Administration and Management of Water Supply Services (A)

Country Reports

FY2024

Japan International Corporation of Welfare Services (JICWELS)

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1. ANGOLA

Inception Report

Country: Angola

Name: Kelson Miguel Domingos

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1. Outline of Water Supply Services

1-1. Legal Basis of Water Supply Services

Water supply services in Angola are regulated by law, the most relevant of which are:

- Lei n.º 6/02, de 21 de Junho, Water Law, establishes the general principles of the legal regime inherent to the use of water resources.
- DP n.º 82/14, de 21 de Abril, Presidential Decree, Regulates the general use of water resources.
- DP n.º 127/23, Presidential Decree, Regulation of regulatory information for the water and wastewater sanitation subsector.
- DP n.º 128/23, Presidential Decree, Regulation of service quality in the Public Water Supply and Wastewater Sanitation subsector.
- DP n.º 129/23, Presidential Decree, Regulation of commercial relations for public water supply and wastewater sanitation services
- DP n.º 130/23, Presidential Decree, Sanctioning regulation of the water and wastewater sanitation subsector

1-2. **Demarcation of Water Supply Services**

Ministry of Energy and Water is responsible for public water supply companies.

1-3. Main Actor of Water Supply Utilities

In Angola, each province has a public company responsible for the distribution of water and sanitation, except Luanda, which only has a water supply component. Additionally, there is a national regulatory entity that supervises the quality of service of provincial companies, called IRSEA, Energy and Water Regulatory Institute.

1-4. Mission/Vision of Water Supply Utilities

Provide a public water supply service within an efficient framework with environmental,

economic and social sustainability, contributing to improving the quality of life of citizens.

1-5. Your Mission/Vision in your organization

Be able to influence strategic-level decisions.

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2. Water Supply Service Levels

2-1. Main Performance Indicators (PI)

Coverage area	18 826 (sq. km)
Population Served	60%
Collection ratio	30 (%)
Production capacity	772 634 (m3/day)
Supply duration	8 (hr/day)
Supply pressure	2 bar
Non-Revenue Water	(%)
Water quality	-
Staff number	1 599
Number of connections	542 000
Staff/1,000 connections	3 (people/1,000connections)

2-2. Any Monitoring by Performance Indicators (PI)

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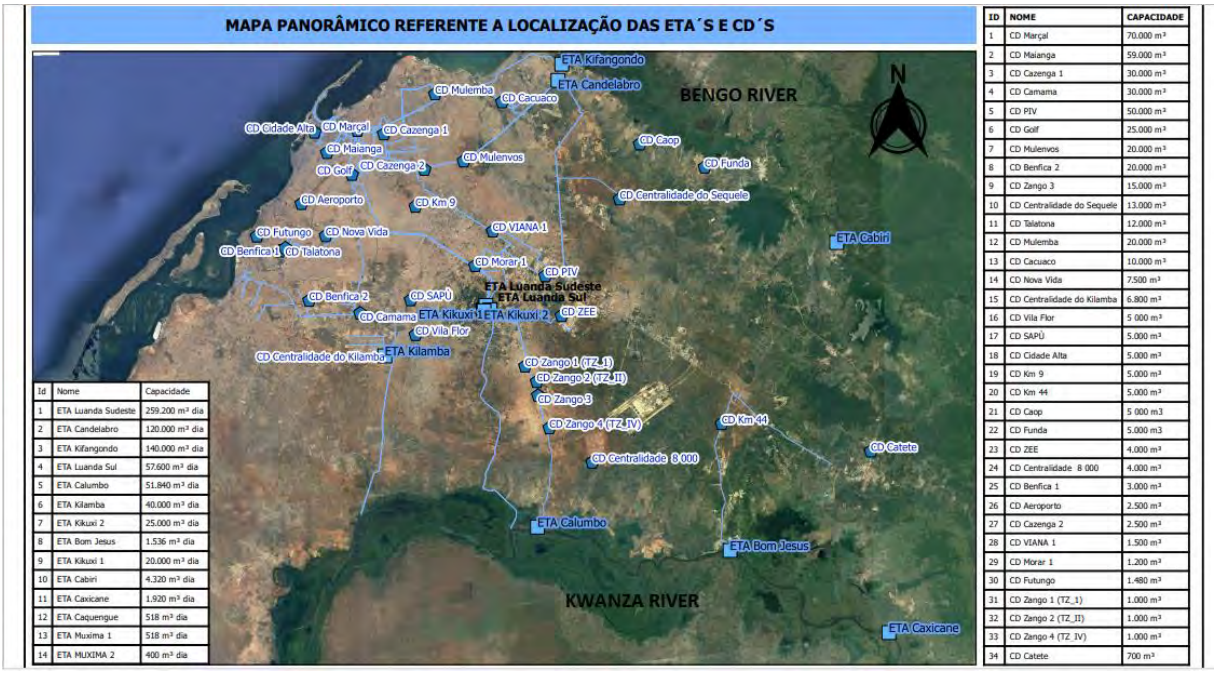
3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems

The rivers flowing into the Luanda Province, named Kwanza and Bengo river, are the unique source of raw water used by EPAL, wich is the government water supply utility in Luanda, Angola's Capital and home to about 9 milion inhabitants. Raw water collected from these rivers is processed such as sedimentation, filtration and disinfection at water plants, and conveyed by underground water pipes, then supplied to customers by different solutions, such as: tap water, public standpipes and water trucks that collect at points owned by public companies and delivery directly to residents of areas without a public water supply network. which corresponds to around 60% of the population with access to safe water. The low availability of produced water, associated with water losses, contributes to an intermittent distribution model that, in addition to affecting comfort levels, also contributes to the deterioration of water quality.

Figure 1 - Map referring to the location of main WTP and water tank facilities



Id	Nome	Capacidade
1	ETA Luanda Sudeste	259.200 m³ dia
2	ETA Candelabro	120.000 m³ dia
3	ETA Kifangondo	140.000 m³ dia
4	ETA Luanda Sul	57.600 m³ dia
5	ETA Calumbo	51.840 m³ dia
6	ETA Kilamba	40.000 m³ dia
7	ETA Kikuxi 2	25.000 m³ dia
8	ETA Bom Jesus	1.536 m³ dia
9	ETA Kikuxi 1	20.000 m³ dia
10	ETA Cabiri	4.320 m³ dia
11	ETA Caxicane	1.920 m³ dia
12	ETA Caquengue	518 m³ dia
13	ETA Muxima 1	518 m³ dia
14	ETA MUXIMA 2	400 m³ dia

ID	NOME	CAPACIDADE
1	CD Marçal	70.000 m³
2	CD Maianga	59.000 m³
3	CD Cazenga 1	30.000 m³
4	CD Camama	30.000 m³
5	CD PIV	50.000 m³
6	CD Golf	25.000 m³
7	CD Mulenvos	20.000 m³
8	CD Benfica 2	20.000 m³
9	CD Zango 3	15.000 m³
10	CD Centralidade do Sequele	13.000 m³
11	CD Talatona	12.000 m³
12	CD Mulemba	20.000 m³
13	CD Cacuaco	10.000 m³
14	CD Nova Vida	7.500 m³
15	CD Centralidade do Kilamba	6.800 m³
16	CD Vila Flor	5 000 m³
17	CD SAPÚ	5.000 m³
18	CD Cidade Alta	5.000 m³
19	CD Km 9	5.000 m³
20	CD Km 44	5.000 m³
21	CD Caop	5 000 m3
22	CD Funda	5.000 m3
23	CD ZEE	4.000 m³
24	CD Centralidade 8 000	4.000 m³
25	CD Benfica 1	3.000 m³
26	CD Aeroporto	2.500 m³
27	CD Cazenga 2	2.500 m³
28	CD VIANA 1	1.500 m³
29	CD Morar 1	1.200 m³
30	CD Futungo	1.480 m³
31	CD Zango 1 (TZ_1)	1.000 m³
32	CD Zango 2 (TZ_II)	1.000 m³
33	CD Zango 4 (TZ_IV)	1.000 m³
34	CD Catete	700 m³

3-2. Current Actions against Those Challenges/Problems

As companies are unable to cover operational costs, the government invests in the rehabilitation and expansion of new infrastructure with the aim of ensuring that at least 70% of the population has safe access to water by 2027. For the period 2023 - 2027, the government plans to build two new water supply systems that will increase the capitation from the current 40 liters/inhabitant equivalent/day to 150 liters/inhabitant equivalent per day. The two new systems will have a cumulative capacity of around 750,000 m3/day and construction is expected to be completed between 2026 and 2027. Additionally, there are other initiatives planned to be carried out during the period 2023 - 2027, such as focusing on reducing non-revenue water and also on maintaining systems to allow distributing a large part of the treated water.

3-3. Any Achievements

According to UNICEF, the Water, Sanitation and Hygiene programs had a significant increase in their budgets of around 365% in five years, from 81.6 billion kwanzas in 2019 to 379.3 billion kwanzas in 2023, allowing us to reach 2% of the OGE against the average of 1.3% of the OGE in the last five years. This priority given to the water supply and sanitation sector allowed, in the period 2012 - 2020, to increase the number of people with access to water by a further 5.4 million and a further 8.5 million with sanitation.

3-4. Water Quality Standards for Drinking Water

The public water supply company in Luanda adopts WHO parameters to control water quality.

3-5. Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others

The National Directorate of Water Supply is currently the entity responsible for ensuring that companies implement and regularly report their water quality control plans. This task will become the responsibility of IRSEA, the regulatory entity for electricity and water supply and sanitation services, that in recent years has developed action procedures through the approval of several presidential decrees with mandatory compliance.

3-6. Implementation of Water Safety Plans* or Similar Efforts

(* Water Safety Plans: refer to the following URL and review before participating in the Course,

URL: Water safety plan manual (WSP manual) (who.int))

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4. Reduction of Non-Revenue Water

4-1. Current Situation and Major Challenges/Problems

Water losses, which vary between 40% and 70%, are among the barriers to overcome in order to become a company with better technical-operational performance.

4-2. Current Actions against Those Challenges/Problems

For the period 2023 - 2027, the company intends to start activities to reduce water losses. Within the scope of initiatives with the World Bank, EPAL intends to develop the Strategic Plan to reduce water losses, whose terms of reference are currently being drawn up. At the same time, 2 or 3 independent projects have been identified to initiate pilot projects to reduce water losses.

4-3. Any Achievements

4-4. Constitution of NRW (If you have the data, please fill in the table)

Authorized consumption	Revenue water	Billed authorized consumption	(m3 /year) (%)
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	(m3 /year) (%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	(m3 /year) (%)
		Physical losses (Leakage)	(m3 /year) (%)

4-4. Situations about Leakage Detection Measures (DMA etc.)

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5. Accounting system of Water Supply Service

5-1. Water Tariff in your Organization

5-2. Balance Sheet of your Organization

5-3. Profit and Loss Statement of your Organization

Operational and Financial Indicators 2019 - 2020

	Descrição	2019	2020	Variação	
				Unid.	%
1)	Água Captada (m³)	199 597 883	211 235 721	11 637 838	5,83
2)	Água Produzida (m³)	180 634 627	189 816 947	9 182 320	5,08
3)	Capacidade Nominal (m³/dia)	690 874	690 874	-	0,00
4)	Produção Real (m³/dia)	494 889	518 717	23 828	4,81
5)	Água Distribuida (m³)	115 259 399	119 158 905	3 899 506	3,38
6)	Água Facturada (m³)	75 680 264	62 892 695	(12 787 569)	-16,90
7)	Montante Facturado (AKz)	24 413 209 266	19 650 639 474	(4 762 569 792)	-19,51
8)	Montante Cobrado (AKz)	9 914 752 082	9 819 497 731	(95 254 351)	-0,96
9)	N.º de Clientes	504 716	514 420	9 704	1,92
10)	N.º de Colaboradores	1 680	1 700	20	1,19

1) Intake water (m3) **2)** Potable Water (m3) **3)** Nominal capacity (m3/day) **4)** Actual capacity (m3/day) **5)** Distributed water (m3)

6) Billed water (m3) **7)** Invoiced amount (AKz) **8)** Received amount (AKz) **9)** Number of customers **10)** Number of employees

Demonstração de Resultados por Naturezas em 31 de Dezembro de 2020

MOEDA AKZ

Designação	Notas	Exercícios	
		Dezembro 2020	Dezembro 2019
Vendas	22	17 835 821 762	22 288 864 288
Prestações de Serviço	23	408 397 967	515 652 877
Outros proveitos operacionais	24	5 551 404 960	6 015 815 494
		23 795 624 690	**28 820 332 659**
Custo das mercadorias vendidas e matérias-primas e subsidiárias consumidas	27	-2 360 821 544	-2 767 464 719
Custos com o pessoal	28	-8 851 642 788	-8 128 883 177
Amortizações	29	-10 721 805 260	-10 033 815 280
Outros custos e perdas operacionais	30	-2 155 894 620	-3 039 430 113
		-24 090 164 212	**-23 969 593 290**
RESULTADOS OPERACIONAIS		**-294 539 522**	**4 850 739 369**
Resultados financeiros	31	-3 348 974 743	-3 959 309 964
Resultados não operacionais	33	-12 653 480 649	-14 745 654 492
RESULTADOS ANTES DE IMPOSTOS		**-16 296 994 914**	**-13 854 225 087**
Imposto sobre o rendimento	35	-1 303 042 944	-2 068 487 461
RESULTADO LÍQUIDO DAS ACTIVIDADES CORRENTES		**-17 600 037 859**	**-15 922 712 548**
Resultados extraordinários	34	112 292 624	
Imposto sobre o rendimento	35	-28 073 156	
RESULTADOS LIQUIDOS DO EXERCICIO		17 515 818 391	-15 922 712 548

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6. Major Recent Achievements in Improvement of Water Supply Services/Management

The Angolan government has implemented the institutional development plan for the water sector, which allowed, among other achievements, to highlight the following:

- Create a public water and sanitation company for each province.
- Create the regulatory entity for water and sanitation services.

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7. Recent Challenges to Improve Water Supply Services

- Identify sustainable financing sources, that allow implementing the planned infrastructure expansion plan.
- Make the company capable of covering at least operational costs to ensure the maintenance of current infrastructure and a good quality service level.
- Strengthen the technical capacity of managers and technicians.
- Develop and effectively implement measures to reduce water losses, non-

revenue water methodology.

- Design tariff systems that allow, in a first phase, to cover system operation and maintenance costs (OPEX) for consumers and in a second phase, also include investment costs (CAPEX), thus gradually eliminating state subsidies.

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8. Expectations toward Japan

8-1. Expectations toward Japanese Government and JICA

The Japanese government has a high reputation for being able to make Japan one of the most developed countries in the world even without abundant natural resources. As a citizen of a developing country rich in natural resources, I hope to learn about the pillars that Japan has used to support the development of the water sector and then try to replicate it in my country.

8-2. Expectations toward Japanese Water Utilities

A great opportunity to learn and get to know on the ground the reality of Japanese companies that have successfully been able to correctly manage the water sector. For example, knowing the specific measures that Tokyo Waterworks has implemented to reduce leakage rates from 10,2% in 1992 to 3,7% in 2022.

8-3. Expectations toward Japanese Private Companies

I hope to learn about the technological capacity of private companies and what role they play in the water sector where the activity is mostly state owned.

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9. Expectations toward the Program.

9-1. Expectations of your supervisors toward your participation in the program.

The expectation that my supervisor has is that this training will be able to help me overcome the various challenges that we face and allow my personal goal to be achieved with this reinforcement of skills.

9-2. Your expectation; Any comments and requests are appreciated.

Increase my knowledge and networking capacity to allow me to influence decisions

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END.

Administration and Management of Water Supply Services(A)

Inception Report Presentation

1. **Country: Angola**
2. **Name: Kelson Miguel Domingos**
3. **Position: Administrator**
4. **Organization: Empresa Publica de Aguas, EPAL-E.P.**

(Luanda Water Supply Company)

1. Outline of Water Supply Services of (EPAL-E.P.)

Empresa Publica de Aguas, EPAL-E.P., is a Public enterprise that wants to provide a public water supply service within an efficient framework with environmental, economic and social sustainability, contributing to improving the quality of life of citizens.

Whole Country: ANGOLA

Area : 1 246 700 km^2

Population : 35,12 million Habitants

Coverage Water Supply: 60 %

Your Water Supply System/City: LUANDA

Service Area : 18 826 km^2

Population: 9,6 million

Population Served: 5,78 million

Coverage Water Supply: 60%

- 37% through an individual house connection
- 23% through other safe drinking water source: public standpipes

1. Outline of Water Supply Services of (your Organization)

Please fill in variation of the indicators below based on your situation.

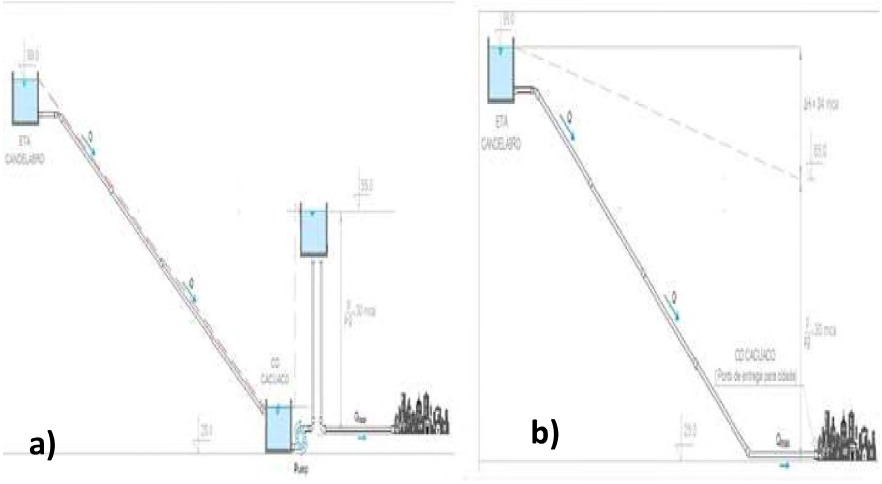
INDICATORS	2006 or 2007	2016 or 2017	Goals for 2025
Staff/1,000 connections	-	3,7	2,7
Production capacity (m3/day)	-	690 490	626 300
Water quality	WHO Guidelines	WHO Guidelines	WHO Guidelines
Coverage area	-	60%	56%
Supply duration (hr/day)	-	10	9
Supply pressure	-	2.5 bars	2.5 bars
Number of connections	-	465 270	610 000
NRW	-	70%	55%
Collection ratio	-	30%	50%
Staff number	-	1736	1657

2. Success Story of your Water Supply Services

Energy Efficiency as Catalyst to Improve Water Supply System's Performance

- Cacuaco Municipality Water Tank (Water Distribution Center)
  - Moves from 100% pumping distribution to 100% gravity distribution;
  - Reduction of GHG emissions;
  - Savings to about 100,000 dollars/year on electricity, maintenance, and labour.

Tank that works as water distribution centre



a) Hydraulic configuration of Cacuaco Municipality water supply source before optimization

b) Hydraulic configuration of Cacuaco municipality after optimization.

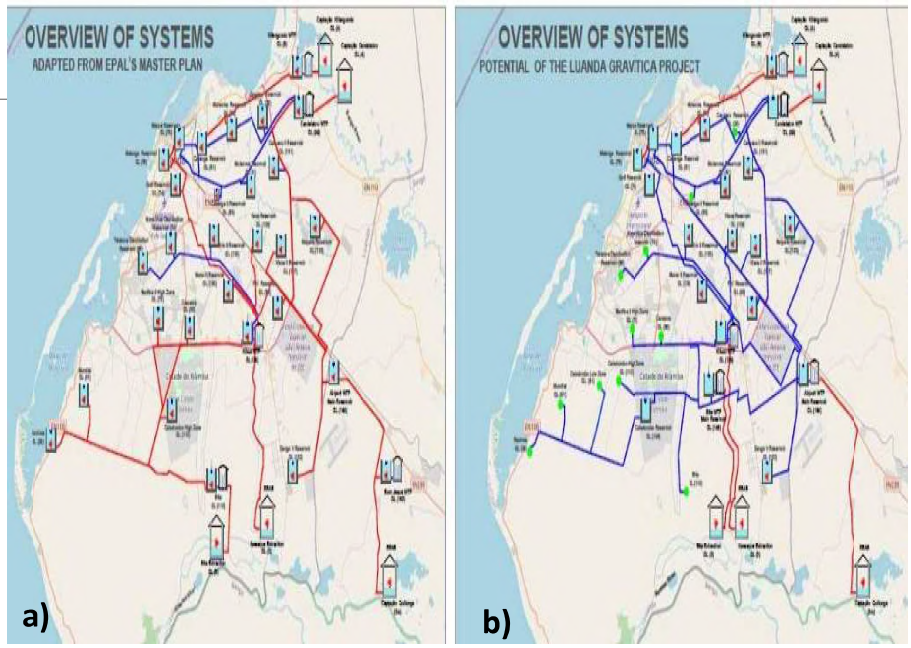
2. Success Story of your Water Supply Services

Energy Efficiency as Catalyst to Improve Water Supply System's Performance

a) Overview of Luanda Main Water Supply Systems.

b) Overview of the Potential of the Luanda Gravitica Project.

The red line represents the pumping supply. The blue line represents gravity supply.



3. Recent Challenges to Improvement of Water Supply Services

- From 2015 to 2020, the population with access to basic drinking water increased from 54% to 57%;
- An annual rate of change of 0.8%, Angola is unlikely to achieve universal access to water supply by 2030, SDG 6.1;
- Non Revenue Water, varying from 39% to 70%;
- Low tariff, varying from to about 0,10 USD/m³ to 0,35 USD/m³;
- Luanda, Angola's capital and home to about 9,6 million inhabitants, with growth rate to about 4,2% a year;
- Low urbanization ratio;
- Limited financial and human resources, weak administrative data systems and inadequate data dissemination.

3. Recent Challenges to Improvement of Water Supply Services

Non Revenue Water, varying from 39% to around 70%

	2017	2018	2019	2020	2021
Treated Water (m^3/ano)	157 737 912	185 215 053	180 634 627	189 816 947	186 778 477
Billed Water (m^3/ano)	95 849 390	92 600 913	75 680 264	62 892 695	60 127 971
Non Revenue Water (m^3)	61 888 522	92 614 140	104 954 363	126 924 252	126 650 506
% Non Revenue Water - NRW	**39,2%**	**50,0%**	**58,1%**	**66,9%**	**67,8%**

3. Recent Challenges to Improvement of Water Supply Services

Luanda, Angola's capital and home to about **9,6 million** inhabitants, with growth rate to about **4,2%** a year

Accelerated and in many cases disorderly urban growth

Illegal connection

4. Expectations toward the Program

My expectation toward this program

- I know **Japan** as a **developed economy based on** the capacity of **human resources**, based on this, I hope after this training to improve my skills and use the knowledge to transform my environment;
- I hope to use the **power of successful examples** from the Japanese reality to support the changes I intend to undertake in my country;
- Strengthen networking and global partnerships.

Expectation of my superior toward this program

They believe that after this training I will be better prepared to contribute to resolving the multiple crises that the water sector has faced: financial, human capacity, partnerships, etc.

ARIGATŌ

ARIGATŌ

2. BANGLADESH

Inception Report

Country: Bangladesh

Name: Mohammad Nazim Uddim

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1. Outline of Water Supply Services

1-1. Legal Basis of Water Supply Services

(What kind of laws and regulations are Water Supply Services based on?)

- Water Supply & Sewerage Authority Law, 1996.

1-2. Demarcation of Water Supply Services

(Which ministry is in charge of what kind of field of water?)

- Ministry of Local Government, Rural Development & Cooperatives, Bangladesh.

1-3. Main Actor of Water Supply Utilities

(e.g. In Japan, most water utilities are public bureau under local government.)

- Most water utilities of Bangladesh are under Ministry of Local Government, Rural Development & Cooperatives.

1-4. Mission/Vision of Water Supply Utilities

Vision: To be the most efficient Customer friendly Water and Sewerage Authority in Bangladesh.

Mission: To provide quality water supply, sewerage and drainage services in the most cost effective manner; while applying appropriate technologies that are environmentally friendly.

1-5. Your Mission/Vision in your organization

Vision: Be the most efficient and friendly official in my organization..

Mission: To provide quality water and sewerage services to the customer of chattogram wasa.

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2. Water Supply Service Levels

2-1. Main Performance Indicators (PI)

Coverage area	720 (sq. km)
Population Served	5,000,000
Collection ratio	74 (%)
Production capacity	466 (m3/day)
Supply duration	24 (hr/day)
Supply pressure	0.6-1.5
Non-Revenue Water	26 (%)
Water quality	Best
Staff number	529
Number of connections	95,336
Staff/1,000 connections	(people/1,000connections)

2-2. Any Monitoring by Performance Indicators (PI)

- N/A

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3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems

- 1. To reduce NRW have to change aged pipe
- 2. More turbidity in moonsoon.
- 3. Saline water instusion at dry season.
- 4. Lack of skilled Manpower.

3-2. Current Actions against Those Challenges/Problems

- 1. We are taking different steps like Mobile Court, leakage detection and rapair etc
- 2. Replaced distribution pipeline by KWSP 1 & 2.
- 3. Intake relocation through upstair.

3-3. Any Achievements

- ISO 9001 Award.

3-4. Water Quality Standards for Drinking Water

- We always maintain WHO recognized quality.

3-5. Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others

- In our organization.

3-6. Implementation of Water Safety Plans* or Similar Efforts

(* Water Safety Plans: refer to the following URL and review before participating in the Course,

URL: Water safety plan manual (WSP manual) (who.int))

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4. Reduction of Non-Revenue Water

4-1. Current Situation and Major Challenges/Problems

- To reduce non revenue water.

4-2. Current Actions against Those Challenges/Problems

-We are taking different steps like Mobile Court, leakage detection and rapair etc.

4-3. Any Achievements

-ISO 9001 Award.

4-4. Constitution of NRW (If you have the data, please fill in the table)

Authorized consumption	Revenue water	Billed authorized consumption	(m3 /year) 70.0(%)
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	(m3 /year) 18.0(%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	(m3 /year) 8.0(%)
		Physical losses (Leakage)	(m3 /year) 4.0(%)

4-4. Situations about Leakage Detection Measures (DMA etc.)

1 Purchased leak detection equipment

2 Taining to use that leak detection equipment

3 Applying SCADA system to monitor & control the water supply.

4 Establishing 59 DMA's in Karnaphully Supply Area (KSA) to reduce the NRW.

5 Rest of DMA is under process.

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5. Accounting system of Water Supply Service

5-1. Water Tariff in your Organization

- Domestic (18.00 taka/ Per Cubic Meter)
- Non Domestic (37.00 taka/ Per Cubic Meter)

5-2. Balance Sheet of your Organization

5-3. Profit and Loss Statement of your Organization

(*[Public Utilities] (1) Profit and Loss Account

(2) Capital Income and Expenditures of your Organization)

(* You can check the case of Tokyo in the chapter 4 ”Financial System and Future Financial Management” of this file.

URL: http://www.waterprofessionals.metro.tokyo.jp/pdf/wst_02.pdf)

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6. Major Recent Achievements in Improvement of Water Supply Services/Management

- ISO 9001 Award
- Mother Teresa Internation Award 2024

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7. Recent Challenges to Improve Water Supply Services

- Turbid water in river.
- Salinity intusion in dry season.
- Lack of skilled Manpower.
- To reduce NRW have to change aged pipe

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8. Expectations toward Japan

8-1. Expectations toward Japanese Government and JICA

8-2. Expectations toward Japanese Water Utilities

8-3. Expectations toward Japanese Private Companies

- Best coopertation and arrangement of best learning Programme.

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9. Expectations toward the Program.

9-1. Expectations of your supervisors toward your participation in the program.

- Sincerely and attentively completed this programme

9-2. Your expectation; Any comments and requests are appreciated.

- Best cooperation and learning.

END

INCEPTION REPORT

Administration and Management of Water Supply Services

JICA Knowledge Co-Creation Program (JICA-KCCP)

Md. Nazim Uddin, Deputy Secretary
Chattogram Water supply & Sewerage Authority (CWASA)
Bangladesh

16-AUGUST, 2024

2. Chattogram City Overview

- Chattogram is the Second largest city, Main Port city and commercial capital of Bangladesh
- Its importance as a port and trading center goes back to the 9th century
- The area of Chattogram City Corporation is 155 square kilometers.
- Present population is 3.2 million. Projected population by 2025 is 4.1 million and by 2030 is 4.6 million (According to JICA Preparatory Survey of KWSP 2 in 2012).

3. Introduction of organization

Organization name: Chattogram Water Supply & Sewerage Authority (CWASA)

❖CWASA established in 1963 under EP ordinance no. XIX, 1963.

❖WASA Act 1996 has been made effective from May 4, 2008.

Total number of employees:1048

Population in Service Area:2.58 million

Service Area: 161 km2

Service Population : 2.47 million

Mission: To provide quality water supply, sewerage and drainage services in the most cost effective manner; while applying appropriate technologies that are environmentally friendly.

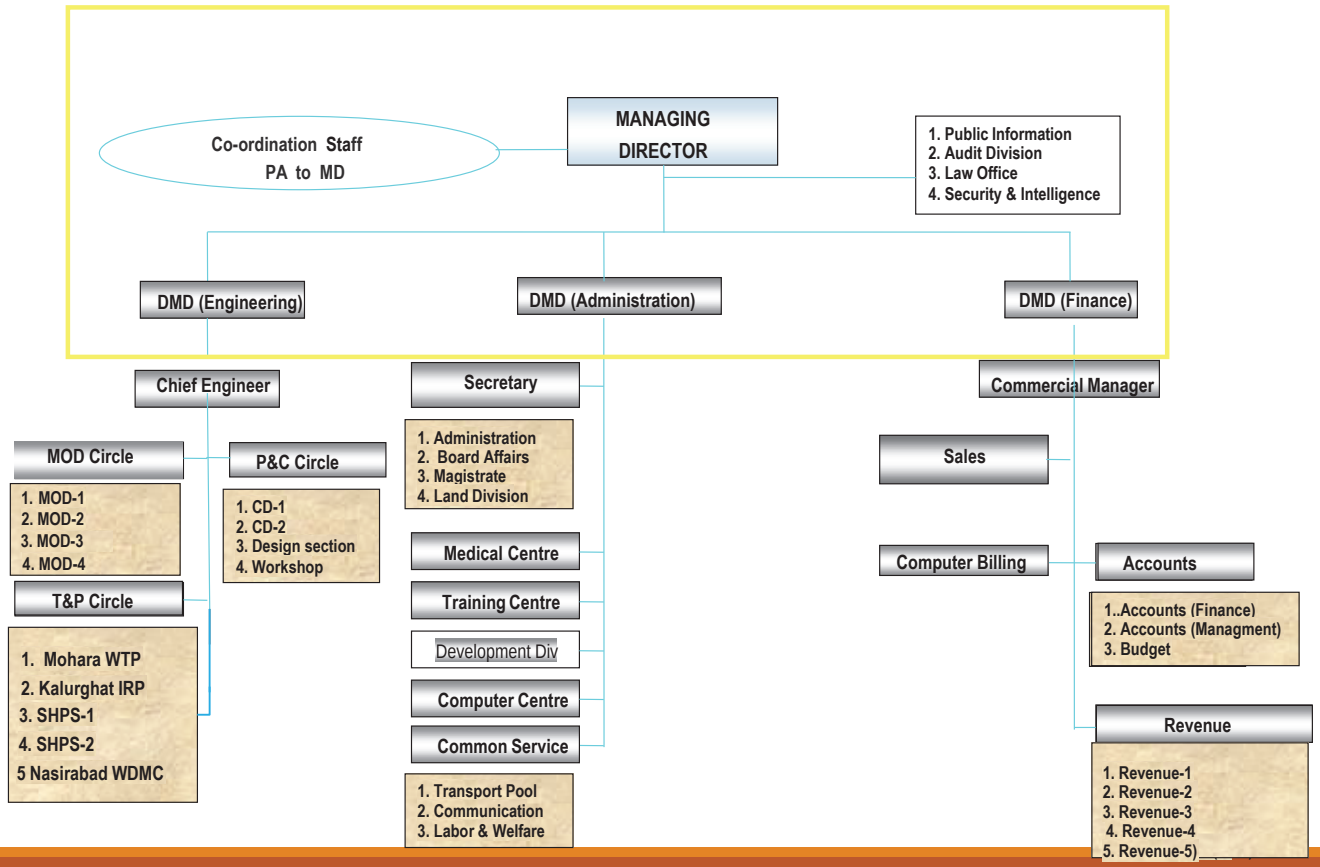
3. Introduction of organization

Vision: To be the most efficient Customer friendly Water and Sewerage Authority in Bangladesh.

Challenges:

- Rapid expansion of the city in relation to high rate of population growth water demand increase day by day.
- Slum dwellers lack safe water supply, sanitation and hygiene services, forcing them to live an inhuman life.
- There is no proper sewage system in Chattogram.
- Canals are often clogged with dumped solid wastes and garbage.

Present Organogram of CWASA



Management of CWASA

- CWASA Board consists of Chairman, Managing Director (MD) DMD (Engineering), DMD (Administration), DMD (Finance)
- MD is the Chief Executive Officer of the Authority
- Three members look after their respective wings
- The Chairman, Managing Director and member of the board are appointed by the Government
- Chief Engineer, Commercial Manager and Secretary are the three head of department
- Presently Commercial Manager and Secretary are working in CWASA on deputation from the Government
- All other officers and staffs are on CWASA's own enrolment
- Out of present 1119 nos. of employee 65 are women
- The number of employees of CWASA in different category is shown in Table-1 and the organization chart of top management is shown in Figure-1.

Personnel Details of CWASA

Sl. #	Category	Approved Post	Presently Working
1.	Class- I officer	126	56
2.	Class- II officer	68	36
3.	Class- III staff	467	201
4.	Class- IV staff	458	235
	Total(Permanent)	1119	528

** Casual staff working as a temporary basis= 222

Total no. of employees=750

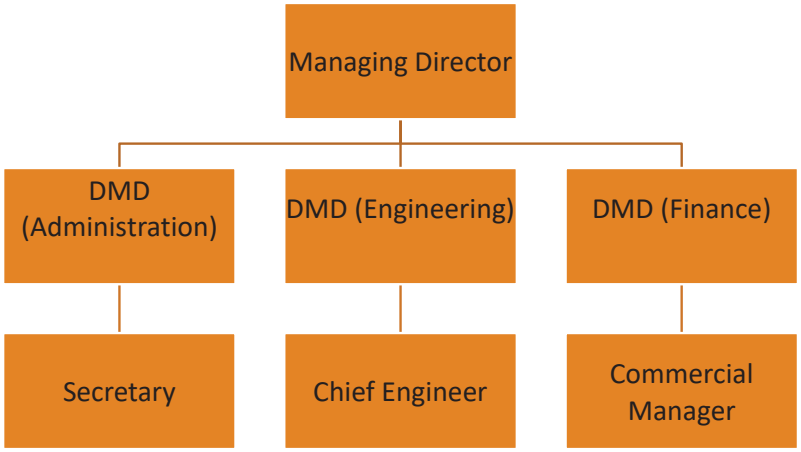


Fig: The organization chart of top management .

1. Outline of Water Supply Services of CWASA

INDICATORS	Year 2024
Staff/1,000 connections(excl non-perm Empl.)	5.8
Production capacity (m3/day)	562,000
Water quality	WHO Guidelines
Coverage area	66%
Supply duration (hr/day)	24
Supply pressure	0.6-1.5bars
Number of connections (Billable)	90,510
NRW	29%
Collection ratio /Bill sent-out ratio	86%
Staff number	611
Total Registered connections	96,510
Average Tarriff(Tk/m3)	19.38
Unit Production Cost (Tk/m3 , incl Capital expenditure, Depreciation & Financial expense)	23.04

Success Story of CWASA Water Supply Services

	From 1963 to 2009	2009 to 2024	Total
Surface WTP	1 Nos.	3 Nos	4 Nos.
New Pipeline	522 Km	230 Km.	752 km
Rehabilitation of Pipeline	-	630 km	630 km
Water Production	140 MLD	360 MLD	500 MLD
Service Connection	40,000 Nos,	39,000 Nos.	91,000 Nos.
Revenue Generation (Monthly)	25 Million BDT	95 Million BDT	120 Million BDT

9

Achievements of CWASA in the last decade

- Chattogram WASA has received the International Construction Award from Global Trade Leaders Club, Spain in recognition of its ability and quality of works in project implementation in 2016 based on the opinions of representatives from 93 countries.
- As a result of achieving quality of treated water and compliance of water treatment plant, Chattogram WASA has been achieved the **ISO 9001:2015** certificate as the first water supply authority in Bangladesh.
- Chattogram WASA will provide safe and potable water to 100% of the people of Chittagong city to achieve the Sustainable Development Goal by 2022.
- Chattogram WASA is undertaking several project to set up sewerage system to achieve Sustainable Development Goal-6.2.

International Construction Award

ISO 9001:2015 Certificate

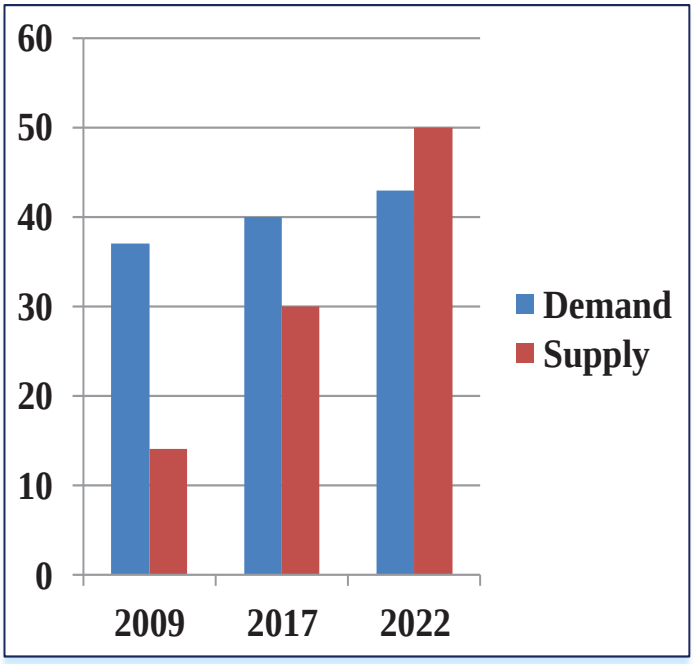
10

Internet Based Services of CWASA to Implement Vision-2021 and Digital Bangladesh

- Provide bills to the customers through online.
- Consumers can pay the bill through bank, mobile operator and digital payment portal (i.e Bkash and Nagad)
- Execution of all tendering works through e-tendering web portal E-GP (www.eprocure.gov.bd).
- Provide printed bills to the customers for payment of deep tube well license through online.

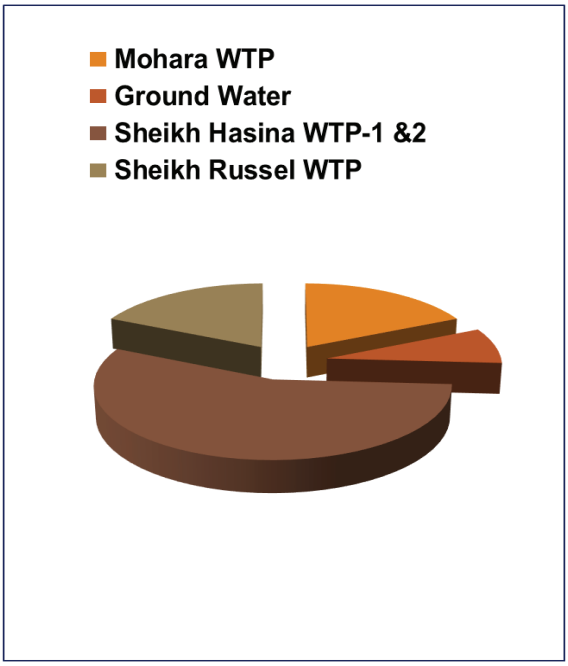
Demand Vs. Supply Capacity

Year	Demand (MLD)	Supply Capacity (MLD)
2009	37	14
2017	40	30
2024	43	50



Supply capacity of CWASA

Source	Supply capacity (MLD)
Mohara WTP	90
Sheikh Hasina WTP 1& 2	280
Sheikh Russel WTP	90
Ground water	40
Total	**500**



3. Recent Challenges to Improvement of Water Supply Services

- Review set-up; rationalize human resources; recruit required human resources against vacant positions
- Training needs assessment (TNA)
- Development of HRD plan
- Computerization of staff information
- Establishment of a training center jointly with DWASA and DPHE, mainly for water supply and sanitation
- Study long-term institutional development needs and reforms
- Define job description of all staff
- Develop 'rules of business' at various levels
- Develop a proper institutional arrangement for effective monitoring of CWASA service facilities
- Study on decentralization and delegation of power at appropriate levels
- Inclusion of stake holders representation in the CWASA board

4 . Expectations toward the Program

My expectation toward this program

- To know about personnel capacity building procedure in Japan Waterworks Bureau.
- To know how to improve or strengthen the HRM / Enhancement of the ability of human resource management
- To know the rules and regulations of daily basis/out sourcing people of Japan
- To know about overtime or extra duty system in japan.
- To know about Japan Govt. service rule for Human Resource Management

Expectation of my superior toward this program.

- Update the organogram of CWASA and take stern action to fulfill the vacant posts on priority basis alongside setup automation system to reduce dependency on human resource .
- Update service related information on the website and increase publicity about service related initiatives.
- Introduce a standard assessment system in order to assess the quality of services and to enhance the capacity of the manpower.

3. BENIN

Inception Report

Country: Benin

Name: Louis-Marc SOGNON

Overview of water supply services

1.1 legal basis of water supply services

what types of laws and regulations are water supply services based on

LAW N° 2010-44 OF NOVEMBER 24, 2010 relating to water management in the Republic of Benin.

1.2 Delimitation of water supply services

which ministry is in charge of what type of water sector

Ministry of Energy, Water and Mines

1-3 Main player in water supply services

(in Japan, most water utilities are public offices under local government)

Benin National Water Company (SONEB)

National Agency for Drinking Water Supply in Rural Areas (ANAEPMR)

1-4 Mission/water of water supply services

**SONEB

Ensure and guarantee the security and continuity of the public water service for the urban and peri-urban population

**ANAEPMR

Develop and organize the management of the State's hydraulic heritage in rural areas with a view to ensuring universal access to drinking water in Benin

1-5 mission/vision in our organization

The General Directorate for Water's mission is to define national strategic guidelines relating to water and to ensure their implementation in collaboration with other relevant stakeholders.

2.Water supply service levels

2.1. Main performance indicators

YEARS		2019	2020	2021	2022	2023
population served (Proportion of people with access to a source of drinking water		69.2	70	80	90	
*collection rate						
production capacity	Service rate in urban areas	61.8	63	70.02	90	74.05
	Urban production yield	97.5	96.14	96.83	100	
	Urban water loss rate	27	32.8	31.91	26.0	34.22
	Drinking water supply rate in rural areas	52	70.16	73.3	85	79.40
	Breakdown rate of hydraulic structures in rural areas	6.4	6	5	4	28.30

3.Water quality management

3.1 Current situation and major challenges/problems

DECREE N 2001-094 of February 20, 2001 setting the quality standards for drinking water in the Republic of Benin

There is a drinking water quality monitoring program (PSQE) monitoring is carried out in the twelve departments. Generally speaking, from a microbiological point of view, there is a deterioration in the quality of water from the distribution source to the point of

consumption/lack of qualified personnel, self-monitoring of water producers, insufficient resources for water quality monitoring, lack of equipment

2 **Current actions against these challenges/problems**
Actions to raise household awareness on hygiene, search for partners for financing in the purchase of equipment and training

3.3 All achievements

Guide to developing PGSSE

Management plan for the health safety of drinking water (PGSSE) at the ANCQ

Water quality monitoring device

It is made up of the ANCQ at the central level and the Departmental Water Quality Control Units (UD).

3.4 Water quality standards for drainage water

N / A

3.5 Drinking water safety monitoring system or plan in your organization/regulatory body/independent institution/others

PGSSE, PSQE, through the ANCQ

3.6 Implementation of water safety plans or similar efforts

The National Action Plan for Integrated Water Resources Management in Benin

(*water safety plans: refer to the following URL AND REVIEW BEFORE attending the course)

4.4 Situation regarding leak detection measures (DMA)

, SONEB has undertaken the establishment of a Geographic Information System (GIS) consisting of a progressive digitization of all its drinking water distribution networks. A modern GIS will allow it to have a reliable and complete database facilitating interventions on its networks to reduce water losses and offer better customer satisfaction. To this end, 48 cities already have GIS.5 digitized systems. Water supply service accounting system

5.1 water rates in your organization

Drinking water prices at SONEB are divided into 3 tranches and depending on the volume consumed. This from 198 fcfa to 658 fcfa in urban areas and peri urban areas

the ANAEPMR, the 25-liter basin of water is set at 15 francs including tax throughout the national territory

5.2 Assessment of your organization

In view of the progress recorded until 2019, the reference value is established at 37.2%.

The target assigned to 2023 management is 80%. The realized value of the indicator in 2023 being 80%, the performance has been achieved in terms of IWRM.

POSITIVE assessment

5.3 income statements of your organization

N / A

Utility Profit and Loss Account 1

2-Revenues and capital expenditures of your organization)

(*you can consult the case of Tokyo in chapter 4 financial system and future financial management of this file

http://www.waterprofessionals.metro.tokyo.jp/pdf/wst 02.pdf

6. Main recent achievements in improving water supply

Service management

strengthening the drinking water supply system of the city of Cotonou and its agglomerations

- Computer Aided Maintenance Management (CMMS);
- electronic payment of water bills in conjunction with the national platform;
- the sectorization of networks and georeferencing of subscribers;
- the installation of a customer call center; And,

dematerialization of services

Realization of SAEPMV in rural areas

7 - recent challenges to improve water supply services

continuation of technical assistance missions, project management assistance and project management for SONEB projects

continuation of the execution of civil engineering works, laying of pipes, construction of dams, drinking water treatment stations (Project to Strengthen the Cities Drinking Water Supply System)

carrying out high-volume drilling to strengthen the cities' drinking water supply system.

Control of water quality in the 12 departments

Reduction in drinking water contamination rates

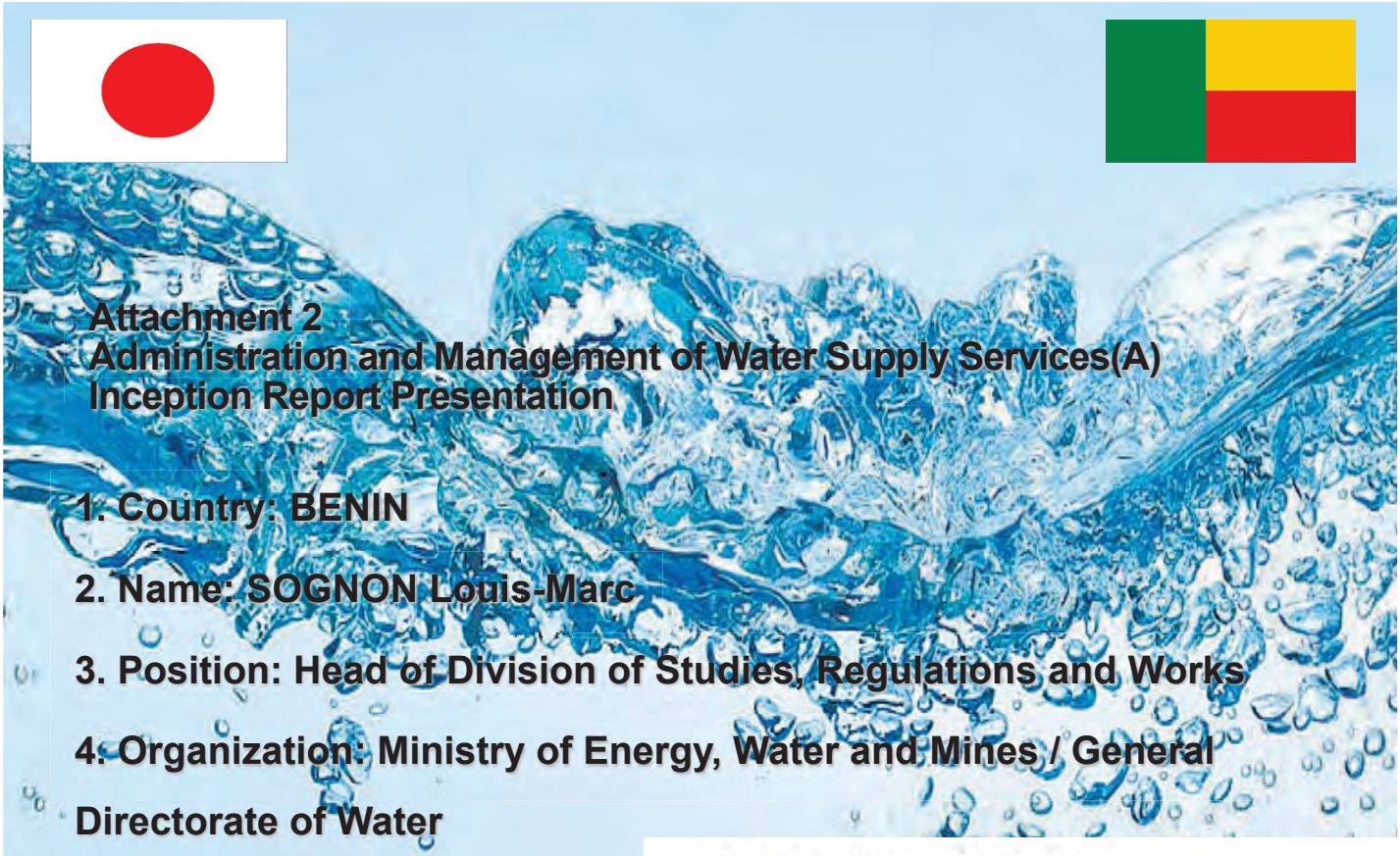
Control and monitoring of water resources across the national territory

8- expectations towards Japan

Construction of multifunctional dams in river basins in Benin

Construction and strengthening of multi-village drinking water supply systems in poorly served or uncovered rural areas

the purchase of equipment for the analysis and monitoring of water quality and staff training



1. Outline of Water Supply Services

Overview of water supply services

1.1- Legal basis of water supply services

what types of laws and regulations are water supply services based on

LAW N° 2010-44 OF NOVEMBER 24, 2010 relating to water management in the Republic of Benin.

1.2- Delimitation of water supply services

which ministry is in charge of what type of water sector

Ministry of Energy, Water and Mines

1.3- Main player in water supply services

(in Japan, most water utilities are public offices under local government)

Benin National Water Company (SONEB)

National Agency for Drinking Water Supply in Rural Areas (ANAEPMR)

1.4- Mission/water of water supply services

**SONEB

Ensure and guarantee the security and continuity of the public water service for the urban and peri-urban population

**ANAEPMR

Develop and organize the management of the State's hydraulic heritage in rural areas with a view to ensuring universal access to drinking water in Benin

1.5- Mission/vision in our organization

The General Directorate for Water's mission is to define national strategic guidelines relating to water and to ensure their implementation in collaboration with other relevant stakeholders.

I'm responsible for carrying out technical monitoring of studies, regulations and water supply works. I'm also responsible for monitoring groundwater resources, integrated water resources management and monitoring water uses and users at the level of the departmental directorate of energy, water and of mines of the Ministry of Energy, Water and Mines

2. Water Supply Service Levels

Main Performance Indicators (PI)/ any other indicator

Coverage area	**114763 (sq. km)**
Population Served	14086016
Collection ratio	(%)
Production capacity	1550000 (m3/day)
Supply duration	24 (hr/day)
Supply pressure	0,5 MPa
Non-Revenue Water	(%)
Water quality	
Staff number	
Number of connections	20500
Staff/1,000 connections	(people/1,000connections)

3. Management of Water Quality

3.1- Water quality management

- Current situation and major challenges/problems

DECREE N 2001-094 of February 20, 2001 setting the quality standards for drinking water in the Republic of Benin

There is a drinking water quality monitoring program (PSQE) monitoring is carried out in the twelve departments. Generally speaking, from a microbiological point of view, there is a deterioration in the quality of water from the distribution source to the point of consumption/lack of qualified personnel, self-monitoring of water producers, insufficient resources for water quality monitoring, lack of equipment

- Current actions against these challenges/problems

Actions to raise household awareness on hygiene, search for partners for financing in the purchase of equipment and training

3.2- All achievements

Guide to developing PGSSE

Management plan for the health safety of drinking water (PGSSE) at the ANCQ

Water quality monitoring device

It is made up of the ANCQ at the central level and the Departmental Water Quality Control Units (UD).

Drinking water safety monitoring system or plan in your organization/regulatory body/independent institution/others

PGSSE, PSQE, through the ANCQ

4. Reduction of Non-Revenue Water Accounting system of Water Supply Service

Current Situation and Major Challenges/Problems

Authorized consumption	**Revenue water**	**Billed authorized consumption**	**(m3 /year) (%)**
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	(m3 /year) (%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	(m3 /year) (%)
		Physical losses (Leakage)	(m3 /year) 8 (%)

5. Accounting system of Water Supply Service

5,1- Implementation of water safety plans or similar efforts

The National Action Plan for Integrated Water Resources Management in Benin

(*water safety plans: refer to the following URL AND REVIEW BEFORE attending the course)

5.2 water rates in your organization

Drinking water prices at SONEB are divided into 3 tranches and depending on the volume consumed. This from 198 fcfa to 658 fcfa in urban areas and peri urban areas

the ANAEPMR, the 25-liter basin of water is set at 15 francs including tax throughout the national territory

5.3 Assessment of your organization

In view of the progress recorded until 2019, the reference value is established at 37.2%. The target assigned to 2023 management is 80%. The realized value of the indicator in 2023 being 80%, the performance has been achieved in terms of IWRM.

POSITIVE assessment

5.4 income statements of your organization

N / A

Utility Profit and Loss Account 1

2- Revenues and capital expenditures of your organization)

(*you can consult the case of Tokyo in chapter 4 financial system and future financial management of this file

http://www.waterprofessionals.metro.tokyo.jp/pdf/wst 02.pdf

6. Major Recent Achievements in Improvement of Water Supply Services

6,1. Main recent achievements in improving water supply

Service management

strengthening the drinking water supply system of the city of Cotonou and its agglomerations

- Computer Aided Maintenance Management (CMMS);
- electronic payment of water bills in conjunction with the national platform;
- the sectorization of networks and georeferencing of subscribers;
- the installation of a customer call center; And,

dematerialization of services

Realization of SAEPMV in rural areas

- ❑ Guide to developing PGSSE
- ❑ Management plan for the health safety of drinking water (PGSSE) at the ANCQ
- ❑ Water quality monitoring device, It is made up of the ANCQ at the central level and the Departmental Water Quality Control Units (UD).
- ❑ Construction of hydraulic works

7. Recent Challenges to Improvement of Water Supply Services

- Continuation of technical assistance missions, project management assistance and project management for SONEB projects;
- Continuation of the execution of civil engineering works, laying of pipes, construction of dams drinking water treatment stations (Project to Strengthen the Cities Drinking Water Supply System);
- Carrying out high-volume drilling to strengthen the cities' drinking water supply system;
- Control of water quality in the 12 departments;
- Reduction in drinking water contamination rates;
- Control and monitoring of water resources across the national territory.

8. Expectations toward Japan

This training will make it possible to strengthen knowledge / skills in many other areas of water by international experts such as the present case in Japan to increase at the national level the rate of supply of drinking water to the populations of Benin, the public service in water and the implementation of Integrated Water Resources Management

9. Expectations toward the Program

The Ministry of Energy, Water and Mines of Benin wishes through this program to strengthen their collaboration in the field of water. Benin also wishes to develop and execute the following development projects together with Japan :

- Construction of multifunctional dams in river basins in Benin
- Construction and strengthening of multi-village drinking water supply systems in poorly served or uncovered rural areas
- The purchase of equipment for the analysis and monitoring of water quality and staff training

THANK YOU FOR YOUR ATTENTION

REPUBLIQUE DU BENIN

MINISTERE DE L'ENERGIE, L'EAU ET DES MINES

4. MOZAMBIQUE

Inception Report

Country: Mozambique

Name: Milton José Massingue

---

1. **Outline of Water Supply Services**

1-1 . Legal Basis of Water Supply Services

(What kind of laws and regulations are Water Supply Services based on?)

- Water supply services in Mozambique are regulated by various laws and regulations. The main legislation includes the Water Law (Law No. 16/91), which establishes the legal framework for the use and management of water, and the Regulation for the Licensing of Water Supply Services (Decree No. 30/2003), which defines the norms for the operation of water supply services.

1-2. Demarcation of Water Supply Services

(Which ministry is in charge of what kind of field of water?)

- In Mozambique, the Ministry of Public Works, Housing and Water Resources (MOPHRH) is primarily responsible for the management of water resources and water supply. The Administration of Water and Sanitation Infrastructure (AIAS) and the Water Supply Investment and Asset Fund (FIPAG) are key entities overseeing infrastructure and investments in the sector.

1-3. Main Actor of Water Supply Utilities

(e.g. In Japan, most water utilities are public bureau under local government.)

- In Mozambique, water supply services are operated by regional commercial companies (AdRN, AdRC, AdRS, and AdRMM), which are public capital entities providing regional water supply services. These companies were established under the second generation framework of Delegated Management of Water Supply Systems. They operate under the supervision of the majority shareholder, which is

FIPAG (Water Supply Investment and Asset Fund). FIPAG is a public entity overseen by the Mozambican government through the Ministry of Public Works, Housing, and Water Resources.

1-4. Mission/Vision of Water Supply Utilities

- The mission of water supply utilities in Mozambique is to ensure a sustainable, efficient, and accessible supply of drinking water for the entire population, promoting public health and socio-economic development. The vision is to achieve a resilient, universal, and high-quality water supply system, adapted to the current and future needs of the country.

1-5. Your Mission/Vision in your organization

- In my organization, our mission is to provide reliable and sustainable potable water to the local community, improving quality of life and promoting sustainable development. Our vision is to be a model of excellence in water resource management, adopting innovative and sustainable practices to ensure universal access to water

2. Water Supply Service Levels

2-1 . Main Performance Indicators (PI)

Coverage area	1 440 (sq. km)
Population Served	232 677
Collection ratio	79%
Production capacity	32 000 (m^3/day)
Supply duration	11 (hr/day)
Supply pressure	0,5 - 6
Non-Revenue Water	51,0
Water quality	100
Staff number	170
Number of connections	34 698
Staff/ 1 ,000 connections	4,9 (people/l ,000connections)

2-2. Any Monitoring by Performance Indicators (PI)

Main Performance Indicators (PI)	Monitoring Frequency	Monitoring Method
Coverage area	Annual	Use of geographic information systems (GIS) to map the extent of the area covered by water supply services
Population Served	Annual	Periodic censuses and customer records revenue
Collection ratio	Monthly	Comparison between collected revenue and total due revenue
Production capacity	Daily	Measurement of daily production in cubic meters at water treatment plants
Supply duration	Daily/Monthly	Records of supply hours in different areas
Supply pressure	Continuous	Use of manometers installed at strategic points in the distribution network
Non-Revenue Water	Monthly	Difference between the amount of water produced and the amount of water billed
Water quality	Daily/Weekly/ Monthly	Regular laboratory tests for parameters such as turbidity, pH, residual chlorine, and fecal coliforms
Staff number	Monthly	Human resources records
Number of connections	Monthly	Customer records and new connections
Staff/ 1 ,000 connections	Monthly/Annual	Calculation based on the total number of staff and the total number of connections

3. Management of Water Quality

3-1 Current Situation and Major Challenges/Problems

❖ Currently, the main challenges/problems in water quality management are:

01. Obsolescence of water treatment equipment and facilities.

02. Lack of transportation and technical personnel to facilitate the process of collecting water samples from the distribution network.

03. Lack of a properly equipped laboratory.

3-2 Current Actions against Those Challenges/Problems

❖ To address these challenges/problems:

01. We do regular preventive maintenance of water treatment equipment and facilities is being carried out to increase their operational time.

02. The process of acquiring new lime, sulfate, and chlorine dosers is underway to improve the efficiency of the water treatment process.
03. There is a planned project to construct a regional laboratory for AdRN at the Water Treatment Plant.

3-3 Any Achievements

❖ New laboratory equipment and materials are already being received

3-4 Water Quality Standards for Drinking Water

❖ The Water Quality standards for Driking Water are based on World Health Organization (WHO) guidelines and are regulated by the Ministry of Health of Mozambique. The standards cover parameters such as turbidity, pH, residual chlorine, fecal coliforms, and other contaminants.

3-5 Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others

❖ A comprehensive monitoring system is coordinated by the Ministry of Health, with support from entities such as AdRN, AURA and other regional institutions.

❖ Plans include regular inspections, laboratory analyses, and a rapid response to water-related emergencies

3-6 Implementation of Water Safety Plans* or Similar Efforts (* Water Safety Plans: refer to the following URL and review before participating in the Course, URL: Water safety plan manual (WSP manual) (who.int))

❖ Mozambique is implementing Water Safety Plans (WSPs) to ensure the safety of water supply throughout the country. WSPs aim to identify and mitigate risks to water quality by improving the management of sources, treatment, distribution, and safe use.

---

4. Reduction of Non-Revenue Water

4-1 . Current Situation and Major Challenges/Problems

❖ Currently, there is a very high loss rate, with losses standing at 51%. The main challenges/problems are:

1. Lack of macro meters at some outlets and inlets of pumping stations and distribution centers.
2. High error rate in domestic meter readings.
3. Lack of materials for repairing leaks and maintaining the distribution network.
4. Existence of leaks in feeder pipelines.
5. Dismantling of illegal domestic connections and water theft.
6. Lack of sufficient data for water balance calculation.
7. Lack of conditions for creating DMAs due to multiple entries in the zones.

4-2 . Current Actions against Those Challenges/Problems

❖ Current actions against these challenges/problems include:

1. Calibration and calibration of macro meters at distribution centers.
2. Calibration and georeferencing of domestic meters.
3. Replacement of damaged and high-counting counters.
4. Mapping of all existing leaks in feeder pipelines.
5. Elimination of pasta distribution network in Military zone.
6. Surveying needs for creating DMA

4-3 Any Achievements

❖ During the process of calibrating domestic meters house-to-house, it has been possible to identify some illegal connections and proceed with the accountability and regularization process.

4-4 Constitution of NRW (If you have the data, please fill in the table)

Authorized consumption	Revenue water	Billed authorized consumption	3.233.912,00(m3/year)
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	2.744.511,00(m3 /year)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	2.286.588,00(m3 /year)
		Physical losses (Leakage)	3.448.833,00 (m3 /year)

4-4. Situations about Leakage Detection Measures (DMA etc.)

❖ Currently, there is no DMA established, which complicates the measurement of detected leaks.

5. **Accounting system of Water Supply Service**

5-1 . Water Tariff in your Organization

- The water Tariff in my Organization is 64,04MTn

5-2. Balance Sheet of your Organization

- The Balance Sheet: 508.563.920,38 MTn

5-3. Profit and Loss Statement of your Organization

(*[Public Utilities] (1) Profit and Loss Account

(2) Capital Income and Expenditures of your Organization) (* You can check the case of Tokyo in the chapter 4 "Financial System and Future Financial Management" of this file. URL: http://www.waterprofessionals.metro.tokyo.ip/pdf/wst 02.pdf)

- Revenues: 23.530.610,00MTn
- Costs: 22.732.943,00MTn
- Profit: 797.666,98MTn
- Losses: 222.878,00MTn

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6. Major Recent Achievements in Improvement of Water Supply Services/Management

- Reactivation of 2 boreholes in the Muatala system.

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7. Recent Challenges to Improve Water Supply Services

- Acquisition of new submersible pumps to increase current capacity from 33,000 m^3/day to 40,000 m^3/day.
- Acquisition of lime, sulfate, and chlorine dosing equipment to enhance the efficiency of the water treatment process and activation of sand filters at Water Treatment Plant 2.
- Acquisition and installation of macro meters.
- Procurement of pipeline materials for maintenance of the distribution network and repair of all existing leaks in feeder pipelines

---

8. Expectations toward Japan

8-1 . Expectations toward Japanese Government and JICA

- Financial and technical support for improvements in water and sanitation infrastructure in Mozambique.
- Collaboration on capacity development projects and training for local technical personnel.
- Assistance in implementing advanced and sustainable technologies in the water sector.

8-2. Expectations toward Japanese Water Utilities

- Partnerships for knowledge exchange and experience in efficient water system management.
- Cooperation on research and development projects to enhance operational efficiency and water service quality.
- Potential collaboration on water conservation initiatives and environmental sustainability.

8-3. Expectations toward Japanese Private Companies

- Investments in innovative technologies and solutions to improve efficiency and safety of water services.
- Partnerships for supplying high-quality water treatment equipment and systems.
- Support in modernizing and expanding water infrastructure in Mozambique, particularly in rural and peri-urban areas.

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9. Expectations toward the Program.

9-1 . Expectations of your supervisors toward your participation in the program.

- My supervisors expect that my participation in the program will enhance my knowledge and skills relevant to our organization's goals, particularly in improving water supply services and management. They anticipate that I will bring back valuable insights and strategies to contribute effectively to our projects and initiatives.

9-2. Your expectation; Any comments and requests are appreciated.

- I am eager to participate in the program to deepen my understanding of best practices in water management and to learn from international experiences, especially those from Japan. I hope to gain practical knowledge that can be applied

to address challenges in our local context. Any support in facilitating networking opportunities and access to resources during the program would be greatly appreciated.

END.

AdRN

INCEPTION REPORT

MILTON MASSINGUE

Mozambique, August of 2024

PRESENTATION STRUCTURE

AdRN

1. OUTLINE OF WATER SUPPLY SERVICES
2. WATER SUPPLY SERVICE LEVELS
3. MANAGEMENT OF WATER QUALITY
4. REDUCTION OF NON-REVENUE WATER
5. ACCOUNTING SYSTEM OF WATER SUPPLY SERVICE
6. MAJOR RECENT ACHIEVEMENTS IN IMPROVEMENT OF WATER SUPPLY SERVICES/MANAGEMENT
7. RECENT CHALLENGES TO IMPROVE WATER SUPPLY SERVICES
8. EXPECTATIONS TOWARD JAPAN
9. EXPECTATIONS TOWARD THE PROGRAM

1. OUTLINE OF WATER SUPPLY SERVICES

1.1. Legal Basis of Water Supply Services

Water supply services in Mozambique are regulated by various laws and regulations. The main legislation includes the Water Law (Law No. 16/91), which establishes the legal framework for the use and management of water, and the Regulation for the Licensing of Water Supply Services (Decree No. 30/2003), which defines the norms for the operation of water supply services.

1.2. Demarcation of Water Supply Services

In Mozambique, the Ministry of Public Works, Housing and Water Resources (MOPHRH) is primarily responsible for the management of water resources and water supply. The Administration of Water and Sanitation Infrastructure (AIAS) and the Water Supply Investment and Asset Fund (FIPAG) are key entities overseeing infrastructure and investments in the sector.

1. OUTLINE OF WATER SUPPLY SERVICES (CONT...)

1.3. Main Actor of Water Supply Utilities

In Mozambique, water supply services are operated by regional commercial companies (AdRN, AdRC, AdRS, and AdRMM), which are public capital entities providing regional water supply services. These companies were established under the second generation framework of Delegated Management of Water Supply Systems. They operate under the supervision of the majority shareholder, which is FIPAG (Water Supply Investment and Asset Fund).

1.4. Mission/Vision of Water Supply Utilities

The mission of water supply utilities in Mozambique is to ensure a sustainable, efficient, and accessible supply of drinking water for the entire population, promoting public health and socio-economic development. The vision is to achieve a resilient, universal, and high-quality water supply system, adapted to the current and future needs of the country.

1.5. Your Mission/Vision in your organization

In my organization, our mission is to provide reliable and sustainable potable water to the local community, improving quality of life and promoting sustainable development.

2. WATER SUPPLY SERVICE LEVELS

2.1. Main Performance Indicators (PI) and Any Monitoring by Performance Indicators (PI)

Main Performance Indicators (PI)	Value	Monitoring Frequency	Monitoring Method
Coverage area	1 440 (sq. km)	Annual	Use of geographic information systems (GIS) to map the extent of the area covered by water supply services
Population Served	232 677	Annual	Periodic censuses and customer records revenue
Collection ratio	79%	Monthly	Comparison between collected revenue and total due revenue
Production capacity	32 000 (m^3/day)	Daily	Measurement of daily production in cubic meters at water treatment plants
Supply duration	11 (hr/day)	Daily/Monthly	Records of supply hours in different areas
Supply pressure	0,5 - 6	Continuous	Use of manometers installed at strategic points in the distribution network
Non-Revenue Water	51,0	Monthly	Difference between the amount of water produced and the amount of water billed
Water quality	100	Daily/Weekly/ Monthly	Regular laboratory tests for parameters such as turbidity, pH, residual chlorine, and fecal coliforms
Staff number	170	Monthly	Human resources records
Number of connections	34 698	Monthly	Customer records and new connections
Staff/ 1 ,000 connections	4,9 (people/l ,000connections)	Monthly/Annual	Calculation based on the total number of staff and the total number of connections

3. MANAGEMENT OF WATER QUALITY

3.1. Current Situation and Major Challenges/Problems

- Lack of transportation and technical personnel to facilitate the process of collecting water samples from the distribution network.
- Obsolescence of water treatment equipment and facilities.
- Lack of a properly equipped laboratory.

3.2. Current Actions against Those Challenges/Problems

- We do regular preventive maintenance of water treatment equipment and facilities is being carried out to increase their operational time.
- The process of acquiring new lime, sulfate, and chlorine dosers is underway to improve the efficiency of the water treatment process.
- There is a planned project to construct a regional laboratory for AdRN at the Water Treatment Plant.

3.3. Any Achievements

- New laboratory equipment and materials are already being received

3.4. Water Quality Standards for Drinking Water

The Water Quality standards for Driking Water are based on World Health Organization (WHO) guidelines and are regulated by the Ministry of Health of Mozambique. The standards cover parameters such as turbidity, pH, residual chlorine, fecal coliforms, and other contaminants

3.5. Monitoring System or Plans for Safety of Drinking

- A comprehensive monitoring system is coordinated by the Ministry of Health, with support from entities such as AdRN, AURA and other regional institutions.
- Plans include regular inspections, laboratory analyses, and a rapid response to water-related emergencies

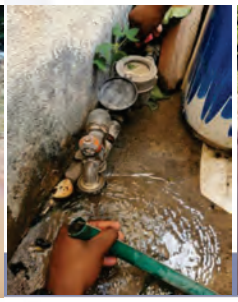
3.6. Implementation of Water Safety Plans

- Mozambique is implementing Water Safety Plans (WSPs) to ensure the safety of water supply throughout the country. WSPs aim to identify and mitigate risks to water quality by improving the management of sources, treatment, distribution, and safe use.

4.1. Current Situation and Major Challenges/Problems

Currently, there is a very high loss rate, with losses standing at 51%. The main challenges/problems are:

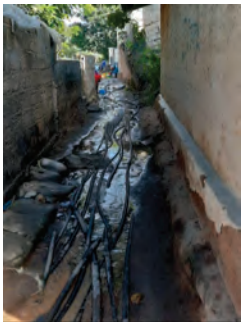
- Lack of macro meters at some outlets and inlets of pumping stations and distribution centers.
- High error rate in domestic meter readings.
- Lack of materials for repairing leaks and maintaining the distribution network.
- Existence of leaks in feeder pipelines.
- Dismantling of illegal domestic connections and water theft.
- Lack of sufficient data for water balance calculation.
- Lack of conditions for creating DMAs due to multiple entries in the zones.



4. REDUCTION OF NON-REVENUE WATER (CONT...)

4.2. Current Actions against Those Challenges/Problems

- ❑ Calibration and calibration of macro meters at distribution centers.
- ❑ Calibration and georeferencing of domestic meters.
- ❑ Replacement of damaged and high-counting counters.
- ❑ Mapping of all existing leaks in feeder pipelines.
- ❑ Elimination of pasta distribution network in Military zone.
- ❑ Surveying needs for creating DMA

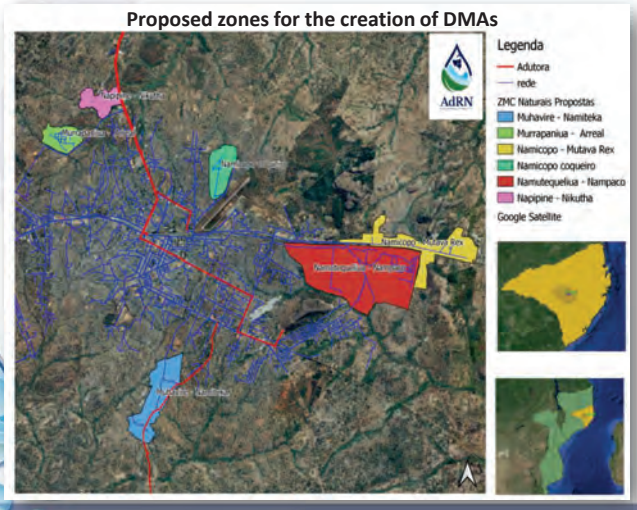


4.3. Constitution of NRW

Authorized consumption	**Revenue water**	Billed authorized consumption	3.233.912,00 (m3/year)
		Unbilled authorized consumption	2.744.511,00 (m3 /year)
Water losses	**Non-Revenue Water (NRW)**	Apparent losses(Unauthorized consumption	2.286.588,00 (m3 /year)
		Physical losses (Leakage)	3.448.833,00 (m3 /year)

4.4. Situations about Leakage Detection Measures (DMA etc.)

Currently, there is no DMA established, which complicates the measurement of detected leaks.



4.5. Any Achievements

During the process of calibrating domestic meters house-to-house, it has been possible to identify some illegal connections and proceed with the accountability and regularization process.

5. ACCOUNTING SYSTEM OF WATER SUPPLY SERVICE

5.1. Water Tariff in my Organization		
The water Tariff in my Organization	64,04 MTn	1,01 USD
5.2. Balance Sheet of my Organization		
The Balance Sheet	508.563.920,38 MTn	7.993.689,43 USD
5.3. Profit and Loss Statement of my Organization		
Revenues	23.530.610,00 MTn	369.857,91 USD
Costs	22.732.943,00 MTn	357.320,05 USD
Profit	797.666,98 MTn	12.537,86 USD
Losses	222.878,00 MTn	3.503,23 USD

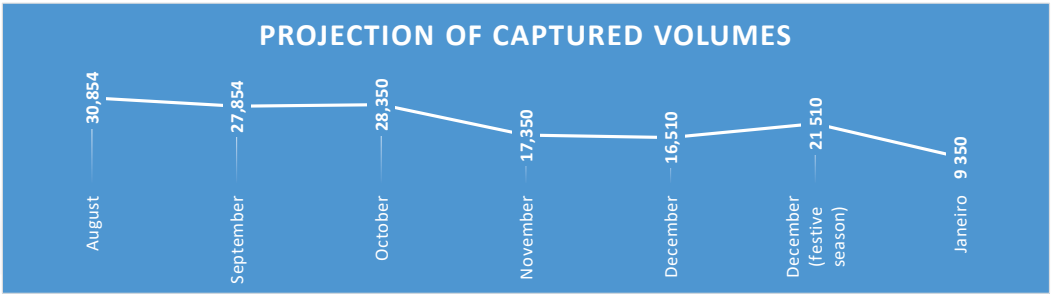
6. MAJOR RECENT ACHIEVEMENTS IN IMPROVEMENT OF WATER SUPPLY SERVICES/MANAGEMENT

- Reactivation of 2 boreholes in the Muatala system.
- Operationalization of the Quinta do Galo system: Water is sourced from an open spring at the Quinta do Galo reservoir, treated by two mobile WTPs with a capacity of 8 m³/h each, and pumped to a Distribution Center at the Mualhaco EPC, 4 km away.

7. RECENT CHALLENGES TO IMPROVE WATER SUPPLY SERVICES

- Acquisition of new submersible pumps to increase current capacity from 33,000 m³/day to 40,000 m³/day.
- Acquisition of lime, sulfate, and chlorine dosing equipment to enhance the efficiency of the water treatment process and activation of sand filters at Water Treatment Plant 2.
- Acquisition and installation of macro meters.
- Procurement of pipeline materials for maintenance of the distribution network and repair of all existing leaks in feeder pipelines

Obs.1: The dam stopped overflowing on July 12th with a level of 9.82m



Obs.2: The average water intakes are as follows: 38,000 m³/day (rainy season), 25,000 m³/day (wet season - post-rains), and 18,000 m³/day (dry season), which may decrease slightly depending on the reservoir water level.

8. EXPECTATIONS TOWARD JAPAN

8.1 . Expectations toward Japanese Government and JICA

- Financial and technical support for improvements in water and sanitation infrastructure in Mozambique.
- Collaboration on capacity development projects and training for local technical personnel.
- Assistance in implementing advanced and sustainable technologies in the water sector.

8.2. Expectations toward Japanese Water Utilities

- Partnerships for knowledge exchange and experience in efficient water system management.
- Cooperation on research and development projects to enhance operational efficiency and water service quality.
- Potential collaboration on water conservation initiatives and environmental sustainability.

8.3. Expectations toward Japanese Private Companies

- Investments in innovative technologies and solutions to improve efficiency and safety of water services.
- Partnerships for supplying high-quality water treatment equipment and systems.
- Support in modernizing and expanding water infrastructure in Mozambique, particularly in rural and peri-urban areas.

9. EXPECTATIONS TOWARD THE PROGRAM

9.1. Expectations of your supervisors toward your participation in the program

My supervisors expect that my participation in the program will enhance my knowledge and skills relevant to our organization's goals, particularly in improving water supply services and management. They anticipate that I will bring back valuable insights and strategies to contribute effectively to our projects and initiatives.

9.2. Your expectation; Any comments and requests are appreciated.

I am eager to participate in the program to deepen my understanding of best practices in water management and to learn from international experiences, especially those from Japan. I hope to gain practical knowledge that can be applied to address challenges in our local context. Any support in facilitating networking opportunities and access to resources during the program would be greatly appreciated.

AdRN

Arigatou Gozaimasu!

5. PAKISTAN

Inception Report

Country: Pakistan

Name: Hafiz M. Raheel Ashraf

---

1. Outline of Water Supply Services

1-1. Legal Basis of Water Supply Services

(WASA Water Act 2017)

1-2. Demarcation of Water Supply Services

(Ministry of Housing & Urban Development)

1-3. Main Actor of Water Supply Utilities

(Local government.)

1-4. Mission/Vision of Water Supply Utilitie

(To provide clean drinking water at doorstep of inhabitants)

1-5. Your Mission/Vision in your organization

(To make organization sustainable & efficient)

---

2. Water Supply Service Levels

2-1. Main Performance Indicators (PI)

Coverage area	248 (sq. km)
Population Served	8.7 Million
Collection ratio	(%)
Production capacity	1736606 (m3/day)
Supply duration	10-12 (hr/day)
Supply pressure	0.02 Mpa
Non-Revenue Water	10 (%)
Water quality	Good
Staff number	6759
Number of connections	7,93,000
Staff/1,000 connections	(people/1,000connections)

2-2. Any Monitoring by Performance Indicators (PI)

Dischage Presuure, Flow, Voltage, Ampere, Power Factor, Motor Efficiency & Per m3 consumption

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3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems

3-2. Current Actions against Those Challenges/Problems

3-3. Any Achievements

3-4. Water Quality Standards for Drinking Water

3-5. Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others

3-6. Implementation of Water Safety Plans* or Similar Efforts

(* Water Safety Plans: refer to the following URL and review before participating in the Course,

URL: Water safety plan manual (WSP manual) (who.int))

---

4. Reduction of Non-Revenue Water

4-1. Current Situation and Major Challenges/Problems

Water scarcity.

4-2. Current Actions against Those Challenges/Problems

Tubewell operational hours have been reduced to 10 hour/day.

4-3. Any Achievements

Water distribution system has been improved so that water may be reach at each house keep operational hours same.

4-4. Constitution of NRW (If you have the data, please fill in the table)

Authorized consumption	Revenue water	Billed authorized consumption	5,704,751,958 (m3 /year) 90 (%)
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	760,633,594 (m3 /year) 8.8 (%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal	63,386,132 (m3 /year) 1 (%)

		use), Customer metering inaccuracies)	
		Physical losses (Leakage)	12,674,498 (m3 /year) 0.2 (%)

4-4. Situations about Leakage Detection Measures (DMA etc.)

A separate cell has been established in WASA Lahore for this purpose who detects & mitigates leakages by survelliance of areas.

---

5. Accounting system of Water Supply Service

5-1. Water Tariff in your Organization

5-2. Balance Sheet of your Organization

5-3. Profit and Loss Statement of your Organization

(*[Public Utilities] (1) Profit and Loss Account

(2) Capital Income and Expenditures of your Organization)

(* You can check the case of Tokyo in the chapter 4 ”Financial System and Future Financial Management” of this file.

URL: http://www.waterprofessionals.metro.tokyo.jp/pdf/wst_02.pdf)

---

6. Major Recent Achievements in Improvement of Water Supply Services/Management

Confined tubewell operational hours to 10 hours which manging to provide water at tail end users too by working at distribution system. To regulant valves in system & ensure equal water distributaion to all users.

---

7. Recent Challenges to Improve Water Supply Services

We are faces significant challenges in providing reliable and safe water supply services. Some recent challenges include. Water scarcity, Aging infrastructure, Inadequate water treatment, Population growth, Energy shortages, Industrial and agricultural activities have contaminated water sources, affecting public health & Limited public awareness.

---

8. Expectations toward Japan

By participating in the training program, i will gain valuable knowledge, skills, and networks to enhance water administration in your home country, leveraging Japan's expertise and experience.I will learn cutting-edge approaches to water supply, treatment, and distribution from Japan's expertise.

---

9. Expectations toward the Program.

It will be beneficial for my mental grouth & personality development too.

END.

Attachment 2
Administration and Management of Water Supply Services(A)
Inception Report Presentation

1. **Country: Pakistan**
2. **Name: Hafiz Muhammad Raheel Ashraf**
3. **Position: Director (Operations & Maintenance) Ravi Town**
4. **Organization: WASA,LDA Lahore**

1.Outline of Water Supply Services

- Water sources (tube wells, boreholes,)

- Water treatment and distribution infrastructure (Faisalabad Water Treatment Plant, pipelines, pumping stations, water storage tanks)

- Water supply services providers (Water and Sanitation Agency in various cities)

- Services offered (domestic, commercial)

- Challenges faced (water scarcity, aging infrastructure, contamination, inadequate water pressure)

- Future plans and projects (upgrades, renewable energy, water conservation, expansion to underserved areas)

2.Water Supply Service Levels

Keeping in view the underground resources limitation, Water supply service levels in Lahore, Pakistan, are inconsistent, with continuity rates of 10 to 16 hours per day . This means that residents are encouraged to use overhead reservoirs to store water and to use water sparingly. However water supply timings may be enhanced keeping in view summer season or any specific events like Ashura, Eid etc.

Whole Country Pakistan:

Area : 79696 km^2

Population : 25 crore Habitants

Coverage Water Supply: 60 %

Water Supply System/Lahore City:

Service Area : 248 km^2

Population Served: 8.77 million/ thousand

2. Water Supply Service Levels

Main Performance Indicators (PI)/ any other indicator

Coverage area	**248(sq. km)**
Population Served	8.77 Million
Collection ratio	80(%)
Production capacity	382 MGD (1445.87 m3/day)
Supply duration	10-12(hr/day)
Supply pressure	Sufficient
Non-Revenue Water	(10%)
Water quality	Drinkable
Staff number	6538
Number of connections	793000
Staff/1,000 connections	6.5(people/1,000connections)

3.Management of Water Quality

1. Water Testing: WASA Lahore do have ISO certified water testing lab containing specialised and dedicated employees. Regular testing of water samples from various sources and treatment plants to detect contaminants and ensure compliance with national and international standards.

2. Distribution Network Management: Maintaining and upgrading the distribution network to minimize losses, prevent contamination, and ensure consistent water pressure.

3. Regular chlorination is being ensured to remove any possible contamination.

4. Regular flushing of water supply lines is being done to ensure potable water at every home.

5.Investment in Infrastructure: Upgrading of inadequate/old pipelines to improve water quality and distribution.

4.Reduction of Non-Revenue Water

1. Leak Detection and Repair: Identify and fix leaks in the distribution network to prevent water loss.

2. Pipe Replacement: Replace old, damaged, or corroded pipes to reduce leaks and breaks.

3. Pressure Management: Optimize water pressure to reduce leaks and bursts.

4. Customer Education: Educate consumers about the importance of reporting leaks and conserving water.

5. Staff Training: Train water utility staff on NRW reduction techniques and best practices.

6. Infrastructure Upgrades: Upgrade aging infrastructure, including pipes, valves, and fittings.

5.Accounting system of Water Supply Service

1. Water Tariff Management: Sets and manages water tariffs, ensuring revenue sufficiency and affordability for customers.

2. Cost Accounting: Tracks costs associated with producing and delivering water, including operational expenses, maintenance, and capital expenditures.

3. Revenue Management: Manages revenue streams, including billing, meter reading, and customer payments.

4. Asset Management: Accounts for and depreciates fixed assets, such as infrastructure, equipment, and vehicles.

5. . Accounts Receivable and Payable: Manages customer payments, credits, and vendor invoices.

6.Major Recent Achievements in Improvement of Water Supply Services

WASA Lahore remained on toes to ensure:

- Uninterrupted supply of clean potable water
- Smooth functioning of sewerage system
- Smooth sewage flow in drains
- Operation of control room & all complaint centres round the clock
- Pre-emptive Maintenance of machinery instead of breakdown maintenance
- All disposal stations including gensets kept functional
- All mobile machinery kept functional
- Rain monitoring dashboard has been developed by WASA IT team
- CCTV Camera monitoring of rain on 24 emergency camps is being done to remain updated about any rain incident
- All critical ponding points were cleared within 8 hours
- Green belts/parks have been lowered to cater more rain water.
- Lahore revamping project has been launched by CM Punjab to address street level issues.

SEWERAGE & DRAINAGE

Combined System	Sewer 4000 km	Drains 76 km
Disposal Stations 12	Lift Stations 112	Generators 137
Mobile Machinery 380	No wastewater treatment plant	

Summer 2024

Challenges	Measures / Outcomes
• Heatwave causing a temperature rise to 45°c. (maximum in 20 yrs.) • Increased water demand due to heat • Power Loadshedding	• 5870 complaints of Water shortage redressed with 95% positive feedback • 24/7 control room active to monitor water shortage complaints • Functionality of 590 tubewells ensured • Functionality of 574 filtration plants ensured • Deployment of water tankers in water scarcity areas • Redressal of tubewell breakdown complaints in minimum time • No public inconvenience in terms of water shortage

Monsoon

Challenges	Measures / Outcomes
• Excess rains this season due to climate change • Record breaking rains, i.e. 315 mm on 12-07-2024 & 360 mm on 01-08-2024 **Dubai (254), NY (216) & Mississauga (200) Urban Flooding**	• Smooth disposal of stormwater in all 42 rain events • 24/7 control room active to monitor rains 1st time through rain monitoring dashboard developed by WASA IT team • Surveillance of 25 emergency camps through CCTV cameras • Desilting • Functionality of 124 disposal stations ensured • Functionality of 137 gensets ensured • Functionality of 380 no. mobile machinery ensured • Smooth flow of traffic in 30 underpasses during rains • Surveillance of smooth flow in drains through drone cameras. • Clearance of hotspots within 8 hours in record rain (360 mm) • No public inconvenience • WASA relief camps were appreciated by CM Punjab and replicated throughout the province

IT Interventions

Measures / Outcomes

• In house development of Complaint Monitoring System (CMS)
• Remote Monitoring of all Generators on disposal stations through special devices
• Monitoring of major wastewater disposal stations through SCADA (pic)
• Monitoring & control of 19 tubewells through SCADA
• State of the art control room is established in WASA head office for 24/7 monitoring of:
  • Rains through rain monitoring dashboard
  • Vehicles through vehicle tracking system
  • Cameras installed on Monsoon emergency camps
• In house development of Recovery app
• Geotagging of consumer properties

IT Interventions

All Gensets on disposal stations are being monitored electronically through special devices, installed on them

Level of wet wells along with the no. of operational pumps on major disposal stations are being monitored through SCADA

Tubewells SCADA

State of the art control room is established in WASA head office for 24/7 monitoring of:

- Complaints from all sources
- Rains through rain monitoring dashboard
- Vehicles through vehicle tracking system
- Gensets through generator monitoring system
- Cameras installed on Monsoon emergency camps
- Filtration plants, Disposal stations and tubewells through SCADA

7.Recent Challenges to Improvement of Water Supply Services

- Rapid Urbanization: Increasing population and urbanization put pressure on existing infrastructure.
- Water Scarcity: Limited water resources and declining groundwater levels.
- Aging Infrastructure: Old and deteriorating pipes, pumps, and treatment plants.
- Financial Constraints: Limited funding for infrastructure upgrades and maintenance.
- Climate Change: Increased frequency of extreme weather events and changing precipitation patterns.
- Institutional Capacity: Limited human resources, skills, and institutional capacity.
- Public Awareness: Low public awareness about water conservation and efficient use.
- Political Interference: Political interference in water management decisions.

8.Expectations toward Japan (Government/JICA, Water utilities, Private companies)

- Technical assistance and expertise sharing

- Infrastructure development and financing

- Capacity building and training

- Technology transfer and innovation

- Private sector investment and participation

- Support for water conservation and efficiency

Japan's support can significantly contribute to improving Lahore's water supply services, addressing challenges, and achieving sustainable water management.

9.Expectations towards the Program

- Enhanced knowledge and skills in water management
- Improved understanding of water policies and regulations
- Effective water administration and governance practices
- Efficient water supply and distribution management
- Water conservation and demand management techniques
- Strengthened institutional capacity and leadership
- Practical tools and solutions for water administration challenges
- Networking opportunities with water professionals
- Improved service delivery and customer satisfaction

6. RWANDA

INCEPTION REPORT

Training program: Administration and Management of Water Supply Services (A) (No 202311680J001)

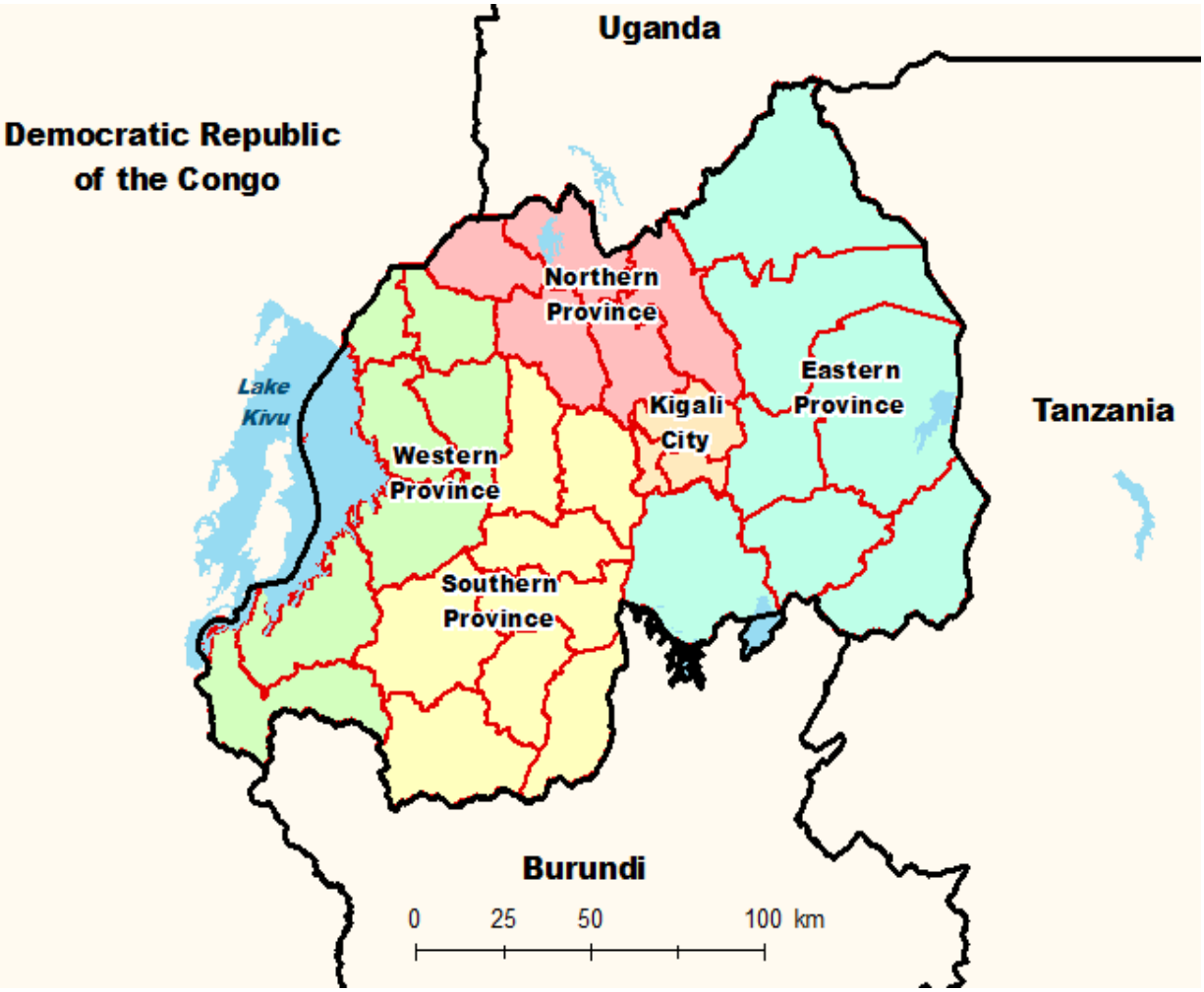
PARTICIPANT: JULIENNE NYIRARUKUNDO

WASAC GROUP/ RWANDA

SEPTEMBER 2024

Country Overview

Rwanda is located in the great lakes region of East Africa. Its Neighbouring countries are Uganda in the North, Tanzania in the East, Burundi in the South and Democratic Republic of the Congo in the West. The country covers an area of 26,338 Km^2 and an estimated population of 13,246,396 million people, with an annual population growth rate of 3 %. The population density is therefore 310 Inhabitants per square kilometer, making Rwanda one of the most populated Countries in Africa.



1. **Outline of Water Supply Services**

National targets

The water Sector is committed to reaching ambitious targets in water supply and sanitation, with the vision to attain 100% service coverage by 2030. Water supply and sanitation services are critical drivers for social and economic development, poverty reduction and public health. To achieve these targets, the Sector needs to increase drinking water access of 4% every year.

Current Status

- National drinking water coverage : 84%
- Urban drinking water coverage : 92 %
- Rural drinking water coverage : 76 %

ANNUARY REPORT OF WATER SUPPLIED BY WTPS AND WATER BILLED BY BRANCH 2021-2022 AND 2022-2023

ANNUARY (2021-2022)					
Code	Branches	Water Supplied	Water Billed	Diff	Average (%)
1	KIGALI City	40,577,201	23,041,548	17,535,653	**43.2%**
2	MUHANGA	1,350,782	795,492	555,290	**41.1%**
3	RUBAVU	3,706,408	1,796,054	1,910,354	**51.5%**
4	MUSANZE	3,987,571	2,132,413	1,855,158	**46.5%**
5	RUSIZI	1,617,279	750,036	867,243	**53.6%**
6	HUYE	2,101,581	1,204,549	897,032	**42.7%**
7	NYANZA	1,133,276	612,922	520,354	**45.9%**
8	NGOMA	767,706	501,463	266,243	**34.7%**
9	GICUMBI	758,149	332,724	425,425	**56.1%**
10	RWAMAGANA	3,290,119	1,880,650	1,409,469	**42.8%**
11	NYAMAGABE	703,919	400,521	303,398	**43.1%**
12	KARONGI	598,745	324,403	274,342	**45.8%**
15	NYAGATARE	2,866,866	1,215,437	1,651,429	**57.6%**
16	BUGESERA	3,739,413	2,069,402	1,670,012	**44.7%**
17	RUHANGO	940,533	412,867	527,666	**56.1%**
TOTAL		**68,139,549**	**37,470,480**	**30,669,069**	**45.0%**

WATER SUPPLIED AND BILLED 2022-2023

ANNUARY (2022-2023)					
Code	**Branches**	**Water Supplied**	**Water Billed**	**Diff**	**Average (%)**
1	KIGALI City	42,870,637	25,125,723	17,744,913	**41.4%**
2	MUHANGA	1,326,385	812,526	513,860	**38.7%**
3	RUBAVU	4,268,048	2,004,411	2,263,637	**53.0%**
4	MUSANZE	3,180,053	2,349,807	830,247	**26.1%**
5	RUSIZI	1,442,739	763,489	679,250	**47.1%**
6	HUYE	2,374,083	1,332,479	1,041,604	**43.9%**
7	NYANZA	1,167,632	767,696	399,936	**34.3%**
8	NGOMA	846,757	532,696	314,061	**37.1%**
9	GICUMBI	777,559	334,839	442,720	**56.9%**
10	RWAMAGANA	3,345,943	2,049,575	1,296,367	**38.7%**
11	NYAMAGABE	809,163	456,421	352,742	**43.6%**
12	KARONGI	717,901	360,747	357,155	**49.7%**
15	NYAGATARE	3,439,174	1,462,093	1,977,081	**57.5%**
16	BUGESERA	4,085,755	2,495,350	1,590,405	**38.9%**
17	RUHANGO	1,136,638	467,301	669,338	**58.9%**
TOTAL		**71,788,467**	**41,315,151**	**30,473,316**	**42.4%**

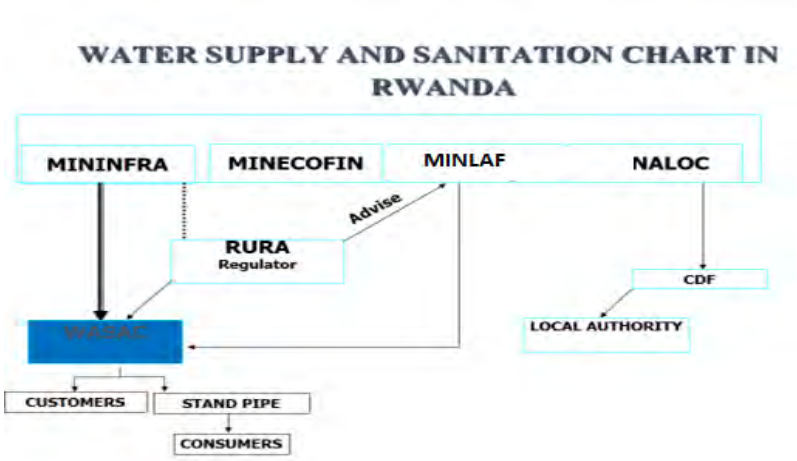
The Water production remains the vanguard of supply within WASAC operational areas. The water treatment plants whose overall volumetric water supply capacity grew from 68,139,549 m^3 to 71,788,467m^3 in 2022-2023 fiscal year and Non-Revenue Water was decreased from 45% to 42,4% in 2022-2023.

1-1. Legal Basis of Water Supply Services

The government of Rwanda established a Rwanda Regulator Agency (RURA) with the main objective of determining the minimum required service level for water service provision. Pursuant the organic law N0 63/2008 of 10/09/2008 putting in place the use, conservation, protection and Management of water resources.

1-2. Demarcation of Water Supply Services

The water supply service in Rwanda is provided upon a collaborative framework among different institutions, but WASAC is the only public company in charge of production and distribute safe water, under direct supervision of Ministry of Infrastructure as shown by the following chart.



1-3. Main Actor of Water Supply Utilities

The actors of water supply in Rwanda are WASAC GROUP which is a Public Enterprise and Private Cooperatives under local government.

1-4. Mission/Vision of Water Supply Utilities

Vision: To be the most sustainable Water and Sanitation Utility in Africa, exceeding stakeholder's expectations

Mission: Providing quality, reliable and affordable water and sewerage services through continuous innovations and detailed care to our customers' needs

1-5. Your Mission/Vision in your organization

Increase the production, reduce NRW, Energy efficiency, increase extensions and though connections, Quality assurance and standard compliance, also improve sanitation services.

---

2. Water Supply Service Levels

2-1. Main Performance Indicators (PI)

Coverage area	(19,348 sq. km)
Population Served	(10,862,043) prs
Collection ratio	(86%)
Production capacity	(329,652 m3/day)
Supply duration	(14-16h/day)
Supply pressure	(2-6 bars)
Non-Revenue Water	(42,4%)
Water quality	AS per WHO standards
Staff number	1,471
Number of connections	321,115
Staff/1,000 connections	(4,6/1,000 connections)

N.B: These figures are likely to change overtime due to increased urbanization rate in Rwanda which implies the development of new water supply systems and extension of existing ones. Currently many new water supply projects are ongoing and ready to be handed over. The new customers were not yet mapped.

2-2. Any Monitoring by Performance Indicators (PI)

WASAC Ltd performs monitoring and evaluation through Management Information System (MIS)

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3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems

Water Quality prays a key role in the water production process, the International water standards regulation established standards procedure for assuring water quality conform to quality needed for a human being. In WASAC Ltd Quality assurance unity has acquired standard documents for

action, but all needed standards were not found in addition to lack of adequate equipment for water quality analysis. Insufficient water quantity and inadequate tools and equipment needed for water supply services, associated with limited infrastructure facilities to meet the demand also constitute a big challenge in water supply process.

3-2. Current Actions against Those Challenges/Problems

Currently WASAC Ltd has established a collaborative framework with Rwanda standards Boards in charge of standardisation in order to acquire missed standards and laboratory equipment. Further under cooperation with Japanese International Agency (JICA) staff from Japan are now working with WASAC staff in charge of water Quality in order help WASAC to get adequate equipment and train staff especially in quality services.

Towards insufficient water problem resolution WASAC ltd Itself is implementing a Project with government support whereby target in Kigali city will be reached as committed, in addition WASAC with its perterners (Districts, World Vision Rwanda, Water for people Rwanda, VITENS EVIDES, JICA and others) together upon signed agreements are implementing intensive water supply projects in urban as well as in rural areas which will help to achieve national target. Especially JICA team working in Rwanda are training WASAC staff and will also help to get proper tool and equipment for water network monitoring and Management.

3-3. Any Achievements

JICA staff have trained WASAC staff based in urban areas in Water quality management who in turn will train their colleagues working in other regions so that all staff in charge of water quality will benefit that training.

3-4. **Water Quality Standards for Drinking Water**

The table below shows examples of parameters regularly checked to be compliance with international standards at acceptable level as recommended law "GOVERNING WATER SUPPLY SERVICES IN RWANDA (Regulations No 002/RB/WAT-EWS/RURA/015) and it should refer to Rwanda's drinking water standard **RS EAS 12:2014**

S. No.	Characteristics	Acceptable
1	Turbidity (NTU)	1
2	Colour (Platinum Cobalt Scale)	5
3	Taste and Odour	Unobjectionable
4	Ph	7-8.5

5	Total Dissolved Solids (mg/l)	500
6	Total Hardness (as CaCo3)	200
7	Chlorides (as Cl) (mg/l)	200
8	Sulphates (as SO4) (mg/l)	200
9	Fluorides (as F) (mg/l)	1
10	Nitrates (as NO3) (mg/l)	45
11	Calcium (as Ca) (mg/l)	75
12	Magnesium (as Mg) (mg/l)	≤30
13	Copper, as Cu^{2+} , (mg/l)	1
14	Iron as Fe^{2+} (mg/l)	0.3
15	Nitrite as NO_2^- (mg/l)	0.003
16	Ammonia nitrogen (mg/l)	0.05
17	Aluminium, as Al^{+++}, (mg/l)	0.1
18	Total coli-forms, Cfu/100 ml	Nil
19	Feacal coli-forms, Cfu/100 ml	Nil
20	E.coli, Cfu/100 ml	Nil

3-5. Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others

Monitoring system and safety checking for drinking water in WASAC Ltd is done by a unit in charge of Quality Management on daily basis following a plan and reports are regularly shared. No independent institutions involved.

3-6. Implementation of Water Safety Plans* or Similar Efforts

WASAC Ltd has produced a procedure manual as Safety plan, in this regards, WASAC has placed emphasis on implementation of Strategies bellow, however the works still ongoing.

Technical strategies

- ✓ Procuring timely hydraulic material and chemicals as per action plan and delivery schedule.
- ✓ Perform a technical inspection of the network from the distribution reservoir to the consumer and identify damages or losses and make reparation.
- ✓ Identification of all old pipes in network and replacing them
- ✓ Using HDPE pipes in water distribution or extensions as they leak less than PVC pipes
- ✓ Rehabilitation whenever it is necessary in water network

Commercial strategies

- ✓ Procuring timely sufficient quantity of meters in order to provide meter to all consumers.
- ✓ To process on replacement of old and inaccuracy meters in network
- ✓ Improvement of billing system by stopping make house connection without meters and replacement of old and blocked meters
- ✓ Improving data management policy (provide reliable data, centralization of statistic activities)

Administrative strategies

- ✓ Organization of regular meetings on the implementation of strategies for water supply service and improvement of water loss reduction.
- ✓ Organization of regular training for staff

---

4. Reduction of Non-Revenue Water

4-1. Current Situation and Major Challenges/Problems

NRW is typically measured as the volume of water lost as a share of net water produced. However, it is sometimes also expressed as the volume of water lost per km of water distribution network per day.

We still having a high levels of NRW which is detrimental to the financial viability of water utilities, as well to the quality of water itself. In 2021-2022, 45%, 2022-2023, 42,4% of water supply has been declared as NRW (Non-Revenue Water). The high level of NRW is mainly due to the frequent pipelines bursts, leakages, high pressure and old network which affect the quality service.

4-2. Current Actions against Those Challenges/Problems

Strategies for NRW Reduction

As far as we are concerned by NRW reduction the service in charge are performing activities bellow:

- Put in place a team of leak detection operators and engineers working on site
- Localization of leakage on pipeline system using advanced instrument from JICA team in RWANDA
- Maximise gravity water supply
- Permanent pressure monitoring (DMA installation under execution)
- Network zoning for water balance(under execution)
- Digitalization of water
- ter network

4-3. Any Achievements

- 14 DMA installation in Kigali city and completed
- Maps are produced

4-4. Constitution of NRW in 2022-2023

Authorized consumption	Revenue water	Billed authorized consumption	(41,321,498 m3 /year) (57.6%)
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. firefighting, cleaning)	(287,133m3 /year) (0.4%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	(10,767,500m3 /year) (15%)
		Physical losses (Leakage)	(19,381,500m3 /year) (27%)

4-4. Situations about Leakage Detection Measures (DMA etc.)

Leakage detection team has been established there are two 3 years ago and is working but still having challenges on sufficient knowledge and enough and adequate material. Meanwhile 22 DMA have been installed.

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5. Water Supply Service

WASAC bills are issued on the basis of actual readings recorded from the meters by our meter readers. All water services are billed monthly and customers settle their bills at WASAC bank accounts indicated on their bills.

5-1**. Water Tariff**

CUSTOMER CATEGORY	**BLOCK OF CONSUPTION PER MONTH**	**APPLIED TARIFF IN FRW(VAT EXCLUSIVE)**
PUBLIC TAP	FLAT PER M3	323
RESIDENTIAL	O-5 6-20 21-50 ABOVE 50M3	340 720 845 877
NON- RESIDENTIAL	0-50 M3 ABOVE 50M3	877 895
INDUSTRIES	FLAT RATE PER M3	736

5.2 COMMERCIAL STRATEGIES

- Improvement of billing system by stopping make house connection without meters and replacement of old and blocked meters
- Improvement of connection service
- Organization of regular training for the technicians on good practice of performing connections

- Improving technical specifications in order to purchase good quality material and meters Centralization of statistics in order to provid reliable data**.**

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6. Major Recent Achievements in Improvement of Water Supply Services/Management

Currently WASAC has increase the water production by 16% in urban areas, also WASAC produced the procedure manual which purpose is to familiarize the standard procedure steps, area of operation (Intervention), and the workflow ways to be used and followed in the operation routines of urban water and sewerage services division on daily basis. Hopefully, it will facilitate the division works by providing them with a ready resource reference for their everyday use.

---

7. Recent Challenges to Improvement of Water Supply Services

Despite the remarkable achievements, the corporation continues to face the following challenges:

- High repetitive water pipe leakages in the network due to poor pressure management in the network,
- No rapid intervention in case of water pipe leakage;
- Lack of apropriate tools and needed skills for leak detection
- Limited fund to implement High impact projects to achieve the 100% access to water supply services.
- High cost of electricity which amounts to almost 45% of total OPEX
- High Non Revenue Water
- Aged networks and treatment plants which need rehabilitation

---

8. Expectations toward Japan

8-1. Expectations toward Japanese Government and JICA

Management problems are related to lack of knowledge in application of modern technologies, lack of efficient studies for water supply, and delayed interventions at the moment of leakages which are related to long bureaucratic processes, delay in procuring process of materials. From Japanese and JICA experiences Participant will learn more on what the government do and the way they do to supply sufficient, safe and reliable drinking water then how to implement the same in home country. JICA shall be facilitator and a channel of Japanese technology towards Rwanda

8-2. Expectations toward Japanese Water Utilities

Participation in this training session will allow participant to better understanding on how water supply services can be improved especially in establishing an efficient organizational structure and their experience in fighting against NRW and other water losses.

8-3. Expectations toward Japanese Private Companies

From experience sharing by Japanese Private Companies participant will learn more mostly on strategies applied by Japanese private Companies to reach their targets.

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9. Expectations toward the Program.

At the end of this training course, I intended to be able to investigate the Non-revenue Water and NRW reduction methods, leakage detection and prevention, get effective knowledge on maintenance of the water supply system. At the end of this training course, I will be able to address all above mentioned causes of NRW through knowledge sharing and able to formulate the suitable strategies to reduce complaints one of my ambitious targets as Ag. Manager Customer Service Delivery. I hope that the key achievement of this training course will help me to contribute on reduction of NRW and Customer service.

END

Training program: Administration and Management of Water Supply Services (A) (No 202311680J001

1. Country: RWANDA
2. Name: NYIRARUKUNDO Julienne
3. Position:Ag. Manager Customer Service Delivery
4. Organization: WASAC GROUP Ltd

WASAC Group
Water & Sanitation Corporation
'Dignifying Life'

JICA

1. Outline of Water Supply Services of WASAC GROUP Ltd

Country Overview

Rwanda is located in the great lakes region of East Africa. Its Neighbouring countries are Uganda in the North, Tanzania in the East, Burundi in the South and Democratic Republic of the Congo in the West. The country covers an area of 26,338 Km^2 and an estimated population of 13,246,396 million people, with an annual population growth rate of 3 %. The population density is therefore 310 Inhabitants per square kilometer, making Rwanda one of the most populated Countries in Africa.

Whole Country:

Area : 26,338 km^2

Population : 13,246,394 Habitants

Coverage Water Supply: 82%

Your Water Supply System/City:

Service Area : 19,348 km^2

Population Served: 10,862,043 million/ thousand

Map of RWANDA

1. Outline of Water Supply Services of WASAC GROUP Ltd (Cont.)

National targets

The water Sector is committed to reaching ambitious targets in water supply and sanitation, with the vision to attain 100% service coverage by 2030. Water supply and sanitation services are critical drivers for social and economic development, poverty reduction and public health. To achieve these targets, the Sector needs to increase drinking water access of 4% every year.

Current Status

- National drinking water coverage : 84%
- Urban drinking water coverage : 92 %
- Rural drinking water coverage : 76 %

1 Outline of Water Supply Services of WASAC GROUP Ltd (Cont

Mission/Vision of Water Supply Utilities

Vision: To be the most sustainable Water and Sanitation Utility in Africa, exceeding stakeholder's expectations.

Mission: Providing quality, reliable and affordable water and sewerage services through continuous innovations and detailed care to our customers' needs.

Mission/Vision in WASAC GROUP

Increase the production, reduce NRW, increase extensions and though connections, Quality assurance and standard compliance, also improve sanitation services.

1. Outline of Water Supply Services of WASAC GROUP Ltd (Cont.)

	ANNUARY (2021-2022)				
Code	Branches	Water Supplied	Water Billed	Diff	Average (%)
1	KIGALI City	40,577,201	23,041,548	17,535,653	43.2%
2	MUHANGA	1,350,782	795,492	555,290	41.1%
3	RUBAVU	3,706,408	1,796,054	1,910,354	51.5%
4	MUSANZE	3,987,571	2,132,413	1,855,158	46.5%
5	RUSIZI	1,617,279	750,036	867,243	53.6%
6	HUYE	2,101,581	1,204,549	897,032	42.7%
7	NYANZA	1,133,276	612,922	520,354	45.9%
8	NGOMA	767,706	501,463	266,243	34.7%
9	GICUMBI	758,149	332,724	425,425	56.1%
10	RWAMAGANA	3,290,119	1,880,650	1,409,469	42.8%
11	NYAMAGABE	703,919	400,521	303,398	43.1%
12	KARONGI	598,745	324,403	274,342	45.8%
15	NYAGATARE	2,866,866	1,215,437	1,651,429	57.6%
16	BUGESERA	3,739,413	2,069,402	1,670,012	44.7%
17	RUHANGO	940,533	412,867	527,666	56.1%
TOTAL		68,139,549	37,470,480	30,669,069	45.0%

1. Outline of Water Supply Services of WASAC GROUP Ltd (Cont.)

	ANNUARY (2022-2023)				
Code	Branches	Water Supplied	Water Billed	Diff	Average (%)
1	KIGALI City	42,870,637	25,125,723	17,744,913	41.4%
2	MUHANGA	1,326,385	812,526	513,860	38.7%
3	RUBAVU	4,268,048	2,004,411	2,263,637	53.0%
4	MUSANZE	3,180,053	2,349,807	830,247	26.1%
5	RUSIZI	1,442,739	763,489	679,250	47.1%
6	HUYE	2,374,083	1,332,479	1,041,604	43.9%
7	NYANZA	1,167,632	767,696	399,936	34.3%
8	NGOMA	846,757	532,696	314,061	37.1%
9	GICUMBI	777,559	334,839	442,720	56.9%
10	RWAMAGANA	3,345,943	2,049,575	1,296,367	38.7%
11	NYAMAGABE	809,163	456,421	352,742	43.6%
12	KARONGI	717,901	360,747	357,155	49.7%
15	NYAGATARE	3,439,174	1,462,093	1,977,081	57.5%
16	BUGESERA	4,085,755	2,495,350	1,590,405	38.9%
17	RUHANGO	1,136,638	467,301	669,338	58.9%
TOTAL		71,788,467	41,315,151	30,473,316	42.4%

1. Outline of Water Supply Services of WASAC GROUP Ltd (Cont.)

The Water production remains the vanguard of supply within WASAC operational areas. The water treatment plants whose overall volumetric water supply capacity grew from 68,139,549 m^3 to 71,788,467m^3 in 2022-2023 fiscal year and Non-Revenue Water was decreased from 45% to 42.4% in 2022-2023.

Simplified WB: July 2022-June 2023

Volume input : 71,788,467m3 (100)%	**Revenue Water**: 41,315,151 m3 (57,6%)
	Non Revenue Water (water loss): 30,473,316 m3= 42.4%

Main Performance Indicators (PI)

INDICATORS	2022-2023	2023-2024	Goals for 2025
Staff/1,000 connections	4.6	4.6	4
Production capacity (m3/day)	329,652	329,652	368,652
Water quality	WHO Guidelines	WHO Guidelines	WHO Guidelines
Coverage area	82%	84%	86%
Supply duration (hr/day)	18	20	22
Supply pressure	2-6 bars	2-6 bars	2-6 bars
Number of connections	321135	357,086	400,000
NRW	42%	39%	38%
Collection ratio	86%	82%	90%
Staff number	1,508	1,448	2,000

2. Success Story of Water Supply Services

JICA staff have trained WASAC staff based in urban areas in Water quality management and water treatment processes who in turn will train their colleagues working in other regions so that all staff in charge of water quality will benefit that training. All laboratory technicians and water purifiers in Water Treatment Plant were trained on Water quality management and water treatment processes .

Water quality issues have decreased by an average of 50% in Kigali

In reduction of Non-Revenue Water, 14 DMA installation in Kigali city and completed, Maps are produced

2. Success Story of Water Supply Services (Cont.)

Reaching 100% water supply access at national level by increasing water production capacity: Introduction of Public-Private Partnership. ⇒

The Kigali Bulk water supply Project was developed on a Build, Operate and Transfer (BOT) basis and is located in Kanzenze, in the South Eastern part of Kigali. The Project provides 40,000 cubic meter per day of fresh, clean and safe water to the residents of Kigali city and Bugesera to serve domestic, commercial and industrial end users.

Completed in 2021, the Kigali Bulk Water Supply Project has increased access , improved water services and supplemented existing water supplies in a strategic move to meet Kigali's growing water demands – a city with a population of over 1.7 million residents.

The First Bulk Water Supply PPP project in Rwanda and Sub-Saharan Africa

3. Recent Challenges to Improvement of Water Supply Services

Despite the remarkable achievements, the corporation continues to face the following challenges:

- High repetitive water pipe leakages in the network due to poor pressure management in the network,
- No rapid intervention in case of water pipe leakage;
- Lack of appropriate tools and needed skills for leak detection
- Limited fund to implement High impact projects to achieve the 100% access to water supply services.
- High cost of electricity which amounts to almost 45% of total OPEX
- High Non Revenue Water
- Aged networks and treatment plants which need rehabilitation

4. Expectations toward the Program

My expectation toward this program

At the end of this training course, I intended to be able to investigate the Non-revenue Water and NRW reduction methods, leakage detection and prevention, get effective knowledge on maintenance of the water supply system. At the end of this training course, I will be able to address all above mentioned causes of NRW through knowledge sharing and able to formulate the suitable strategies to reduce complaints one of my ambitious targets as Ag. Manager Customer Service Delivery. I hope that the key achievement of this training course will help me to contribute on reduction of NRW and Customer service can be improved.

4. Expectations toward the Program (Cont.)

Expectation of my superior toward this program.

Participation in this training session will allow participant to better understanding on how water supply services can be improved especially in establishing an efficient organizational structure and their experience in fighting against NRW and other water losses.

THANK YOU FOR YOUR ATTENTION

7. SOLOMON ISLANDS

Inception Report

Country: **Solomon Islands**

Name:**Claudetta Emma Ora**

---

1. Outline of Water Supply Services

1-1. Legal Basis of Water Supply Services

(What kind of laws and regulations are Water Supply Services based on?)

The Solomon Islands Water Authority (SW) is established under the Solomon Islands Water Authority Act 1993. Section 7(d) Functions of the Authority states Solomon Water is;;

"To provide, construct, operate, manage and maintain buildings, works, systems and services for impounding, conserving and supplying water for domestic, industrial, commercial and other purposes".

The principle objective of a state owned enterprise like Solomon Water is based on the SOE Act 2017.

1-2. Demarcation of Water Supply Services

(Which ministry is in charge of what kind of field of water?)

Solomon Water is exclusively owned by the government of the Solomon Islands and through the board of directors who are responsible to the Minister of Mines, Energy and Rural Electrification, and the Minister of Finance and Treasury

1-3. Main Actor of Water Supply Utilities

Solomon Water is a state owned enterpises under the local Government.

(e.g. In Japan, most water utilities are public bureau under local government.)

1-4. Mission/Vision of Water Supply Utilities

To provide reliable and safe water supply and sewerage services within our area of operations in Solomon Islands

1-5. Your Mission/Vision in your organization

To Asist in the construction of water infrastructure which are environmentally sustainable and are constructed with good quality and are sustainable for operation.

---

2. Water Supply Service Levels

2-1. Main Performance Indicators (PI)

Coverage area	28.7(sq. km)
Population Served	740,424 people
Collection ratio	8.3(%)
Production capacity	(m3/day)
Supply duration	22(hr/day)
Supply pressure	0.08-0.1Bar
Non-Revenue Water	60(%)
Water quality	Disinfection
Staff number	235
Number of connections	16,531 Connections
Staff/1,000 connections	0.235

2-2. Any Monitoring by Performance Indicators (PI)

Solomon water has sub divided the service location into specific District metered areas (DMAs). This assists in monitoring non-revenue water.

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3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems

The Major issue that Solomon water is facing is due to contamination to water services due to pipe leakages, limited resources options and the negative impacts of the changing climate. Currently in Solomon Islands most of the existing distribution pipes are old which leads to frequent leaks and contamination of water supply services. More frequent and sever weather events are negatively impacting water supply and quality. Leading to water being shut down due to high turbidity. Water purification is only carried out through chlorination. This approach is not suitable to be used during high water turbidity. And finally, Limited resources especially

shortage of financial and technical
resources needed for upgrading water treatment plan infrastructure is also a major issue contributing to low quality and service of water to Solomon Islanders.

3-2. Current Actions against Those Challenges/Problems

As part of the Urban Water Supply and sanitation sector project, are number of projects are secured such as the pipeline replacement, construction of a water treatment facility and expansion of the Honiara distribution network. Currently, a 11km Trunkmains project have been implemented since 2023, construction of two new concrete reservoirs and a water treatment plant will also be constructed near kongulai source.

3-3. Any Achievements

Enhanced water treatment processes and monitoring plans have resulted in better adherence to WHO water quality standards.

An online system to monitor turbidity levels at the primary water sources, Kongulai and Kombito have also been introduced by Fluvio. This project have ensured that water turbidity is accurately measured and electronic message is sent via sms to Solomon water operation team.

Figure 1: Fluvio personnal with Solomon water Catchment officer, Robert Iromalefo. Source: *(Fluvio, 2024)*

3-4. Water Quality Standards for Drinking Water

Solomon Water currently carry out water testing daily and follows the WHO Drinking Water Quality Standards, which set parameters for the microbiological, chemical, and physical characteristics of drinking water:

- **Microbiological Quality**: Ensures the absence of pathogens such as *E. coli* and other harmful bacteria.
- **Chemical Quality**: Limits the levels of chemicals like chlorine, lead, and nitrates.
- **Physical Quality**: Sets standards for turbidity, color, and taste to ensure water is visually and palatably acceptable to consumers.

3-5. Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others

Solomon Water uses a comprehensive monitoring system to ensure drinking water safety:

- Routine Testing: Daily and routine testing of water samples from various points in the supply system, including source water, treatment facilities, and distribution networks.
- Laboratory Analysis: Detailed analyses of water samples are conducted in in-house laboratories.
- Digital Tracking: Utilization of digital systems to track and analyze water quality data, identify trends, and promptly address potential issues.
- Emergency Procedures: Established procedures to manage contamination incidents and other water quality emergencies.

Figure 2: Measuring water turbidity at source and check points and flashing of water.

3-6. Implementation of Water Safety Plans* or Similar Efforts

Solomon Water has created and implemented Water Safety Plans (WSPs) in accordance with WHO guidelines. These plans encompass:

- **Risk Assessment**: Identifying potential hazards to water quality from the source to the consumer.
- **Risk Management**: Applying control measures to mitigate identified risks, such as improved filtration and disinfection processes.
- **Regular Review**: Periodic review and updates of WSPs every two years to incorporate new information and address emerging challenges.

4. Reduction of Non-Revenue Water

4-1. Current Situation and Major Challenges/Problems

Solomon water reported last year, 2023, a non-revenue water of 60%. The growing issue is based on leakages from old pipes and storage facilities, illegal connection and unbilled services. Currently, physical water loss is not measured and data is assumed based on probability of illegal connection, zero consumption and estimated authorized unbilled usage. Based on the data and using IBM, physical water loss accounts for 51% of the total water loss.

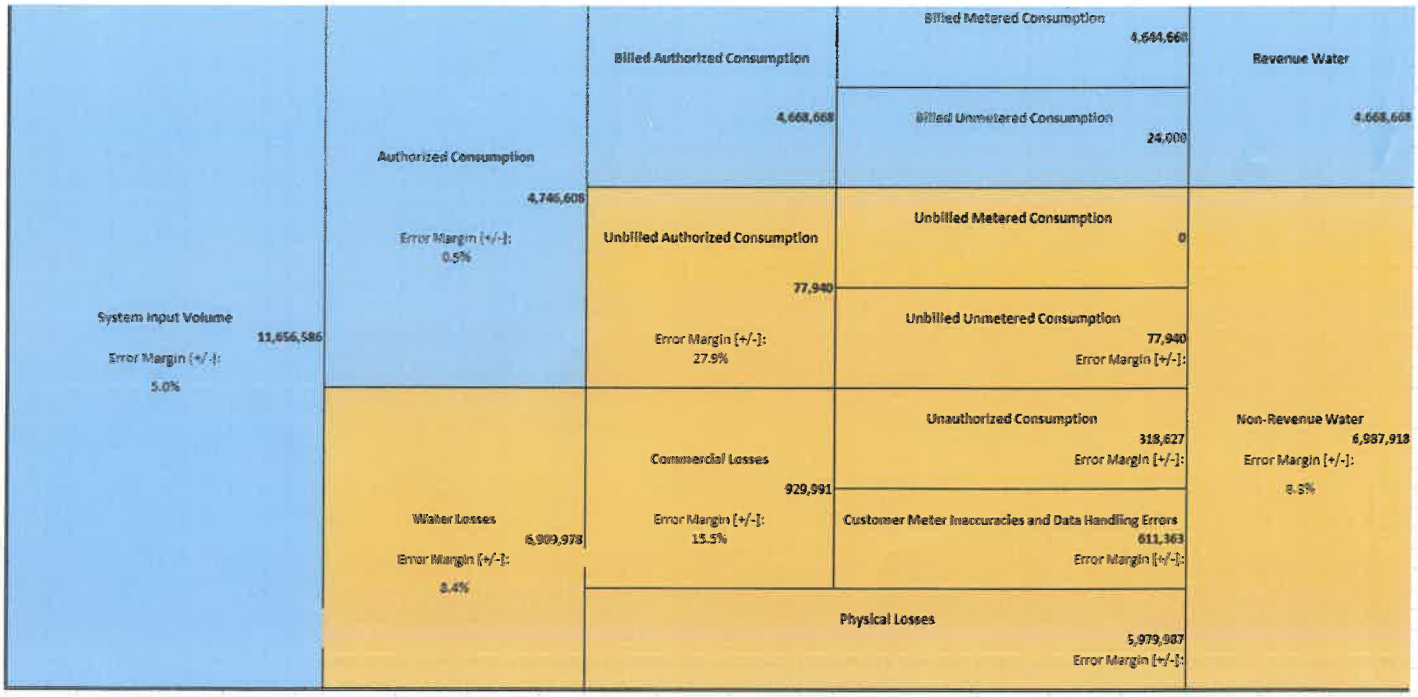

Figure 3: Information extracted from Water balancesoftware. Source: *Water balance software*

4-2. **Current Actions against Those Challenges/Problems**

In an attempt to reduce water loss, Solomon water has established district metered area (DMA), conducted aggressive diagnostic of distribution pipes and conducted survey of existing services to identify location of pipes that needs to be replaced.

4-3. **Any Achievements**

In the attempt to address the growing problems contributing to the high water loss, Solomon Water has secured funding for replacement of two steel tanks, Panatina and Tasahe and are currently constructing an 11km HDPE, at Western, central and Eastern Honiara.

Figure 3: Photo extracted from Volume 4; Bidding document page 41. Tasahe Steel tank

Figure 4: Photo extracted from Volume 4; Bidding document page 41. Panatina Steel tank

Figure 5: Progress of construction of Concrete reservoir at Tasahe Reservoir.

Figure 6: Progress of construction of Concrete reservoir a Panatina Reservoir.

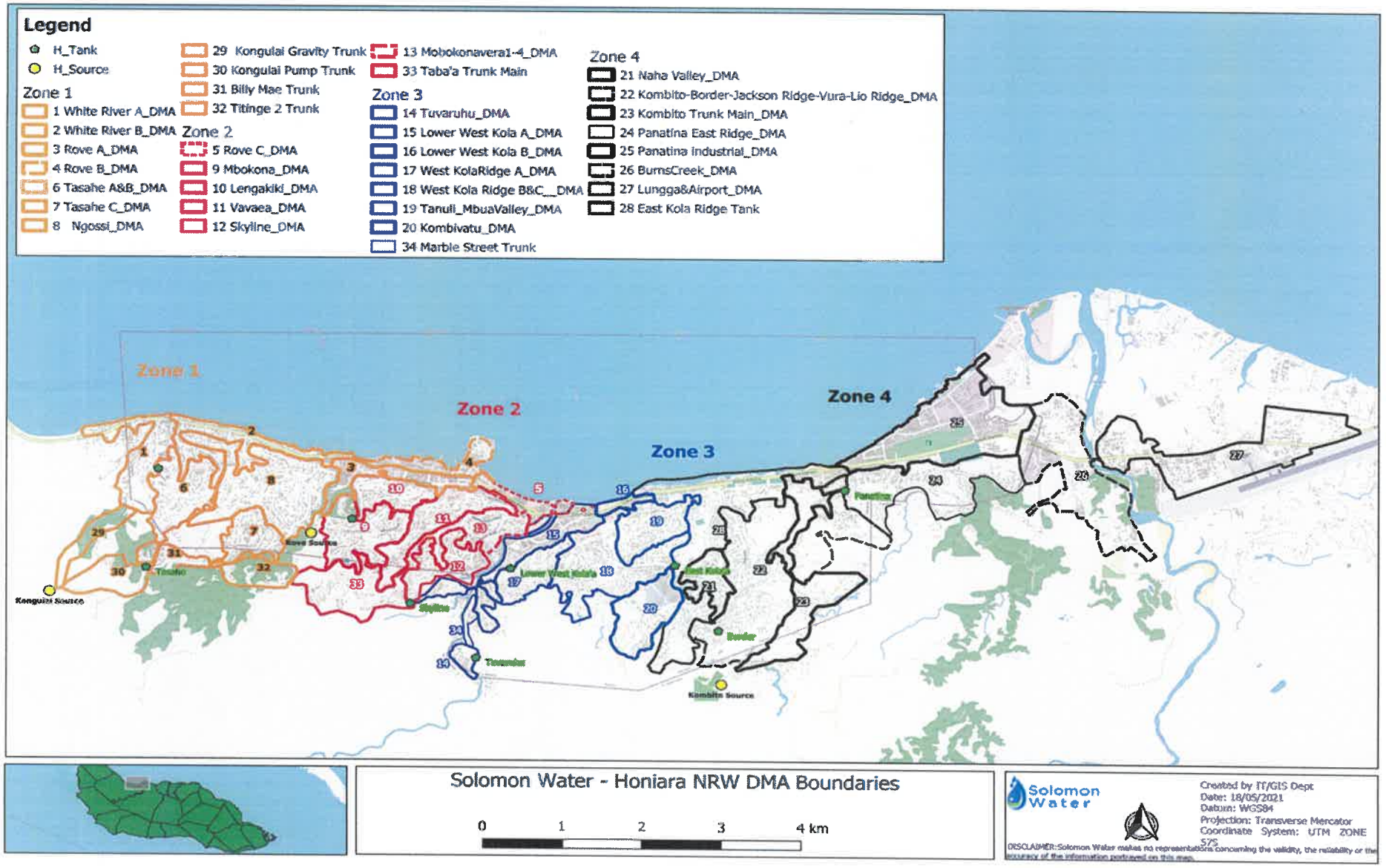

Figure 7: Honiara DMA boundaries

4-4. Constitution of NRW (If you have the data, please fill in the table)

Authorized consumption	Revenue water	Billed authorized consumption	4,668,668(m3 /year) 40.05(%)
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	77,940(m3 /year) 0.67(%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	929,991(m3 /year) 7.98(%)
		Physical losses (Leakage)	5,979,987(m3 /year) 51.30(%)

4-4. Situations about Leakage Detection Measures (DMA etc.)

Step test is conducted within a DMA to compare total volume input and minimum night flow into an area. If there is any discrepancy, the Leakage team in Solomon water are tasked with verifying specific location of leakages where Solomon Water cami repair.

---

5. Accounting system of Water Supply Service

5-1. Water Tariff in your Organization

Solomon Water
Safe water for a healthy nation

WATER AND WASTEWATER TARIFFS
Effective Monday 1 January 2024

Consumer Category	Service	Consumption	Tariff Effective 1 Jan 2024 ($/kL)
Domestic	Water	0 to 15 kL	$9.71
		15 to 30 kL	$14.44
		Greater than 30 kL	$16.80
	Wastewater	0 to 15 kL	$4.75
		15 to 30 kL	$7.11
		Greater than 30 kL	$8.27
Commercial	Water	0 to 30 kL	$38.03
		30 to 60 kL	$42.75
		Greater than 60 kL	$47.48
	Wastewater	0 to 30 kL	$18.89
		30 to 60 kL	$21.26
		Greater than 60 kL	$23.62

5-2. Balance Sheet of your Organization

SOLOMON ISLANDS WATER AUTHORITY
STATEMENT OF FINANCIAL POSITION
AS AT 31 DECEMBER 2021

	Note	2021 SBD	2020 restated SBD	2019 restated SBD
Assets				
Current assets				
Cash and cash equivalents	10	30,011,684	28,532,137	9,366,569
Trade receivables	11	22,162,218	16,324,589	15,827,135
Contract assets	12	4,520,881	4,101,076	2,783,803
Debt securities	15	29,771,909	10,000,000	10,000,000
Inventories	13	14,937,209	7,474,971	8,460,042
Other receivables and prepayments	14	5,563,532	3,227,359	3,196,280
		106,967,433	69,660,872	49,633,829
Non-current assets				
Property, plant and equipment (1)	16	335,157,748	326,455,725	282,219,691
Intangible assets	17	-	-	248,888
Right-of-use assets	18 (i)	4,614,110	3,299,836	2,770,649
		339,771,858	329,755,561	285,239,228
Total assets		446,739,291	399,415,633	334,873,057
Liabilities				
Current liabilities				
Trade and other payables	19	17,257,628	12,340,372	15,858,666
Employee benefits liability	20	2,262,186	1,607,628	1,379,099
Contract liabilities	12	1,025,206	1,623,186	908,877
Lease liabilities	18 (ii)	1,031,073	891,862	950,344
Deferred revenue (1)	21	3,100,000	3,696,272	3,028,969
Payable to related parties	24 (e)	894,067	184,443	720,464
		25,570,160	20,343,763	22,846,419
Non-current liabilities				
Lease liabilities	18 (ii)	3,836,880	2,564,534	1,893,974
Employee benefits liability	20	1,390,074	1,254,637	-
Deferred revenue (1)	21	162,830,504	113,087,890	100,978,622
Payable to related parties	24 (e)	33,465,261	35,353,620	-
		201,522,719	152,260,681	102,872,596
Total liabilities		227,092,879	172,604,444	125,719,015
Equity				
Capital contribution	22	59,625,874	59,625,874	59,625,874
Asset revaluation reserve		104,088,846	104,088,846	104,088,846
Retained earnings (1)		55,931,692	63,096,469	45,439,322
Total equity		219,646,412	226,811,189	209,154,042
Total equity and liabilities		446,739,291	399,415,633	334,873,057

(1). The comparative information is restated on account of errors. See note 26.

5-3. Profit and Loss Statement of your Organization

(*[Public Utilities] (1) Profit and Loss Account

(2) Capital Income and Expenditures of your Organization)

(* You can check the case of Tokyo in the chapter 4 "Financial System and Future Financial Management" of this file.

URL: http://www.waterprofessionals.metro.tokyo.jp/pdf/wst_02.pdf)

SOLOMON ISLANDS WATER AUTHORITY
STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME
FOR THE YEAR ENDED 31 DECEMBER 2021

	Note	2021 SBD	2020 restated SBD
Continuing operations			
Revenue from contracts with customers	5	118,679,205	98,257,235
Other income (1)	6	15,425,436	19,784,297
		134,104,641	118,041,532
Expenses			
Corporate expenses (1)	7	(22,028,311)	(11,754,737)
Depreciation and amortisation		(20,015,935)	(11,409,775)
Salaries and employee benefits	8	(41,503,767)	(33,582,079)
Impairment of financial assets	4 (i)	(11,917,307)	(7,513,150)
Repairs and maintenance		(12,058,804)	(5,874,053)
Tools and uniforms		(2,901,906)	(1,227,548)
Utilities		(27,925,834)	(25,887,837)
Water treatment		(1,936,467)	(1,243,955)
		(140,288,331)	(98,493,134)
Finance income	9 (a)	105,643	38,203
Finance costs	9 (b)	(1,086,730)	(1,929,454)
Net (loss) / profit for the year (1)		(7,164,777)	17,657,147
Other comprehensive income		-	-
Other comprehensive income		-	-
Total comprehensive (loss) / income for the year (1)		(7,164,777)	17,657,147

6. Major Recent Achievements in Improvement of Water Supply Services/Management

Through the contract with Fluvio on online system to monitor turbidity levels at the primary water sources, Kongulai and Kombito have been introduced.

Early Last year a new software call Pronto has been introduced to assist in management of resources issued, billing and recording of data.

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7. Recent Challenges to Improve Water Supply Services

With the introduction of new technology and software, there is the challenge of familiarizing oneself to use this resources. Furthermore, improving management of Solomon water management of water supply is limited to resources availability and funding.

---

8. Expectations toward Japan

8-1. Expectations toward Japanese Government and JICA

I expect to learn and acquire knowledge in the water industry of Japan.

8-2. Expectations toward Japanese Water Utilities

I expect advice on the challenges and issues faced by Japanese water utilizes on reducing non-revenue water and construction of new infrastructure and how they have addressed this issues.

8-3. Expectations toward Japanese Private Companies

I expect to learn about the administration and management strategies adapted and how have that improved their services.

---

9. Expectations toward the Program.

9-1. Expectations of your supervisors toward your participation in the program.

To share the knowledge which I have gained throughout the training and assist with the

9-2. Your expectation; Any comments and requests are appreciated.

Having this opportunity to gain knowledge and learn to improve the Administration and Management of Solomon water supply services especially in the Construction and operation phase is a vital knowledge, one that I am very happy to be a participant.

END.

Attachment 2
Administration and Management of Water Supply Services(A)
Inception Report Presentation

1. Country: Solomon Islands
2. Name: Claudetta Emma Ora
3. Position: Graduate Engineer
4. Organization: Solomon Water

Inception Report Presentation

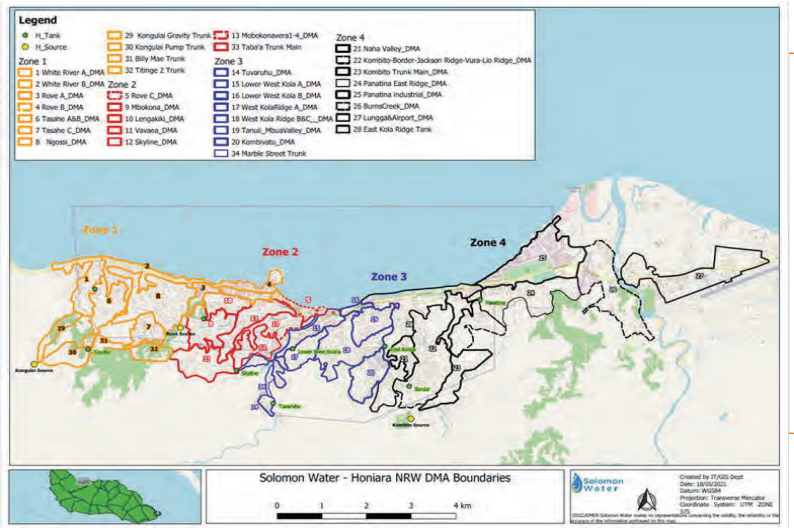
Following:

1. Outline of Water Supply Services
2. Water Supply Service Levels
3. Management of Water Quality
4. Reduction of Non-Revenue Water
5. Accounting system of Water Supply Service
6. Major Recent Achievements in Improvement of Water Supply Services
7. Recent Challenges to Improvement of Water Supply Services
8. Expectations toward Japan (Government/JICA, Water utilities, Private companies)
9. Expectations toward the Program

Over view of Solomon Water

General Information

- Solomon Water provides water services to three provinces; Honiara Guadalcanal Province, Central Province, Western Province and Malaita Province.
- Presentation will be centered around water supply services in **Honiara Guadalcanal** Province.
- 235 Staff
- Sources of water – Ground water (42%) and Spring water (58%)



Whole Country:

Area : 28,896 km^2

Population : 756,673 Habitants

Coverage Water Supply: 59%

Water Supply System/City:

Service Area : 28.7 km^2

Population Served: 740,424 thousand

1. Outline of Water Supply Services

Legal basis of water supply services, demarcation of water supply services , main actor of water supply utilities, Mission/Vision of Water Supply Utilities, your Mission/Vision in your organization etc.

Legal basis of water Supply services

Solomon Water Authority Act 1993. Section 7(d)

Functions

"To provide, construct, operate, manage and maintain buildings, works, systems and services for impounding, conserving and supplying water for domestic, industrial, commercial and other purposes".

The principle objective of a state owned enterprise like Solomon Water is based on the SOE Act 2017.

Demarcation of water supply services

Board of directors

- Minister of mines
- Minister of Energy and Rural Electrification
- Minister of Finance and Treasury

1. Outline of Water Supply Services

Legal basis of water supply services, demarcation of water supply services , main actor of water supply utilities, Mission/Vision of Water Supply Utilities, your Mission/Vision in your organization etc.

Solomon Water

State owned enterprises under the local government

Solomon Water Mission

To provide reliable and safe water supply and sewerage services within our area of operations in Solomon Islands

My Mission

To Asist in the construction of water infrastructure which are environmentally sustainable and are constructed with good quality and sustainable for operation

2. Water Supply Service Levels

Main Performance Indicators (PI)/ any other indicator

Coverage area	**28.7(sq. km)**
Population Served	740,424 thousands
Collection ratio	8.3(%)
Production capacity	30(m3/day)
Supply duration	22(hr/day)
Supply pressure	0.08-0.1Bar
Non-Revenue Water	60(%)
Water quality	Disinfection
Staff number	235
Number of connections	16,531 Connections
Staff/1,000 connections	0.235(people/1,000connections)

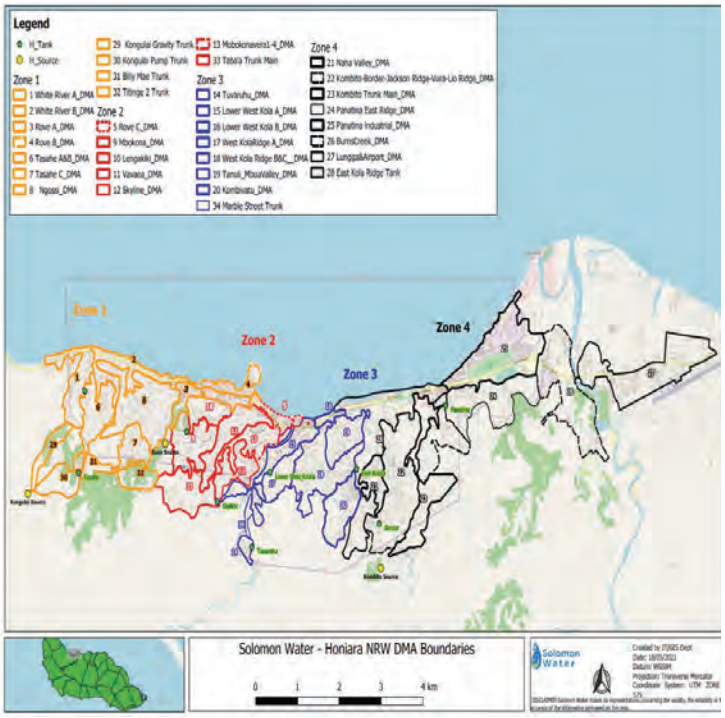


Figure 7: Honiara DMA boundaries

3. Management of Water Quality

Current situation and major challenges/problem, Current Actions against those challenges/problems, Water quality standards for drinking water, Monitoring system or plans for safety of drinking water in your organization / regulatory body / Independent Institution, Implementation of Water Safety Plans or Similar Efforts

1. **Current situation and major challenges/problems**
   - Contamination to water supply services due to pipe leakages, limited resources options and the negative impacts of the changing climate
2. **Current actions against those challenges/problems**
   - Construction of 10km Trunk mains and three new concrete Reservoir under the Urban water supply and sanitation sector project.(UWSSSP) As well as construction of a water treatment plant at Kongulai.
3. **Water quality standards for drinking water**
   - Water testing daily and comply with the WHO standards
     - Microbiological Quality, Chemical Quality and physical Quality

3. Management of Water Quality

Current situation and major challenges/problem, Current Actions against those challenges/problems, Water quality standards for drinking water, Monitoring system or plans for safety of drinking water in your organization / regulatory body / Independent Institution, Implementation of Water Safety Plans or Similar Efforts

4. Monitoring system or plans for safety of drinking water in your organization / regulatory body / Independent Institution, Implementation of Water Safety Plans or Similar Efforts

1. Routine testing
2. Laboratory Analysis
3. Digital Tracking
4. Emergency Procedures

Figure 2: Measuring water turbidity at source and check points and flashing of water.

5. Implementation of Water Safety Plans* or Similar Efforts

Solomon Water has created and implemented Water Safety Plans (WSPs) in accordance with WHO guidelines. These plans encompass:

•**Risk Assessment**: Identifying potential hazards to water quality from the source to the consumer.

•**Risk Management**: Applying control measures to mitigate identified risks, such as improved filtration and disinfection processes.

•**Regular Review**: Periodic review and updates of WSPs every two years to incorporate new information and address emerging challenges.

4. Reduction of Non-Revenue Water

Current Situation and Major Challenges/Problems

Authorized consumption	**Revenue water**	**Billed authorized consumption**	**4,668,668(m3 /year) 40.05(%)**
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	77,940(m3 /year) 0.67(%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	9,29991(m3 /year) 7.98(%)
		Physical losses (Leakage)	5,979,987(m3 /year) 51.3(%)

Figure 3: Information extracted from Water balance software for 2023. Source: *Water balance software*

The growing issue is based on **leakages from old pipes and storage facilities, illegal connection and unbilled services**. Currently, physical water loss is not measured and data is assumed based on probability of illegal connection, zero consumption and estimated authorized unbilled usage. Based on the data and using IBM, physical water loss accounts for 51% of the total water loss in 2023.

5. Accounting system of Water Supply Service

Water Tariff in your Organization, Balance Sheet of your Organization Profit and Loss Statement of your Organization etc.
*[Public Utilities] Profit and Loss Account, Capital Income and Expenditures of your Organization

Solomon Water
Safe water for a healthy nation

WATER AND WASTEWATER TARIFFS
Effective Monday 1 January 2024

Consumer Category	Service	Consumption	Tariff Effective 1 Jan 2024 ($/kL)
Domestic	Water	0 to 15 kL	$9.71
		15 to 30 kL	$14.44
		Greater than 30 kL	$16.80
	Wastewater	0 to 15 kL	$4.75
		15 to 30 kL	$7.11
		Greater than 30 kL	$8.27
Commercial	Water	0 to 30 kL	$38.03
		30 to 60 kL	$42.75
		Greater than 60 kL	$47.48
	Wastewater	0 to 30 kL	$18.89
		30 to 60 kL	$21.26
		Greater than 60 kL	$23.62

5. Accounting system of Water Supply Service

Water Tariff in your Organization, Balance Sheet of your Organization Profit and Loss Statement of your Organization etc.
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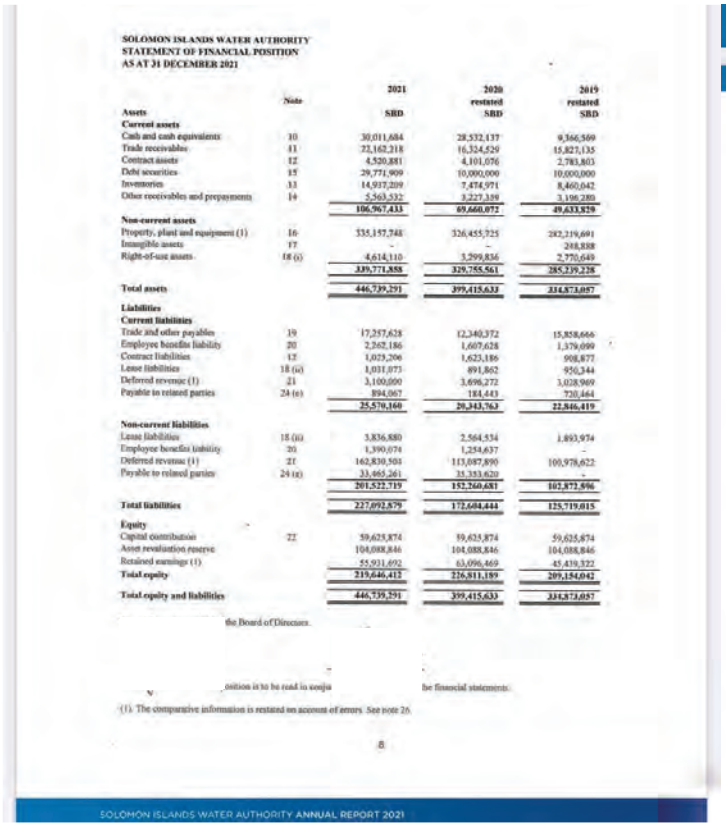


SOLOMON ISLANDS WATER AUTHORITY
STATEMENT OF FINANCIAL POSITION
AS AT 31 DECEMBER 2021

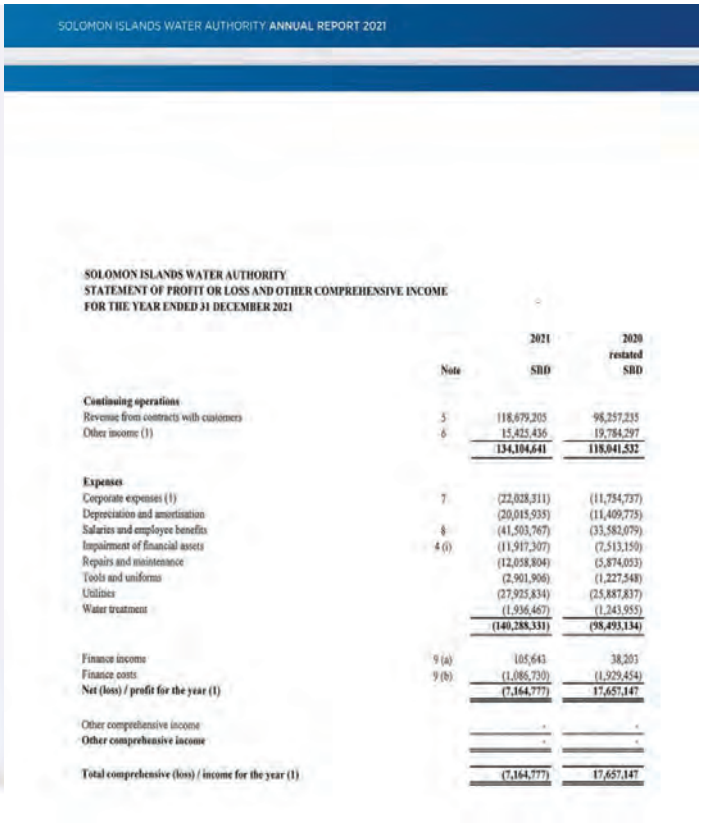
	Note	2021 SBD	2020 restated SBD	2019 restated SBD
Assets				
Current assets				
Cash and cash equivalents	10	30,011,684	28,532,137	9,366,569
Trade receivables	11	22,162,218	16,324,529	15,827,135
Contract assets	12	4,520,881	4,101,076	2,783,803
Debt securities	15	29,771,909	10,000,000	10,000,000
Inventories	13	14,917,209	7,474,971	8,460,042
Other receivables and prepayments	14	5,563,332	3,227,339	3,196,280
		106,967,433	69,660,052	49,633,829
Non-current assets				
Property, plant and equipment (1)	16	335,157,748	326,455,725	282,219,691
Intangible assets	17	-	-	288,888
Right-of-use assets	18 (i)	4,614,110	3,299,836	2,770,649
		339,771,858	329,755,561	285,239,228
Total assets		446,739,291	399,415,633	334,873,057
Liabilities				
Current liabilities				
Trade and other payables	19	17,257,628	12,340,372	15,858,666
Employee benefits liability	20	2,262,186	1,607,628	1,379,099
Contract liabilities	12	1,023,206	1,623,186	908,877
Lease liabilities	18 (ii)	1,031,073	891,862	930,344
Deferred revenue (1)	21	3,100,000	3,696,272	3,028,969
Payable to related parties	24 (e)	894,067	184,443	720,464
		25,570,160	20,343,763	22,846,419
Non-current liabilities				
Lease liabilities	18 (ii)	3,836,880	2,564,534	1,893,974
Employee benefits liability	20	1,390,074	1,254,637	-
Deferred revenue (1)	21	162,830,501	113,087,890	100,978,622
Payable to related parties	24 (e)	33,465,261	35,353,620	-
		201,522,719	152,260,681	102,872,596
Total liabilities		227,092,879	172,604,444	125,719,015
Equity				
Capital contribution	22	59,625,874	59,625,874	59,625,874
Asset revaluation reserve		104,088,846	104,088,846	104,088,846
Retained earnings (1)		55,931,692	63,096,469	45,439,322
Total equity		219,646,412	226,811,189	209,154,042
Total equity and liabilities		446,739,291	399,415,633	334,873,057

the Board of Directors.

sition is to be read in conju — he financial statements.

(1). The comparative information is restated on account of errors. See note 26.

SOLOMON ISLANDS WATER AUTHORITY ANNUAL REPORT 2021



SOLOMON ISLANDS WATER AUTHORITY ANNUAL REPORT 2021

SOLOMON ISLANDS WATER AUTHORITY
STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME
FOR THE YEAR ENDED 31 DECEMBER 2021

	Note	2021 SBD	2020 restated SBD
Continuing operations			
Revenue from contracts with customers	5	118,679,205	98,257,235
Other income (1)	6	15,425,436	19,784,297
		134,104,641	118,041,532
Expenses			
Corporate expenses (1)	7	(22,028,311)	(11,754,737)
Depreciation and amortisation		(20,015,935)	(11,409,775)
Salaries and employee benefits	8	(41,503,767)	(33,582,079)
Impairment of financial assets	4 (i)	(11,917,307)	(7,513,150)
Repairs and maintenance		(12,058,804)	(5,874,053)
Tools and uniforms		(2,901,906)	(1,227,548)
Utilities		(27,925,834)	(25,887,837)
Water treatment		(1,936,467)	(1,243,955)
		(140,288,331)	(98,493,134)
Finance income	9 (a)	105,643	38,203
Finance costs	9 (b)	(1,086,730)	(1,929,454)
Net (loss) / profit for the year (1)		(7,164,777)	17,657,147
Other comprehensive income		-	-
Other comprehensive income		-	-
Total comprehensive (loss) / income for the year (1)		(7,164,777)	17,657,147

6. Major Recent Achievements in Improvement of Water Supply Services

Good practices etc.

1. Replacement of Tanks

Figure 3: Photo extracted from Volume 4; Bidding document page 41. Tasahe Steel tank

Figure 4 : Photo extracted from Volume 4; Bidding document page 41. Panatina Steel tank

Figure 5: Progress of construction of Concrete reservoir at Tasahe Reservoir.

Figure 6: Progress of construction of Concrete reservoir at Panatina Reservoir.

6. Major Recent Achievements in Improvement of Water Supply Services

Good practices etc.

2. Monitoring systems

Figure 1: Fluvio personal with Solomon water Catchment officer, Robert Iromalefo. Source: *(Fluvio, 2024)*

3. Construction of 10km pipe

Trenching and pipe installation at Culvert #6, CH 2+620m

Progress of works from White River to CH900m

7. Recent Challenges to Improvement of Water Supply Services

With the introduction of new technology and software, there is the challenge of familiarizing oneself to use this resources. Furthermore, improving management of Solomon water management of water supply is limited to resources availability and funding.

8. Expectations toward Japan

Government/JICA, Water utilities, Private companies

8-1. **Expectations toward Japanese Government and JICA**

I expect to learn and acquire knowledge in the water industry of Japan.

8-2. **Expectations toward Japanese Water Utilities**

I expect advice on the challenges and issues faced by Japanese water utilizes on reducing non-revenue water and construction of new infrastructure and how they have addressed this issues.

8-3. **Expectations toward Japanese Private Companies**

I expect to learn about the administration and management strategies adapted and how have that improved their services.

9. Expectations toward the Program

Expectations of your supervisors toward your participation in the program, your expectation(any comments are appreciated).

9-1. Expectations of your supervisors toward your participation in the program.

To share the knowledge which I have gained throughout the training and assist with the improvement in the development of water infrastructures in Honiara.

9-2. Your expectation; Any comments and requests are appreciated.

Having this opportunity to gain knowledge and learn to improve the Administration and Management of Solomon water supply services especially in the Construction and operation phase is a vital knowledge, one that I am very happy to be a participant.

Thank you
Questions?

8. SOUTH SUDAN

Inception Report

Country: South Sudan

Name:Leon Lewis Rum

---

1. Outline of Water Supply Services

1-1. Legal Basis of Water Supply Services

(What kind of laws and regulations are Water Supply Services based on?)

1-2. Demarcation of Water Supply Services

- Ministry of Water Resources and Irigation RSS-JUBA

(Which ministry is in charge of what kind of field of water?)

1-3. Main Actor of Water Supply Utilities

- National Government

(e.g. In Japan, most water utilities are public bureau under local government.)

1-4. Mission/Vision of Water Supply Utilities

- Mission to Develop and provide adequate safe and affortable water services in an efficient sustainable and environmentally friendly manner to our stakeholder delight.
- Vision: to be the leading and most vibrant service provider in South Sudan.

1-5. Your Mission/Vision in your organization:

- Mission: To become a sustainable utility.
- Vision: To leader service provider in Juba City

---

2. Water Supply Service Levels

2-1. Main Performance Indicators (PI)

Coverage area	(sq. km)
Population Served	459, 000
Collection ratio	50 and 2(%)
Production capacity	18, 000 (m3/day)
Supply duration	14 and 22 (hr/day)
Supply pressure	0.04

Non-Revenue Water	49 and 10(%)
Water quality	East Africa and WHO
Staff number	93
Number of connections	2292
Staff/1,000 connections	5(people/1,000connections)

2-2. Any Monitoring by Performance Indicators (PI)

Yes. Been developed by JICA expert.

---

3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems

- Chemical optimization not easy to be meet by the operaters.
- Minimum monitering mechanisism not been applied.

3-2. Current Actions against Those Challenges/Problems

- Refreshing training to our operators.
- Budget been proposed to facilitate monitering mechanism.

3-3. Any Achievements

- Increase in optimization from 40% to 70%

3-4. Water Quality Standards for Drinking Water

- Turbidity, pH, Conductivity, TDS, Residual Chlorine, and optimization analysis such as Jar test and Chlorine demand.

3-5. Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others

3-6. Implementation of Water Safety Plans* or Similar Efforts

(* Water Safety Plans: refer to the following URL and review before participating in the Course,

URL: Water safety plan manual (WSP manual) (who.int))

---

4. Reduction of Non-Revenue Water

4-1. Current Situation and Major Challenges/Problems

- Aged pipes
- Illegal connection

4-2. Current Actions against Those Challenges/Problems

- Replacement of old network

- Inspection being carried out

4-3. Any Achievements

Yes. NRW been reduced from 55% to 49%

4-4. Constitution of NRW (If you have the data, please fill in the table)

Authorized consumption	Revenue water	Billed authorized consumption	(m3 /year) (%)
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	(m3 /year) (%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	(m3 /year) (%)
		Physical losses (Leakage)	(m3 /year) (%)

4-4. Situations about Leakage Detection Measures (DMA etc.)

none

---

5. Accounting system of Water Supply Service

5-1. Water Tariff in your Organization

1000ssp/m^3

5-2. Balance Sheet of your Organization

Yes exist. Been developed by JICA Expert.

5-3. Profit and Loss Statement of your Organization

(*[Public Utilities] (1) Profit and Loss Account

(2) Capital Income and Expenditures of your Organization)

(* You can check the case of Tokyo in the chapter 4 "Financial System and Future Financial Management" of this file.

URL: http://www.waterprofessionals.metro.tokyo.jp/pdf/wst_02.pdf)

---

6. Major Recent Achievements in Improvement of Water Supply Services/Management

- Quick response to leak repair
- Conversion of unmetered customers to metered

---

7. Recent Challenges to Improve Water Supply Services

- increase operation hours to maximum

---

8. Expectations toward Japan

8-1. Expectations toward Japanese Government and JICA

- More donation interms of capacity building, grant aid projects on water infrasturature.

8-2. Expectations toward Japanese Water Utilities

- To acquire more new technology on waterworks.

8-3. Expectations toward Japanese Private Companies

- To come and invest in water sector in South Sudan.

---

9. Expectations toward the Program.

9-1. Expectations of your supervisors toward your participation in the program.

- To come back and implement action plan gain from the knowledge acquire from the training.

9-2. Your expectation; Any comments and requests are appreciated.

- Transform the organization.

END.

INCEPTION REPORT

PRESENTER:

ENG. LEON LEWIS RUM,
AREA MANAGER,
South Sudan Urban Water Corporation/RSS-Juba
On 1st Sept to 14th 2024

1

1. OUTLINE OF WATER SUPPLY SERVICES

1-1. Legal Basis of Water Supply Services

(What kind of laws and regulations are Water Supply Services based on?)

1-2. Demarcation of Water Supply Services

- Ministry of Water Resources and Irrigation RSS-JUBA

1-3. Main Actor of Water Supply Utilities

- - National Government

2

CONT…

1-4. Mission/Vision of Water Supply Utilities

- Mission: to Develop and provide adequate safe and affordable water services in an efficient sustainable and environmentally friendly manner to our stakeholder delight.
- Vision: to be the leading and most vibrant service provider in South Sudan.

1-5. Your Mission/Vision in your organization:

- Mission: To become a sustainable utility.
- Vision: To become leading service provider in Juba City

3

2. Water Supply Service Levels

2-1. Main Performance Indicators (PI)	
Coverage area	(sq. km)
Population Served	459, 000(pple)
Collection ratio	50 and 92(%)
Production capacity	18, 000 (m3/day)
Supply duration	14 and 22 (hr/day)
Supply pressure	0.04

4

2.1 Cont…

2-1. Main Performance Indicators (PI)	
Non-Revenue Water	49 and 10(%)
Water quality	East Africa and WHO
Staff number	93
Number of connections	2292
Staff/1,000 connections	5(people/1,000connections)

5

2-2. Any Monitoring by Performance Indicators (PI)

Yes. Been developed by JICA expert.

6

3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems

- Chemical optimization not easy to be meet by the operators.
- Minimum monitoring mechanism not been applied.

3-2. Current Actions against Those Challenges/Problems

- Refreshing training to our operators.
- Budget been proposed to facilitate monitoring mechanism.

7

3. cont...

3-3. Any Achievements

- Increase in optimization from 40% to 70%

3-4. Water Quality Standards for Drinking Water

- Turbidity, pH, Conductivity, TDS, Residual Chlorine, and optimization analysis such as Jar test and Chlorine demand.

8

4. Reduction of Non-Revenue Water

4-1. Current Situation and Major Challenges/Problems

- Aged pipes that let to too much bursts;



9

4. 1 cont..

- Lack of some materials for leak repair;



Need more fittings In order to repair water leakage just in time

- Coupling for 8," 6," 4" and 3"
- PVC pipe 8," 4"and 3"
- Flow meter 12," 8," 4" and3".
- Repair tools

10

4. 1 cont…

- Illegal connection.

11

4. cont…

4-3. Any Achievements

- Yes. NRW been reduced from 55% to 49%

4-4. Constitution of NRW (If you have the data, please fill in the table)

- Data not available

4-5. Situations about Leakage Detection Measures (DMA etc.)

- none

12

5. Accounting system of Water Supply Service

5-1. Water Tariff in your Organization

- 1000ssp/m^3 for house connections and 2500ssp for TFS

5-2. Balance Sheet of your Organization

- Yes exist. Been developed by JICA Expert.

13

6. Major Recent Achievements in Improvement of Water Supply Services/Management

- - Quick response to leak repair
- - Conversion of unmetered customers to metered

14

7. Recent Challenges to Improve Water Supply Services

- **- Increase operation hours to maximum**

15

8. Expectations toward Japan

8-1. Expectations toward Japanese Government and JICA

- More donation in terms of capacity building, grant aid projects on water infrastructure.

16

8-2. Expectations toward Japanese Water Utilities

- To acquire more new technology on waterworks.

17

8-3. Expectations toward Japanese Private Companies

- To come and invest in water sector in South Sudan.

18

9. Expectations toward the Program.

9-1. Expectations of your supervisors toward your participation in the program.

- To come back and implement action plan gain from the knowledge acquire from the training.

9-2. Your expectation; Any comments and requests are appreciated.

- Transform the organization.

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Once more, thanks to Japan Government through JICA OFFICE SOUTH SUDAN for being supporting SSUWC/RSS/JUBA.

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The end
21

9. UGANDA

Inception Report

Country: UGANDA
Name: KARUNGI SHARON

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1. Outline of Water Supply Services

1-1 Legal Basis for Water Services.

The laws affecting the water sector include:

- The Water Act, Cap 152: An Act that makes provision for the use, protection and management of water resources and supply; to provide for the constitution of water and sewerage authorities; and to facilitate the devolution of water supply and sewerage undertakings. The act is a primary legislation that governs the operations of NWSC in ensuring provision of water and sewerage services within the designated areas throughout Uganda.
- The National Water and Sewerage Corporation Act, Cap 317: The act stipulates the objectives, powers and structure of National Water and Sewerage Corporation.

1-2 Demarcation of Water Supply Services

Ministry of Water and Environment: This ministry is the overarching body responsible for policy formulation, regulation, and oversight of the water sector. It coordinates with other ministries, local governments, NWSC and other agencies to implement water policies and strategies.

1-3 Main Actor of the Water Supply Utilities

The National Water and Sewerage Corporation (NWSC) is the main actor in Uganda's water sector with the mandate to provide water and sewerage services in urban centres and major towns across the country.

Kampala Water operates the water and sewerage services in greater Kampala (Kampala, Mukono and Wakiso).

1-4 Mission/Vision of Water Supply Utilities

To promote and ensure the rationale and sustainable utilization, development and effective management of water and environment resources for social economic development of the country

1-5 Your Mission/Vision in your Organisation

Vision: "The leading customer service oriented utility in the world."

Mission: "To sustainably and equitably provide cost effective quality water and sewerage services while conserving the environment and enhancing stakeholder trust."

2.0 Water Supply Service Levels.

2-1. Main Performance Indicators (PI)

Coverage area	828 (sq. km) For Kampala Water
Population Served	19,000,000 for the whole of NWSC
Collection ratio	98 %
Production Capacity	401,500m^3/day (Kampala water)
Supply duration	20hrs/day (Kampala Water)
Supply pressure	Average of 3bar (Kampala water)
Non-Revenue water	40% (Kampala Water)
Water Quality	
Staff number	2090 as at April 2024 (Kampala Water)
Number of connections	430,207 as at April 2024 (Kampala Water)
Staff/1000connections	5 Staff per 1000 Connections

2-2 Monitoring by Performance Indicators (PI)

Kampala Water has a number of performance indicators as indicated in the table below. It is therefore expected that Kampala water will have attained the performance parameters as indicated in the baseline year 2023/2024

#	Performance Indicators	Baseline 2023/2024	FY 2024/2025	FY 2025/2026	FY 2026/2027	FY 2027/2028	FY 2028/2029
SERVICE COVERAGE							
	New PSPs	755	830	755	755	755	755
	Total PSPs	8,016	8,846	9,601	10,355	11,110	11,864
	New Water Connections	28,334	29,183	28,334	28,334	28,334	25,973
	Total Water Connections (Nos)	440,153	469,336	497,670	526,004	554,338	580,311
	New Sewer Connections	141	140	93	93	93	93
	Total Sewer Connections (Nos)	14,724	14,864	14,957	15,051	15,144	15,237
	New Water Extensions (Km)	156	118	88	88	88	88
	Total Network Length (Km)	4,044	4,162	4,250	4,339	4,427	4,515
	Customer Satisfaction Index (%)	80%	80%	80%	80%	80%	80%
	Staff Engagement Index (%)	70%	80%	80%	80%	80%	80%
OPERATIONAL EFFICIENCY							
	NRW (%)	40.0	38.8	38%	37%	36%	36%
	Water Supplied (million m^3/Annum)	110.7	115.6	113.97	115.69	117.45	120.98
	Water Sales (million m^3/Annum)	66.7	68.7	70.74	72.86	75.05	77.30
FINANCIAL PERFORMANCE							
	Billing Revenue VAT inclusive (UGX Billions)	379.2	396.3	409.3	421.6	434.3	447.3
	Arrears (UGX Billions)	66.6	58.7	50.5	42.1	33.4	24.4
	Collections (UGX Billions)	386.8	404.2	417.5	430.1	443.0	456.2

3. Management of Water Quality.

3-1. Current Situation and Major Challenges /Problems

Current Situation in Kampala Water

Currently water supplied to Kampala Metropolitan area is abstracted from Inner Murchison Bay on the Northern shores of Lake Victoria. It is treated at the Ggaba I, II and III water treatment works found 13 km Southeast of Kampala city. Ggaba I an old plant that was commissioned in 1929 while Ggaba II and III are relatively new commissioned in 1993 and 2007 respectively. All the water treatment plants employ conventional water treatment i.e. coagulation, flocculation, sedimentation, filtration and disinfection. One of the streams in Ggaba I has been recently upgraded to Dissolved Air Flotation system (DAF). The total daily average production of the 3 plants is 250,000 m^3/day. NWSC has another new water works located south of Kampala at Katosi in Mukono District. Its design capacity is 160,000m^3/day but currently operates at half its capacity. The plant was commissioned in July 2021The two plants are DAF systems fully automated in all its operations controlled by the SCADA (Supervisory Control and Data Acquisition) control system.

Process control is conducted at the laboratories set up at Ggaba and Katosi water treatment works. In order to ensure that clean and safe water is supplied to the public, a mobile water quality team monitors the quality from the catchment, at point of production, in the distribution network up to the final consumer taps using the water safety plan approach.

Major Challenges /Problems

At Production Level

- There is deterioration of the raw water quality which affects the water treatment processes at Ggaba treatment works. Algal blooms dominated with blue green algae usually occur from August – November when the lake mixes increasing chemical consumption hence treatment costs. The plant is forced to adjust to higher doses of alum or blend with polymers in order to remove colour and organic matter in order to meet the WHO guidelines

At distribution level

- Frequent bursts and leakages resulting into re-contamination.
- Old pipe network.
- Intermittent supply of water leading to dry pipes.
- Low pressure in the pipes leading to intrusion of contaminated water.
- Infrequent flushing of dead ends.
- Low free chlorine residuals to counter post contamination.

3-2 Current Actions against Those Challenges/Problems

At Production Level

- Efforts have been made to improve the treatment process. NWSC has reverted on the use of dissolved air flocculation (AQUADAF) at both the Katosi treatment plant and Ggaba I and significant in colour has been achieved.

Actions

- Zoned out the members to ensure continuous monitoring of the Network.
- Systematic replacement of aged pipe sections.
- Monitoring of the flushing schedule and addition of fixtures where needed.

- Increasing on the number of sampling areas to improve quality monitoring.

3-3 Any Achievements

- Effective process control and water quality management activities at water production and sewage treatment plants.
- Conformity of water supplied and sewage effluent discharged to set National Standards.
- Establishment of trends in behavioural characteristics of IMB water quality with aim of improving water treatment through short-term and long-term remedial measures.
- Assessment and sanitary inspections of water distribution units related to quality aspects at the primary and the secondary valves, the service tanks, reservoirs and tertiary points.

3-4 Water Quality Standard for Drinking Water

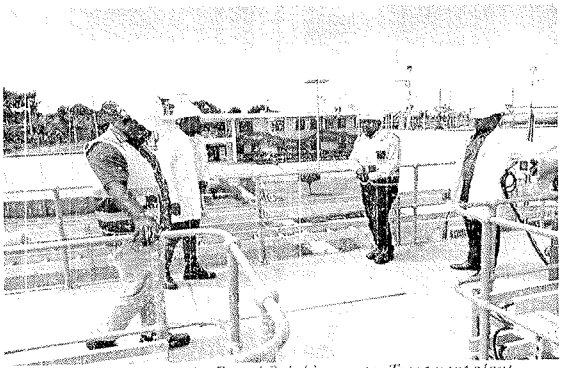
The table below shows a number to tests carried out by Central Laboratory of NWSC to ensure conformity to drinking water standards.

NATIONAL STANDARDS FOR POTABLE WATER –KAMPALA WATER (NWSC)

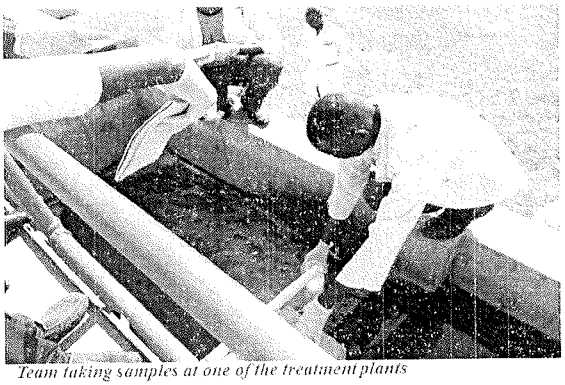
Parameters	Units	National Standard for Portable water (Maximum permissible) Treated Water.	National Standard for Portable water (Maximum permissible) Un- Treated Water.
pH	--	6.5-8.5	6.5-8.5
Electrical Conductivity	(µS/cm)	1500	2500
Colour Apparent	PtCo	15	15
Turbidity	NTU	5.0	10.0
Total Dissolved Solids	Mg/L	700	1200
Total Suspended Solids	Mg/L	0.0	0.0
Alkanity: total as $CaCO_3$,	Mg/L	500	500
Hardness: total as $CaCO_3$,	Mg/L	300	500
Calcium: Ca^{2+}	Mg/L	150	150
Magnesium: Mg^{2+}	Mg/L	100	100
Bi-Carbonate : as $CaCO_3$,	Mg/L	500	500
Manganese: Mn^{2+}	Mg/L	0.1	0.1
Chloride: Cl^-	Mg/L	250	500
Fluoride: F^-	Mg/L	1.5	1.5
Iron: total	Mg/L	< 0.30	1.0
Sulphate: SO_3^{2-},	Mg/L	400	200
Nitrate as NO_2^-	Mg/L	45	45
Aluminium: Residual as Al^{3+}	Mg/L	< 0.20	< 0.20
Chlorine: Free Residual	Mg/L	0.20 - 0.50	Not Specified.
Chlorine: Total Residual	Mg/L	Not Specified	Not Specified
Ammonia	Mg/L	0.5	1.0
Orthophosphate	Mg/L	2.0	5.0
Cadmium	Mg/L	< 0.001	< 0.001
Cooper	Mg/L	1.0	1.0
Lead	Mg/L	0.01	0.05
Zinc	Mg/L	5.0	5.0
E-Coli	CFU/100mL	0	0
Total Coliforms	CFU/100mL	0	10
Faecal Coliforms	CFU/100mL	0	0

Source: UNBS 2014

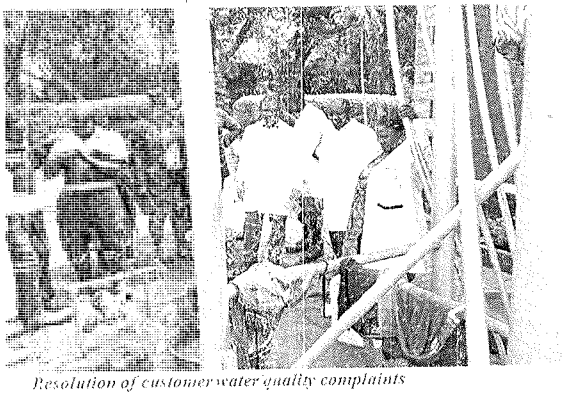
Pictorial view of some of the water quality monitoring activities.



Water quality team at the Katosi Drinking water Treatment plant



Team taking samples at one of the treatment plants



Resolution of customer water quality complaints

Sampling at one of the network fixtures

3-5 Monitoring System or Plans for Safety of Drinking Water Your Organisation / Regulatory Body / Independent Institution /others.

Water Quality in NWSC is monitored through the implementation of the water safety plan. The monitoring parameters cover physiochemical, microbiological and biological parameters. The frequency of monitoring these parameters is dependent on sampling point types. The sampling stations are designated as raw water source (Lake), water treatment plants, distribution, sewage treatment plant, streams and channels, and industries. The frequency of the monitoring in Kampala water is as per the attachment.

Water Quality Monitoring Parameters for the IMB, Streams, Distribution network and Sewage Treatment Works, Industries connected to Sewers, and water works.

Catchment	Frequency	
Parameter	Lake	Industries and streams
Algal cells	Once a month	NR
Ammonia	Once a month	Once a month
Chlorophyll a	Once a month	NR
Colour	Once a month	NR
Depth	Once a month	NR
E.Coli	Once a month	NR
Electrical conductivity	Once a month	Once a month
Feacal coliforms	Once a month	NR
Flow rate	Once a month	Once a month
Hardness	NR	NR
Heavy metals	NR	Once a month
Nitrate	Once a month	Once a month
pH	Once a month	Once a month
Temperature	Once a month	Once a month
Total alkalinity	Once a month	Once a month
Total Iron	Once a month	Once a month
Total Phosphorus	Once a month	Once a month
Total suspended solids	Once a month	Once a month
Total Nitrogen	Once a month	Once a month
Turbidity	Once a month	NR

At the source

Ggaba	Frequency			
Parameter	Raw water	Clarified water	Filtered water	Final water pH Corrected
pH	Daily	Daily	Daily	Daily
Colour	Daily	Daily	Daily	Daily
Turbidity	Daily	Daily	Daily	Daily
Hardness	Twice month	NR	NR	Twice month
Total alkalinity	Twice month	NR	NR	Twice month
Total Iron	Twice month	NR	NR	Twice month
Free chlorine	NR	NR	NR	Daily
Total chlorine	NR	NR	NR	Daily
Total suspended solids	Daily	NR	NR	Daily
Sulphate		NR	NR	Once a month
Nitrate		NR	NR	Once a month
Chlorine		NR	NR	Once a month
Aluminium Residual	NR	NR	NR	Once a week
E.Streptococci	Once a month	NR	NR	Once a week
Clostridium perfringens	Quarterly	NR	Monthly	NR
Heavy metals	Quarterly			Quarterly
E.coli	NR	NR	NR	Once a week
Feacal coliforms	Once a month			Once a week
Pilot Experiments	Frequency			
Jar test	Once a week			
Marble Test	Once a month			
Critical e Demand	Once a week			

At the treatment plant

Distribution	Frequency		
Parameter	Reservoirs + Tanks	Control points (1^0 & 2^0 lines)	Tertiary Points + PSP
pH	Once a week	Twice a month	Once a month
Colour	Once a week	Twice a month	Once a month
Turbidity	Once a week	Twice a month	Once a month
Hardness	Once a month	Once a month	Once a month
Total alkalinity	Once a month	Once a month	Once a month
Total iron	Once a month	Once a month	Once a month
Free chlorine	Once a week	Once a month	Twice a month
Total chlorine	Once a week	Once a month	Twice a month
Total suspended solids	Once a week	Once a month	Twice a month
Sulphate	Once a month	Once a month	Once a month
Nitrate	Once a month	Once a month	Once a month
Aluminium Residual	As need araises^	As need araises^	As need araises^
F.Streptococci	Quarterly	Quarterly	Quarterly
E.coli	Once a week*	Twice a month*	Once a month*
Feacal coliforms	Once a week*	Twice a month*	Once a month*
Total coliforms	Once a week	Twice a month	Once a month
*Only test this if Total coliform is present			
As need araises^; Do only if the final water is not compliant			

at the distribution

3-6 Implementation of the water Safety plan* or Similar Efforts

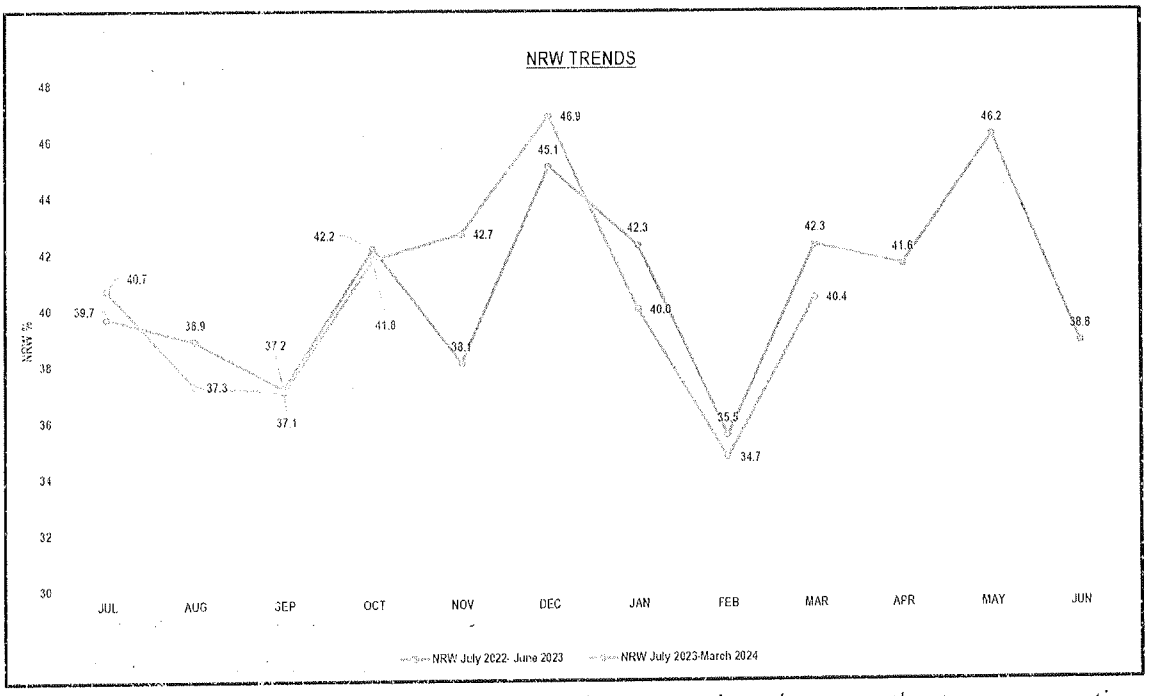
(Water Safety Plans: refer to the following URL and review before participating in the course, URL: Water safety plan manual (WSP manual) (who.int))

NWSC currently has a water safety plan that was established and implementation is on-going based on the activities and budgets allocated every year to ensure that water is safe from the source to the customer draw off points back to the source. These are some of the actions under taken in the approach:

- Process control and quality management.
- Systematic water quality checks from the catchment area, treatment plant, reservoirs and distribution networks.
- Zoning of the management of quality and increasing of sampling points to ensure good quality of water.
- Regular monitoring of the raw water to ensure that the treatment process and chemicals are adequately applied.
- Periodic reservoir cleaning to ensure quality is not compromised. This is done at least twice a year.

4. Reduction of Non-Revenue Water

4.1 Current Situation and Major Challenges/Problems



The above graphical representation indicates the comparison between the two consecutive years expressed as a percentage of water system input volume.

The major challenges being faced are;

- Frequent pipe failures due to aged pipe network, pipe expose to damage and excessive pressures.
- Customer meter inaccuracy (Metering inefficiency).
- Un-authorized consumption (Water Theft).
- Vandalism of infrastructure.
- Data handling and accounting errors (Billing errors).

4-2 Current actions against Those Challenges/Problems

Current actions being taken against above mentioned challenges are as below;

- ✓ Mapkit-Tool for reporting/recording and real time updating of all field anomalies, all staff
- ✓ CRM used for reported complaints by customers through Call Centre-toll free numbers
- ✓ Social media platforms for handling customer complaints; X & WhatsApp groups
- ✓ Daily Leak search, reporting and handling and Field audits - Confirm repairs are handled
- ✓ Pressure and flow measurement management; PRVs installation to regulate excessive pressures.
- ✓ House to house audits
- ✓ Exceptions audit
- ✓ System input volume audit and calibration of bulk meters' quarterly
- ✓ Customer meter servicing
- ✓ Customer meter testing

- ✓ Customer meter Calibration especially large consumers
- ✓ Spot billing audits
- ✓ Illegal water use dedicated teams code maned WALOPU and 10% NRW Program

4-3 Any Achievements;

- ➢ Established a NRWM Department with clear strategy and structure for implementation up the branch level.
- ➢ Dedicated team with equipment for hidden leak detection and flow measurements that assist in active leakage control activities.
- ➢ Carry out monthly water balances that track progress before the annual water balance is produced at the end of the year.
- ➢ Established and monitor about 48 mini district metered areas that assist in testing some the activities before they are rolled out to bigger system network.
- ➢ Established four pressure management areas that have assisted in regulating excessive pressures.
- ➢ Currently piloting smart metering to improve on real time capture and data analytics to minimise down time especially at large consumer accounts.

4-4. Constitution of NRW

Kampala Water NRW for Financial year 2022-2023

Water Balance in m3/year

<table>
<tr><td rowspan="6">System Input Volume
102,552,623 m3/year
Error Margin [+/-]:
2.0%</td><td rowspan="3">Authorised Consumption
64,255,577 m3/year
Error Margin [+/-]:
#DIV/0!</td><td rowspan="2">Billed Authorised Consumption
60,355,635 m3/year
Error Margin [+/-]:
#DIV/0!</td><td>Billed Metered Consumption
60,355,635 m3/year
Error Margin [+/-]: #DIV/0!</td><td rowspan="2">Revenue Water
60,355,635 m3/year
Error Margin [+/-]:
#DIV/0!</td></tr>
<tr><td>Billed Unmetered Consumption
0 m3/year
Error Margin [+/-]: 0.0%</td></tr>
<tr><td rowspan="2">Unbilled Authorised Consumption
3,899,942 m3/year
Error Margin [+/-]:
7.9%</td><td>Unbilled Metered Consumption
802,876 m3/year
Error Margin [+/-]: 1.2%</td><td rowspan="3">Non-Revenue Water
42,196,988 m3/year
Error Margin [+/-]:
#DIV/0!</td></tr>
<tr><td>Unbilled Unmetered Consumption
3,097,065 m3/year
Error Margin [+/-]: 10.0%</td></tr>
<tr><td rowspan="3">Water Losses
38,297,046 m3/year
Error Margin [+/-]:
#DIV/0!</td><td rowspan="2">Apparent Losses
11,828,873 m3/year
Error Margin [+/-]:
9.1%</td><td>Unauthorised Consumption
921,990 m3/year
Error Margin [+/-]: 9.5%</td></tr>
<tr><td>Customer Meter Inaccuracies and Data Handling Errors
10,906,883 m3/year
Error Margin [+/-]: 9.8%</td></tr>
<tr><td colspan="2">Real Losses
26,468,173 m3/year
Error Margin [+/-]: #DIV/0!</td></tr>
</table>

4-4. Situation about Leakage Detection Measures. (DMA etc.)

Refer to 4-2 above.

5. Accounting System of Water Supply Service.

5-1 Water Tariff in your Organisation.

Water Tariff in NWSC.

NWSC has a well-defined tariff structure, approved by the Minister of Water and Environment. The tariff is adjusted periodically whenever there are significant changes in the macro-economic parameters that affect the cost of inputs. The table below shows the current tariffs for the various consumer categories;

CATEGORY	CHARGES PER CUBIC METER (UG sh) VAT inclusive
Public standpipes	1060
Domestic	4224
Institutional/Government	4274
Commercial;	
· First 500 m3 per month	5069
· 501 – 1500 m3 per month	5069
· Over 1500 m3 per month	4052
Industrial;	
· Under 1,000 m3 per month	5069
· Above 1,000 m3 per month	2500

5.2 Balance sheet of your organisation.

The figure below shows the balance sheet/ financial position of NWSC for the year 2022/2023

Statement of Financial Position

	Notes	2023 UGX'000	2022 UGX'000
Assets			
Non-current assets			
Property, plant and equipment	16	3 360 592 826	3 356 850 136
Capital work in progress	17	275 307 160	167 879 865
Intangible asset	[illegible]	1 242 844	1 583 272
Right of use assets	[illegible]	8 809 117	9 764 057
Captive investment	[illegible]	2 028 908	171 816
		3 647 980 846	3 536 260 227
Current assets			
Inventories	[illegible]	42 420 227	38 156 099
Trade and other receivables	[illegible]	369 925 860	212 619 917
Cash and cash balances	[illegible]	292 994 809	298 528 193
Tax recoverable	[illegible]	2 158 000	[illegible]
		701 439 [illegible]	[illegible]
Total Assets		4 349 420 193	4 087 631 373
Equity And Liabilities			
Capital employed			
Government funding	[illegible]	410 889 416	410 889 416
Revaluation reserve	[illegible]	511 129 927	620 958 251
Retained earnings		414 522 725	361 867 836
Equity attributable to the owners of the entity		1 437 542 118	1 392 543 844
Non-current liabilities			
Borrowings	[illegible]	84 001 991	44 897 521
Terminal benefits (non-funded)	[illegible]	3 118 189	3 579 493
Deferred tax	[illegible]	300 770 442	324 797 626
Deferred income	[illegible]	3 184 549 229	3 002 059 507
Lease liability	[illegible]	2 310 700	2 221 102
		3 574 750 [illegible]	3 377 555 [illegible]
Current liabilities			
Borrowings	[illegible]	30 026 929	3 921 631
Provision for gratuity	[illegible]	26 787 087	15 440 355
Deferred income	[illegible]	49 121 971	48 914 458
Trade and other payables	[illegible]	229 286 345	242 379 813
Lease liability	[illegible]	1 900 [illegible]	1 874 661
		337 121 [illegible]	317 531 [illegible]
Total Reserves And Liabilities		4 349 420 193	4 087 631 373

5.3 Profit and Loss Statement of your Organisation.

The figure below summarizes the revenues, costs, and expenses incurred by NWSC for the year 2022/2023

Statement of Profit or Loss

	Notes	2023 UGX'000	2022 UGX'000
Income			
Water and sewerage income	2	466 179 288	424 100 369
Deferred income	3	79 761 555	91 571 687
Other income	4	4 097 925	3 610 392
Total income		550 038 768	519 282 448
Expenditure			
Employee benefit expenses		176 116 337	167 572 661
Administrative expenses		62 469 470	56 676 644
Provision for impairment of receivables		3 545 350	-
Static plant and pipe network expense		113 247 691	106 846 460
Supplies and services expenses		37 061 793	32 323 936
Premises' expenses		11 039 953	9 517 582
Transport and mobile plant expenses		15 321 433	11 602 164
Total expenditure before depreciation		419 030 972	396 538 489
Operating profit before depreciation		131 007 796	122 743 959
Depreciation and amortisation		98 704 385	124 072 014
Operating profit/(loss) before finance costs		32 303 411	(1 328 055)
Net finance costs		(11 293 952)	(9 746 170)
Net profit/(loss) before tax		21 009 459	(11 074 225)
Tax credit/(charge)	5	19 777 751	(27 791 920)
Profit/(loss) for the year		40 787 210	(38 866 145)

6.0 Major Recent Achievements in Improvement of Water Supply Service/ Management.

Below are some of the recent Improvement plans in Kampala Water.

- Commissioning of the Katosi Drinking Water treatment plant. This has helped to stabilise supply in the greater Kampala Metropolitan.
- Digitisation of process system like the online new connection, online Process monitoring of all operations at the Katosi Drinking water plant, Mapkit usage etc.
- Increased service coverage due to several main supply extensions.
- Enhanced District Metering with the fully fledged NRW department.

7.0 Recent Challenges to Improve Water Supply Services

Despite the achievements above, the Kampala water still has challenges;

- Water losses though leakages and bursts, water theft etc which increases the Non-Revenue water figure which currently stands at an average of 40%.

- Alternative water sources: People opt to utilizing rain water especially during rainy season for both domestic and animal use as well as sinking of shallow wells in areas of intermittent supply.
- Bad Staff attitude which affects service delivery plans.
- Intermittent supply in some areas despite having the Katosi plant running at half capacity due to inadequate funds.

8. Expectations toward Japan.

8-1 Expectations towards Japanese Government and JICA

- Financial support to enhance water supply service coverage and improved capacity building.
- To ensure a positive return on investments through growth in water sales and billing.
- Modernized technologies applied in Water Management and administration

8-2 Expectations toward Japanese Water Utilities

- Attaining vast experience in best practical measures to deploy in reduction of Non-Revenue Water (NRW).
- Understanding and comparing different water sources and how best the Japanese utilize the available water to ensure every resident is on supply.
- Networking and implementing Knowledge acquired to grow business and serve more Ugandans better.
- Bench marking on how the water safety plan is implemented in the Japanese Water Utilities.
- Best Management practices of Public Utilities in Japan.

8-3 Expectations toward Japanese Private Companies

- Understanding the collaboration between private and public sectors in service delivery to the people of Japan

9. Expectations towards the programme.

9-1 Expectations of your supervisors towards your participation in the program

- Implementation and application of the better technology which can be adapted.
- Knowledge sharing on return from this programme.

9-2. Your expectation; Any comments and requests are appreciated.

- Personal growth and career development

THE END

Attachment 2
Administration and Management of Water Supply Services(A)
Inception Report Presentation

1. Country: UGANDA
2. Name: ENG. SHARON KARUNGI
3. Position: MANAGER, ENVIRONMENTAL AND SOCIAL SAFEGUARDS
4. Organization: NATIONAL WATER AND SEWERAGE CORPORATION

Inception Report Presentation

1. Outline of Water Supply Services
2. Water Supply Service Levels
3. Management of Water Quality
4. Reduction of Non-Revenue Water
5. Major Recent Achievements in Improvement of Water Supply Services
6. Recent Challenges to Improvement of Water Supply Services
7. Expectations toward Japan (Government/JICA, Water utilities, Private companies)
8. Expectations toward the Program




1. Outline of Water Supply Services

Legal basis of water supply services: Water Act, Cap 152; National Water and Sewerage Corporation Act, Cap, 317

Demarcation of water supply services: Ministry of Water and Environment, NWSC is one arm of the

Main actor of water supply utilities: NWSC for urban areas. Kampala Water for greater Kampala (Kampala, Mukono, Wakiso)

Mission/Vision of Water Supply Utilities: To promote and ensure the rationale and sustainable utilization, development and effective management of water and environment resources for social economic development of the country

NWSC Mission: The leading customer service oriented utility in the world

NWSC Vision: To sustainably and equitably provide cost effective quality water and sewerage services while conserving the environment and enhancing stakeholder trust

Whole Country:

Area : 242,550 km^2 (37,000 km^2 is open water)

Population : 49,500,000 Habitants

Coverage Water Supply: 40%

Water Supply System/City: Kampala Water

Service Area : 828 km^2

Population Served: 2,640,000 (Av 6 people per connection)

2. Water Supply Service Levels – Kampala Water

Main Performance Indicators (PI)/ any other indicator

Coverage area	**828(sq. km)**
Population Served	2,640,000
Collection ratio	98(%)
Production capacity	401,500 (m3/day)
Supply duration	20 (hr/day)
Supply pressure	Average 3bars
Non-Revenue Water	40(%)
Water quality	
Staff number	2090
Number of connections	430,000
Staff/1,000 connections	5(people/1,000connections)

3. Management of Water Quality

Water is abstracted from Lake Victoria and treated through four treatment plants. The oldest of the plants commissioned in 1929 and the newest in 2021. The total daily production capacity is 410,,00m3 with three of the plants running at full capacity.

Major challenges/problems:

- Deterioration of raw water quality mainly due to environmental degradation/encroachment
- High level of NRW – results in minimizing flashing
- Low pressure in the system leading to intrusion at weak points
- Aged pipe network
- Frequent pipe bursts/leakages

Current Actions against those challenges/problems:

- Improvement of treatment process – AQUADAF – at Gaba 1 and Katosi
- Systematic replacement of aged pipe sections
- Zoning of branch/network staff to ensure timely response to breakages

Water quality standards for drinking water:

National Standards and International standards act as a guide for compliance. Monitoring is done through implementation of the water safety plan covering physiochemical, microbiological and biological parameters. The standards, frequency of monitoring is as indicated below.

Parameters	Units	National Standard for Portable water (Maximum permissible) Treated Water.	National Standard for Portable water (Maximum permissible) Un- Treated Water.
pH	--	6.5-8.5	6.5-8.5
Electrical Conductivity	(µS/cm)	1500	2500
Colour Apparent	PtCo	15	15
Turbidity	NTU	5.0	10.0
Total Dissolved Solids	Mg/L	700	1200
Total Suspended Solids	Mg/L	0.0	0.0
Alkanity: total as CaCO3,	Mg/L	500	500
Hardness: total as CaCO3,	Mg/L	300	500
Calcium: Ca^{2+}	Mg/L	150	150
Magnesium: Mg^{2+}	Mg/L	100	100
Bi-Carbonate : as CaCO3,	Mg/L	500	500
Manganese: Mn^{2+}	Mg/L	0.1	0.1
Chloride: Cl^-	Mg/L	250	500
Fluoride: F^-	Mg/L	1.5	1.5
Iron: total	Mg/L	< 0.30	1.0
Sulphate: SO_3^{2-},	Mg/L	400	200
Nitrate as NO_3^-	Mg/L	45	45
Aluminium: Residual as Al^{3+}	Mg/L	< 0.20	< 0.20
Chlorine: Free Residual	Mg/L	0.20 - 0.50	Not Specified.
Chlorine: Total Residual	Mg/L	Not Specified	Not Specified
Ammonia	Mg/L	0.5	1.0
Orthophosphate	Mg/L	2.0	5.0
Cadmium	Mg/L	< 0.001	< 0.001
Cooper	Mg/L	1.0	1.0
Lead	Mg/L	0.01	0.05
Zinc	Mg/L	5.0	5.0
E-Coli	CFU/100mL	0	0
Total Coliforms	CFU/100mL	0	10
Faecal Coliforms	CFU/100mL	0	0

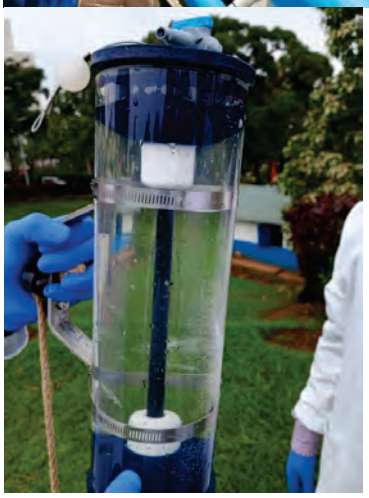
Distribution	Frequency		
Parameter	Reservoirs + Tanks	Control points (1^0 & 2^0 lines)	Tertiary Points + PSP
pH	Once a week	Twice a month	Once a month
Colour	Once a week	Twice a month	Once a month
Turbidity	Once a week	Twice a month	Once a month
Hardness	Once a month	Once a month	Once a month
Total alkalinity	Once a month	Once a month	Once a month
Total Iron	Once a month	Once a month	Once a month
Free chlorine	Once a week	Once a month	Twice a month
Total chlorine	Once a week	Once a month	Twice a month
Total suspended solids	Once a week	Once a month	Twice a month
Sulphate	Once a month	Once a month	Once a month
Nitrate	Once a month	Once a month	Once a month
Aluminium Residual	As need araises^	As need araises^	As need araises^
F.Streptococi	Quarterly	Quarterly	Quarterly
E.coli	Once a week*	Twice a month*	Once a month*
Feacal coliforms	Once a week*	Twice a month*	Once a month*
Total coliforms	Once a week	Twice a month	Once a month
*Only test this if Total coliform is present			
As need araises^; Do only if the final water is not compliant			

Catchment	Frequency	
Parameter	Lake	Industries and streams
Algal cells	Once a month	NR
Ammonia	Once a month	Once a month
Chlorophyll a	Once a month	NR
Colour	Once a month	NR
Depth	Once a month	NR
E.coli	Once a month	NR
Electrical conductivity	Once a month	Once a month
Feacal coliforms	Once a month	NR
Flow rate	Once a month	Once a month
Hardness	NR	NR
Heavy metals	NR	Once a month
Nitrate	Once a month	Once a month
pH	Once a month	Once a month
Temperature	Once a month	Once a month
Total alkalinity	Once a month	Once a month
Total Iron	Once a month	Once a month
Total Phosphorus	Once a month	Once a month
Total suspended solids	Once a month	Once a month
Total Nitrogen	Once a month	Once a month
Turbidity	Once a month	NR

At the source

Ggaba	Frequency			
Parameter	Raw water	Clarified water	Filtered water	Final water pH Corrected
pH	Daily	Daily	Daily	Daily
Colour	Daily	Daily	Daily	Daily
Turbidity	Daily	Daily	Daily	Daily
Hardness	Twice month	NR	NR	Twice month
Total alkalinity	Twice month	NR	NR	Twice month
Total Iron	Twice month	NR	NR	Twice month
Free chlorine	NR	NR	NR	Daily
Total chlorine	NR	NR	NR	Daily
Total suspended solids	Daily	NR	NR	Daily
Sulphate		NR	NR	Once a month
Nitrate		NR	NR	Once a month
Chloride		NR	NR	Once a month
Aluminium Residual	NR	NR	NR	Once a week
F.Streptococi	Once a month	NR	NR	Once a week
Clostridium perfringens	Quarterly	NR	Monthly	NR
Heavy metals	Quarterly			Quarterly
E.coli	NR	NR	NR	Once a week
Feacal coliforms	Once a month			Once a week
Pilot Experiments	**Frequency**			
Jar test	Once a week			
Marble Test	Once a month			
Chlorine Demand	Once a week			

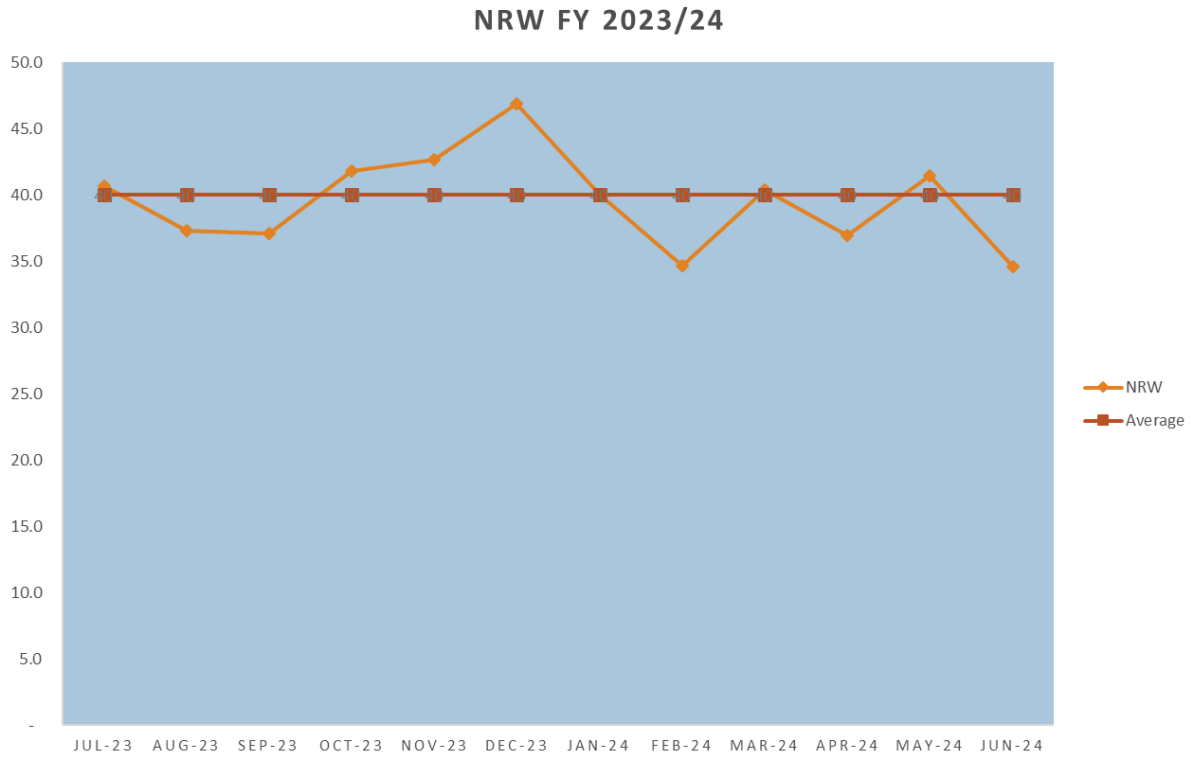
At the treatment plant



4. Reduction of Non-Revenue Water Accounting system of Water Supply Service

Current situation FY 2023/24

Authorized consumption **67,982,175 m³**	**Revenue water**	**Billed authorized consumption**	**62,731,440 (m^3 /year) 60.4(%)**
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	5,250,735 (m^3/year) 5.1(%)
Water losses **35,833,788 m³**		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	19,004,730 (m^3/year) 18.3(%)
		Physical losses (Leakage)	16,829,058 (m^3 /year) 16.2(%)



Challenges/Problems

- Frequent pipe failures due to aged pipe network
- Customer meter inaccuracy (Metering inefficiency).
- Un-authorized consumption (Water Theft).
- Vandalism of infrastructure.
- Data handling and accounting errors (Billing errors)

Current actions

- Mapkit-Tool for reporting/recording and real time updating of all field anomalies
- Call Centre-toll free numbers, Social media platforms; X & WhatsApp groups
- Daily Leak search, reporting and handling and Field audits
- Pressure and flow measurement management; PRVs installation to regulate excessive pressures.
- House to house audits and exceptions audits
- System input volume audit and calibration of bulk meters' quarterly
- Customer meter servicing and testing
- Periodic Customer meter Calibration especially large consumers
- Spot billing audits
- Illegal water use dedicated teams code maned WALOPU and 10% NRW Program
- Enhanced district metering

AUGUST 2024 MAPKIT LEAKS & BURSTS SUMMARY AS OF TODAY 12TH AT 05:00HRS

ZONE	BRANCH	Leaks reported Yesterday	leaks completed Yesterday	Average Response Time (Hrs)	Cumulative Completed Leaks	Pending Leaks	Cumulative reported Leaks	% age Completion
CENTRAL ZONE	Kampala Water/Nateete	29	29	5.0	51	0	51	100%
	Kampala Water/Ndeje	19	17	3.7	57	3	60	95%
	Kampala Water/Bunga	10	10	4.5	36	0	36	100%
	Kampala Water/Salaama	15	15	2.3	45	0	45	100%
	Kampala Water/Nakawa	7	6	4.1	40	1	41	98%
	Kampala Water/Kansanga	8	5	3.0	57	0	57	100%
	Kampala Water/Nakulabye	15	13	23.2	56	0	56	100%
	Kampala Water/Najjanankumbi	28	25	2.3	102	3	105	97%
	Total	127	122	8.2	444	7	451	98.4%
CBD ZONE	Kampala Water/Kisenyi	5	5	3.8	23	0	23	100%
	Kampala Water/Industrial Area	2	1	19.0	23	2	23	91%
	Kampala Water/Kamwokya	15	16	5.1	33	0	33	100%
	Kampala Water/Nakasero	22	22	0.6	62	0	62	100%
	Total	44	44	8.6	139	2	141	97.8%
WESTERN ZONE	Kampala Water/Kyengera	5	7	6.3	27	0	27	100%
	Kampala Water/Lutembe	26	26	8.3	84	0	84	100%
	Kampala Water/Nansana	12	9	7.2	51	3	54	94%
	Kampala Water/Gayaza	28	31	8.0	66	0	66	100%
	Kampala Water/Matugga	9	9	4.9	28	0	28	100%
	Kampala Water/Bulenga	18	18	2.4	49	0	49	100%
	Kampala Water/Wakiso	7	7	1.9	24	0	24	100%
	Kampala Water/Busiika	14	16	4.8	61	0	61	100%
	Kampala Water/Masanafu	17	17	2.7	58	0	58	100%
	Kampala Water/Kanyanya	24	24	2.7	74	0	74	100%
	Total	160	164	4.3	517	3	520	99.4%
EASTERN ZONE	Kampala Water/Kyaliwajjala	5	5	4.4	51	0	51	100%
	Kampala Water/Bulindo	11	11	9.2	29	0	29	100%
	Kampala Water/Kireka	19	20	2.2	94	0	94	100%
	Kampala Water/Luzira	4	3	0.8	11	1	12	92%
	Kampala Water/Mpelela	30	31	3.9	74	2	76	97%
	Kampala Water/Mukono	19	19	2.5	62	0	62	100%
	Kampala Water/Ntinda	16	15	7.4	76	2	78	97%
	Kampala Water/Seeta	38	41	5.1	106	0	106	100%
	Total	142	145	4.4	503	5	508	99.0%
	GLOBAL	473	475	5.9	1,603	17	1,620	99.0%

5. Major Recent Achievements in Improvement of Water Supply Services

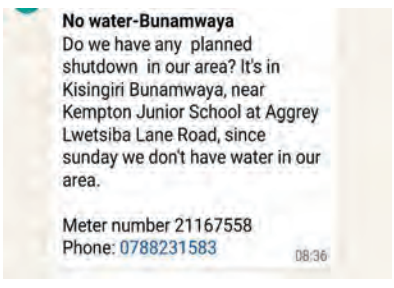
- Commissioning of new water treatment plant with capacity of 160,000m3/day
- Digitalization of systems and processes e.g. new connection application, MAPKIT (report of field anomalies), Katosi WTP and Nakivubo WWTP
- Increase service coverage due to mains extensions
- Continuous training of staff for improved efficiency
- Use of prepaid token meters to improve accessibility in urban poor settings

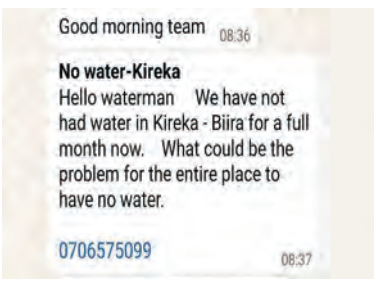
6. Recent Challenges to Improvement of Water Supply Services

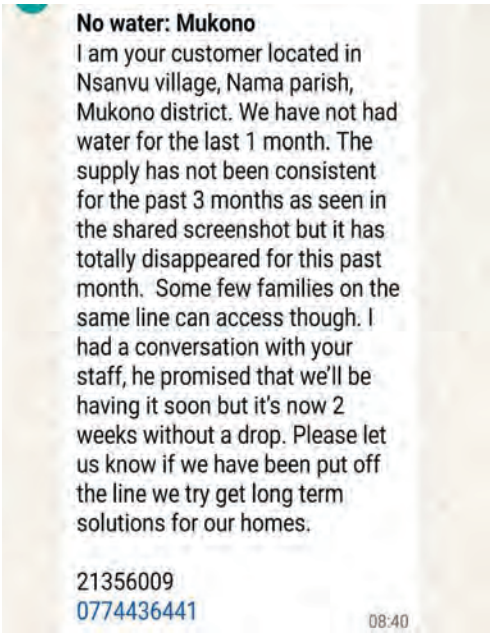
- Intermittent supply in some areas
- High level of losses (40% NRW)
- Restrictive land tenure system making cost of projects (both capital and operational projects) expensive
- High cost of inputs such as chemicals, pipes and fittings, electricity

KW-ZONAL CRM PENDING INQUIRIES AS OF 14TH AUGUST 2024 7.00AM

ZONE	BRANCH	LEAKS	RECONNECTION	NO WATERS	OTHERS	TOTAL
CBD	INDUSTRIAL	3	3	4	5	15
	KAMWOKYA	0	1	0	6	7
	KISENYI	0	0	0	1	1
	NAKASERO	1	0	4	0	5
TOTAL		4	4	8	12	28
CENTRAL ZONE	BUNGA	2	0	5	7	14
	KANSANGA	6	2	10	18	36
	NAJJANKUMBI	5	4	7	1	17
	NAKAWA	1	1	2	3	7
	NAKULABYE	5	1	14	3	23
	NATEETE	12	0	28	9	49
	NDEJJE	6	1	7	3	17
	SALAAMA	7	3	18	12	40
TOTAL		44	12	91	56	203
WESTERN ZONE	BULENGA	3	0	34	1	38
	BWAISE	2	2	6	10	20
	GAYAZA	5	3	1	15	24
	KAKIRI	1	0	0	0	1
	KANYANYA	1	2	3	3	9
	KYENGERA	1	0	12	5	18
	LUTEETE	2	6	4	13	25
	MASANAFU	5	2	4	7	18
	MATUGGA	2	0	10	8	21
	NANSANA	9	0	108	12	129
	WAKISO	3	0	9	1	13
TOTAL		35	15	191	75	316
EASTERN ZONE	BULINDO	5	2	4	5	16
	KIREKA	6	3	5	4	18
	KYALIWAJJALA	5	6	2	12	25
	LUZIRA	0	1	2	14	17
	MBALALA	5	2	3	2	12
	MUKONO	0	0	0	1	1
	NTINDA	1	1	3	4	9
	SEETA	2	2	8	8	20
TOTAL		24	17	27	50	118
NO ZONE	6TH STREET	22	0	3	27	52
	Sewerage cases	13				13
		22				65
GRAND TOTAL		129	48	317	220	730







7. Expectations toward Japan

- Financial support towards improved supply coverage
- Capacity building
- Technology transfer for improved systems/operations
- Support towards national policy formation

8. Expectations toward the Program

- Implementation and application of technology that can be adapted
- Knowledge and experience sharing with colleagues
- Personal growth and career development
- New culture experiences and discovery

Inception Report

Country: Zambia

Name: Willick Nsama

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1. Outline of Water Supply Services

1-1. Legal Basis of Water Supply Services

(What kind of laws and regulations are Water Supply Services based on?)

The provision of water and sanitation services is based on the Water Act supported by the Urban Water Supply and Sanitation Program in urban areas, while in rural areas through the Rural Water Supply and Sanitation Program implemented by Water Utilities. There are eleven (11) Water Utilities with mandates of service provision within their jurisdiction.

1-2. Demarcation of Water Supply Services

(Which ministry is in charge of what kind of field of water?)

The Ministry of Water Development and Sanitation was created in September 2021 under Government Gazette notice number 1123 of 24th September, 2021 with the portfolio functions consisting of water resources development and management and water supply and sanitation.

Key statutory bodies and institutions under the Ministry include:

i. The Water Resources Management Authority (WARMA) established under the Water Resources Management Act No. 21 of 2011 to oversee the development, management, conservation, protection, and preservation of all water resources and their ecosystems in Zambia;
ii. The National Water Supply and Sanitation Council (NWASCO) established under the Water Supply and Sanitation Act No. 28 of 1997 to regulate water supply and sanitation services in Zambia; and
iii. Eleven Water Utility Companies, operating across the country's ten provinces. These companies are responsible for providing water supply and sanitation services.

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10. ZAMBIA

1-3. Main Actor of Water Supply Utilities

(e.g. In Japan, most water utilities are public bureau under local government.)

The major shareholders of Water Utilities are local authorities, while the Government through the Ministry of Water Development and Sanitation formulates policies and resources mobilization for the sector.

1-4. Mission/Vision of Water Supply Utilities

To provide climate resilent quality water and sanitation services

1-5. Your Mission/Vision in your organization

Sustainable service provision with regard to environment safety

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2. Water Supply Service Levels

2-1. Main Performance Indicators (PI)

Coverage area	21,896 (sq. km)
Population Served	3,610,977
Collection ratio	92(%)
Production capacity	330,000 (m3/day)
Supply duration	18.2 (hr/day)
Supply pressure	(0.03 - 0.05) MPa
Non-Revenue Water	57(%)
Water quality	Good
Staff number	722
Number of connections	142,079
Staff/1,000 connections	5.1 (people/1,000connections)

2-2. Any Monitoring by Performance Indicators (PI)

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3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems

Lack of funds to invest into new areas, pollution of water sources, droughts leading to diminishing water sources, some citizens have settled in areas that floods rendering service provision a challenge, lack of authorities to formulate and implement more

sustainables plans that safeguards water sources, etc.

3-2. Current Actions against Those Challenges/Problems

Construction of dams and boreholes for water supply improvement. Installation of solar system for power supply to water supply and sanitation facilities. Intergrated planning involving all sectors while safeguarding the environment, including water sources etc. Identification of the financing gap in the sector through feasibility studies and sourcing of funds for investment into water and sanitation infrastructure

3-3. Any Achievements

The country has achevied 87.7% coverage for water provision and 73.6% for sanitation in urban areas. However, there still lower water and sanitation coverage in low income communities including peri urban areas.

3-4. Water Quality Standards for Drinking Water

The quality of water provided is monitored by the regulator NWASCO and water utility companies also conductor their due dilligency. Members of the public can also report poor service provision on different platforms of the regulator and Water Utilities.

3-5. Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others

The quality of water supplied is monitored at specific monitoring points by Water Utilities, this is intensified when there is an outbreak or outbreaks of water borne diseases. The regulator NWASCO, also monitors the quality of water supplied, including sanitation provision.

3-6. Implementation of Water Safety Plans* or Similar Efforts

There are no Water Safety Plans, but we try to formulate one for Lusaka Province then roll out to other provinces of Zambia.

(* Water Safety Plans: refer to the following URL and review before participating in the Course,

URL: Water safety plan manual (WSP manual) (who.int))

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4. Reduction of Non-Revenue Water

4-1. Current Situation and Major Challenges/Problems

Low investments into the setor due low uneconomical tariffs leading into low rehabilitation and extension of infrastructure especially in low income areas.

4-2. Current Actions against Those Challenges/Problems

The Ministry with commercial water utlity companies are trying to have the water tariffs adjusted. They are also trying to mobilise resources for rehabilitation and extension of the service to nserviced areas, especially through Public Private Partnership and the Government.

4-3. Any Achievements

The creation of the Ministry that that deals specifically with water, unlike in the past when it just used to be a department under some Ministries.

4-4. Constitution of NRW (If you have the data, please fill in the table)

Authorized consumption	Revenue water	Billed authorized consumption	30,800 (m3 /year) 11 (%)
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	2,800 (m3 /year) 1 (%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	28,000 (m3 /year) 10 (%)
		Physical losses (Leakage)	98,000 (m3 /year) 35 (%)

4-4. Situations about Leakage Detection Measures (DMA etc.)

Lack of resources to invest into Non-Revenue Water interventions mitigation in DMAs,

like low metering ratio, lack of leakage detection equipment, materials for repairing physical losses, etc.

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5. Accounting system of Water Supply Service

5-1. Water Tariff in your Organization

LUSAKA PROVINCE APPROVED TARIFFS SCHEDULE FOR DOMESTIC PROPERTIES (2021)			
		(ZMW)	**(USD)**
1st Block	(0 - 6) m^3	5.93	0.24
2nd Block	(6 - 30) m^3	7.12	0.28
3rd Block	(30 - 100) m^3	8.08	0.32
4th Block	(100 - 170) m^3	9.49	0.38
5th Block	(Above 170) m^3	11.64	0.47

LUSAKA PROVINCE APPROVED TARIFFS SCHEDULE FOR COMMERCIAL PROPERTIES (2021)			
		(ZMW)	**(USD)**
1st Block	(0 - 30) m^3	14.20	0.57
2nd Block	(30 - 170) m^3	18.50	0.74
3rd Block	(Above 170) m^3	21.10	0.84

5-2. Balance Sheet of your Organization

BALANCE SHEET FOR THE YEAR ENDED 31ST DECEMBER, 2022		
	(ZMW)	**(USD)**
Non-Current Assets		
Property, plant and equipment	2,018,230,509.00	80,729,220.36
Total Non-Current Assets	**2,018,230,509.00**	**80,729,220.36**
Current Assets		
Inventories	30,242,229.00	1,209,689.16

Trade and other recievable	172,286,352.00	6,891,454.08
Cash and Cash equivalent	221,410,413.00	8,856,416.52
Total Current Assets	**423,938,994.00**	**16,957,559.76**
Total Assets	**2,442,169,503.00**	**97,686,780.12**
Equity		
Share Capital	7,500.00	300.00
Share Premium	1,997,000.00	79,880.00
Funds awaiting Allotment of Shares	95,711,210.00	3,828,448.40
Capital Reserves	15,693,034.00	627,721.36
Revaluation Reserves	39,813,976.00	1,592,559.04
Accumulated Profit (losses)	(381,428,343.00)	(15,257,133.72)
Surplus/(Deficit) in Equity	**(228,205,623.00)**	**(9,128,224.92)**
Non-Current liabilities		
Deferred Grant	388,575,310.00	15,543,012.40
Capital Grant	649,063,360.00	25,962,534.40
Interest-bearing loans and borrowings	1,323,953,215.00	52,958,128.60
Obligations under losses	310,414.00	12,416.56
Total Non-Current liabilities	**2,361,902,299.00**	**94,476,091.96**
Current Liabilities		
Deferred Grant	31,873,667.00	1,274,946.68
Bank Overdraft	-	-
Interest-bearing loans and borrowings	3,796,400.00	151,856.00
Obligations under leases	471,044.00	18,841.76
Capital Grants	23,456,637.00	938,265.48
Employee Benefits	65,916.00	2,636.64
Trade and Other payables	248,788,300.00	9,951,532.00
Income Tax	20,863.00	834.52
Total Current Liabilities	**308,472,827.00**	**12,338,913.08**
Total Liabilities	**2,670,375,126.00**	**106,815,005.04**
Total Equity and Liabilities	**2,442,169,503.00**	**97,686,780.12**

5-3. Profit and Loss Statement of your Organization

STATENT OFPROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME FOR THE YEAR ENDED 31ST DECEMBER, 2022		
	ZMW	**USD ($)**
Revenue	454,028,374.00	18,161,134.96
Cost of sales	(287,440,487.00)	(11,497,619.48)
Gross Profit	**166,587,887.00**	**6,663,515.48**
Grant Income	55,330,304.00	2,213,212.16
Other Operating Income	516,644.00	20,665.76
Administrative Expenses	195,764,697.00	7,830,587.88
Other Operating expenses	50,189,859.00	2,007,594.36
Net Financial costs	37,188,088.00	1,487,523.52
Loss Before Tax	**(60,707,809.00)**	**(2,428,312.36)**
Income Tax expenses	378,751.00	15,150.04
Loss for the year	**(61,086,560.00)**	**(2,443,462.40)**

(*[Public Utilities] (1) Profit and Loss Account
(2) Capital Income and Expenditures of your Organization)
(* You can check the case of Tokyo in the chapter 4 ”Financial System and Future Financial Management” of this file.
URL: http://www.waterprofessionals.metro.tokyo.jp/pdf/wst_02.pdf)

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6. Major Recent Achievements in Improvement of Water Supply Services/Management

The launching of the National Non-Revenue Strategy with corresponding department/sections head by senior managers for mitigating the high Non-Revenue Water in all commercial Water Utilities.

7. Recent Challenges to Improve Water Supply Services

Load power management being implemented by the electricity supply company that is not sparing some water and sanitation facilities that is leading to no or poor service delivery

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8. Expectations toward Japan

8-1. Expectations toward Japanese Government and JICA

To learn about the tariff structure, Non-Revenue Mitigation, sustainable operations conducted to increase viability of their water utilities, protection of water sources, treatment plants and water distribution systems, etc.

8-2. Expectations toward Japanese Water Utilities

I expect Japanese Water Utilities to be oprated in sustainable commercially viable with low Non Revenue Water.

8-3. Expectations toward Japanese Private Companies

That they formulate solutions for the Water Utilities, thereby resolving their problems cheaper than our Water Utilities in less industrised countries. I also expect that support is also provided in form of subsidies in expansion, rehabilitation and maintenance of infrastructure as social corporate responsibilities..

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9. Expectations toward the Program.

9-1. Expectations of your supervisors toward your participation in the program.

My supervisors will be expectant that once trained, we will be able to formulate better strategies and more resources mobilisation for mitigation of challenges in our water sector.

9-2. Your expectation; Any comments and requests are appreciated.

I will appreciate more if inserts are also shared about durable plumbing materials and appurtences, sustainable management and operations of Water Utilities being implemented while upholdering high standards of servce provision.

END.

Attachment 2
Administration and Management of Water Supply Services(A)
Inception Report Presentation

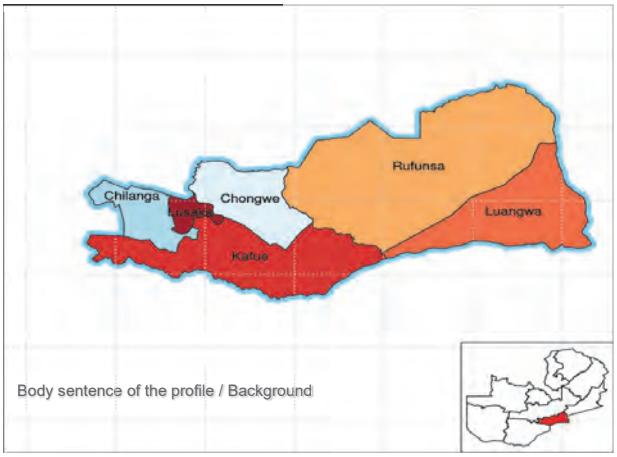
1. Country: ZAMBIA
2. Name: Willick NSAMA
3. Position: Senior Engineer Peri Urban Water Supply
4. Organization: Ministry of Water Development and Sanitation

Inception Report Presentation

4 topics:

- 1. Outline of Water Supply Services of your Organization
- 2. Success Story of your Water Supply Services
- 3. Recent Challenges to Improvement of Water Supply Services
- 4. Expectations toward the Program

1. Outline of Water Supply Services of (Lusaka Water Supply and Sanitation Company Limited)



Whole Country:

Area : 752,614km^2

Population : 21,393,476 Habitants

Coverage Water Supply: 94.8%

Your Water Supply System/City:

Service Area : 21,896 km^2

Population Served: 3,079,964/ thousand

1. Outline of Water Supply Services of (MWDS - LWSC)

INDICATORS	2006 or 2007	2016 or 2017	Goals for 2025
Staff/1,000 connections	13	8.99	6
Production capacity (m3/day)	216,109	234,457.53	330,000
Water quality	ZABS (WHO) Guidelines (	ZABS (WHO) Guidelines	ZABS (WHO) Guidelines (97%)
Coverage area	85%	78.61%	95%
Supply duration (hr/day)	15	14.4	21
Supply pressure	0.2 bar	0.5 bars	0.5 bars
Number of connections	52,488	97,811	148,000
NRW	51%	46.3%	45%
Collection ratio	83%	82.7%	95%
Staff number	682	879	723

2. Success Story of your Water Supply Services

- Creation of the stand alone Ministry
- Just launched the Non Revenue Water Strategy
- Creation Non Revenue Water Sections/Departments in various utility company head by senior officials

3. Recent Challenges to Improvement of Water Supply Services

- Low water supply and sanitation coverage 87.7% and 73.6%, respectively
- Aging and dilapidated water supply and sanitation infrastructure
- Low investment in the water sector leading to ineffective asset management in the sector
- Low uneconomical water and sanitation tariffs
- High Non Revenue Water (57.3%)
- Contamination of water sources

- Adverse Effects of Climate Change
  - Power outages (Alternative sources of power are being implemented and are very expensive)
  - Diminishing water sources

4. Expectations toward the Program

My expectation toward this program

(What do you learn or accomplish in this program?)

To plan mitigate high NRW within limited resources and improve services provision especially in developing areas

Expectation of my superior toward this program.

(Please ask your superior their expectation.)

To know how Japan and other country maintain low NRW, lower cost of service provision and improve water supply coverage, especially in developing areas

出典：2024 年度 JICA 課題別研修「水道管理行政及び水道事業経営(A)」インセプションレポート

Japan International Corporation of Welfare Services (JICWELS) was established with the sanction of the Minister for Health, Labour and Welfare in July 1983 and implements international technical cooperation programmes with purpose of contributing to the promotion of health and social welfare activities in the friendly nations.

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公益社団法人国際厚生事業団（JICWELS）は、国際的な保健・福祉分野の国際協力に貢献することを目的として、1983 年（昭和 58 年）7 月 7 日に厚生省（現厚生労働省）から社団法人の認可を受け設立されました。開発途上国の行政官研修や WHO フェローの受け入れ、調査企画や研究開発並びに情報の交換及び広報活動など、海外諸国との国際交流活動を推進しています。

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