shows access by customers through individual connections and public standpost/kiosks.

Table 27: Water Coverage Proportions

	Total Population 2022	Population Served 2022	Proportion of Population Serviced by Household Connections 2022	Proportion of Population Serviced by Public Standposts & Kiosks 2022	Total Population 2023	Population Served 2023	Proportion of Population Serviced by Household Connections 2023	Proportion of Population Serviced by Public Stand posts & Kiosks 2023
LWSC	3,012,425	2,786,596	38.8%	61.2%	2,988,247	2,831,531	41.0%	59.0%
NWSC	901,756	885,273	73.0%	27.0%	856,668	825,634	70.5%	29.5%
KWSC	810,273	674,906	92.4%	7.6%	827,579	666,143	95.9%	4.1%
MWSC	597,318	562,401	76.9%	23.1%	603,293	570,478	77.4%	22.6%
LGWSC	481,163	409,590	43.4%	56.6%	551,327	452,327	41.3%	58.7%
SWSC	549,062	521,549	88.8%	11.2%	598,312	568,397	87.8%	12.2%
CHWSC	505,917	413,517	57.1%	42.9%	601,464	512,232	67.0%	33.0%
NWWSC	306,540	216,903	51.4%	48.6%	356,740	220,071	52.1%	47.9%
WWSC	253,289	105,447	92.8%	7.2%	273,606	129,107	66.9%	33.1%
EWSC	350,574	327,792	54.5%	45.5%	375,398	344,692	56.3%	43.7%
LPWSC	266,044	133,024	77.5%	22.5%	331,323	164,617	95.1%	4.9%
Total	**8,034,361**	**7,036,998**	**59.0%**	**41.0%**	**8,363,957**	**7,285,229**	**60.5%**	**39.5%**

LWSC and LGWSC, have in the past four years, continued to have less than 50% of the proportion of the population served by individual connections. This

implies that the majority of people in these CUs have basic access to water mainly through kiosks/public water points and may even have *'limited'* access depending on the distance and/or time taken to draw water. The desirable trend is to have more people served by individual connections as this is mainly safely managed.

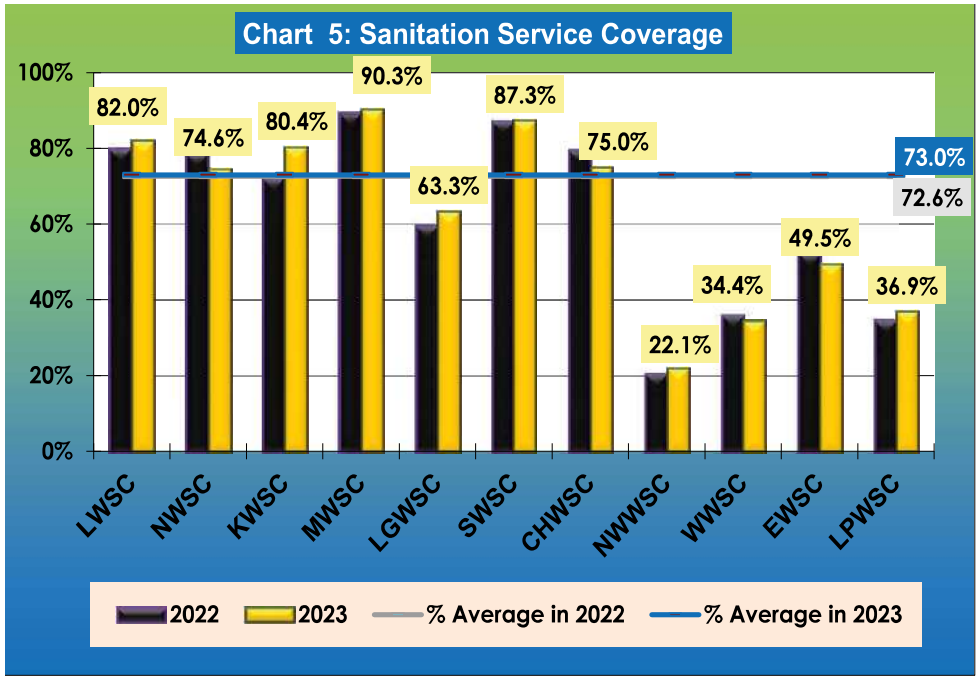
7.2.1.4 Sanitation Coverage

Sanitation coverage consists of the population serviced by offsite (centralised system) and septic tanks only.

Benchmark for Sanitation coverage	Good	>90%
	Acceptable	85% - 90%
	Unacceptable	<85%

The acceptable benchmark for sanitation coverage for the period 2021-2025 is 85%. It will be increased to 90% for the period beyond 2025 in order to align to the national aspirations of 90% coverage for sanitation by 2030.

Onsite sanitation facilities such as traditional pit latrines are not considered as acceptable for urban sanitation because they do not meet the basic criteria for safely managed sanitation. However, improved sanitation facilities can be considered based on availability of accurate data on existing facilities. This will be complimented by the enforcement of the code of practice/standards for onsite sanitation systems and Faecal Sludge Management being developed in collaboration with the Zambia Bureau of Standards (ZABS).



The average sanitation coverage for CUs' serviced areas increased slightly from 72.6% to 73%, translating into 273,753 more people accessing sanitation services. Only MWSC and SWSC met the acceptable benchmark. NWWSC, WWSC and LPWSC remained significantly below the acceptable benchmark with coverages of 22.1%, 34.4% and 36.9% respectively.

Table 28 shows the total number of sewer connections across CU service areas.

Table 28: Total Sewer Connections

CU	Total Sewer Connections 2022	Domestic Sewer Connections 2022	Total Sewer Connections 2023	Domestic Sewer Connections 2023
LWSC	43,221	39,268	48,220	44,267
NWSC	51,753	48,809	51,863	48,914
KWSC	47,701	45,659	50,996	48,962
MWSC	59,914	56,584	59,916	56,586
LGWSC	13,174	12,559	12,852	12,852
SWSC	14,838	14,087	15,905	15,143
CHWSC	4,685	3,922	4,737	4,737
NWWSC	714	687	710	688
WWSC	104	101	106	106
EWSC	3,831	1,986	2,093	1,993
LPWSC	1,437	1,220	1,520	1,220
Total	241,372	224,882	248,918	235,468

7.2.1.5 Population Served with Sanitation

Table 29 shows the proportions of people serviced by septic tanks and those on the network.

Table 29: Sanitation Coverage Proportions

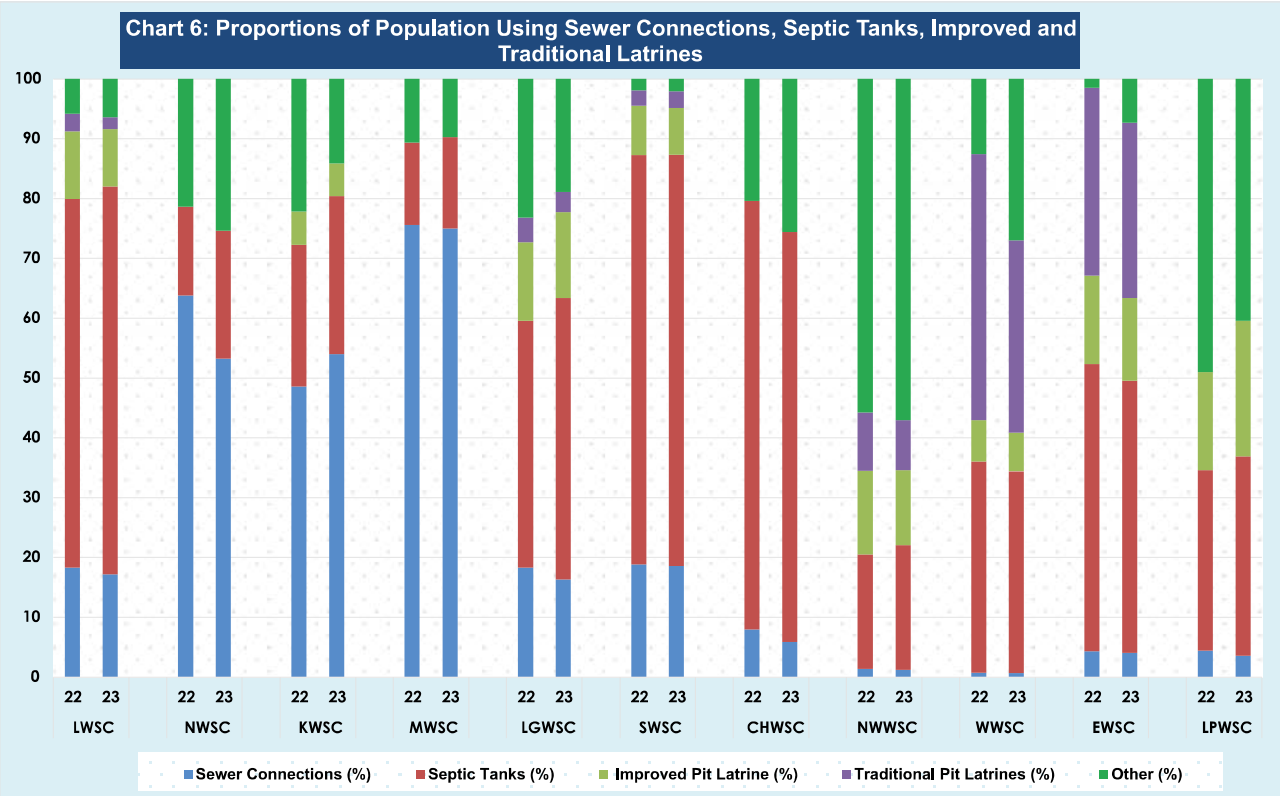
CU	Total Population 2022	Population Served 2022	Proportion of Population Served on Sewer Network 2022	Proportion of Population Served by Septic Tanks 2022	Total Population 2023	Population Served 2023	Proportion of Population Served on Sewer Network 2023	Proportion of Population Served by Septic Tanks 2023
LWSC	3.012.425	2.406.935	22.9%	77.1%	2.988.247	2.457.890	20.9%	79.1%
NWSC	901.756	709.198	81.1%	18.9%	856.668	639.259	71.3%	28.7%
KWSC	810.273	585.330	67.2%	32.8%	827.579	665.329	67.1%	32.9%
MWSC	597.318	533.846	84.6%	15.4%	603.293	544.750	83.0%	17.0%
LGWSC	481.163	286.705	30.7%	69.3%	551.327	349.159	25.8%	74.2%
SWSC	549.062	479.023	21.6%	78.4%	598.312	522.290	21.3%	78.7%
CHWSC	505.917	402.725	10.0%	90.0%	601.464	456.871	9.7%	90.3%
NWWSC	306.540	62.874	6.6%	93.4%	356.740	78.658	5.4%	94.6%
WWSC	253.289	91.338	2.0%	98.0%	273.606	94.091	2.0%	98.0%
EWSC	350.574	183.415	8.2%	91.8%	375.398	185.935	8.2%	91.8%
LPWSC	266.044	92.093	12.6%	87.4%	331.323	122.122	9.5%	90.5%
Total	8,034,361	5,833,482	38.3%	61.7%	8,363,957	6,116,354	35.1%	64.9%

Table 29 depicts sanitation coverage which is reflected in Chart 5, broken down to reflect access by sewer network, septic tanks, latrines and others.

Chart 6 depicts the proportion of population using sewer connections, septic tanks, improved pit latrines and traditional pit latrines. The information provided is not exhaustive as CUs are in a continuous process of undertaking citywide mapping of sanitation facilities in their service areas.

Therefore, NWASCO encourages all CUs to continue undertaking citywide mapping of sanitation facilities and updating their sanitation databases as this data is critical for planning and development of business and service delivery models.

Water quality testing at customer premises



Sewer ponds

Chart 6 shows that the largest proportion of the population under NWSC, KWSC and MWSC used offsite sanitation systems through sewer connections. LWSC, SWSC and CHWSC had the highest proportion of population using septic tanks. EWSC and WWSC had the highest proportion using traditional pit latrines. LPWSC and NWWSC had the highest proportion falling under the category *'other'*, which consisted of population yet to be captured by CUs or were practicing open defaecation.

The majority of people continued to access sanitation services through septic tanks. There was a slight increase in the proportion of people served with septic tanks. CUs continued to capture data on onsite sanitation facilities available in their service areas. For LWSC, the number of people served by the 5,750 improved latrines constructed under the Lusaka Sanitation Programme (LSP) were included in the coverage.

7.2.1.6 WHO/UNICEF Joint Monitoring Programme Sanitation Service Ladders

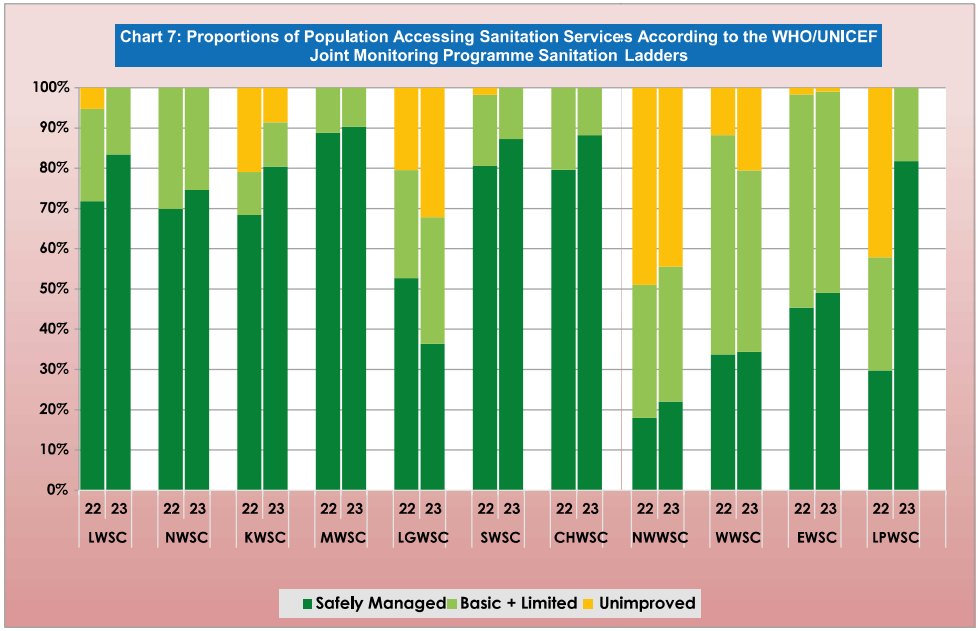
The WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) is responsible for global monitoring of the Sustainable Development Goals (SDGs) targets related to WASH. The WHO/UNICEF JMP uses sanitation service ladders to monitor, benchmark and report progress made by individual member countries in attaining the SDG targets on WASH by 2030. Therefore, in order to increase national harmonisation of all sanitation indicators, NWASCO now requires all CUs to capture and report sanitation data in accordance with the WHO/UNICEF JMP sanitation service ladders shown in Table 30.

Table 30: The New JMP ladder for Sanitation Services

SERVICE LEVEL	DEFINITION
SAFELY MANAGED	Use of improved facilities that are not shared with other households and where excreta is safely disposed of in situ or transported and treated offsite.
BASIC	Use of improved facilities that are not shared with other households.
LIMITED	Use of improved facilities that are shared between two or more households.
UNIMPROVED	Use of pit latrines without a slab or platform, hanging latrines or bucket latrines
OPEN DEFECATION	Disposal of human faeces in fields, forests, bushes, open bodies of water, other open spaces or with solid waste

Note: Improved sanitation facilities are those designed to hygenically separate excreta from human contact, and include: flush/pour flush to piped sewer system, septic tanks or pit latrines; ventilated improved pit latrines, composting toilets or pit latrines with slabs.

7.2.1.7 Proportion of population serviced by different sanitation facilities



i. Safely Managed Sanitation Services

Chart 7 depicts proportions of population accessing sanitation services according to the WHO/UNICEF JMP sanitation service ladders.

For purposes of this report, safely managed sanitation is taken as population using sewer connections and septic tanks only. It can be observed that the majority population in the CU service areas, save for NWWSC, WWSC, LGWSC and WWSC accessed sanitation using safely managed sanitation facilities.

ii. Basic and Limited Sanitation Services

Use of improved OSS facilities that are not shared fall under basic services. Limited services on the WHO/UNICEF sanitation ladders entails use of improved OSS facilities that are shared by more than one household. The data for limited sanitation services was not conclusive as the CUs were still

undertaking baseline surveys to capture the data. Therefore, for now basic and limited sanitation have been combined for ease of reporting.

EWSC and WWSC had the highest proportion of population using limited sanitation facilities such as VIPs and Pit Latrines.

iii. Unimproved services

The proportion of the population that does not fall in any of the two categories outlined in (i) and (ii) above was considered to fall under unimproved services. This category arises from incomplete data capture for the two categories above and those practicing open defaecation. NWWSC and LPWSC had the highest proportions of the population under this category.

7.2.1.8 Benchmarking Faecal Sludge Management Services

In November 2022, NWASCO developed Citywide Inclusive Sanitation (CWIS) Planning and Service Provision Guidelines to promote equity, safe management and financial sustainability of sanitation services. CWIS promotes inclusivity in urban sanitation service provision and embraces diverse sanitation technologies to respond to sanitation needs of various population segments that is, onsite or offsite systems.

Commercial Utilities are required to plan, provide and report inclusive FSM services as per licence condition. Further, reporting requirements and templates for FSM services are provided in the NWASCO CWIS Guidelines.

Following the development of the Regulatory Frameworks for Urban Onsite Sanitation and Faecal Sludge Management in June 2018, NWASCO further developed a benchmarking system which initially focuses on two Key Performance Indicators (KPIs) as shown in Table 31.

Table 31: Key Performance Indicators for Faecal Sludge Management

SN	Performance Indicator	Measurement	Data Requirements	Formula
1.	Desludged Septic tanks (%)	Percentage of septic tanks Desludged	Total number of septic tanks desludged; Total planned number of septic tanks to be desludged in the area	(Number of septic tanks desludged)/(Number of septic tanks planned for desludging in the area) (Number of septic tanks desludged)/(Total number of septic tanks in the area)
2.	Desludged Pit Latrines (%)	Percentage of Pit Latrines Desludged	Total number of Pit Latrines desludged; Total planned number of Pit Latrines to be desludged in the area	(Number of pit latrines desludged)/ (Number of pit latrines planned for desludging in the area) (Number of pit latrines desludged)/(Total number of pit latrines in the area)

Benchmarks for desludged pit latrines and septic tanks in required area	**Good**	**>100%**
	Acceptable	**85% - 95%**
	Unacceptable	**<85%**

CUs are at various levels in FSM service provision. Whilst some have

established units, systems, constructed treatment infrastructure and have commenced service provision, others are still mobilizing to have all these in place. The status of FSM service delivery with regard to the two KPIs has been reported for four CUs namely CHWSC, LWSC, LGWSC and SWSC. As other CUs meet data requirements for these KPIs, they will be included in future reports.

Table 32: Number of Emptied Onsite Sanitation Facilities and Faecal Sludge Volumes

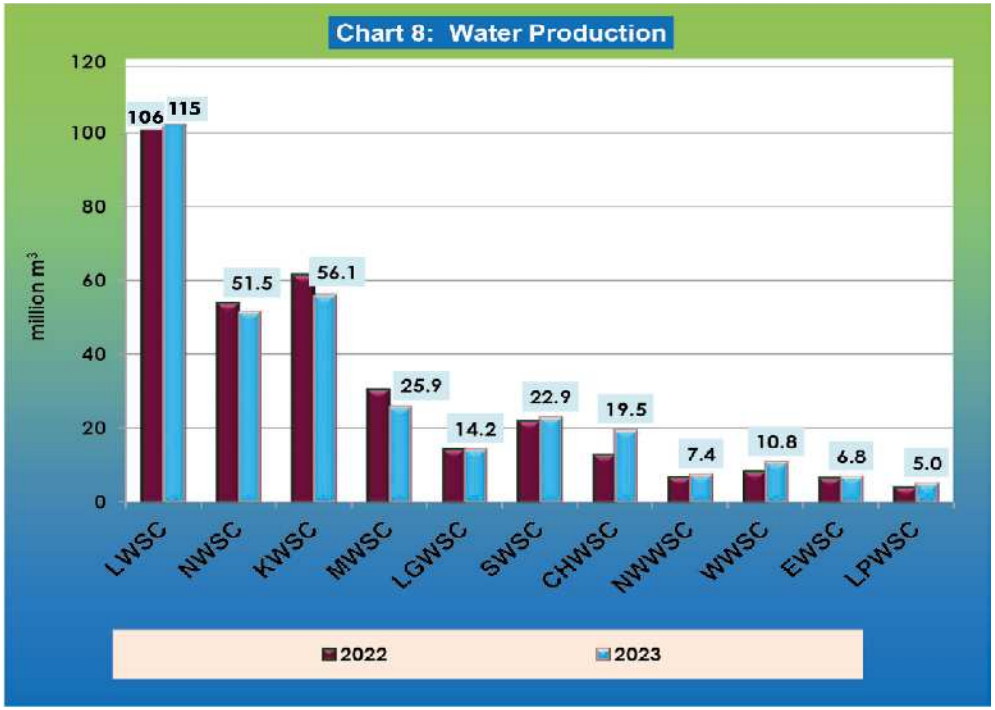
CU	Type of Onsite Sanitation				Total Number of OSS facilities emptied	Volume of Faecal Sludge emptied from pit latrines (m3)	Volume of Faecal Sludge emptied from Septic tanks (m3)	Total Volume of Faecal Sludge discharged at the Faecal Sludge Treatment Plant (m3)
	Septic tanks		Pit Latrines					
	No. Planned	No. Emptied	No. Planned	No. Emptied				
LWSC	Nil	6,776	Nil	3,571	10,347	11,071	33,878	44,949
SWSC	Nil	458	Nil	22	480	18	8,932	8,950
LGWSC	480	24	480	105	129	81.96	284.25	366.21
CHWSC	204	82	216	72	154	180.81	820.27	1,001.08
TOTAL		7,340		3,770	11,110	11,351.77	43,914.52	55,266.29

It can be observed from Table 32 that 55,266.29m^3 of Faecal Sludge (FS) was harvested from 11,110 OSS facilities, that is, pit latrines and septic tanks across the four CUs. The majority of the facilities emptied were septic tanks which are common forms of OSS systems in low to middle income townships.

7.2.1.9 Water Production

Water production reflects the volume of water treated and distributed into a network.

The figures in Chart 8 for water production are looked at in relation to the water losses depicted in Chart 10. With good operational efficiency, an increase in water production should only be necessitated by an increase in demand, customer base and/ or improved hours of supply. CUs should therefore aim at reducing NRW first before considering to increase production.



The total water production increased by 8.71 mil m^3 during the reporting period. The notable increase observed in LWSC of 8.9mil m^3 was due to additional production from the Lusaka bulk water supply line. Production volumes for CHWSC, WWSC and LPWSC increased due the new facilities constructed under the ISTWSS projects funded by the AfDB which were in use during the period under review. NWSC experienced pump breakdowns at the raw water source and treatment works in Kalulushi for a prolonged period of time which resulted in a reduction. The drop in MWSC was attributed mainly to increased pump breakdowns, frequent bursts and limited raw water availability in Mufulira that resulted in prolonged periods of supply interruption. The reduction in KWSC was as a result of the reduced levels in the Kafubu River. Additionally Mikomfwa Dam and Fisenge stream dried up during the year under review. KWSC also shut down the Kafubu Water Treatment Plant to facilitate works on the Kafulafuta Water System Supply Project.

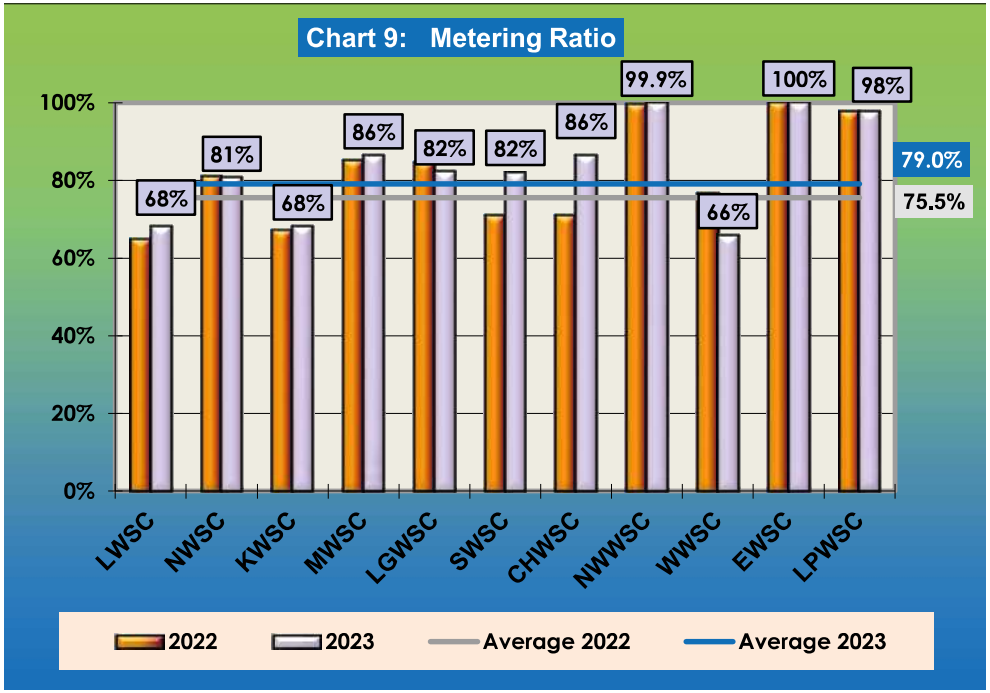
7.2.1.10 Metering Ratio

Metering ratio is the proportion of the metered connections compared to the total connections

Metering is required in order to measure the amount of water consumed, as well as charge consumers according to their consumption. It is one of the important strategies for managing NRW.

There was an increase in the sector average metering ratio from 75.5% to 79% as shown in Chart 9. CHWSC and SWSC made notable increases in their metering ratios owing to the ISTWSSP and support from the MWDS, respectively.

Only WWSC and LGWSC recorded drops in their metering ratio. This was attributed to the CU having made a significant number of new connections without meters.



According to the Tariff Setting Guidelines, no meter should remain stuck for more than 3 months. CUs should therefore endeavour to repair or replace stuck meters. Table 33 below shows the number of stuck meters as at 31st December 2023. LGWSC and SWSC had the highest number of stuck meters.

Table 33: Number of Stuck Meters

CU	2022	2023
LWSC	17,000	18,859
NWSC	323	246
KWSC	305	950
MWSC	698	1,510
LGWSC	1,793	1,669
SWSC	1,000	1,235
CHWSC	620	752
NWWSC	131	238
WWSC	645	746
EWSC	568	534
LPWSC	158	120
Total	**6,241**	**8,000**

Table 34 shows the proportions of water sold as metered and unmetered. The metered volumes are derived from meter readings while the unmetered sold volumes are estimated from the applicable flat rate tariffs for each CU.

Table 34: Proportions of water sold for metered and unmetered

	Total Water Sold 2022 m3	Proportion of Sold Water Metered m3 2022	Proportion of Sold Water Unmetered 2022 m3	Total Water Sold 2023 m3	Proportion of Sold Water Metered 2023	Proportion of Sold Water Unmetered 2023
LWSC	49.00	63%	37%	49.38	57%	43%
NWSC	21.67	56%	44%	22.21	47%	53%
KWSC	17.01	75%	25%	17.41	71%	29%
MWSC	16.53	86%	14%	14.85	83%	17%
LGWSC	6.22	77%	23%	6.01	73%	27%
SWSC	11.38	66%	34%	12.55	75%	25%
CHWSC	8.31	99%	1%	9.50	97%	2.7%
NWWSC	3.80	100%	0%	4.01	100%	0%
WWSC	2.65	56%	44%	2.92	53%	47%
EWSC	3.54	100%	0%	3.74	100%	0%
LPWSC	1.12	98%	2%	1.61	96%	4%
Total	**141.22**	**71.3%**	**28.7%**	**144.19**	**67.5%**	**32.5%**

The bulk of the volume of water sold was metered at about 67.5% against a metering ratio of 79%. Instances where the proportion of water sold which is metered is significantly lower than the metering ratio may imply that the proportion of customers who are metered are predominantly low consumers. This may have been the case for CUs such as SWSC, LPWSC and WWSC. The CUs should prioritise metering high consuming customers' especially institutions and commercial entities.

7.2.1.11 Water Loss Performance Indicators

Water losses are reported using different parameters such as the percentage of NRW (Chart 10), infrastructure leakage index (Table 38) and water loss per connection and length of water network/ litre/day (Table 39).

NRW, when compared with the total quantity of water put into supply, fluctuates widely in time and cannot, therefore, be expressed in a single fixed figure such as percentage, without extensive qualification. To be truly meaningful, the water lost, expressed as a percentage should always be related either to the distribution system (length of water network) and/or to service points (customer

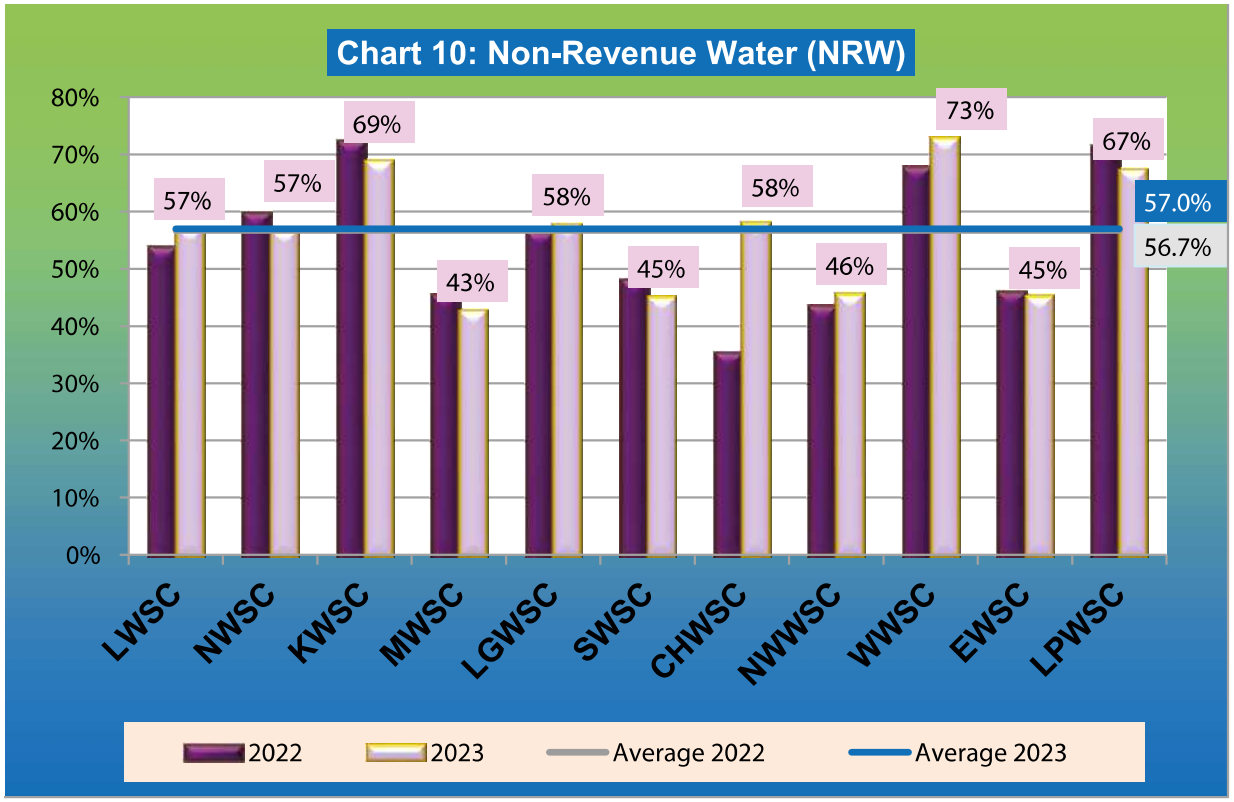
connections).

7.2.1.11.1 Non-Revenue Water

Non-Revenue Water (NRW) is the difference between the quantity of treated water distributed in the network and the quantity of water billed as shown in Chart 10. NRW consists of technical losses (leakages) and commercial losses (illegal connections, unbilled customers, wastage on un-metered customers' premises etc.). In the absence of metering, the volumes could be unreliable estimates.

Bench-mark for NRW	Good	<20%
	Acceptable	20-25%
	Unacceptable	>25%

Chongwe Dam



The CUs lost an additional volume of 7.23mil m^3 from previous year and the overall average percentage of NRW increased marginally. WWSC and KWSC had the highest NRW which requires urgent attention. For LWSC and WWSC, their increase in production did not correspond to the increase in billing.

7.2.1.11.2 Network Failures per 100km

Network failures per 100km shows how weak the network is, thus contributing to water losses. The higher the number, the more porous the network. A porous network may lead to increased water losses hence timely repair of leakages is required. LWSC, NWSC and KWSC had relatively low number of failures on their main lines while NWWSC and WWSC had relatively high number of failures per 100km.

Table 35: Failures per 100km of main line

CU	2022	2023
LWSC	0.2	0.3
NWSC	0.5	0.6
KWSC	19.0	0.1
MWSC	7.1	2.7
LGWSC	0.2	0.0
SWSC	11.6	9.6
CHWSC	56.1	2.8
NWWSC	129.9	156.5
WWSC	62.6	10.7
EWSC	1.3	1.3
LPWSC	2.8	0.0

Table 36: Infrastructure leakage Index Guidelines

Technical Performance Category		ILI	Litres/connection/day (when the system is pressurized) at an average pressure of:				
			10 m	20 m	30 m	40 m	50 m
Developing Country Situation	A	1 - 4	< 50	< 100	< 150	< 200	< 250
	B	4 - 8	50-100	100-200	150-300	200-400	250-500
	C	8 - 16	100-200	200-400	300-600	400-800	500-1000
	D	> 16	> 200	> 400	> 600	> 800	> 1000

7.2.1.11.3 Water loss per connection and length of water network in litres/day

The International Water Association (IWA) has developed the infrastructure Leakage Index (ILI) as a method of performance comparison which can be used by a Water Utility to measure its own success. The index is calculated from the ratio of current annual real losses to unavoidable annual real losses (UARL) and provides the basis for developing a leakage management strategy. According to IWA classification, the lower the ILI, the better is the Utility's performance. It also allows inter-company and inter-country comparisons.

Table 37: IWA Infrastructure Leakage Index Technical Performance Categories

Infrastructure Leakage Index International Water Association classification

Category	Comments/ Recommendations
A	Further loss reduction may be uneconomic unless there are shortages; careful analysis needed to identify cost effective improvement
B	Potential for marked improvements; consider pressure management; better active leakage control practices, and better network maintenance
C	Poor leakage record; tolerable only if water is plentiful and cheap; even then, analyse level and nature of leakage and intensify leakage reduction efforts
D	Horrifically inefficient use of resources; leakage reduction programs imperative and high priority

IWA comments/ Recommendations on categories

7.2.1.11.4 Infrastructure Leakage Index

Table 38 shows the ILI for CUs. The technical performance of CUs is compared to the IWA Guidelines in Table 37.

Table 38: **Infrastructure Leakage Index**

CU	2022	2023	Category
LWSC	45.9	50.1	D
NWSC	56.2	50.4	D
KWSC	74.4	63.6	D
MWSC	28.8	22.7	D
LGWSC	42.5	55.3	D
SWSC	15.3	14.1	C
CHWSC	25.0	28.7	D
NWWSC	13.8	15.5	C
WWSC	64.3	87.6	D
EWSC	12.4	12.0	C
LPWSC	27.8	19.4	D

All CUs had an undesirable ILI. The status quo remained the same for all the CUs. Commercial Utilities need to have in place comprehensive programmes for NRW reduction.

Table 37 is used to check whether CUs are conforming to the loss in litres/day/connection standard, within the categories that they fell in. A loss of greater than 1,000 litres/day/connection is unacceptably high.

Table 39: Water loss per connection and length of water network in litres/day

Provider	Water Loss per length of network per day 2022 (L/km/day)	Water Loss per length of network per day 2023 (L/km/day)	Water Loss per Connection per Day 2022 (L/con/day)	Water Loss per Connection per Day 2023 (L/con/day)
LWSC	60,031	65,805	1,160	1,265
NWSC	85,563	77,170	1,178	1,055
KWSC	87,546	76	1,718	1,458
MWSC	41,328	32,724	617	486
LGWSC	7,657	8,145	690	1,292
SWSC	12,431	11,591	441	403
CHWSC	9,505	2,338	380	389
NWWSC	10,575	12,075	417	464
WWSC	27,023	37,709	905	1,210
EWSC	13,497	13,662	298	282
LPWSC	15,153	15,190	648	271

The magnitude of losses per day per connection increased while that of per length of network reduced. LWSC, NWSC KWSC, LGWSC and WWSC recorded unacceptably high losses per connection per day of above 1,000 litres per connection per day. KWSC, LWSC and LGWSC had the highest losses per length of network per day.

7.2.1.11.5 Assumed Lost Revenues due to NRW in 2023

To appreciate the magnitude of water losses, the NRW figures were translated into monetary terms, as shown in Table 40. Any loss of revenue in business is unacceptable. However, in the water sector, a benchmark of 25% has been set as acceptable loss. If NRW is not reduced to the acceptable benchmark, the magnitude of loss becomes even greater as the business expands. CUs must strive to come up with strategies of realising some of the assumed lost revenue.

Table 40: Assumed Lost Revenues due to NRW

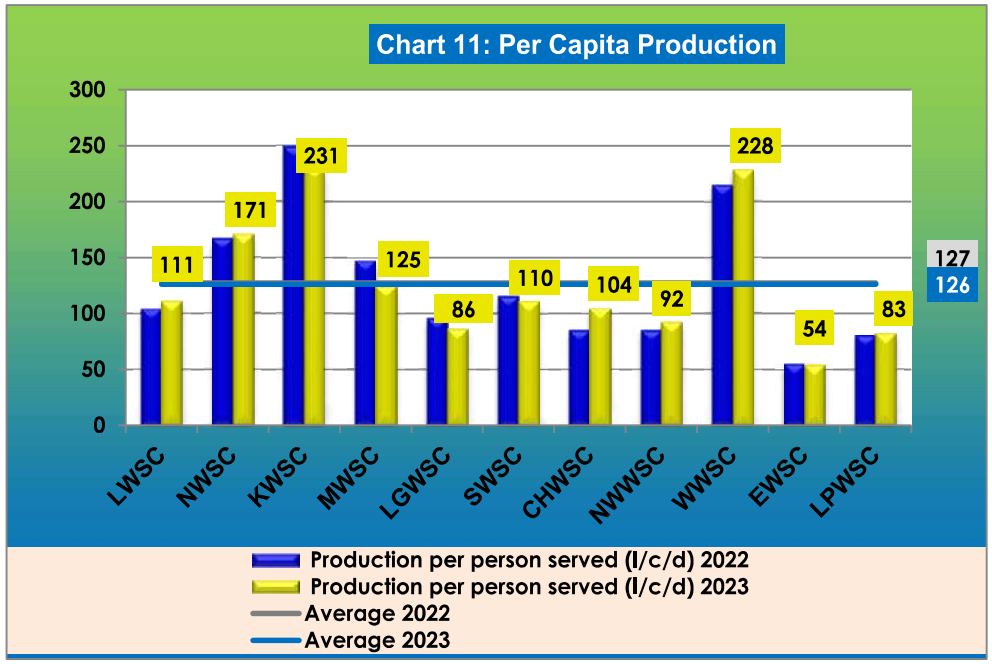
	Metering Ratio 2023	Total Water Billing (ZMW) 2023	NRW 2023 (in %)	NRW (ZMW) 2022	NRW (ZMW) 2023
LWSC	68%	371,588,054	57%	418,850,209	493,576,216
NWSC	81%	134,032,139	57%	194,267,989	176,730,993
KWSC	68%	114,917,748	69%	298,642,701	255,187,721
MWSC	86%	101,362,856	43%	96,231,121	75,659,247
LGWSC	82%	45,125,102	58%	62,362,900	61,679,874
SWSC	82%	108,917,244	45%	85,488,338	89,510,965
CHWSC	86%	35,824,305	58%	17,691,914	49,471,659
NWWSC	100%	27,277,305	46%	19,830,769	22,855,584
WWSC	66%	20,494,252	73%	39,564,747	54,963,230
EWSC	100%	35,274,927	45%	28,328,276	29,013,258
LPWSC	98%	11,518,192	67%	20,646,627	23,857,090
Total		**1,006,332,124**		**1,281,905,591**	**1,332,505,836**
				Unaccepatable Loss	**747,796,346**
AcceptableLoss		2,338,837,960	**584,709,490**		

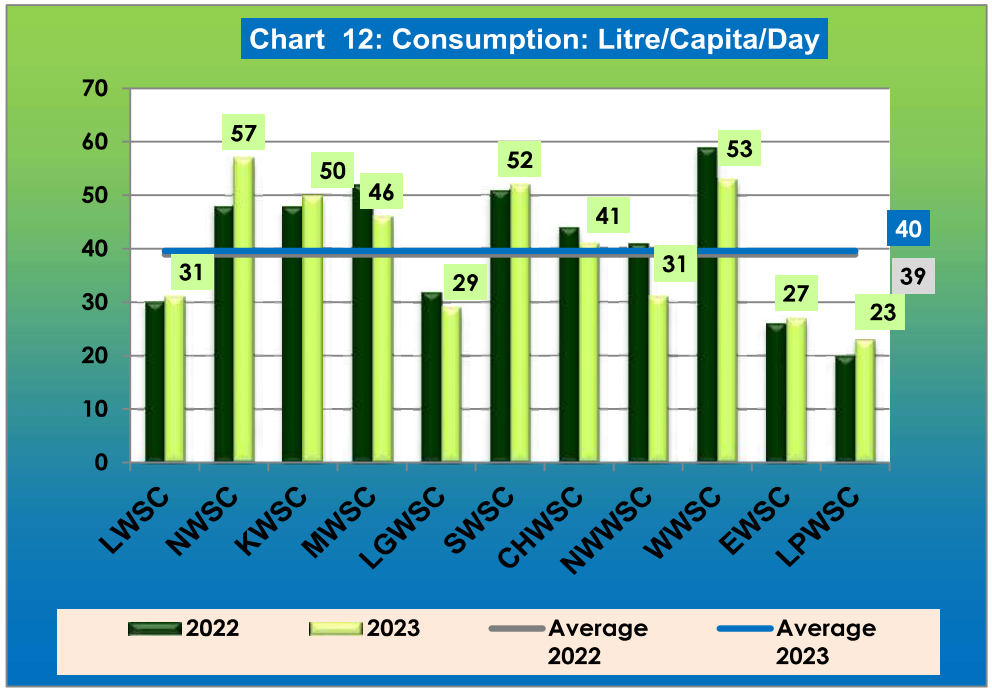
There was an increase in the assumed lost revenue due to NRW of over K25.9mil. At the benchmark of 25% NRW, the acceptable loss would have been about K584.7million against the actual loss of about K1.33billion. This translates into an unacceptable loss of K747.8mil.

7.2.1.12 Production and Consumption in Litre per Capita per Day

Charts 11 and 12 show the average amounts of water produced and consumed per person per day, respectively. An analysis of the two charts reveals the degree to which CUs are able to meet the required water consumption standards.

According to the World Health Organisation (WHO) guidelines, 50 litres is the acceptable minimum water consumption required per person per day for basic hygienic considerations. However, this is a bare minimum and could still pose health risks.





Four CUs namely NWSC, KWSC, SWSC and WWSC met the minimum recommended consumption volume of 50 litres per capita per day in Chart 12. The average per capita consumption increased slightly from to 39 to 40 litres.

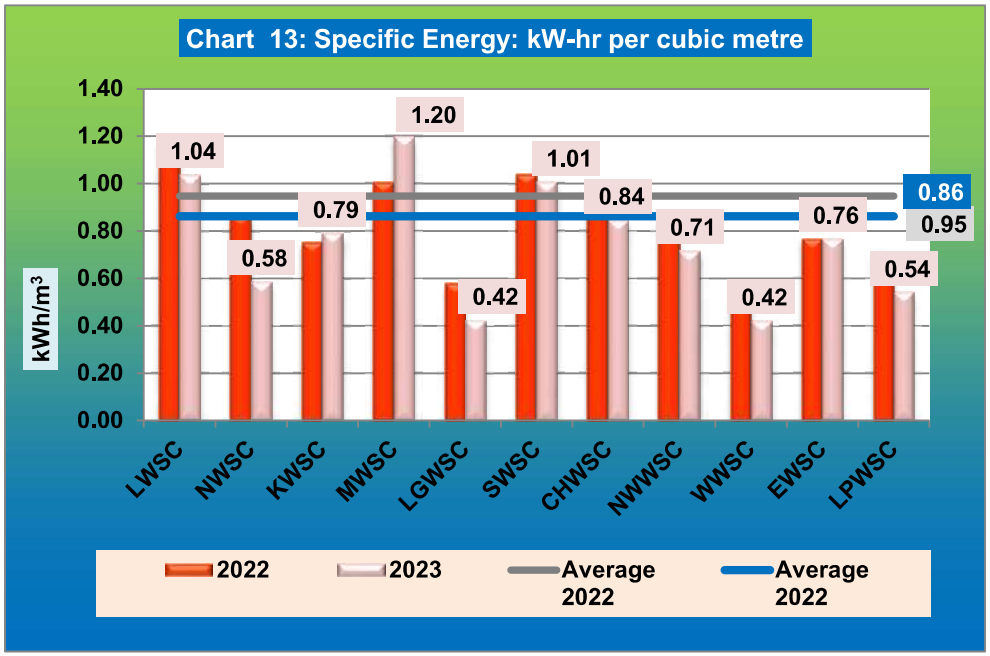
The low consumption per l/c/d for EWSC and LPWSC could be attributed to their high metering and low sewerage coverage which may result in low water usage. When metered, customers generally become more cautious with water usage. Where sewered sanitation coverage is low, people utilise facilities which use little or no water.

LWSC and LGWSC had a higher proportion of their population served by public water points and kiosks which tend to pose limitation to the quantity of water drawn hence the low consumption per capita per day.

CUs with higher per capita production could either have higher NRW or high non-domestic consumption. This was true for KWSC and WWSC which had high production per capita but low consumption per capita hence most of the water went to waste. NWSC and MWSC high per capital production could be mainly due to the huge industrial base which form part of non-domestic customers.

7.2.1.13 Specific Energy

Energy consumption has traditionally been reported as a monetary figure which also includes costs related to fuel used in the running of vehicles and other machinery not directly related to water production or waste water treatment. The main contributor to the energy cost however, is energy used in pumping operations. It has become important for Utilities to single out this part and report it separately so as to help Utilities monitor their energy usage and therefore develop energy efficiency strategies aimed at using energy more sustainably and efficiently.



It should be noted that specific energy in kWh/m³, in Chart 13, cannot be used to compare one Utility to another because of the different operating environments and technologies used in pumping and treatment processes. The operating environment includes type of source used i.e. surface, groundwater or both, distribution method used i.e. gravity or pumping, and length of distribution system and pressure head. It is however, possible for Utilities to benchmark their individual pumping stations and treatment plants with those employing similar technologies in other Utilities. A downward trend for specific energy is desirable.

The recommended sector range for specific energy per cubic meter is 0.39 – 1.03kW-hr/m³. All CUs were within the recommended range except for LWSC and MWSC. The increased specific energy for LWSC could be attributed to the high energy required to pump water from Iolanda Water Treatment Plant which is 65km from the City of Lusaka and at an elevation distance of over 100 meters. For MWSC, it could be attributed to pumping energy inefficiencies.

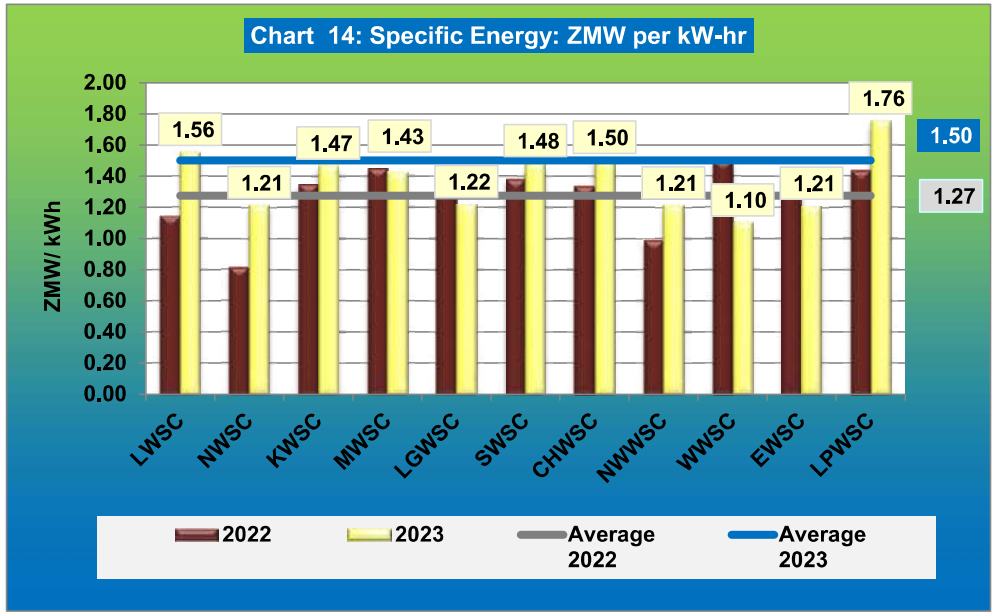


Chart 14 shows the specific energy in kwacha per kilowatt hour. The specific energy in kwacha per kilowatt hour must be looked at in comparison to the electricity cost per kilowatt hour for 2023 which were as stated in Table 41.

Table 41: Electricity Tariffs

Category	2023 Tariff (K)
0–12,000 kWh	0.5
12,000 – 50,000kWh	0.57
50,000 – 100,000kWh	1.01
Above –100,000kWh	1.53

It is expected that all CUs specific energy ZMW/kW-hr should fall within the maximum charge per kilowatt hour of K1.53 for social tariff for treatment and pump stations. For the period under consideration, LWSC and LPWSC had a specific energy higher than the maximum charge of K1.53. CUs are encouraged to institute energy reduction strategies to optimise energy usage.

7.2.1.14 Maintenance

A good Maintenance Management System (MMS) is required for a CU to reduce down time. This entails good planning, record keeping, skilled personnel to undertake maintenance, effective monitoring and evaluation of systems and processes. Charts 14, 15 and 16 depict the extent to which planned and unplanned maintenance works were attended to.

Sewer Blockages

This indicator measures sewer blockages per 100 connections and per 100km of sewer network to show the density of blockages. A high number of blockages may reflect a poor state of the sewer network and/or poor maintenance. Blockages may also indicate bad usage practices (such as dumping solid waste in manholes) and also overloading of the network. Table 42 shows the number of blockages per connection and per 100km sewer network.

Table 42: Sewer Blockages

	Sewer Blockages/ 100 Connections 2022	Sewer Blockages/ 100 Connections 2023	Sewer Blockages/100km 2022	Sewer Blockages/100 km 2023
LWSC	0.5	12	28	627
NWSC	15	11	273	487
KWSC	4	18	5,934	1,469
MWSC	20	10	818	535
LGWSC	6	9	536	800
SWSC	28	3	545	333
CHWSC	0.8	3	3	9
NWWSC	20	5	553	127
WWSC	28	68	65	161
EWSC	48	43	2,981	2,612
LPWSC	1	1	63	52

KWSC and EWSC had the highest numbers of sewer blockages for both per 100 connections and per 100km. This was mainly due to the deplorable state of the sewer networks. The Copperbelt CU and LWSC were mainly affected by high rates of vandalism and theft of sewer facilities and indiscriminate dumping of solid waste in the sewer system.

Plant Utilisation: Water and Sewage

Plant Utilisation in Table 43 reflects the operational efficiency of the plant in relation to the design capacity. A low level of plant utilisation could indicate inadequacies in maintenance, frequent downtime or just underutilisation of the facilities. Fully utilised plants could signal the need for new investment to expand infrastructure.

Table 43: Plant Utilisation: Water and Sewage

CU	Plant Utilisation Water 2022	Plant Utilisation Water 2023	Plant Utilisation Sewage 2022	Plant Utilisation Sewage 2023
LWSC	84.4%	91.4%	78.5%	67.7%
NWSC	77.8%	74.4%	88.3%	88.3%
KWSC	65.8%	60.0%	81.7%	106.3%
MWSC	35.8%	30.6%	47.1%	44.0%
LGWSC	37.8%	37.6%	84.0%	78.0%
SWSC	67.2%	68.2%	46.0%	47.9%
CHWSC	69.6%	73.1%	38.3%	47.6%
NWWSC	65.9%	72.2%	14.0%	14.0%
WWSC	47.4%	60.7%	N/A	53.9%
EWSC	69.5%	72.4%	79.8%	45.1%
LPWSC	60.2%	76.3%	N/A	40.0%

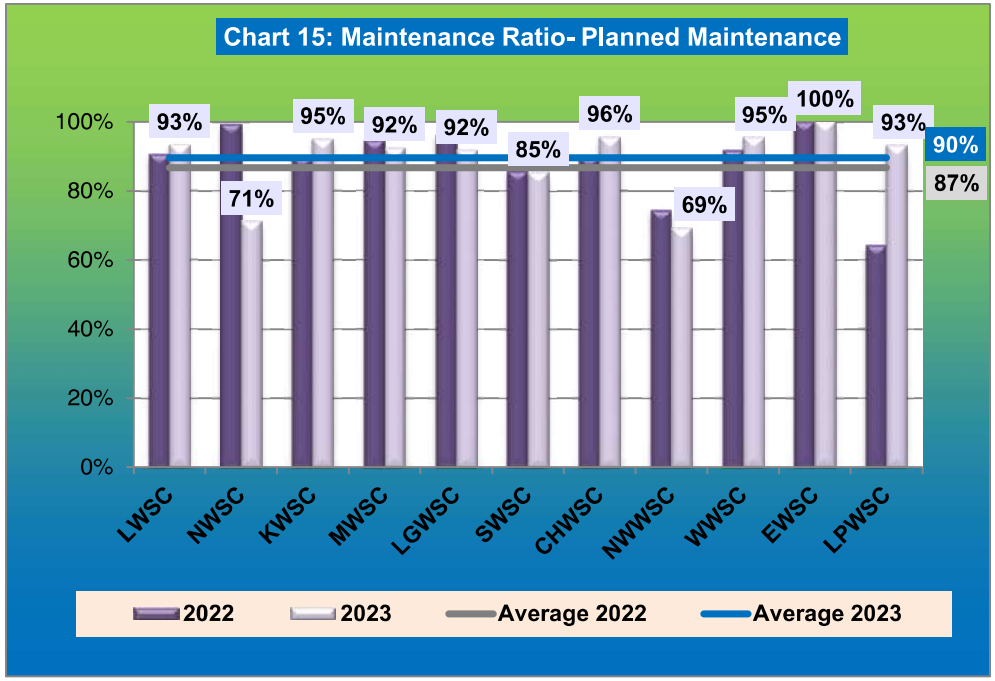
In an attempt to meet demand amid high water losses, CUs may resort to increasing utilisation of their plants. Three CUs reduced their water plant utilisation namely NWSC, KWSC and MWSC. KWSC recorded the highest drop in plant utilisation for water due to reduced pumping arising from drying of water sources and eutrophication in the Kafubu Dam in Ndola.

LWSC, MWSC, LGWSC and EWSC reduced their wastewater plant utilisation as a result of reduced in flows. LPWSC partially commenced utilisation of the new sewage treatment plant in Mansa hence the recorded plant utilisation.

7.2.1.14 Maintenance Ratio

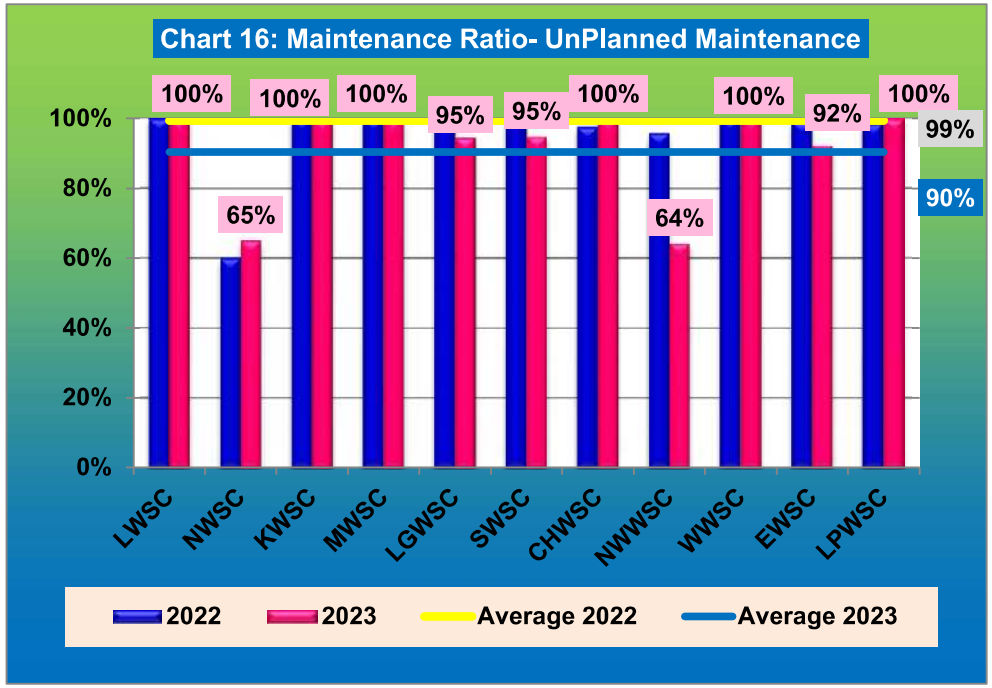
i. Planned Maintenance

In order to ensure that CUs have developed and are implementing Maintenance Management Systems, the number of planned maintenance works with those that were actually carried out is compared in Chart 15. CUs should ensure that they have robust MMS that they adhere to and carry out at least 95% of the planned works.



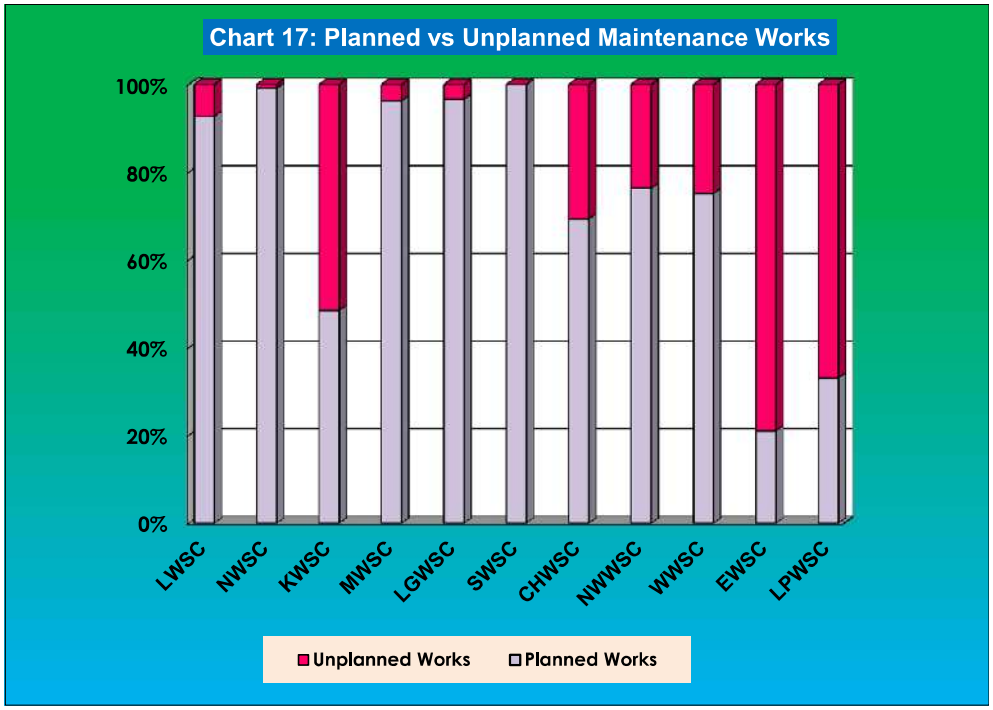
The average ratio on planned maintenance improved slightly although it was still below the benchmark. Four CUs namely KWSC, CHWSC, WWSC and EWSC met the target of 95% on execution of planned maintenance works. NWWSC had the least compliance which was largely attributed to the lack of maintenance materials.

All unplanned maintenance works should ideally be executed within a short period of time as they are usually deemed as emergencies. Nearly all the unplanned works were executed during the year under review except NWSC and NWWSC.



ii. Planned vs Unplanned Maintenance

To further appreciate the volume of maintenance works that CUs undertake, the quantity of unplanned works undertaken was compared to the planned works. Unplanned works generally arise from unexpected disturbances to the infrastructure/ facilities.



EWSC and LPWSC had the highest proportion of unplanned works which may indicate poor planning or infrastructure challenges.

7.2.2 SERVICE LEVEL INDICATORS

The Service Level Indicators portray the quality of service a company is rendering to its customers. Three major ones include water quality, hours of supply and resolution of customer complaints.

7.2.2.1 Water Quality

Water quality is very important due to the health impact it has on the consumers. The two main parameters considered are bacteriological (total and faecal coliforms) and physiochemical (Chlorine residue, pH, turbidity and colour). Chlorine residue test is given prominence under physiochemical parameters because of its relation to the bacteriological aspect of water.

For water quality monitoring, the assessment criteria used is in line with ISO/IEC 17025: 2005 standard (General requirement for the competence of testing and calibration laboratories). The overall compliance is assessed through a sequential three-step process as below:

a) Confidence level

The confidence level step is the first stage of assessment and evaluates the credibility of the whole water quality monitoring chain with respect to 10 equally weighted key criteria that are likely to influence the correctness of test results. The criteria are:

i. Availability and accessibility of laboratory quality manual and Standard Operating Procedures (SOPs)

ii. Availability and state of water testing equipment

iii. Calibration of water testing equipment

iv. Laboratory operating environment

v. Availability of fit-for-use chemicals and reagents

vi. Reporting ethics (data manipulation, selective reporting, etc.)

vii. Recording of data in a prescribed format

viii. Adherence to sampling, sample handling and testing protocols

ix. Evidence of feedback to stations and evidence of corrective action

x. Qualification and competence of personnel

Providers are required to meet at least 80% of the criteria, failure to which they are rated **red/D**.

b) Number of samples tested in relation to the minimum required

The second stage of assessment considers the number of analysed samples for each prescribed parameter against the required minimum tests in a particular network. This assessment step requires that service providers analyse at least

95% of all samples required for each parameter for each network serviced. Failure by more than 5% in any single network is considered as non-compliance with a rating of **orange/C**.

c) Number of tests meeting the national drinking water standards

This is the final stage of assessment and considers the number of test results that meet the national drinking water standards specified in ZS 190: 2010 for each particular parameter from all samples analysed.

If the overall compliance score is at least 95%, it is rated **green/A** or else a **yellow/B** rating applies.

	Rating	Performance
Benchmark	D	< 80% at competence level stage
	C	< 95% to required samples analysed
	B	< 95% to National Drinking Water Standards
	A	≥ 95% to National Drinking Water Standards

Table 46 shows the performance of providers in the reported year.

Aerator

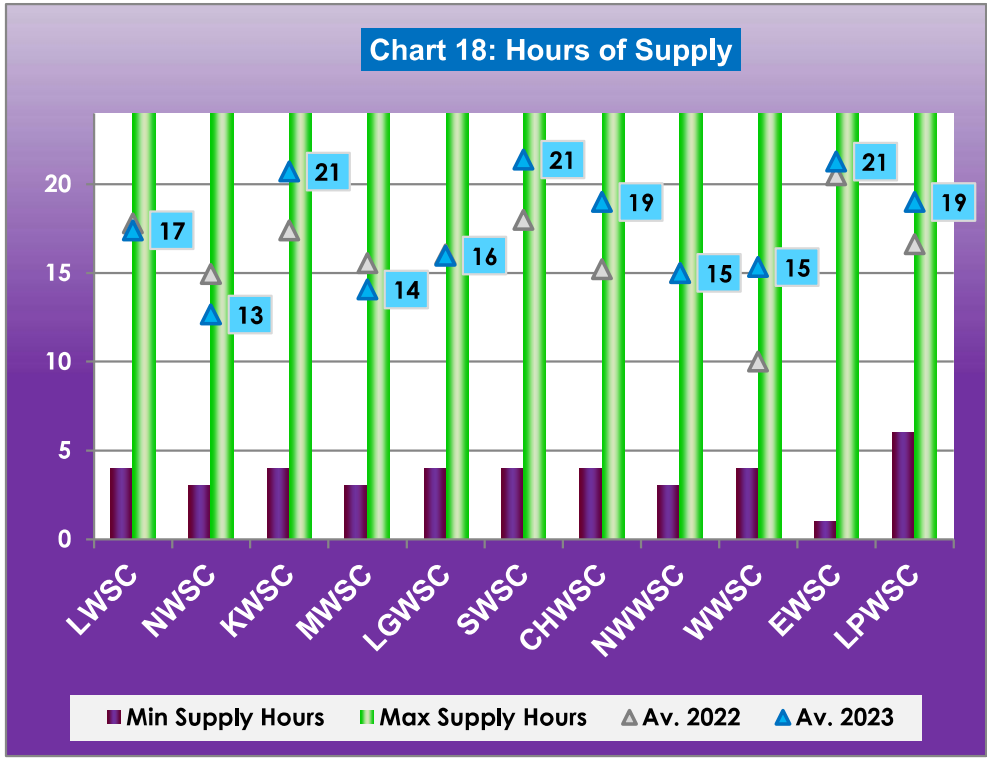
Table 44: Water Quality Analysis

Name of CU	Confidence level	Overall Rating	Remarks
LWSC	87%	B	Chlorine residue failures in Lusaka, Kafue and Chilanga District and high turbidity failures in Chongwe District
NWSC	90%	A	Generally experienced bacteriological and turbidity failures
KWSC	87%	A	Bacteriological failures in Ndola District networks and Turbidity failures in Luanshya and Masaiti Boma Networks
MWSC	82%	A	Bacteriological and colour failures in Chingola and Mufulira Districts' networks
LGWSC	84%	A	Chlorine residue failures in Kapiri Mposhi and Serenje Districts' networks
SWSC	88%	A	Turbidity failures in Choma Chirundu and Mazabuka Districts' networks
CHWSC	87%	A	Turbidity failures in Nakonde District
NWWSC	90%	B	The CU had frequent breakdowns of their chlorine dosing equipment leading to them using drip ineffective dosing methods
WWSC	92%	B	Failures in chlorine residue in Mongu, Kaoma, Limulunga,Sesheke, Senaga and Namushakende Disricts networks. Also turbidity and colour failures in Kalabo , Senaga, Sesheke and Mwandi Districts' networks
EWSC	89%	A	High turbidity failures in Chipata District
LPWSC	90%	A	Despite the overall score, Water supplied to Nchelenge District is merely disinfected. The district experiences high levels of turbidity and colour

7.2.2.2 Hours of Supply

The weighted average hours of supplied by CU is reflected in Chart 18.

Benchmark for hours of supply (cluster 1 and 2)	Good	20- 24 hours
	Acceptable	18 - 20 hours
	Unacceptable	<18 hours
Benchmark for hours of supply (cluster 3)	Good	>18 hours
	Acceptable	16 -18 hours
	Unacceptable	<16 hours



The sector average for hours of supply increased from 16.9 to 17. 4 between 2022 and 2023. Increases in the hours of supply recorded in KWSC, CHWSC, WWSC and LPWSC were due to the ongoing projects. Only KWSC, SWSC and CHWSC met the sector benchmark in clusters 1 and 2 while in cluster 3, only WWSC and NWWSC did not meet the benchmark.

7.2.2.2.1 Minimum Supply Hours

The least number of hours were supplied in areas such as:

- Under LWSC, the entire Chongwe District;
- Under NWSC, Luangwa, Chamboli P, Wusakile T and E Townships in Kitwe District and most parts of Kalulushi District;
- Under KWSC, Ibenga Township in Masaiti, Mpatamato Township in Ndola and parts of Kamirenda Township in Luanshya District;
- Under MWSC, Kalukanya, Kamuchanga Butondo, Fairview, Ndeke and Kantanshi Section 8 Townships in Mufulira, parts of Twatasha, Lulamba Stages 5, 6 and 7, Twatasha Site and Service, Nchanga North, Kamba, Chiwempala, Maiteneke and Chabanyama Townships in Chingola District;
- Under LGWSC, parts of Mumbwa District, Tazara and Police Townships in Kapiri Mposhi District, High cost, Indeco and parts of town centre Townships in Mkushi District;
- Under SWSC, Highlands Township in Mazabuka, Mayakayaka, Kambilombilo and Lumbwe Townships in Maamba District and parts of Ellen Britel Township in Livingstone District;
- Under CHWSC, Mwenzo Township in Nakonde District;
- Under NWWSC, parts of Zambia Compound, Messengers, Kimasala, Kazomba Kyawama and Prisons Townships in Solwezi District and most parts of Mufumbwe District;
- Under WWSC, Mulamatila, Airport and parts of Mulamba Townships in Kaoma District, Boma, North Park and parts of Imwiko stage 2 Townships in Mongu District, Katuya and Mungule Townships in Senanga District;
- Under EWSC, Chanida Boarder, Zone 3 (main location and new houses), Zone 5 (Kamunzi), Tasala and Chimate Townships in Petauke

District, East Rise, Chimwemwe, Magazine, Magwero and Old gym Townships in Chipata, Makeni A, parts of new hospital, Chipazi, Kaluba and Chipyola Townships in Chama District, Old airport Township in Lundazi District; and

- Under LPWSC, St Mary's and Lupili Townships in Kawambwa District, Ndeke Air Strip, Robby area, Kafimbwa, parts of Low Density and parts of Police Camp Townships in Nchelenge District.

7.2.2.2.2 Interruption of Service

Major interruptions in water supply lasting for more than 48 hours continuously were experienced in a number of areas as shown in Table 45:

Table 45: Interruption of Water Supply

CU	District/Town	Details
LWSC	Lusaka City	There was a shutdown at Iolanda Water Works to facilitate for maintenance works on the rising main from the treatment plant resulting in interruptions of supply in most parts of Lusaka City for close to 60 days
	Chongwe	The high turbidity in the dam and the breaking down of boreholes as well as dilapidated Water Modular Plant resulted in water supply interruption for most part of the year
LGWSC	Kabwe	Mulungushi Dam was not operational during most parts of the year due to a burst on the transmission line resulting in supply interruption in parts of Kabwe District
	Kapiri Mposhi	Pump failures at Mushimbili and Luchu dams affecting supply in most parts of Kapiri Mposhi District
	Mumbwa	High lift Pump failures and submerging of the pump chamber in Chibila dam resulting in interruption of supply in Kambobe, Munengu, Malata and Chibila site and service
CHWSC	Luwingu	Frequent pump failures both at the intake and booster stations resulting in water interruption in the entire district
	Kasama	Frequent pump failures at the intake and treatment plants mainly due to electrical faults resulting in water interruptions in parts of Kasama District
	Isoka	Electrical panel failure at Kasoka affecting supply in the entire district
NWWSC	Solwezi	The high turbidity and frequent pump failures at the main treatment plant in Solwezi affected supply to most parts of the district
WWSC	Mongu	Vandalism of Katongo Boreholes, collapse of four production boreholes in the main wellfield, collapse of ZESCO main line resulted in supply interruptions in parts of Mongu District
LPWSC	Nchelenge	Supply interruptions due to pump failure in Kashikishi
MWSC	Mufulira	Pump failure at mine plant and shutdown to pave way for projects resulted in frequent interruptions of supply
	Chingola	Frequent shutdown to pave way for projects resulted in frequent interruptions of supply

7.2.2.3 Customer Complaints

Complaints figures are important in gauging customer satisfaction regarding the service received from the provider. By regulation, CUs are required to keep a record of customer complaints and resolve them within a stipulated timeframe. Customer awareness plays a critical role in ensuring that complaints are reported and resolved.

A reduction in the number of complaints could indicate improvement in service and/or that customers are losing confidence in providers for not attending to their complaints.

Table 46: Customer Complaints

CU	Total Customer Complaints 2022	Total Customer Complaints 2023	Total Complaints Resolved 2023	Total Complaints % Resolution 2023	Complaints per 100 Connections 2022	Complaints per 100 Connections 2023
LWSC	35,333	38,991	37,011	95%	26	27
NWSC	6,274	5,379	5,094	95%	8	7
KWSC	8,178	8,661	7,822	90%	12	12
MWSC	31,393	31,817	30,322	95%	51	51
LGWSC	14,961	9,645	7,062	73%	18	18
SWSC	9,607	8,109	8,109	100%	15	12
CHWSC	27,729	58,164	57,696	99%	85	125
NWWSC	4,309	3,776	3,360	89%	22	19
WWSC	4,076	6,096	5,580	92%	29	49
EWSC	9,361	6,500	4,798	74%	34	22
LPWSC	2,189	3,160	2,880	91%	47	29
Total Complaints	153,410	180,298	169,734	94%	28	31

The overall complaints resolution rate remained at 94% which was below the acceptable benchmark of 95%. Five CUs namely SWSC, LWSC, CHWSC, NWSC and MWSC met the benchmark. LGWSC had the lowest resolution rates at 73%. Although MWSC, NWSC and CHWSC met the benchmark, complaints were generally not resolved within the stipulated timeframes.

7.2.3 FINANCIAL INDICATORS

Financial indicators analyse the revenues and costs of the CUs to illustrate viability and sustainability.

World Consumer Rights Day exhibition

Customer Survey on water service delivery

7.2.3.1 Billing for Water and Sewerage Services

Billing for water and sewerage services is shown in Table 47. This is the revenue that the CUs get for providing water supply and sewerage services. It excludes other charges such as sanitation surcharge, meter charges, reconnection fees and penalties. The billing for water and sewerage services were reflected separately in order to monitor viability of the two business units.

Table 47: Billing for Water and Sewerage Services

CU	Billing Water 2022 (ZMW)	Billing Sewer 2022 (ZMW)	TotalBilling Water and Sewer (ZMW)2022	Billing Water 2023 (ZMW)	Billing Sewer 2023 (ZMW)	Total Billing Water and Sewer (ZMW) 2023
LWSC	359,681,778	100,072,715	459,754,494	371,588,054	101,624,851	473,212,905
NWSC	130,757,925	35,108,632	165,866,557	134,032,139	35,177,622	169,209,761
KWSC	114,189,343	37,858,200	152,047,543	114,917,748	39,927,219	154,844,967
MWSC	115,358,854	33,030,782	148,389,636	101,362,856	33,335,901	134,698,757
LGWSC	47,935,827	6,731,470	53,652,498	45,125,102	6,623,367	51,748,469
SWSC	92,353,014	6,614,644	98,967,659	108,917,244	8,182,017	117,099,261
CHWSC	32,384,265	404,029	32,788,294	35,824,305	549,545	36,373,850
NWWSC	25,736,255	585,029	26,321,284	27,277,305	692,355	27,969,660
WWSC	18,712,977	127,494	18,840,471	20,494,252	188,198	20,682,450
EWSC	33,389,101	1,045,474	34,434,575	35,274,927	1,505,879	36,780,806
LPWSC	8,229,774	622,505	8,852,279	11,518,192	435,954	11,954,146
Total	**978,729,115**	**222,200,974**	**1,199,915,290**	**1,006,332,124**	**228,242,908**	**1,234,575,032**

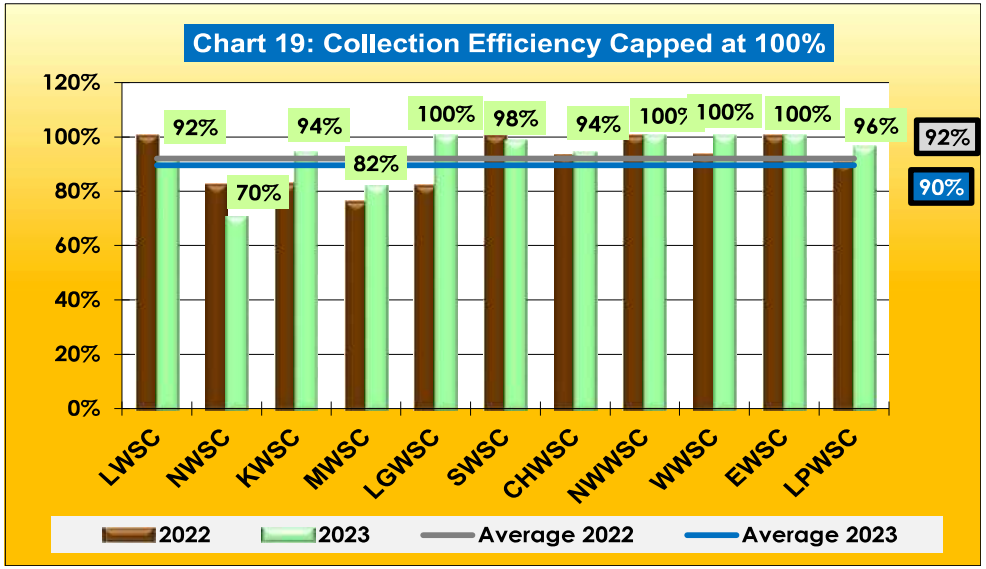
There was an increase in total billing for water and sewerage by K33.6mil compared to the increase of K57.1 million recorded in 2022. LPWSC recorded an increase of 26% which was attributed to the increase in the number of connections under the ISTWSSP. Apart from additional billing from Chirundu and the over 3,000 new connections, SWSC embarked on a strategy to meter Livingstone which has the largest customer base and also tightened controls in meter reading processes which resulted in a 15% increase in the billing.

The 10% decrease in MWSC was mainly attributed to the decline in sales owing to reduced water production.

7.2.3.1.1 Collection Efficiency

The collection efficiency is the proportion of billed amounts (shown in Chart 19) that are collected. Since 2021, the collection efficiency reflected in this report does not include payment towards arrears in the previous years (only reflected in Table 48). This practice enables a fair comparison between billing and collections for the reporting period. The calculation considers collections and billing for water supply and sewerage only. Other charges and fees (i.e. sanitation surcharge, meter charges, new connection and disconnection fees) are not included.

Benchmark for collection efficiency	Good	>95%
	Acceptable	90% - 95%
	Unacceptable	<90%



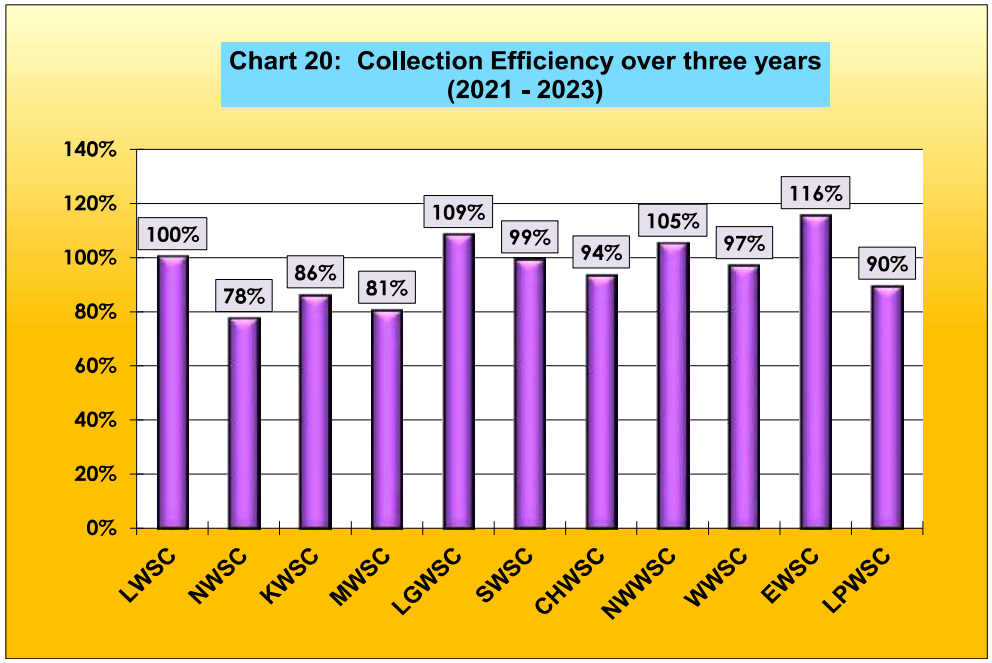
The sector average collection efficiency dropped from 92% to 85% which is below the sector benchmark of 90%. All CUs met the benchmark save for LWSC, NWSC and MWSC. The high collection efficiencies recorded by most CUs were due to payment of water supply and sewerage bills by Government Institutions and departments. The drop in the collection efficiency for LWSC was due to non-payment by most government institutions and departments.

7.2.3.1.2 Collections towards arrears

Collections that are above the total billing are considered to be payments towards arrears. Therefore, CUs whose collection efficiency was above 100% was capped at 100%. Only EWSC, LGWSC, NWWSC and WWSC had collections above 100% which were 115%, 150%, 109% and 102%, respectively.

7.2.3.1.3 Collection Efficiency over three years

It must be noted that the figure for collection efficiency spikes upwards when outstanding amounts and/or advance payments made are added to current collections. Therefore, by calculating collection efficiency over a three-year period, distortions are evened-out to give a more realistic picture of the collection efficiency as shown in Chart 20.



All CUs met the acceptable benchmark of 90% over a three-year period save for NWSC, KWSC and MWSC.

7.2.3.1.4 Trade Receivables and Payables

A trade receivable is a legally enforceable claim for payment held by a business against its customer/ clients for goods supplied and/or services rendered. Trade receivable is shown in a Statement of Financial Position as a current asset. Payables are current liabilities of a business shown on a company's Statement of Financial Position. The payables include both trade and non-trade.

Failure to manage trade receivables and payables may affect the working capital of the business in terms of poor liquidity which may result in its inability to meet operational obligations when they fall due, thereby straining supplier relationships. The desired trend is that both trade receivables and payables should be reducing.

Table 48: Trade Receivables and Payables

CU	Trade Receivables (ZMW) 2022	Payables (ZMW) 2022	Trade Receivables (ZMW) 2023	Payables (ZMW) 2023
LWSC	254,715,362	198,437,225	354,428,955	560,813,203
NWSC	194,793,284	299,411,295	245,026,109	261,214,426
KWSC	390,978,416	375,581,901	408,002,320	377,919,441
MWSC	249,187,581	260,413,466	342,056,361	307,733,951
LGWSC	71,289,616	70,117,140	58,305,459	86,967,686
SWSC	40,540,637	95,825,885	45,634,029	162,145,637
CHWSC	33,311,899	85,595,810	35,506,703	104,435,227
NWWSC	15,674,913	52,138,591	13,087,803	56,783,100
WWSC	12,872,738	67,636,278	12,784,847	47,868,252
EWSC	10,549,169	53,342,671	9,688,545	66,194,955
LPWSC	12,900,631	139,735,108	15,478,626	146,809,618
Total	1,286,814,246	1,698,235,370	1,539,999,757	2,178,885,495

Trade receivables increased by 19.7% due to non-payment of bills. For LWSC, NWSC and MWSC, the increase was mainly due to non-payment of bills by most government institutions and departments. CUs that had significant reductions in receivables were LGWSC and NWWSC. For LGWSC, the reduction was as a result of payments from Government institutions and departments while for NWWSC, it was as a result of payments by domestic customers.

The increase in payables of 28% was attributed to delayed payments of ZESCO, other suppliers and statutory liabilities by all CUs. LWSC and SWSC had the highest increase in payables of 183% and 69%, respectively.

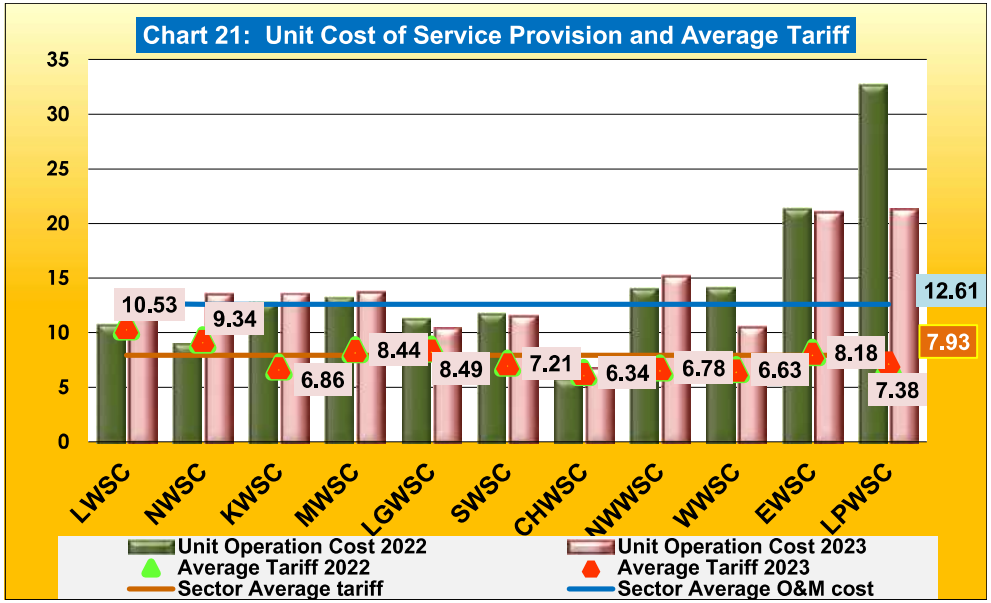
7.2.3.1.4 Average Tariff and Unit Cost of Service Provision

Water and sewerage tariffs are raised periodically to move the CUs towards full cost recovery through user charges in line with the National Water Policy. NWASCO approves all tariff adjustments and has the responsibility of ensuring that only justified costs are passed on to the customers. Thus, the justified costs of providing water and sanitation services have a direct bearing on the price of water.

The water supply and sanitation tariffs have not been revised since 2020 despite the increase in input costs such as electricity, chemicals, fuel and labour.

For financial viability, the average tariff (billing/m^3) should be equal to or higher than the unit operation

cost. The unit operation cost includes the cost related to water and sewerage services whereas the average tariff does not incorporate the revenue from the sewerage services. For CUs that are not 100% metered, the average tariff is calculated by converting an assessed consumption of water using the rising block tariff. Chart 21 shows the water average tariff and total unit operation cost for water and sewerage services.



As shown in Chart 21, the sector average water and sanitation tariff was not able to cover the costs of service provision. None of the CUs was able to meet their cost. For LPWSC, which had the highest tariff deficit, the limited revenue base could not match the costs incurred in providing the service.

7.2.3.1.5 Computation of Tariffs

The cost drivers of CU activities in the cost structure are specific to their operating environments, hence the tariffs differ. It is worth noting that, consumption of up to 6m^3 is considered a lifeline, therefore the tariff per cubic meter is priced at, or below, cost of service provision.

Table 49 shows computation of a water bill for a metered domestic customer using the rising block tariff at different consumption volumes. This does not include fixed meter charge (at K15) or sewerage charges.

Table 49: Computation of Bill using Rising Block Tariffs for Domestic Customer Water Consumption Only

	2023		
CU	Water Bill of 6 m^3 (Low consumption) (in K)	Water Bill of 30 m^3 (Medium consumption) (in K)	Water Bill of 60 m^3 (High consumption) (in K)
LWSC	35	206	449
NWSC	27	169	385
KWSC	27	173	374
MWSC	29	161	362
LGWSC	35	212	518
SWSC	31	227	510
CHWSC	29	246	555
NWWSC	24	206	503
WWSC	31	236	536
EWSC	36	282	672
LPWSC	32	249	525
Average	**34**	**237**	**539**

CUs did not implement upward tariff adjustments in the year under review hence there was no change in the bill computation between 2022 and 2023.

7.2.3.2 Cost Analysis

7.2.3.2.1 Operation and Maintenance Costs

Cost containment is very critical in service provision. The major operation costs consist of personnel, chemical, maintenance and energy which have a direct

impact on the viability of a CU. The *'Other Cost'* component include administrative, operational consumables, services by sub-contractors and vehicle running expenses. Operation costs are normally analysed during tariff adjustments in order to remove unjustified costs that may otherwise be passed on to the consumers.

CUs operate under varying socio-economic conditions hence the differences in their costs. That notwithstanding, the proportion of the various cost elements to the overall costs and the trends are of essence. For certain cost categories such as chemicals, a reduction may not necessarily be desirable as this may mean a compromise in the quality of water rather than cost containment and so are the maintenance costs. Energy costs include electricity and fuel. Table 53 shows the actual cost of operation in the reporting year.

Table 50: Costs of Operation and Maintenance

	Personnel Cost (in '000 K)			Chemicals Cost (in '000 K)			Energy Cost (in '000 K)			Maintenance Cost (in '000 K)			Other Cost (in '000 K)			Total O&M Cost (in '000 K)		
	2022	2023	%change	2022	2023	%change	2022	2023	%change	2022	2023	%change	2022	2023	%change	2022	2023	%change
LWSC	185,980	207,919	11.8%	25,627	35,840	40%	146,262	188,352	29%	13,114	13,318	2%	57,415	82,378	43%	428,399	527,807	23%
NWSC	72,526	78,014	7.6%	16,333	16,351	0%	42,855	41,657	-3%	4,746	4,299	-9%	25,642	20,769	-19%	162,102	161,090	-1%
KWSC	92,061	105,856	15.0%	13,666	16,087	18%	68,746	71,703	4%	3,919	3,059	-22%	11,247	12,045	7%	189,638	208,750	10%
MWSC	76,842	76,595	0%	9,094	9,592	5%	46,315	46,187	0%	5,777	10,267	78%	45,886	25,996	-43%	183,914	168,637	-8%
LGWSC	32,836	30,043	-8.5%	3,103	1,923	-38%	14,918	9,834	-34%	2,134	2,697	26%	8,012	9,507	19%	61,003	54,004	-11%
SWSC	58,812	62,285	5.9%	7,947	9,784	23%	34,000	36,901	9%	1,914	3,697	93%	13,590	17,539	29%	116,263	130,206	12%
CHWSC	21,673	26,162	20.7%	790	1,032	31%	17,397	21,393	23%	1,396	1,266	-9%	4,193	4,704	12%	45,449	54,557	20%
NWWSC	28,219	32,597	16%	1,815	1,496	-18%	6,041	6,377	6%	1,787	1,608	-10%	8,573	11,687	36%	46,436	53,765	16%
WWSC	18,878	18,846	0%	1,803	1,641	-9%	6,356	4,997	-21%	376	879	134%	3,219	3,124	-3%	30,631	29,487	-4%
EWSC	31,510	38,318	21.6%	3,145	2,865	-9%	7,704	6,770	-12%	2,578	2,462	-5%	9,231	8,439	-9%	54,169	58,853	9%
LPWSC	9,503	15,180	59.7%	755	1,453	92%	3,285	3,703	13%	165	1,628	887%	10,537	6,114	-42%	24,246	28,078	16%
Totals	628,840	691,814	10.0%	84,080	98,064	17%	393,880	437,874	11%	37,904	45,179	19%	197,545	202,302	2%	1,342,249	1,475,233	10%

Note: Red-negative trend, Green- positive trend (considering reduction of 10% and increase of 20%)

Overall costs increased by 10% due to increases in personnel, fuel and chemicals among other inputs costs as well as other costs.

Personnel Costs

Personnel costs include wages and salaries, training and other staff-related costs such as medicals, recruitment and provision for retirement benefits.

Overall personnel cost increased by 10%. Only LPWSC, EWSC and CHWSC was above the 20% mark-up increase in personnel costs.

Chemical Costs

Chemical costs increased by 17% with most CUs recording a significant increase. This was mainly due to the increase in the chemical prices due to the devaluation of the Kwacha. For LWSC, the use of chemical quantities for coagulants/flocculants and chlorine went up due to increased production and costs. For chlorine, it was also because of the scarcity of chlorine gas, which meant that more of granular chlorine was used. For LPWSC and CHWSC, the increase was as a result of increase in production from the new water treatment plants. The reduction in chemical costs for LGWSC was due to the shift from surface water from Mulungushi Dam to the boreholes for most part of the year.

Energy Costs

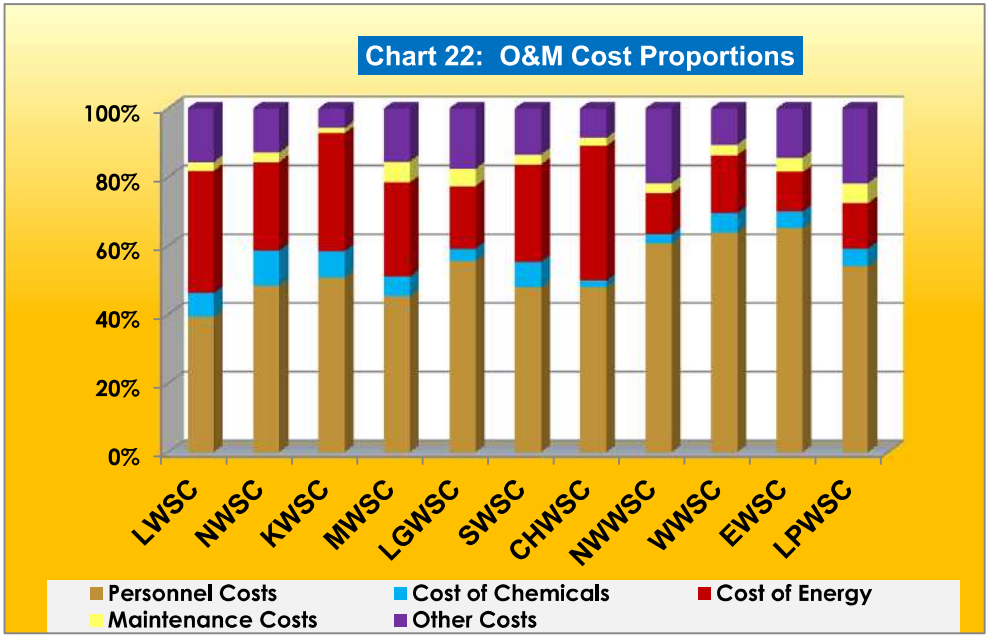
Energy costs increased by of 11%. It is important to note that during the year under review, the structure of electricity tariffs was revised from straight to rising block. As a result, CUs with larger installations such as LWSC were negatively impacted by the change. For CHWSC, the new facilities constructed under the ISTWSSP resulted in high energy consumption. The drop for LGWSC was due to an increase in the use of ground water during the period when Mulungushi Dam, which has high energy consumption, was not in operation.

Maintenance Costs

Overall maintenance costs increased by 19%. This could be attributed to the fact that CUs had to undertake a lot of unplanned maintenance works due to dilapidated infrastructure.

Cost Proportions

The cost proportions in Table 50 are shown in Chart 22.



The highest proportion of costs was attributed to personnel which accounted for 47% of total operational costs. EWSC had the highest personnel costs at 65% followed by WWSC at 64%.

Personnel costs were was followed by Energy (30%) then *'other cost'* (14%), Chemical (7%) and maintenance (3%).

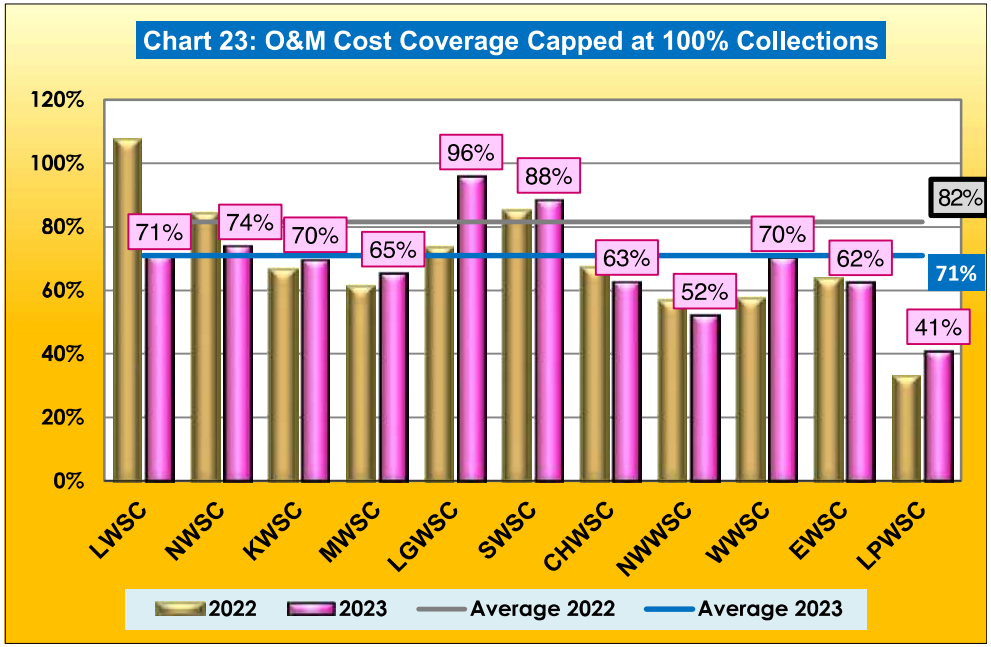
7.2.3.2.2 Operation and Maintenance Cost Coverage by capped Collections

This indicates the extent to which the level of collection is able to cover all the operational costs.

Benchmark for coverage of O+M cost	**Good**	**>150%**
	Acceptable	**100 – 150 %**
	Unacceptable	**< 100%**

The analysis in Chart 23 considers revenue collections from water and

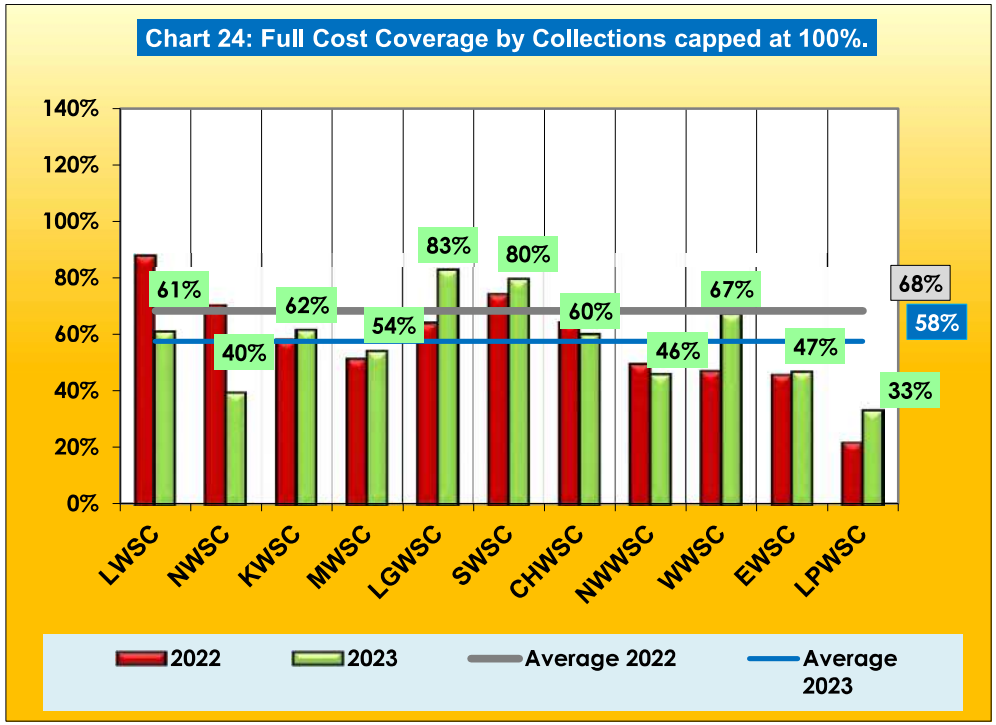
sewerage billing only. It does not include income from other fees (such as penalties, meter charges, surcharges), operating grants from Government and Cooperating Partners. The collections are capped at 100% for CUs whose collection efficiency was above 100%.



None of the CUs met the acceptable benchmark of 100%. This was a significant drop in collection efficiency coupled with an increase in operation costs. Most CUs did not collect from government institutions.

7.2.3.2.3 Full Cost Coverage by Collection capped at 100%

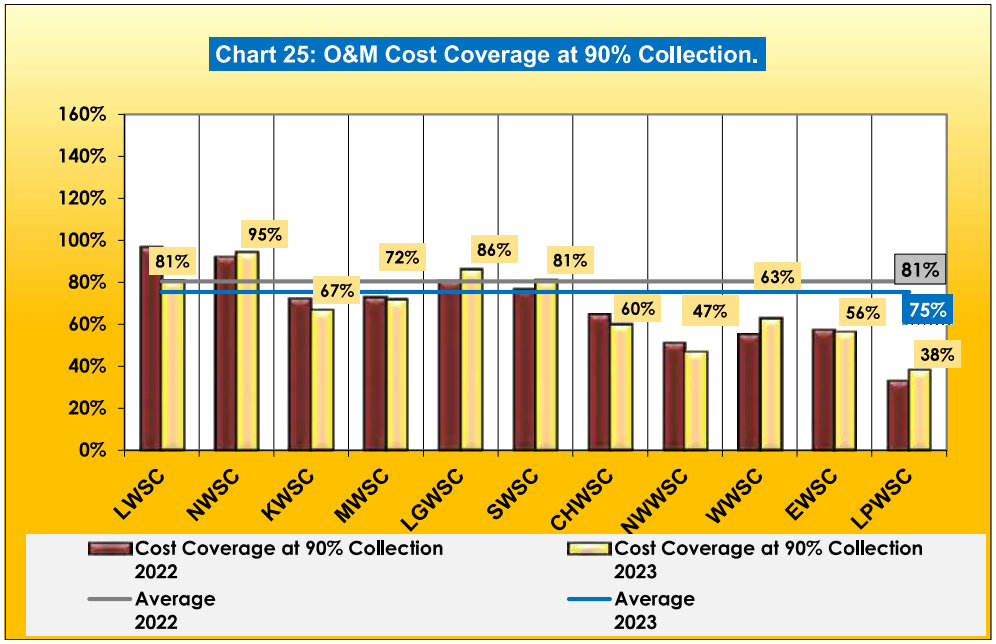
Full cost includes all O&M costs plus depreciation, finance charges and allowable provisions such as pension. The total collections reflect all payments for water and sanitation services received during the period. As earlier indicated, the collections were capped 100%.



There was a notable drop in average full cost covered by collections as shown in Chart 24. Despite the drop, KWSC, MWSC, WWSC, LGWSC, EWSC and LPWSC increased their cost coverage ratio.

7.2.3.2.4 Operation and Maintenance Cost Coverage at 90% Collection

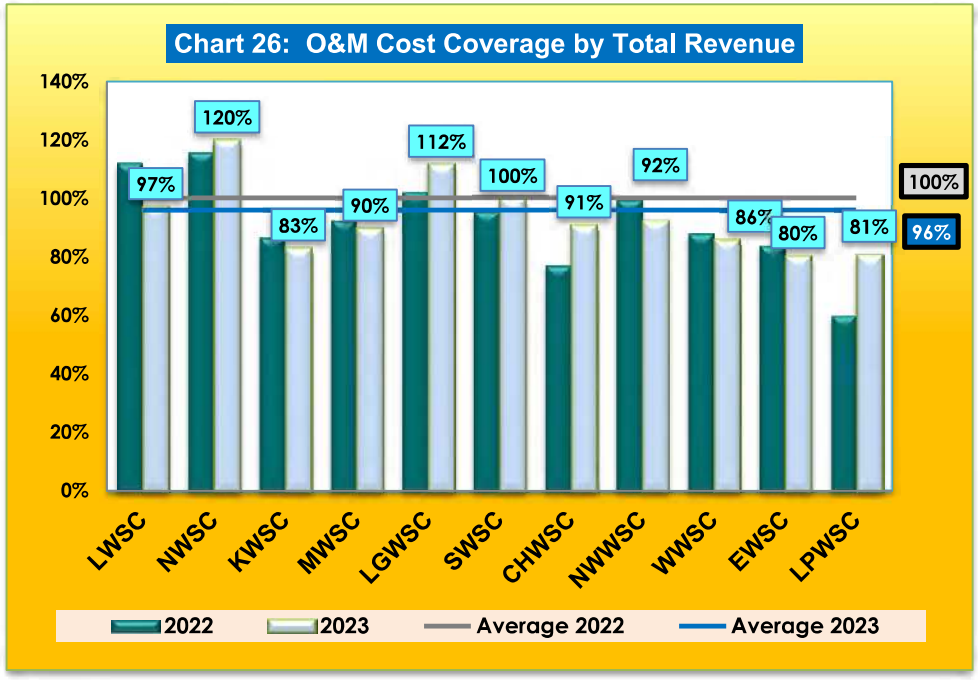
Chart 25 shows the cost coverage assuming an acceptable benchmark for collection efficiency of 90% of the billed amount. NWASCO uses the benchmark for collection efficiency to arrive at a tariff that would cover O&M costs at a certain level. NWASCO desires an upward trend in cost coverage to ensure sustainability of CUs and therefore, recommends an adverse variance of not more than 10% of approved costs within the tariffs. The ability to meet the approved cost coverage is driven by prudent financial management.



The sector average O&M cost coverage at the benchmark of 90% collection efficiency dropped from 81% to 75% as shown in Chart 25. This was mainly due to the increase in the input costs that was not matched without any increase in the water and sanitation tariffs.

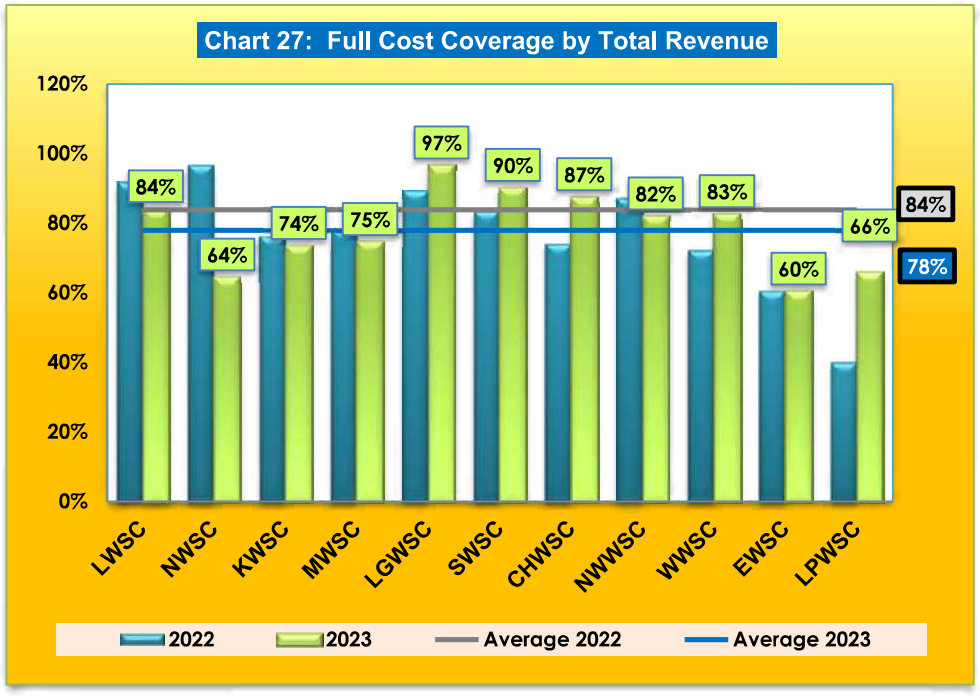
7.2.3.2.5 Operation and Maintenance Cost Coverage by Total Revenue

Charts 26 and 27 depict the financial performance of the CUs. Total revenue includes net billed amounts, other income such as penalty fees, interest, subsidies and recurrent (income) grants.



The sector average for O&M cost coverage by total revenue was below the benchmark after dropping from 100% to 96%. This was as a result of the increased costs that were not matched by a corresponding increase in revenue as the tariff remained unchanged since 2020. Despite the drop in the sector average, NWSC, LGWSC and SWSC met the acceptable benchmark of 100%. For sustainability, CUs need to seriously concert efforts to managing their costs, improving collection efficiency and increasing the revenue base.

Chart 27 shows the full cost coverage by total revenue. The full costs include depreciation and finance charges and the revenues include net billed amounts, other income such as other fees (meters charges and connection/ disconnection), interest, subsidies and recurrent (income) grants.



None of the CUs met the benchmark of 100%. LGWSC, SWSC, CHWSC, WWSC and LPWSC recorded increases. SWSC, LPWSC, CHWSC and WWSC received operational grants from the Ministry of Water Development and Sanitation.

7.2.3.2.6 Financial Ratio Analysis

This section presents Profitability, Liquidity and Activity ratios to provide more information on whether each CU is applying its assets in an efficient and profitable manner. One major ratio from each of the above classes appropriate to the WSS sector was analysed as highlighted in Table 51.

Table 51: Financial Ratios

	Current Ratio		Net Profit Margin		Non-Current Asset Turnover	
	2022	2023	2022	2023	2022	2023
LWSC	1.94	1.11	5%	-13%	0.24	0.23
NWSC	1.48	2.55	-3%	-55%	0.15	0.18
KWSC	1.13	1.24	-31%	-36%	0.12	0.13
MWSC	2.92	1.28	-27%	-34%	0.11	0.08
LGWSC	1.45	1.10	-2%	-0.2%	0.20	0.20
SWSC	0.47	0.31	-12%	-5%	0.24	0.38
CHWSC	0.53	0.42	-35%	-14%	0.09	0.10
NWWSC	0.90	0.40	-15%	-22%	0.41	0.41
WWSC	0.68	0.36	-32%	-21%	1.17	0.50
EWSC	0.52	0.41	-41%	-41%	0.21	0.23
LPWSC	0.32	0.23	-89%	-52%	0.22	0.29

i. Liquidity Ratios

The Current Ratio is the ratio of current assets to current liabilities. It indicates a company's ability to satisfy its current liabilities with its current assets (Current ratio = Current assets/ current liabilities). For current ratio, a range of 1 to 3 is acceptable for the water sector and indicates that a company is able to meet its financial obligations partially or in full as they fall due.

LWSC, NWSC, KWSC, MWSC and LGWSC were within the acceptable range for Current Ratio. However, consideration has to be made on the extent to which the trade receivables are able to be liquidated as they make up a significant proportion of the current assets.

ii. Profitability Ratios

The Net Profit Margin is the ratio of net Income to Turnover and indicates how

much of each Kwacha of Turnover is left over after all expenses. (Net Profit Margin = Net Income/ Turnover). None of the CUs made a profit. No CU posted a profit during the period under review.

iii. Activity Ratios

Non-Current Asset Turnover is the ratio of turnover to fixed (non-current) assets. The ratio indicates the ability of the company's management to put the fixed assets to work to generate sales. (Fixed Asset Turnover= Turnover/Fixed assets).

The desirable trend for CUs is to have higher ratios than in the previous year. Slight increases were noted in NWSC, KWSC, SWSC, CHWSC, EWSC and LPWSC.

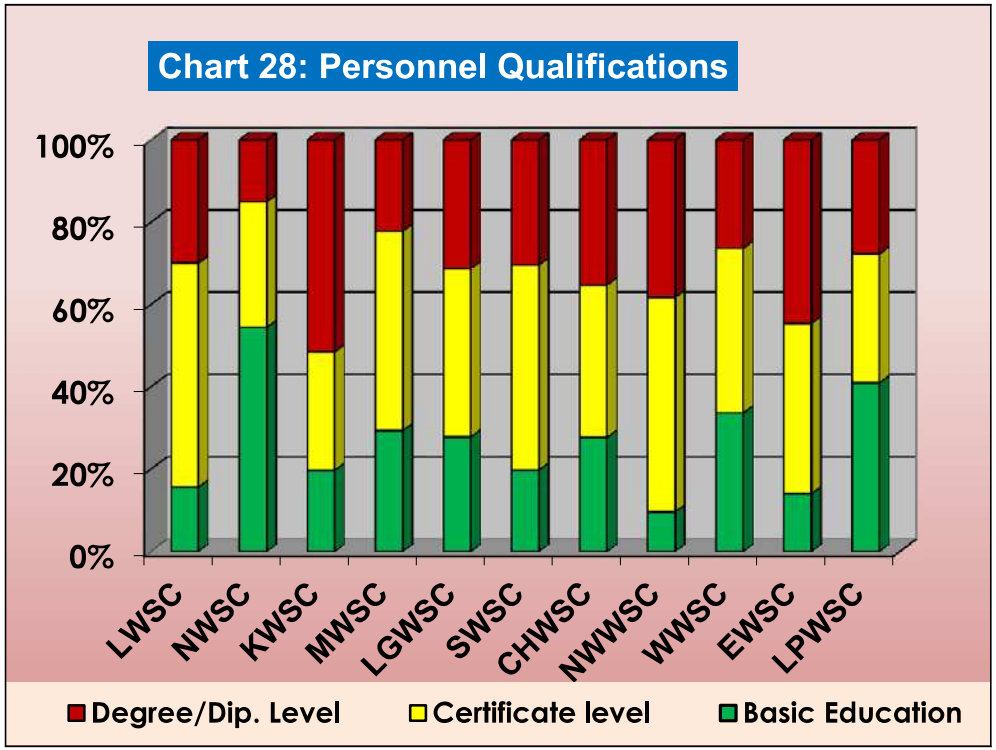
7.2.4 STAFF EFFICIENCY INDICATORS

These measure the output of personnel in relation to various aspects of operations such as billing, connections and personnel costs.

7.2.4.1 Human Resource Development

Human Resource Development

Chart 28 shows the personnel qualifications in the sector.



The categorisation of staff was 31% degree and diploma holders, 42% certificate and the rest basic education. NWSC and LPWSC had the highest staff with basic education at 54% and 41% respectively. The Zambian water sector is labour intensive, hence it is desirable to have a higher proportion of skilled staff with certificates and diplomas who tend to be more of field workers.

LWSC, SWSC and NWWSC had a desirable proportion of staff qualifications with majority of staff with certificate. NWSC had the most undesirable proportion of staff qualifications with 54% having basic education.

7.2.4.2 Gender Mainstreaming

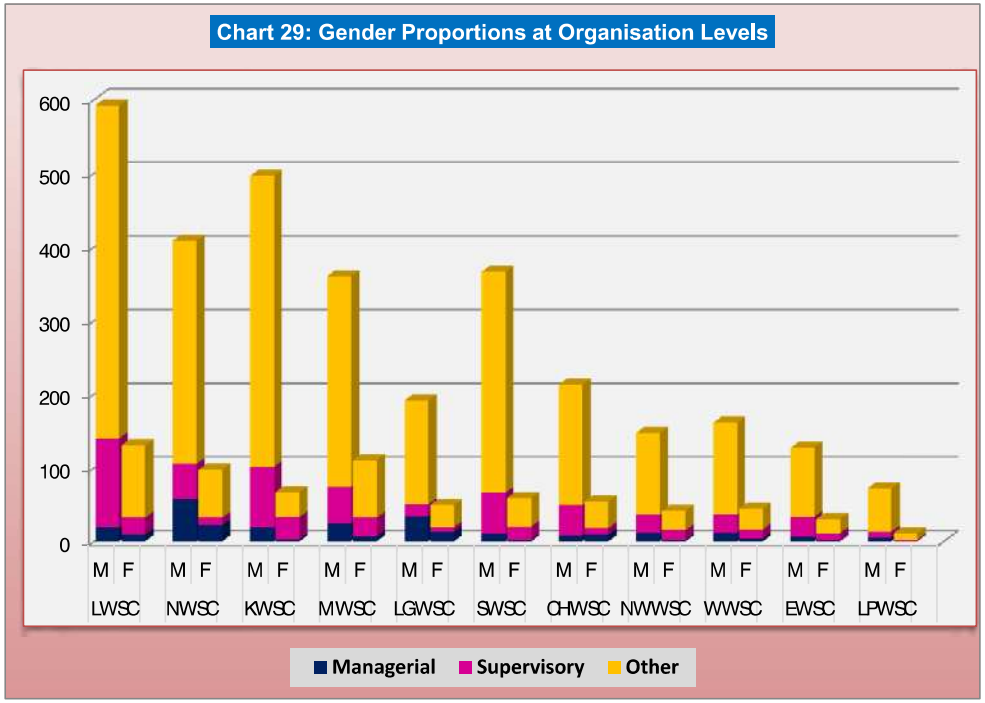
The number of personnel working in the sector has been disaggregated by gender to show the extent of participation of women and men. Table 52 and

Chart 29 shows the number of males and females.

Table 52: Number of Staff Disaggregated by Gender

CU	Female 2022	Male 2022	Female 2023	Male 2023	Total
LWSC	104	652	130	592	722
NWSC	105	428	97	408	505
KWSC	68	520	67	496	563
MWSC	116	369	110	360	470
LGWSC	35	207	49	191	240
SWSC	76	362	59	366	425
CHWSC	48	210	57	210	267
NWWSC	38	125	41	147	188
WWSC	31	148	44	161	205
EWSC	28	134	30	127	157
LPWSC	11	62	11	72	83
Total	**660**	**3,217**	**695**	**3,130**	**3,825**

There was an overall net increase in the total number of staff in the CUs by 37. LWSC increased the number of staff by 42. These were mainly operatives. WWSC increased the number of staff at middle management by seven. The drop for KWSC was due to staff separation at expiry of contracts and retirements which staff were not replaced.



The percentage of women working in the CUs at various levels in the hierarchy was 18%. This is still below the 30% provided for in the National Gender Policy. Female representation at managerial positions increased to 27% from 23% while the supervisory reduced to 24% from 26%. The females represented at other levels increased from 14% to 16%.

7.2.4.3 Staff per 1,000 Connections

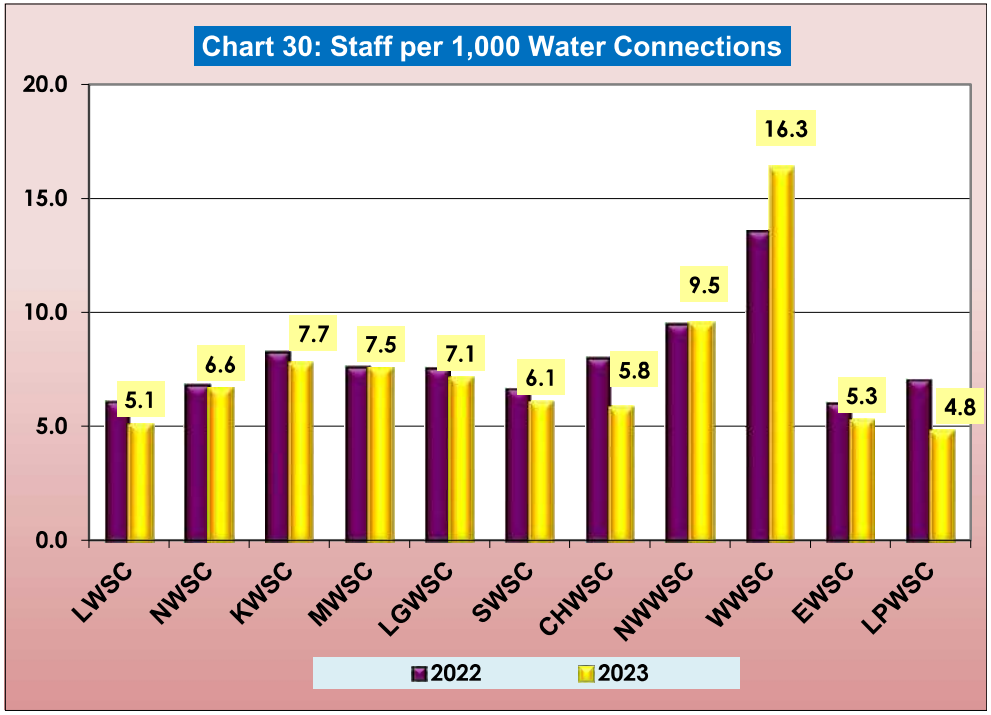
This indicates the number of employees servicing 1,000 connections. The computation includes staff on at least a year's contract.

Staff efficiency can be measured as "staff per 1,000 water connections" as well as "staff per 1,000 water and sewer connections" as shown in Chart 30 and 31. In order to be efficient, CUs must endeavour to keep the staff per 1,000 water connections within the acceptable benchmark highlighted below.

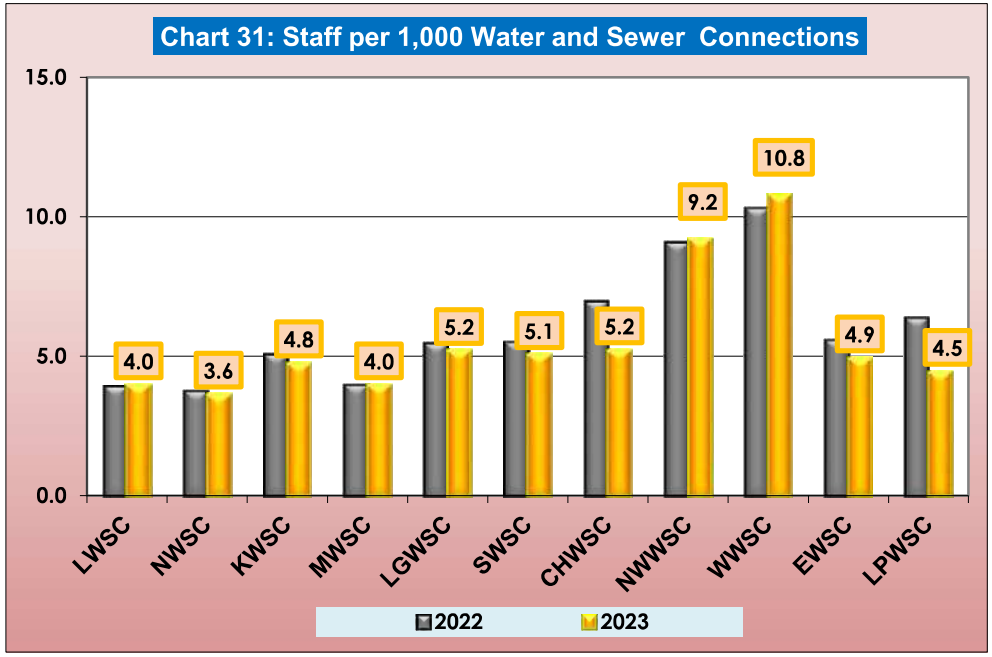
Benchmark for staff per 1,000 water connections (Cluster 1)	Good	5
	Acceptable	6– 8
	Unacceptable	>8

Benchmark for staff per 1,000 water connections (Cluster 2 and 3)	Good	9
	Acceptable	10 – 14
	Unacceptable	>14

In Clusters 1 and 2, all CUs, met the *'acceptable benchmark' for staff per 1,000 water connections while in cluster 3 only WWSC did not meet the 'acceptable benchmark'*. This was due to the increase in the number of connections being outstripped by the increase in the number of staff.



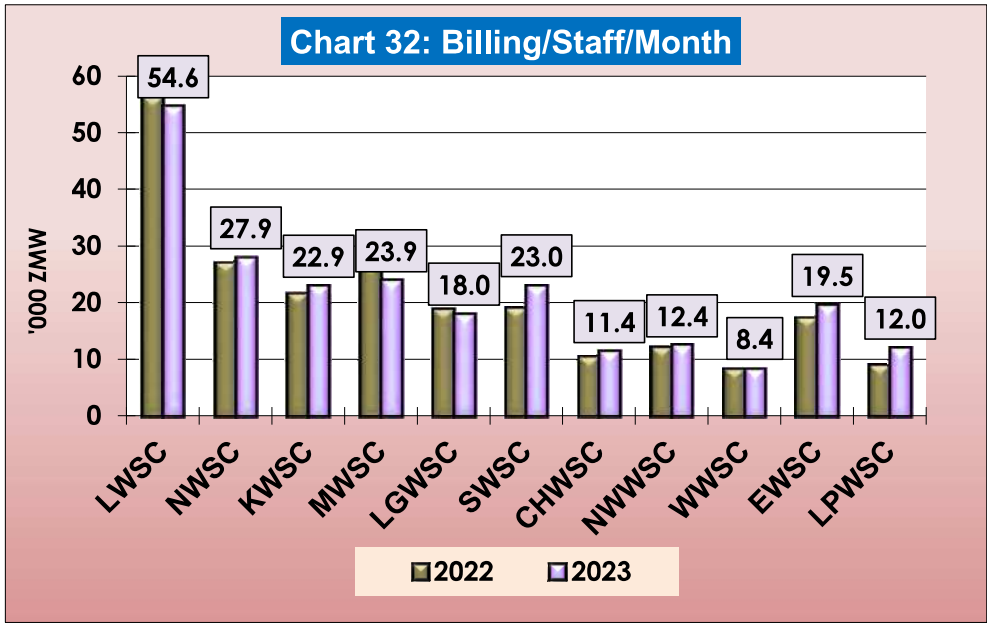
The combined staff efficiency for water and sanitation is derived from the total number of staff divided by the total number of water and sewer connections, assuming that the time spent on a water connection is the same as that on a sewer connection.

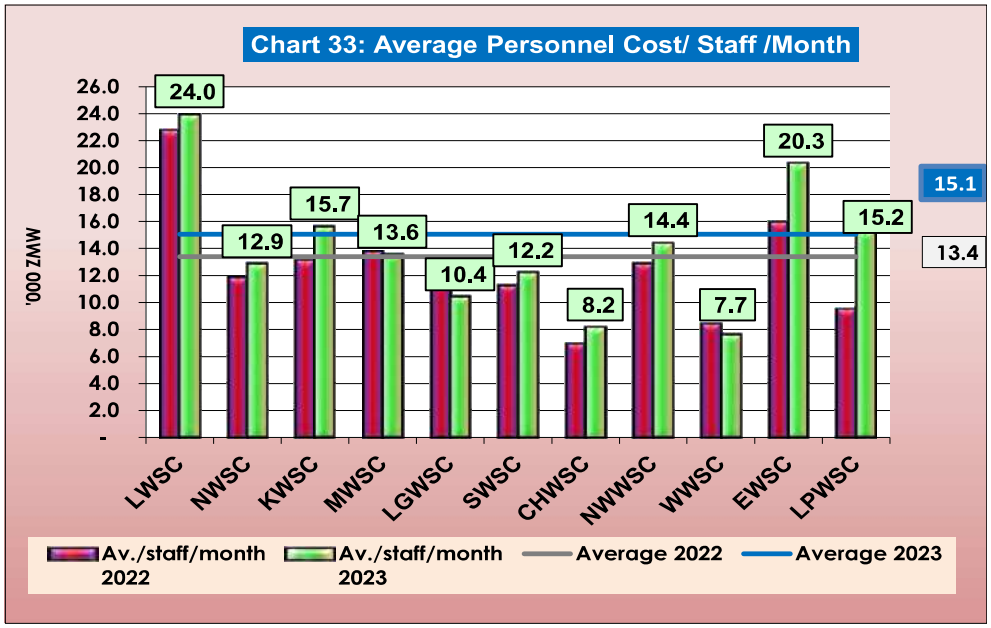


7.2.4.4 Billing and Average Personnel Cost per Staff per Month

Billing per staff per month is the billing attributable to one member of staff per month. A higher figure indicates better staff efficiency. On the other hand, average personnel cost per staff per month reflects the cost attributed to each staff. Charts 32 and 33 must therefore, be analysed in relation to each other.

For sustainability, the billing per staff per month must be higher than the average personnel cost per staff per month. As such, what the CU pays each employee, must be lower than the revenue the employee is bringing into the company. The desirable trend in the sector is for billing to cover at least three times the personnel costs in order to cover other cost categories.





NWWSC, EWSC and LPWSC had average personnel costs higher than the billing per staff. None of the CUs had the desirable ratio of 3 to 1 for billed revenue to staff costs. However, LWSC and NWSC were close with ratios of 2.3 and 2.2 respectively.

7.2.4.5 Summary of staff efficiency

Table 53 gives a consolidated view of staff efficiency.

Table 53: Observations on Staff Efficiency

Commercial Utility	No. of Staff	Staff/1000 water connections	Av. personnel cost/Staff/Month	Billing/Staff /Month	Collection/Staff /Month	Staff Cost in Relation to Billing and Collection
			K	*K*	*K*	
LWSC	722	5	23.998	54.618	43.109	0.51
NWSC	505	7	12.874	27.922	19.633	0.58
KWSC	563	8	15.668	22.920	21.547	0.71
MWSC	470	8	13.581	23.883	19.512	0.65
LGWSC	240	7	10.432	17.968	26.886	0.47
SWSC	425	6	12.213	22.961	22.575	0.54
CHWSC	267	6	8.075	11.353	10.668	0.74
NWWSC	188	9	14.449	12.398	13.545	1.11
WWSC	205	16	7.661	8.408	8.610	0.90
EWSC	157	5	20.338	19.523	22.538	0.96
LPWSC	83	5	15.241	12.002	11.515	1.30
Average						**0.61**

For staff cost in relation to billing and collection, the desirable target for the sector is 0.4 (or 40%) or less. The average staff efficiency worsened from 0.54 to 0.61. This was mainly attributed to the increase in personnel costs which

was not matched by the increase in billing. This was exacerbated by the drop in collection efficiency. The increase in the personnel cost was mainly attributed to the implementation of the recommendation of the Emoluments Commission which sought to rationalise and harmonise conditions of service among the CUs. None of the CUs met the benchmark for staff efficiency.

7.2.5 CORPORATE GOVERNANCE AND MANAGEMENT INDICATORS

Adherence to good corporate governance enhances performance of the CU. It is the role of the Board and Management to steer the Utility in a strategic direction thus achieve the CU's objectives.

In order to assess the performance of the Board and Management, it is important to focus on corporate decisions and expenditure on the Boards of Directors.

7.2.5.1 Performance of the Boards

The performance of the Boards was based on the number of Board meetings held, the key decisions made during the meeting and budgetary control as shown in Table 54.

Table 54: Corporate Governance Indicators

	Approved Corporate Documents				Full Board Meetings				Budget variance against approved
	Strategic plan	Approved Budget	2022 Annual report with audited accounts	Investment plan	Attendance	Meetings held	Meetings planned	Total Board expenditure as a % of O&M costs	
LWSC	✓	✓	✓	✓	96%	11	8	0.1	10%
NWSC	✓	✓	✓	✓	98%	5	5	0.6	24%
KWSC	✓	✓	✓	✓	100%	4	4	0.3	26%
MWSC	✓	✓	×	✓	96%	5	5	0.5	16%
LgWSC	✓	✓	×	×	97%	2	4	1.1	32%
SWSC	✓	✓	✓	✓	75%	4	4	0.6	2%
ChWSC	✓	✓	×	×	100%	2	2	0.1	-47%
NWWSC	✓	✓	×	✓	75%	6	4	1.0	-7%
WWSC	✓	✓	×	×	100%	4	4	0.8	16%
EWSC	✓	✓	✓	×	80%	4	4	1.0	13%
LPWSC	✓	✓	×	×	92%	5	4	1.5	6%

i. Budgetary Control

Budgetary control is one of the key functions of the Board. A budget variance of ±10% is acceptable. This could be attributed to the unforeseen cash flow constraints that most CUs experienced hence less expenditure. All CUs operated outside the recommended budget variance save for LWSC, NWWSC, LPWSC and SWSC.

ii. Board Meetings

Board Meetings should be held once a quarter and costs maintained within 1% of the total O&M for big CUs (Cluster 1) and 1.5% for the smaller ones (Cluster 2 and 3). All CUs operated within the recommended board expenditure limits.

iii. Status on Corporate Documents

It is the role of the Board of Directors to ensure that the CUs have the corporate documents and ensure they monitor their implementation. MWSC, LGWSC, CHWSC NWWSC, WWSC and LPWSC did not have audited accounts for the financial year ended 31st December 2022.

7.3 QUALITY OF SUBMITTED INFORMATION

As part of the licence conditions, all service providers are required to submit via an information system developed by NWASCO, an annual report with accurate data by 31st January of each year.

All CUs submitted the data on time and with fairly good quality as illustrated in Table 55.

Table 55: Quality of Submitted Information

Utility	Quality of Submitted Information in the NWASCO Information System 2023	
	The Annual Report	Remark
Lusaka WSC	Fair	Timely. *Major clarifications required.*
Nkana WSC	Good	Timely.
Kafubu WSC	Fair	Timely. *Minor clarifications required.*
Mulonga WSC	Fair	Timely. *Minor clarifications required.*
Lukanga WSC	Fair	Timely. *Minor clarifications required.*
Southern WSC	Good	Timely.
Chambeshi WSC	Fair	Timely. *Major clarifications required.*
North Western WSC	Fair	Timely. *Minor clarifications required.*
Western WSC	Fair	Timely. Major clarifications required.
Eastern WSC	Good	Timely.
Luapula WSC	Fair	Timely

Note: *All submitted data is checked for accuracy and completeness. Where data is found to be lacking, verifications are done with the CU, as well as with data collected during routine inspections carried out during the year under review. The data presented in this report is therefore complete and accurate.*

8

PERFORMANCE OF PRIVATE SCHEMES

8.1 INTRODUCTION

Private Schemes are companies that provide WSS services primarily to their employees as a fringe benefit. The WSS services are run as an auxiliary function and not on a commercial basis. There were four licenced Private Schemes in the reporting period:

- Kaleya Smallholders;
- Zambia Sugar;
- Kafue Sugar; and
- ZESCO (Itezhi Tezhi, Kafue Gorge and Victoria Falls and Musonda Falls).

The regulatory performance requirements for Private Schemes providing services on non- commercial basis mainly relate to service level aspects of WSS coverage, hours of supply and water quality. The performance of the Private Schemes during the reporting period is shown in Table 56.

Table 56: Performance of Private Schemes

	Popula-tion in Service Area	Water Service Coverage %	Hours of Supply 2022	Hours of Supply 2023	Water Quality Compli-ance 2022	Water Quality Compli-ance 2023
Kaleya Small Holders	4,185	100	19	16	99.7%	99.9%
ZESCO	23,948	100	18	20	96.9%	99.4%
Zambia Sugar Plc	20,421	100	24	24	98.0%	99.2%
Kafue Sugar	485	100	24	24	91.7%	95.4%
Total	**49,040**					

8.2 COVERAGE

All Private Schemes provided water to all consumers within their area of operation through individual connections and public stand taps.

On sanitation, all Private Schemes, save for Kafue Sugar and Kaleya Smallholders, provided sanitation services through individual connections and discharging into sewage ponds or into communal or individual septic tanks. Kafue Sugar and Kaleya Smallholders had additional population using pit latrines.

8.3 HOURS OF SUPPLY

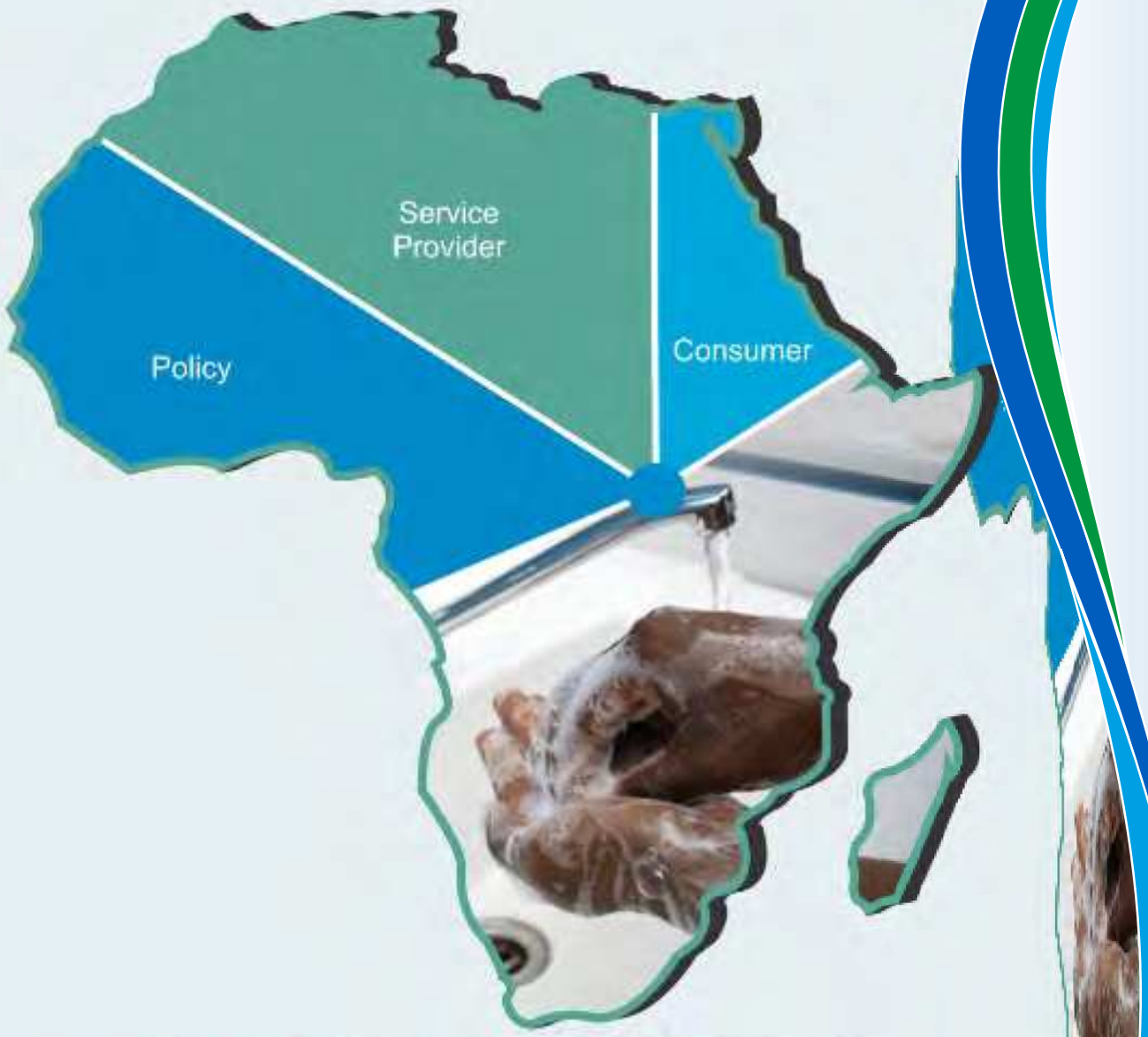
Under ZESCO, Hours of supply were maintained at 24 at Victoria Falls station in Livingstone while supply hours were fairly high in most areas of Kafue Gorge save for the problematic area of Camp 3 Township where hours were erratic with some upper parts not receiving water at all. Further, hours of supply for some ZESCO managed areas such as the ZESCO Club were maintained between10-14. Hours of supply at Kaleyas' Barracks, Mizinga, Kaleya East, Staff Area, Mulundu A, Mulundu B, KASCOL Club and Group II were maintained at 24 while Group 3-A and Group 3-B were maintained at 18 with incidences of low pressure in the network.

8.4 WATER QUALITY COMPLIANCE

During the reporting period, all schemes recorded more than 95% compliance to water quality. This means that majority of the schemes water quality test results met the national drinking water standards.

In a bid to improve water quality monitoring at Kaleya Smallholders, the scheme procured a multi-parameter handheld field water testing colorimeter. In addition to conducting pH, Turbidity, Color and residual chlorine tests in the network, Zambia Sugar had also outsourced Alfred H. Knight and ZABS to provide quality control for their water quality monitoring.

Despite ZESCO (Kafue Gorge) having a spectrometer capable of undertaking a wide range of water quality tests, the equipment was not being utilised by the scheme during the reporting period due to lack of reagents needed for various water quality tests such as pH, color and turbidity.



WATER SUPPLY AND SANITATION
REGULATION TRAINING CENTRE

9

REGIONAL BENCHMARKING OF LARGE WSS UTILITIES

9.1 INTRODUCTION

The Eastern and Southern Africa Water and Sanitation (ESAWAS) Regulators Association is a network of regional water supply and sanitation (WSS) Regulators that seeks to enhance the capacity of members to deliver quality and effective regulation through cooperation and mutual assistance.

The objectives of the ESAWAS Regulators Association as stated in its Constitution are:

a). Capacity Building and Information Sharing;

Facilitating 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;

Identifying and encouraging the adoption of best practices to improve the effectiveness of WSS regulation in the region.

The ESAWAS Regulators Association has ten members and these are: the Water Services Regulatory Board (WASREB) of Kenya; the Autoridade Reguladora de Águas, Instituto Público (AURA,IP formerly CRA) of Mozambique; the Rwanda Utilities Regulatory Authority (RURA) of Rwanda; the Energy and Water Utilities Regulatory Authority (EWURA) of Tanzania; the National Water Supply and Sanitation Council (NWASCO) of Zambia; the Lesotho Electricity and Water Authority (LEWA) of Lesotho; the Autorité de Régulation des secteurs de l'Eau potable et de l'Energie (AREEN) of Burundi; the Zanzibar Utilities Regulatory Authority (ZURA) of Zanzibar; the Water Services Association of Malawi (WASAMA); and the Water Utility Regulation Department (WURD) of Uganda.

ESAWAS undertakes an annual regional benchmarking exercise, introduced by ESAWAS in 2014, to compare the performance of the largest or single Utility in the Member countries across the region. 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.

Therefore, this Chapter presents a summary of ESAWAS benchmarking report for the period 2021/2022. It covers ten Utilities in the region and from Zambia, Lusaka and Eastern WSC as the biggest and the best utility respectively have been featured.

9.2 REGIONAL BENCHMARKING PERFORMANCE BOUNDARIES

ESAWAS uses ten Key Performance Indicators (KPIs) for regional benchmarking, grouped into three main components namely,

a). Quality of Service- relating to the extent and assurance of the service;

b). Economic Efficiency - relating to the viability of the service provider; and

c). Operational Sustainability – relating to operational efficiencies.

Performance boundaries for regional benchmarking were defined by considering the minimum average performance of the Utilities, as well as the minimum for the acceptable benchmarks among the countries. The weights were arrived at by a process of normalisation of the various weights defined by the different regulators. Table 57 shows the framework used for regional benchmarking.

Table 57: Benchmarking 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

9.3 REGIONAL PERFORMANCE OF 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; National Water and Sewerage Corporation (NWSC) of Uganda; and Lilongwe Water Board (LWB) of Malawi.

Maintenance works on the Rising main in WWSC

9.3.1 General data on Utilities

All the Utilities are publicly owned companies. The general profile about the Utilities is shown in Table 58.

Table 58: 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
Lilongwe Water Board	LWB	Malawi	Lilongwe City and surrounding areas	1947

The key background data about the Utilities is shown in Table 59.

Table 59: Key background data on Benchmarked Utilities

Utility	Urban Population in the Service Area 2020/21	Number of Water Connections 2020/21	Annual Water Production (mil m^3/yr) 2020/21	Urban Population in the Service Area 2021/22	Number of Water Connections 2021/22	Annual Water Production (mil m^3/yr) 2021/22
NCW&SC, Kenya	4.82 Million	232,946	179.341	5.02 Million	244,813	178.523
LWSC, Zambia	2.92 Million	130,150	87.675	3.01 Million	134,807	106.068
DAWASA, Tanzania	7.53 Million	343,091	145.888	8.17 Million	370,982	141.098
AdRMM, Mozambique	2.52 Million	288,051	86.885	2.91 Million	301,718	91.349
WASCO, Lesotho	0.742Million	110,750	25.186	0.767 Million	114,638	26.621
WASAC, Rwanda	6.46 Million	263,344	59.524	6.75 Million	287,608	69.454
ZAWA, Zanzibar	1.71 Million	124,776	67.676	1.89 Million	166,636	69,596
NWSC, Uganda	22.54Million	775,794	144.105	23.36Million	840,508	164.608
LWB, Malawi	1.11 Million	96,589	38.582	1.14 Million	102,051	28.522

9.3.2 Utilities Performance Comparison

The summary of the Utilities performance in the 2021/22 period is shown in Table 60. Further details on performance of the Utilities are available on the ESAWAS website (www.esawas.org.zm).

Recognising high performance

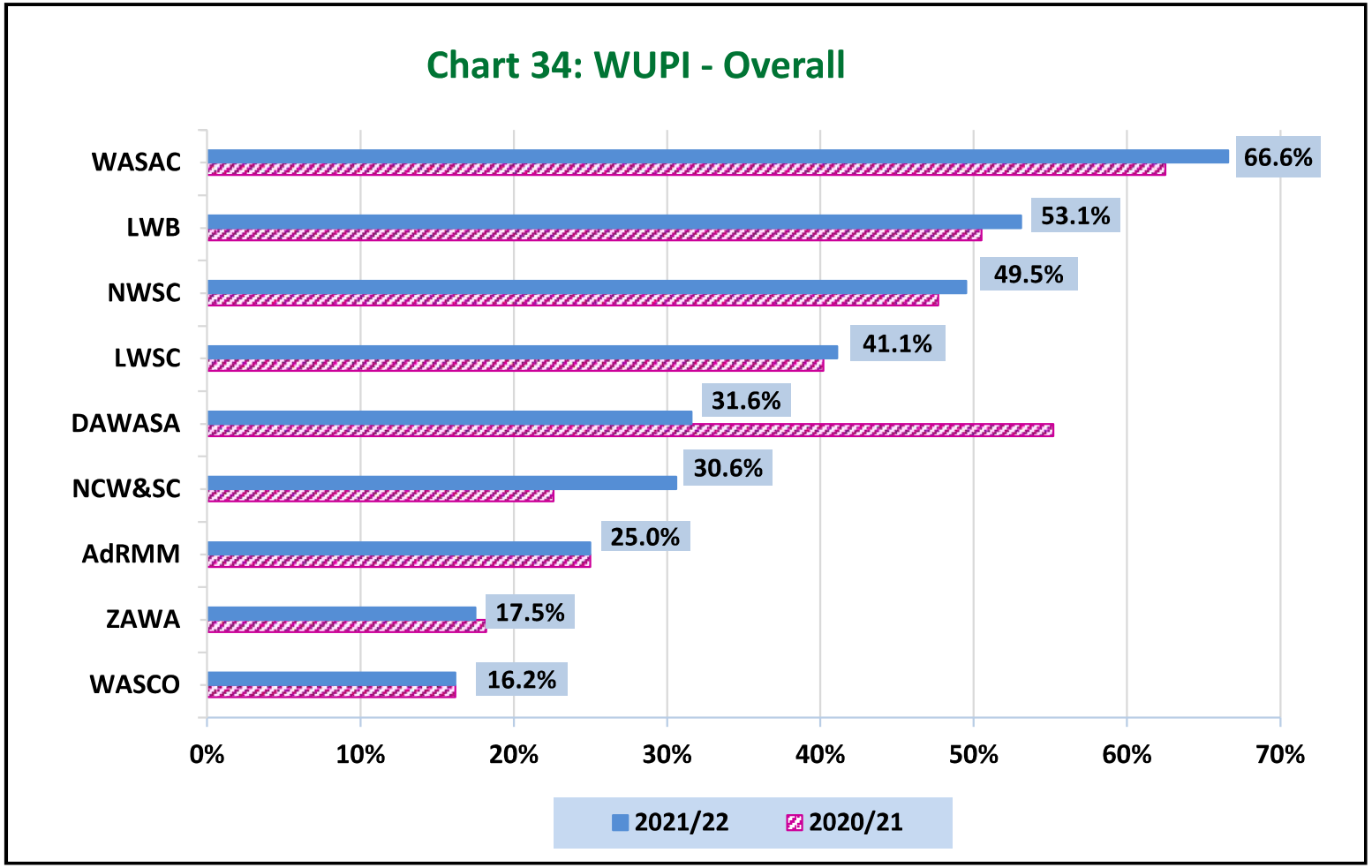
Minister of Water rewarding Best performing CU

Table 60: Summary of Utility Performance

	KPI	NCW&SC	LWSC	DAWASA	AdRMM	WASCO	WASAC	ZAWA	NWSC	LWB
Quality of Services	Water Coverage [10]	79.6%	92.5%	83.1%	53.1%	59.8%	83.4%	89.0%	84.0%	86.4%
	Sewerage Coverage [5]	51.3%	18.3%	10.0%	-	4.4%	-	9.8%	22.9%	-
	Water Quality [15]	96.1%	98.2%	86.5%	100%	95.4%	99.3%	93.4%	99.9%	89.3%
	Hours of Supply [10]	7	18	20	15	18	21	14	18	22
Economic Efficiency	O&M Cost Coverage [10]	95%	107%	96%	92%	77%	187%	73%	123%	180%
	Collection Efficiency [15]	97%	100%	96%	87%	88%	99%	85%	96%	93%
	Staff Cost vs O&M Costs [5]	59.2%	43.4%	37.6%	29.5%	41.0%	33.3%	31.8%	42.3%	28.0%
Operational Sustainability	Staff/1,000 W&S Connections [5]	7.33	3.82	3.98	3.26	3.98	5.09	3.40	5.14	4.99
	Metering Ratio [10]	100%	64.9%	100%	78.2%	100%	100%	39.3%	100%	100%
	NRW [15]	49.9%	53.8%	39.2%	45.8%	57.0%	46.3%	37%	38.1%	40.9%

All the Utilities maintained acceptable performance in Staff/1,000 W&S Connections. Conversely, the worst performance by all the Utilities was in Non-Revenue Water where none met the acceptable benchmark. WASAC met the acceptable benchmark in all indicators except NRW while LWB recorded poor performance in only two indicators. ZAWA had 7 indicators with poor performance followed by AdRMM and WASCO that had unsatisfactory performance in six indicators.

In summary, Chart 34 shows the ranking of the Utilities by using a Water Utility Performance Index (WUPI). WASAC of Rwanda emerged as the best performer after aggregating all the three categories of indicators and was followed LWB of Malawi, NWSC of Uganda and LWSC of Zambia.



9.4 PERFORMANCE RANKING OF THE BEST PERFORMERS

The ESAWAS benchmarking framework was used to rank the performance of the best performers in the ten KPIs and three components of Quality of Services, Economic Efficiency and Operational Sustainability. It should be noted that in some countries, particularly those that had more than one utility, the best performer may not have been the biggest utility.

Table 61: Performance of the best utilities in the ten KPIs

Utility	Quality of Services				Economic Efficiency			Operational Sustainability		
	Water Coverage [10]	Sewerage Coverage [5]	Water Quality [15]	Hours of Supply [10]	O&M Coverage [10]	Collection Efficiency [15]	Staff Cost as a % of O&M Cost [5]	Staff/1,000 WS Connections [5]	NRW [15]	Metering ratio [10]
	%	%	%	Hours/day	%	Ratio	%	Ratio	%	%
Nyeri WSP, Kenya	97.7%	33.4%	100.0%	24	101.9%	96.5%	39.2%	4.10	17.3%	100%
Eastern WSC, Zambia	93.5%	4.3%	99.8%	21	63.6%	100.0%	58.2%	5.58	45.9%	100%
Iringa WSSA, Tanzania	95.2%	30.2%	97.0%	24	96.9%	95.9%	31.0%	3.54	23.0%	100%
Blantyre WB, Malawi	85.1%	N/A	97.1%	22	90.3%	87.7%	27.5%	8.68	52.7%	100%
WASAC, Rwanda	83.4%	N/A	99.3%	21	187.3%	99.1%	33.3%	5.09	46.3%	100%

The ranking of the best of the best performers was done by combining the three WUPI components and the results are shown in Chart 35.

Nyeri WSP of Kenya for emerging the overall best of the best performers for 2021/22 with a total score of 75.1% followed by Iringa WSSA of Tanzania in second place.

9.5 CONCLUSION

A general picture of the performance of benchmarked Utilities. Using the average performance, Table 62 provides an overview of the progress on Key Performance Indicators in the period under review. Overall, only five of the ten benchmarks were met and improvements were made in only four KPIs while the performance declined in five indicators.

Table 62: Progress on average Key Performance Indicators

	KPIs	2020/21	2021/22	Progress	Benchmark
Quality of Service	Water service coverage %	78.5	79.0	↑	75
	Sewerage service coverage %	20	19.3	↓	40
	Water quality %	96	95.4	↓	95
	Hours of supply	17	17	→	18
Economic Efficiency	O&M cost coverage by billing %	118	115	↓	100
	Collection efficiency %	97	94	↓	90
	Staff cost in relation to O&M cost %	41.9	38.5	↑	30
Operational Sustainability	Staff/1,000 W&S connections	4.93	4.55	↑	8
	Metering ratio %	87.6	86.9	↓	90
	NRW %	45.7	45.3	↑	35
	↑ Increase ↓ Decline ▬ Benchmark met ▬ Benchmark not met				

With regard to the three components of KPIs:

- **Quality of Service –**there was a slight improvement in Water Supply Service Coverage and a performance decline in Sewerage Service Coverage and Water Quality indicators while Hours of Supply remained the same.
- **Economic Efficiency –** an improvement was recorded in Staff Cost vs O&M Cost. However, the performance in O&M Cost Coverage and Collection efficiency dropped but remained above the acceptable benchmark.
- **Operational Sustainability –** Utilities made improvement in Staff Efficiency but the average performance in Metering Ratio dropped. Despite a slight improvement in NRW, performance in this indicator is still significantly poor for all utilities.

10

CONCLUSION

10.1 INTRODUCTION

The Water Supply and Sanitation Sector Report stands as one of NWASCO's tool for information dissemination on the performance of Commercial Utilities and highlights key sector issues in the reporting year. This is in line with NWASCO's functions as mandated by the Water Supply and Sanitation Act No. 28 of 1997.

In the reporting year, the sector recorded positive trends in only four indicators namely Non-revenue Water (NRW), water supply hours, metering ratio and sanitation coverage. Although NRW recorded an increase, the reduction was not significant and the indicator remained a major challenge for the sector. Metering ratio improved slightly mainly as a result of the water supply improvement projects being undertaken in various CUs and internal efforts by the Utilities. Sustaining the improvement will require more innovative strategies to finance meter replacements and for new connections.

In addition to the new sewer connections and onsite sanitation (OSS) facilities made in the various on-going projects, CUs continued to capture more existing OSS facilities hence contributing to the increased sanitation coverage.

Improvements were also recorded in the water quality indicator in that all the CUs managed to comply with the confidence level requirements pertaining to the 10 integrity parameters for water quality based on the ISO 17025 and most CUs scored above the benchmark of 95% on drinking water national standards.

Much as a significant number of connections were made in the reporting period resulting in over 249 thousand people accessing clean and safe water, only two CUs met the acceptable benchmark of 95% for the Water Service Coverage indicator.

None of the CUs was able to meet the acceptable benchmark for Operation and Maintenance Cost Coverage by collection capped at 100%. This was because of increased operational costs which was not matched with an increase tariff coupled with poor collections by some CUs.

10.2 PROGRESS TOWARDS ATTAINING NATIONAL GOALS

The Eighth National Development Plan (8NDP) was launched in September 2022 and covers the period 2022 – 2026. Water and sanitation are covered under the Human and Social Development strategic development area number 2 of the plan. In particular, strategic outcome number 3 with the following strategies:

Strategy 1: Improve access to clean and safe water – the first programme under this strategy is the infrastructure development. In the reporting period, a number of projects were on-going in all CUs. Major projects included the Integrated Small Towns Water Supply and Sanitation projects in WWSC, LPWSC and CHWSC, the Zambia Water Supply Programme in MWSC, the Kafulafuta Dam and Water Supply System and the Lusaka Sanitation Programme in LWSC. Other projects implemented are discussed in section 4.6

The second programme under the strategy is water quality monitoring. In the reporting period, this was taken care of under some projects that would see the construction of laboratories and equipping them. This was the case for the Integrated Small Towns Water Supply and Sanitation projects.

Strategy 2: Improve sanitation services – the strategy has four programmes namely infrastructure development, solid waste management, sanitation and hygiene promotion and investment promotion. Sanitation infrastructure was addressed alongside the projects discussed in section 4.6. Additionally, CUs continued on their quest to embrace On-site Sanitation through institutionalising the OSS and FSM business. CUs with the support of Cooperating Partners such as SNV constructed faecal sludge management plants and supported Lukanga WSC and Chambeshi WSC in capacity building on the engagement of the private sector. OSS data capture through GIS mapping exercises and sanitation surveys were some of the activities done.

Solid waste has a profound bearing on sanitation and hygiene and must be therefore be addressed by the relevant authorities. This became apparent in the recent cholera outbreak that started in the later part of the reporting period which was attributed to a number of factors including poorly managed solid

waste.

In July 2022, the Zambia Water Investment Programme (ZIP) was launched that will see the US$5.75 billion raised for water security and creation of 200,000 formal jobs up to 2030.

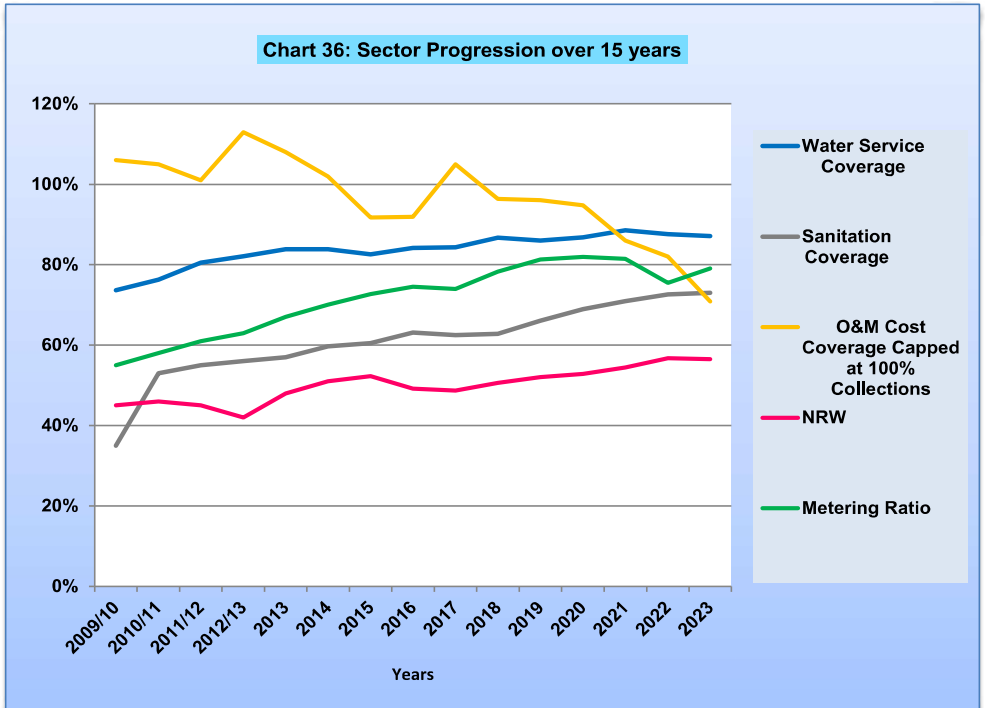
10.3 SECTOR PROGRESSION OVER 15 YEARS – URBAN & PERI URBAN AREAS

Chat 36 shows the performance of the sector on a few critical indicators namely water service coverage, sanitation coverage, O&M Cost Coverage Collections capped at 100% and NRW over a period of 15 years.

Despite having over 249 thousand additional people accessing water in the reporting period, water coverage declined by 0.5%. In terms of connections, 39,658 domestic connections were added. This was because the population increase was unmatched with the rate of increase in these connections.

Sanitation coverage on the other hand continued to increase although marginally by 0.4% with 273,753 additional people having sanitation services through sewer networks and septic tanks.

Operation and Maintenance Cost coverage has had a sharp decline in the last five years, reaching a record low of 71%. Cost of inputs required to sustain acceptable level of service such as electricity, chemicals and labour increased in the period while there was no increase in water and sanitation tariffs. While CUs must strive to contain costs and improve operational efficiencies, there is clearly a need to have a corresponding increase in water and sanitation tariffs to meet the ever increasing costs.

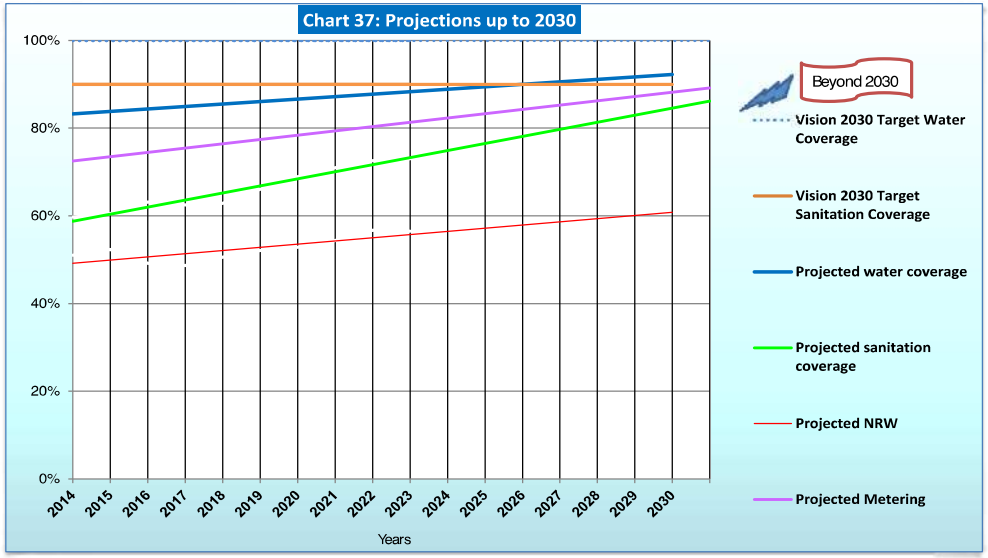


Key factors in the NRW reduction such as metering and infrastructure development continued to be addressed. These efforts evidently contributed to the reduction recorded in the reporting period. The sector average NRW still remains high as only a marginal reduction was recorded in the reporting period. Concerted efforts are required to understand the factors influencing NRW in specific CUs in order to devise tailor made solutions.

10.4 PROJECTIONS UP TO 2030 – URBAN AND PERIURBAN AREAS

Chart 37 demonstrates the progression of sector averages up to 2030 for urban water and sanitation coverages, metering ratio and NRW with the assumption that the current rate of investment in the sector is maintained at more or less the same rate. These projections were made from 2011/12. The reason is that it was only up until around 2011 that the reform process of the sector

had fully taken some level of stability in sector financing, utility governance/ management and institutional reforms. With the dismal performance of the sector in the reporting period, the Chart shows that the country is not likely to meet its Vision 2030 targets for urban and peri-urban water and sanitation coverage of 100% and 90% respectively. Additionally, NRW and metering ratio will not reach the sector benchmarks until after 2030. Attainment of these targets is extended further when access to services in rural areas is taken into account considering the lower coverage rates in rural areas.



JMP PROGRESS ON HOUSEHOLD DRINKING WATER, SANITATION AND HYGIENE 2000-2022

The 2030 Agenda for Sustainable Development Goal 6 aims to *'ensure availability and sustainable management of water and sanitation for all' and includes targets for universal access to safe drinking water (6.1), and sanitation and hygiene (6.2). Data for the corresponding global indicators was available during the reporting period for more than 50% of the world's* population but, at the mid-point of the SDG period, the world is not on track to achieve SDG targets 6.1 and 6.2. Achieving universal coverage by 2030 would require a sixfold increase in current rates of progress for safely managed drinking water, a fivefold increase for safely managed sanitation and a threefold increase for basic hygiene services. For at least basic water and sanitation, the current rates of progress need to be doubled to reach universal coverage by 2030. For Zambia, the progress made for water and sanitation coverages based on JMP ladders is presented in Table 63 and Table 64.

Table 63: Water Coverage based on JMP ladders

Service level	Rural	Urban	Total
Safely managed	No data	45	No data
At least Basic service **	51	89	68
Limited service	9	4	6
Unimproved	28	7	19
Surface water	12	<1	7
Average Annual rate of change at least basic	1.05	0.27	0.97

NWASCO water coverage of at least basic stood at about 88% against JMP of 89%.

Table 64: Sanitation Coverage based on JMP ladders

Service level	Rural	Urban	Total
Safely managed	31	No data	No data
At least Basic service **	32	42	36
Limited service	9	36	22
Unimproved	48	21	36
Open defecation	11	<1	6
Average Annual rate of change at least basic	1.3	- 0.04	0.89

** includes safely managed

NWASCO sanitation coverage of at least basic combines safely managed, basic and limited but excludes latrines except those that are verified that they are indeed improved which stood at 73.6% against JMP 78%. The slight difference could be mainly on capturing of latrines.

WATER SUPPLY AND SANITATION SECTOR REPORT 2023

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