Administration and Management of Water Supply Services (B)

Country Reports

FY2024

Japan International Corporation of Welfare Services (JICWELS)

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1. CUBA

Inception Report

Country: Cuba

Name: Gerardo Miguel Ginarte Sánchez

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1. Outline of Water Supply Services

1-1. Legal Basis of Water Supply Services

The main legal basis that regulates the field of water is Law 124 of terrestrial waters. This regulates the integrated and sustainable management of terrestrial waters that are found within the earth's crust or above it, regardless of their physical, chemical or bacteriological composition, in the space that makes up the emerged part of the national territory limited by the line of coast.

1-2. Demarcation of Water Supply Services

The field of water is regulated in our country by the National Institute of Hydraulic Resources and its administration is carried out through the Higher business management organization Water and Sanitation where the aqueducts are located and the Higher business management organization Integrated Water Management where the administration of supply sources is concentrated.

1-3. Main Actor of Water Supply Utilities.

In each municipality of the provinces there are aqueduct and sewage companies that directly manage the water supply service to the population. All companies that manage this activity are state-owned.

1-4. Mission/Vision of Water Supply Utilities

The National Institute of Hydraulic Resources (INRH) has the mission of proposing and, once approved, directing and controlling the policies of the State and the Government for terrestrial waters.

In Cuba, water is managed in an integrated manner at the scale of society, the economy and the environment, providing sustainable development and security to the nation.

1-5. Your Mission/Vision in your organization

I currently direct the Provincial Delegation of the INRH in Santiago de Cuba, where my function is to guarantee compliance with everything regulated regarding terrestrial waters as well as the specific objectives of the INRH, among which the following stand out:

a) control the hydraulic heritage within the territory, with special attention to the control of the efficient use of water and its quality;

b) control the updating periodically of monitoring networks of the variables of the hydrological cycle, the quality of terrestrial waters and early warning systems and provide the corresponding information within the territory;

c) direct and propose actions to improve programs and strategies for the integrated and sustainable management of terrestrial waters in the territory;

d) control the application of hydraulic regulations and Cuban standards that relate to terrestrial waters;

e) control the process of Annual Balance of Terrestrial Waters in the territory.

f) demand, as far as it is concerned, compliance with the measures to prevent, confront and mitigate the effects of extreme hydrometeorological events; and

g) control public services of drinking water, sanitary sewage and storm drainage.

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2. Water Supply Service Levels

The data that will be shown below will represent a locality in the territory and not the entire province, since in our territory there are 2 aqueduct companies with a municipal

structure.

Some requested data is not managed and others depend on measurements that are not made and data are estimated. Example leaks.

2-1. Main Performance Indicators (PI)

Coverage area	58 (sq. km)
Population Served	485000
Collection ratio	99(%)
Production capacity	162926 (m3/day)
Supply duration	Between 20 hours a day to cycles of up to 16 days (hr/day)
Supply pressure	1 bar
Non-Revenue Water	30(%)
Water quality	100 %
Staff number	2300
Number of connections	117023
Staff/1,000 connections	9.1 (people/1,000connections)

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

- Proportion of the population using safely managed drinking water services.
- Proportion of population served by public water companies.
- Population with daily service.
- Per capita consumption in metered households.

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3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems

All water supplied to the city undergoes treatment. Some with filtration and disinfection and another part coming from groundwater is subjected to disinfection.

The main problems faced in this regard are most of the time related to equipment breakage and the maintenance required by treatment plants.

3-2. Current Actions against Those Challenges/Problems

The monitoring of water quality, fundamentally the residual free chlorine indicator, is carried out permanently by the health authorities of the territory and is controlled by the delegation.

The fundamental work, given the current resource limitation, is the maintenance of the treatment plants. These works include maintenance of electromechanical and mechanical equipment as well as the replacement of sand in the filters, which are often replaced by similar filter materials.

3-3. Any Achievements

The use of zeolite is being experimented with to partially replace silica sand.

3-4. Water Quality Standards for Drinking Water

The maximum permissible limits for physical parameters and organoleptic, chemical, biological and radioactive that ensure adequate sanitary quality of the water consumed by the population are regulated in Cuban standard 827/2012 Drinking water — Sanitary requirements.

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

The critical points of the distribution networks are monitored and the aqueduct staff and the Hygiene and Epidemiology entity belonging to the Ministry of Public Health are monitored regularly on a monthly basis to verify compliance with the regulated indicator.

Visits to the treatment plants are carried out by Hygiene to verify their operation.

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))

There is a Water Safety Plans that currently adapts to the recommended methodology to apply to this course.

Among the main difficulties for monitoring and updating is the monitoring and verification of the measurements necessary for decision making.

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4. Reduction of Non-Revenue Water

4-1. Current Situation and Major Challenges/Problems

There are several important problems regarding water control.

Firstly, the completion of all network coverage. Today approximately 70% of the problems are present.

There is a significant portion of homes that are multi-family buildings whose construction does not present adequate conditions for the individual measurements of the apartments.

Weakening of the structure for water control and collection.

Low resources for the maintenance of the installed hydrometers.

4-2. Current Actions against Those Challenges/Problems

The installation of meters to all homes has been developing for a few years and it is an objective of the organization to reach 100%.

Today this program is slowed down due to objective problems of lack of resources.

4-3. Any Achievements

Uncontrolled consumption constitutes one of the major problems for the adequate distribution of pressures in the network. The placement of hydrometers in places of high pressure has managed to discreetly improve this situation.

We consider that a change in the rate as well as better control could, under these same conditions, improve this situation much more.

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) (%)

Not information available.

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

There are many leaks in the network that could be associated with the lack of coating that are visible to the eye with the consequent deterioration of the tracks.

One of the great challenges is to close hydrometric sectors with measurements to identify physical and measurement leaks. This aspect limits a good hydraulic balance.

The steps for its implementation have been studied but it has not been possible due to financial problems.

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5. Accounting system of Water Supply Service

5-1. Water Tariff in your Organization

In Cuba, two charging systems are applied, one by measurement and the other by fixed rate.

5-2. Balance Sheet of your Organization

Establishing the losses in the measured homes is not possible if there are no hydraulically controlled sectors. In other words, there is no volume measurement in these sectors to be able to differentiate the volume delivered.

5-3. Profit and Loss Statement of your Organization

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

Net income per year 212 usd (24 peso / usd).

(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)

In Cuba, aqueduct companies present very light capital expenditures. For only 2 years now, capital expenditures have been for pumping equipment.

Capital expenditures for infrastructure are developed by the state through the Delegation of the National Institute of Hydraulic Resources in each Province.

The companies manage the hydraulic infrastructure for free, with the state assuming the depreciation expenses, thereby subsidizing the price of water to the consumer.

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

The greatest achievements have been achieved where the network has been intervened with constructive actions, reducing delivery cycles.

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7. Recent Challenges to Improve Water Supply Services

Among the main current challenges are the lack of technical personnel, the somewhat deterioration of the pumping equipment and its associated facilities, and deterioration of the disinfection equipment.

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8. Expectations toward Japan

8-1. Expectations toward Japanese Government and JICA

Acquire as much knowledge as possible that can be implemented in the country to obtain improvements in water service and quality.

8-2. Expectations toward Japanese Water Utilities

The main expectations focus on the exchange of experiences and technologies and their possible application in our country, appropriate to each company.

8-3. Expectations toward Japanese Private Companies

The main expectations focus on the exchange of experiences and technologies and their possible application in our country, appropriate to each company.

Obtain experiences about the differences that may exist in the management of a private company and a state-owned company. Advantages that can be applied.

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9. Expectations toward the Program.

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

Obtain experiences that can be implemented in our country and result from better management in water supply services.

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

Increase knowledge on the subject, update the state of the art of this activity in the world, be able to contribute to improvements and changes that are required in our management regarding the water supply service.

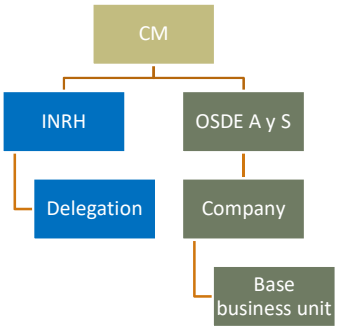
Be a more comprehensive professional.

END.

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

1. Country: Cuba
2. Name: Gerardo Ginarte Sánchez
3. Position: Delegate
4. Organization: Provincial Delegation of Hydraulic Resources Santiago de Cuba

1. Outline of Water Supply Services



Structure for the control and supply of water in Cuba

CM: Council of Ministers.
INRH: National Institute of Hydraulic Resources with provincial Delegations.
OSDE: Higher Organization of Business Management , with its companies and municipal base units, executive structure for the provision of the water supply service,

Main regulations and legal bases for the management and supply of water:

- Law 124 of terrestrial waters,
- Resolution 419/2021 Water tariff for productive and budgeted sectors.
- Agreement 8991/2021 Council of Ministers Water tariff for the population

1. Outline of Water Supply Services (Cont…)

CUBA

SANTIAGO DE CUBA

9.86 million inhabitants
109884 km²
53,7 % Coverage Water Supply (CWS)

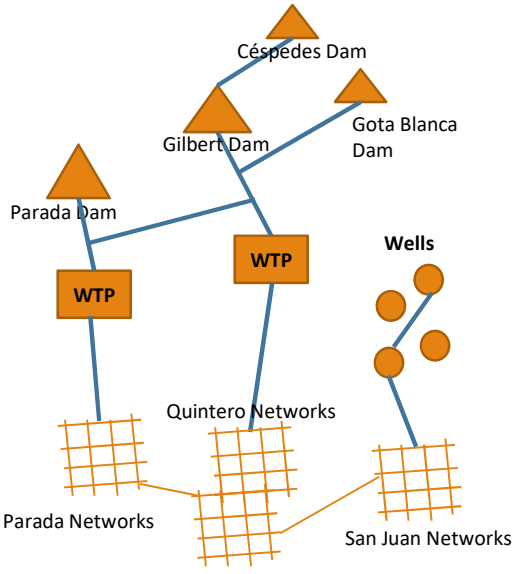
Santiago de Cuba City

485 thousand inhabitants
641,4 km²
45 % CWS
Steep topography. Large slopes.
Second largest city in Cuba

1. Outline of Water Supply Services (Cont…)

SANTIAGO DE CUBA WATER SUPPLY SYSTEM

- Population served: 479 thousand inhabitants
- Service Area: 254,5 km²
- Height difference: More than 70 m
- Design per capita per day average water consumption: 370 L/inhabitant x day



WTP: Water treatment plant.

2. Water Supply Service Levels

Coverage area	58,0 (sq. km)
Population Served	485000 people
Collection ratio	99 (%)
Production capacity	162926 (m3/day)
Supply duration (SD)	* 22 (hr/day)
Supply pressure (SP)	* 1 Bar
Non-Revenue Water	30 (%)
Water quality (WQ)	* 0,3 mg/L
Staff number	1062 p.
Number of connections	117023 u
Staff/1,000 connections	9,1 (people/1,000 con)

*** Observations**

SD: Referred to supply at source.
SP: Variable behavior on the network.
WQ: Chlorinated water with a minimum of 0.3 mg/L at critical points in the network.

3. Management of Water Quality

Ensuring water quality in accordance with standards is a priority. (Cuban standard 827/2012 Drinking water — Sanitary requirements).

- Monitored by the institutions of the Ministry of Public Health
- Review of residual free chlorine at critical points in the network.

Main challenges:

- Equipment breakdown
- Deterioration of water treatment plant infrastructure

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

Water measurement is a relevant indicator within the improvement plans implemented.
Santiago achieved approximately 70 % in homes
Program affected by availability of resources.

Hydraulic sector of the network controlled (WSP)

- Fixed hydrometers at the entrance to the sector.
- Completion of hydrometers in the houses
- Guarantee the borders of the sector
- Guarantee adequate readings of the hydrometers

5. Accounting system of Water Supply Service

Tarif Water:

- Accounted water: Fixed rate Non-revenue (0.29 usd/inhabitant x month)
- Non Accounted water : Increasing rate. From 0.07 USD to 3.00 USD depending on consumption. (See Agreement 8991/2021 Council of Ministers Water tariff for the population).

Balance Sheet

- Net income per year 212000 usd (24 Cuban peso/ USD)
- No Loss

The state assumes capital expenses with their depreciation

Large amounts of debt to be collected.

- Dissatisfaction with the service.
- Poor collection management.

6. Major Recent Achievements in Improvement of Water Supply Services

Achievements

Increase in the number of connections.
Improved pressures at critical points.

How?

Constructive actions. Network sectorization. Network modifications.

No increase in coverage is achieved:

- Accessibility: Connections _Ok
- Quality: Compliance with established standards _ Ok.
- Availability: Having the service when required _ Not achieved

7. Recent Challenges to Improvement of Water Supply Services

- Insufficient technical personnel.
- Deterioration and aging of pumping equipment.
- Insufficient measurements.
- Lack of implementation of methodologies for water accounting.
- Lack of portable water quality measurement equipment
- Dissatisfaction with the service in parts of the city.
- Non-existence of spare parts.
- Insufficient means of transport for management.

8. Expectations toward Japan

Government/JICA, Water utilities, Private companies

How did they do it?

- What do we do similarly?
- What do we do differently?
- Our problems and the experience in Japan about possible causes.
- What should we do to improve?

9. Expectations toward the Program

Acquire new knowledge
about the activity.
Share experiences.
Train staff.
Propose improvements.

2. FIJI

Inception Report

Country: Fiji

Name: Sekove Uluinayau (WAF)

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1. Outline of Water Supply Services of the Water Authority of Fiji (WAF)

1-1. Legal Basis of Water Supply Services

The Water Authority of Fiji Act 2007

1-2. Demarcation of Water Supply Services

The Ministry of Public Works, Transport & Meteorological Services

1-3. Main Actor of Water Supply Utilities

The Water Authority of Fiji (WAF)

1-4. The Water Authority of Fiji Vision.

Vision: Clean water and sanitation for a better life.

1-5. The Water Authority of Fiji Mission

Mission: We are committed to optimizing water and wastewater services through resilience, innovation, safe working practices, engaging stakeholders, capacity building, being environmentally focused and modernization.

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2. Water Supply Service Levels at the Water Authority of Fiji (WAF)

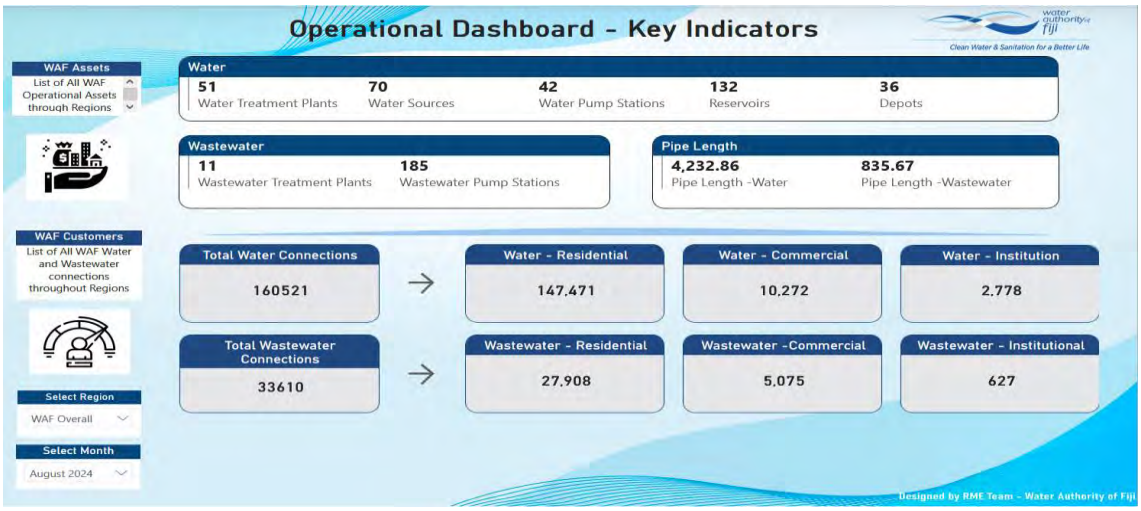
2-1. Main Performance Indicators (PI)

Coverage area	18,274 (sq. km)
Population Served	829,110 people
Collection ratio	38.2(%)
Production capacity	134,000,000 (m3/day)
Supply duration	22 (hr/day)
Supply pressure	Minimum 10m Head
Non-Revenue Water	47 (%)
Water quality	98% WHO compliance
Staff number	1,071 employees
Number of connections	160,521

Staff/1,000 connections	6.7 (people/1,000connections)

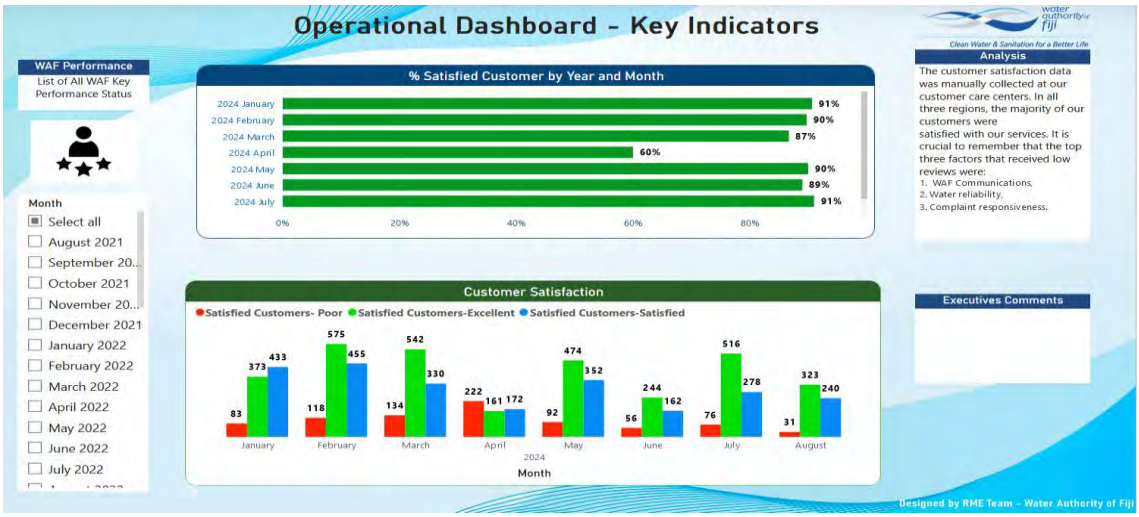
2-2. Any other Performance Indicators (PI) used at Water Authority of Fiji relevant to this program.

WAF Operational Assets



Intermittent Water Supply Areas and Complaints Resolution

Customer Satisfaction Survey



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3. Management of Water Quality at the Water Authority of Fiji (WAF)

3-1. Current Situation and Major Challenges/Problems

Current Situation: The Water Authority of Fiji (WAF) is responsible for supplying clean and safe drinking water to Fiji's population. The organization operates a network of water treatment plants, pipelines, and distribution systems across various regions of the country, including urban and rural areas.

Major Challenges/Problems:

1. **Aging Infrastructure:** Many of WAF's assets, including pipelines and treatment facilities, are outdated and require significant upgrades or replacement. This can lead to inefficiencies and increased risk of contamination.
2. **Climate Change and Natural Disasters:** Fiji is prone to extreme weather events such as cyclones and heavy rainfall, which can impact water sources and treatment processes, potentially leading to water quality issues.
3. **Source Water Contamination:** Agricultural runoff, industrial activities, and inadequate sanitation in some areas pose risks to the quality of source water, requiring stringent treatment measures.
4. **Resource Constraints:** Limited financial and human resources can affect the ability to implement comprehensive water quality management practices and infrastructure improvements.
5. **Regulatory Compliance:** Adhering to both national and international water quality standards can be challenging, especially with evolving regulations and standards.

3-2. Current Actions against Those Challenges/Problems

1. **Infrastructure Upgrades:** WAF is investing in modernizing and upgrading aging

infrastructure. This includes replacing old pipelines, enhancing treatment facilities, and improving the overall reliability of the water supply system.

2. **Climate Adaptation Strategies:** Implementing climate adaptation strategies to enhance the resilience of water supply systems to extreme weather events. This includes improving flood protection measures and diversifying water sources.

3. **Enhanced Water Treatment:** Upgrading water treatment processes and technologies to better address contaminants and ensure the safety of drinking water. This includes investing in advanced treatment technologies and improving source water protection.

4. **Capacity Building:** Strengthening human resources through training programs and capacity-building initiatives to enhance the skills and knowledge of WAF staff in water quality management.

5. **Regulatory Compliance:** Regularly reviewing and updating procedures to ensure compliance with national and international water quality standards and working closely with regulatory bodies.

3-3. Any Achievements

1. **Improved Water Quality:** Improved overall water quality through upgraded treatment processes and enhanced monitoring.

2. **Infrastructure Projects:** Completed several major infrastructure projects, including the construction of new treatment plants and the replacement of outdated pipelines.

3. **Community Engagement:** Increased public awareness and engagement through customer forums, community outreach programs and educational campaigns about water conservation and safety.

4. **Certification:** Achieved certification for water quality management systems under recognized standards, demonstrating a commitment to quality and safety.

5. **Response to Emergencies:** Effectively managed responses to natural disasters and other emergencies, ensuring continued provision of safe drinking water during challenging times.

3-4. Water Quality Standards for Drinking Water

WAF adheres to the following water quality standards:

- **National Standards:** Compliance with Fiji's national drinking water quality standards, which include limits for microbial, chemical, and physical parameters as set by the Ministry of Health and Medical Services.
- **World Health Organization (WHO) Guidelines:** Aligning with WHO’s guidelines for

safe drinking water, which include limits for various contaminants to ensure safety and health.

- **Specific Parameters:** Regular monitoring and adherence to standards for key contaminants such as bacteria, nitrates, fluoride, and disinfection byproducts.

3-5. Monitoring System or Plans for Safety of Drinking Water

Monitoring System:

1. **Routine Testing:** Regular sampling and testing of water at various points, including source water, treatment facilities, and distribution networks, to ensure compliance with quality standards.
2. **Advanced Technologies:** Use of modern monitoring technologies and real-time sensors to track water quality parameters and detect any deviations promptly.
3. **Quality Assurance:** Implementation of quality assurance protocols to ensure the accuracy and reliability of water quality data.
4. **Data Management:** Integration of data management systems to analyze and manage water quality information effectively.

Plans for Safety:

1. **Emergency Preparedness:** Developing and maintaining comprehensive emergency preparedness plans to address potential water quality incidents and natural disasters.
2. **Public Health Collaboration:** Working with public health agencies to ensure timely responses to any water quality issues and to maintain public health safety.
3. **Continuous Improvement:** Regular review and enhancement of monitoring and safety plans based on emerging risks, technological advancements, and feedback.

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

Water Safety Plans (WSPs):

1. **Risk Assessment:** Conducting thorough risk assessments to identify and evaluate potential hazards in the water supply chain, from source to delivery.
2. **Control Measures:** Implementing control measures and preventive actions to mitigate identified risks, including improvements in treatment processes and source water protection strategies.
3. **Monitoring and Verification:** Establishing robust monitoring and verification programs to ensure the effectiveness of control measures and compliance with safety standards.
4. **Emergency Response:** Developing and updating emergency response plans to

address potential incidents or contamination events effectively.

5. **Stakeholder Engagement:** Engaging with stakeholders, including local communities and regulatory bodies, to promote awareness and collaboration on water safety issues.

6. **Training Programs:** Providing ongoing training and capacity-building for staff to ensure effective management of water safety and quality challenges.

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4. Reduction of Non-Revenue Water at the Water Authority of Fiji (WAF)

4-1. Current Situation and Major Challenges/Problems

Current Situation: Non-Revenue Water (NRW) at the Water Authority of Fiji (WAF) remains a significant challenge, impacting both operational efficiency and financial performance. NRW encompasses water that is produced but not billed to customers, leading to lost revenue and inefficiencies in water management.

Major Challenges/Problems:

1. **Aging Infrastructure:**
   - Many of WAF's pipelines and distribution networks are old and prone to leaks and breaks, resulting in significant water losses.
2. **Unaccounted-for Water Losses:**
   - A considerable amount of water is lost due to leaks in the distribution system, unauthorized connections, and inaccuracies in metering.
3. **Metering Issues:**
   - Problems with outdated or malfunctioning meters lead to discrepancies between actual water consumption and billed amounts.
4. **Limited Resources:**
   - Financial and human resource constraints limit the ability to implement extensive NRW reduction measures and maintain existing infrastructure.
5. **Lack of Real-Time Monitoring:**
   - Inadequate real-time monitoring systems make it challenging to promptly detect and address water loss issues.

4-2. Current Actions against Those Challenges/Problems

1. **Infrastructure Improvements:**
    - **Pipe Replacement and Rehabilitation:** Ongoing projects to replace old and damaged pipelines and rehabilitate the distribution network with modern materials.
    - **Asset Management:** Implementing an asset management system to track the condition and maintenance needs of infrastructure.
2. **Leak Detection and Repair:**
    - **Advanced Leak Detection Technologies:** Utilizing acoustic sensors, ground-penetrating radar, and other technologies to identify and locate leaks more effectively.
    - **Leak Repair Teams:** Establishing dedicated teams to respond quickly to leak reports and conduct repairs.
3. **Metering Enhancements:**
    - **Meter Replacement Program:** Replacing outdated meters with new, more accurate models to improve billing accuracy.
    - **Regular Calibration:** Implementing regular calibration schedules for meters to ensure accuracy and reliability.
4. **Data Management and Monitoring:**
    - **Real-Time Monitoring:** Installing real-time monitoring systems to track water flows and pressure, enabling quicker detection of anomalies.
    - **Data Analytics:** Using data analytics to assess water usage patterns, identify discrepancies, and inform NRW reduction strategies.
5. **Customer Engagement:**
    - **Awareness Campaigns:** Conducting public education campaigns to raise awareness about water conservation and encourage reporting of leaks.
    - **Reporting Tools:** Providing customers with accessible tools and platforms to report water issues and unauthorized connections.

4-3. Any Achievements

1. **Reduction in NRW:**
    - Achieved a measurable reduction in NRW through effective implementation of leak detection and repair programs, as well as infrastructure upgrades.
2. **Successful Infrastructure Projects:**
    - Completed significant infrastructure improvement projects, including

pipeline replacements and upgrades, resulting in reduced water loss.

3. **Enhanced Metering Accuracy:**
   - Improved billing accuracy and customer satisfaction by replacing outdated meters and implementing regular calibration.
4. **Increased Customer Participation:**
   - Elevated customer engagement and participation in conservation efforts and leak reporting through targeted outreach and communication strategies.

4-4. Constitution of NRW

<table>
<tr><td rowspan="2">Authorized consumption
69,406,151 m3/year
54%</td><td>Revenue water
67,264,873
53%</td><td>Billed authorized consumption</td><td>67,264,873 m3 /year
97%</td></tr>
<tr><td rowspan="3">Non-Revenue Water (NRW)
60,780,319 m3/year
47%</td><td>Unbilled authorized consumption (ex. fire fighting, cleaning, water tanker/cartage for rural and disruption)</td><td>2,141,278 (m3 /year)
3 %</td></tr>
<tr><td>Water losses
58,639,041 m3/year
46%</td><td>Apparent losses
(Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)</td><td>10,481,798 (m3 /year)
18 (%)</td></tr>
<tr><td>Physical losses
(Leakage)</td><td>48,157,243 (m3 /year)
82 (%)</td></tr>
</table>

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

Leakage Detection Measures at Water Authority of Fiji (WAF):

1. **District Metered Areas (DMAs):**

- **Implementation:** Dividing the distribution network into District Metered Areas to monitor and manage water consumption and leakage within smaller, manageable sections.
- **Benefits:** Allows for targeted detection of leaks and more precise analysis of water loss within each DMA.

2. **Advanced Technologies:**
   - **Acoustic Sensors:** Using acoustic sensors to detect and locate leaks based on sound waves generated by escaping water.
   - **Ground-Penetrating Radar:** Employing radar technology to detect and map leaks beneath the surface.
3. **Real-Time Monitoring Systems:**
   - **Flow and Pressure Monitoring:** Installing sensors to monitor flow rates and pressure throughout the distribution network, enabling early detection of potential leaks or pressure drops.
   - **Data Integration:** Integrating real-time monitoring data with GIS and data analytics tools for better leak management.
4. **Leak Detection Teams:**
   - **Dedicated Teams:** Establishing specialized teams trained in leak detection and repair, equipped with advanced tools and technologies.
   - **Rapid Response:** Implementing procedures for rapid response to detected leaks to minimize water loss and service disruption

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5. Accounting system of Water Supply Service

5-1. Water Tariff at Water Authority of Fiji

Current Water Tariff Structure: The Water Authority of Fiji (WAF) utilizes a tiered water tariff structure designed to promote conservation and ensure equitable pricing for different levels of water consumption. The tariff is typically structured as follows:

1. **Residential Tariffs:**

- **Tiered Rates:** Customers are billed at different rates based on their water consumption levels. Lower usage levels are charged at a lower rate with incremental rates applied as consumption increases.
- **Current Tariff:** 15 cents per unit for 1-50 units, 44 cents per unit for 51-100 units and 84 cents per unit for consumption exceeding 100 units. Wastewater services is charged at 20 cents per unit of water consumption.

2. **Commercial Tariffs:**
   - **Standard Fixed Rates:** Commercial customers are charged based on the volume of water consumed, are charged at standard fixed rate of $1.06 per unit and 20 cents per unit for wastewater services
3. **Institutional Tariffs:**
   - **Subsidized Rates:** Schools and place of worships are current charged at 53 cents per unit of water consumed and 20 cents per unit for wastewater services.

5-2. Audited Financial Statements are available on the Water Authority of Fiji website in the Annual Report on the URL https://waterauthority.com.fj/annual-reports/

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6. Major Recent Achievements in Improvement of Water Supply Services/Management at Water Authority of Fiji (WAF)

1. **Infrastructure Upgrades:**
   - **Pipeline Replacement Projects:** Completed several major pipeline replacement projects, reducing leaks and improving water distribution efficiency.
   - **New Treatment Facilities:** Commissioned new water treatment plants, enhancing capacity and reliability in water supply.
2. **Enhanced Water Quality:**
   - **Advanced Treatment Technologies:** Implemented state-of-the-art treatment technologies that have significantly improved water quality and safety.
   - **Certification and Compliance:** Achieved certification for compliance with international water quality standards, ensuring high standards of water safety.
3. **Customer Service Improvements:**
   - **Enhanced Communication Channels:** Introduced new customer service channels, including online platforms and mobile apps, improving accessibility and response times.

- **Public Awareness Campaigns:** Successfully launched public education campaigns on water conservation and safety, increasing community engagement.

4. **Technological Advancements:**
   - **Smart Metering Systems:** Rolled out smart metering technology, leading to more accurate billing and better management of water resources.
   - **Real-Time Monitoring:** Implemented real-time monitoring systems for improved detection of leaks and operational issues.
5. **Operational Efficiency:**
   - **Operational Restructuring:** Reorganized operational processes and workflows to enhance efficiency and reduce costs.
   - **Staff Training and Development:** Invested in staff training programs to improve skills and operational capabilities.

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7. Recent Challenges to Improve Water Supply Services at the Water Authority of Fiji (WAF)

1. **Aging Infrastructure:**
   - **Maintenance Needs:** Ongoing issues with the maintenance and replacement of old infrastructure, leading to frequent repairs and potential service disruptions.
2. **Climate Change Impacts:**
   - **Extreme Weather Events:** Increased frequency of extreme weather events, such as cyclones and heavy rainfall, which affect water sources and distribution systems.
3. **Funding Constraints:**
   - **Budget Limitations:** Limited financial resources impacting the ability to undertake comprehensive upgrades and improvements.
4. **Regulatory Compliance:**
   - **Evolving Standards:** Challenges in keeping up with evolving national and international water quality standards and regulations.
5. **Customer Engagement:**
   - **Behavioral Change:** Difficulties in changing customer behavior related to water conservation and the reporting of issues.

---

8. Expectations toward Japan

8-1. Expectations toward Japanese Government and JICA:

1. **Technical Assistance:**
    - **Expertise Sharing:** Provide technical assistance and expertise to support infrastructure projects, water management strategies, and capacity building.
2. **Funding Support:**
    - **Grants and Loans:** Offer grants or low-interest loans for major infrastructure projects and improvements in water supply systems.
3. **Policy Guidance:**
    - **Regulatory Support:** Assist in developing and implementing best practices and policies for water management and quality standards.

8-2. Expectations toward Japanese Water Utilities

1. **Knowledge Exchange:**
    - **Best Practices:** Share best practices and operational experiences in managing water supply and improving service delivery.
    - **Training Programs:** Conduct training programs and workshops for WAF staff on advanced water management and treatment techniques.
2. **Collaborative Projects:**
    - **Joint Ventures:** Engage in collaborative projects or pilot programs to test new technologies and methodologies in water management.
3. **Technical Support:**
    - **Consultancy Services:** Provide consultancy services to help resolve specific technical challenges and optimize water supply systems.

8-3. Expectations toward Japanese Private Companies

1. **Investment Opportunities:**
    - **Partnerships:** Explore opportunities for investment in water infrastructure projects and technological advancements.

2. **Innovative Solutions:**
    - **Technology Transfer:** Introduce innovative technologies and solutions that can improve water treatment, distribution, and conservation.
3. **Capacity Building:**
    - **Training and Development:** Offer training and development programs for WAF staff to enhance their skills in using new technologies and managing complex systems.

---

9. Expectations toward the JICA Administration and Management of Water Supply Services(B) Program.

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

1. **Knowledge Acquisition:**
    - **Skill Development:** Expect you to acquire advanced knowledge and skills that can be applied to improve water supply management at WAF.
2. **Implementation of Best Practices:**
    - **Application of Learning:** Anticipate that you will apply best practices and insights gained from the program to enhance operational efficiency and service delivery.
3. **Reporting and Sharing:**
    - **Knowledge Sharing:** Expected to share knowledge and insights with colleagues and contribute to organizational learning and development.

9-2. *My Expectation from the Program*:

1. **Comprehensive Training:**
    - **Practical Training:** Request practical, hands-on training that addresses real-world challenges and provides actionable solutions.
2. **Collaborative Opportunities:**

- **Networking:** Look forward to opportunities for networking and collaborating with peers from other countries to exchange experiences and ideas.

3. **Support and Resources:**
    - **Ongoing Support:** Seek continued support and resources post-program to assist in implementing new strategies and technologies effectively.
4. **Feedback Mechanism:**
    - **Constructive Feedback:** Appreciate a feedback mechanism to evaluate the effectiveness of the training and ensure continuous improvement in program delivery.

---

10. My Action Plan after completing the JICA Administration and Management of Water Supply Services (B) Program

1. Review and Synthesize Training Insights

Objective: Deeply understand and contextualize the training insights in relation to the Water Authority of Fiji's strategic goals.

- **Action Steps:**
    - **Consolidate Learning:** Summarize key takeaways and actionable strategies from the training.
    - **Align with Strategic Goals:** Map these insights against the Water Authority's existing strategic goals and identify alignment opportunities or gaps.
    - **Engage Key Staff:** Discuss the training insights with senior management to ensure a unified understanding and to gather input on potential applications.

2. Develop Strategic Initiatives

Objective: Translate training insights into strategic initiatives that address key challenges and opportunities.

- **Action Steps:**
    - **Identify Key Areas:** Determine critical areas for improvement based on the training, such as operational efficiency, regulatory compliance, or customer service.
    - **Define Strategic Goals:** Set specific, measurable objectives for each initiative (e.g.,

reduce water loss by X%, enhance customer satisfaction scores).

- **Develop Action Plans:** Create detailed action plans for each strategic initiative, including timelines, resource requirements, and performance metrics.

3. Engage Stakeholders and Communicate Vision

Objective: Ensure stakeholder buy-in and align organizational efforts with the new strategic direction.

- **Action Steps:**
  - **Communicate Vision:** Present the new strategic initiatives to key stakeholders, including senior management, board members, and external partners.
  - **Solicit Feedback:** Gather input and feedback from stakeholders to refine the initiatives and address any concerns.
  - **Foster Collaboration:** Promote collaboration among departments and teams to support the successful implementation of the initiatives.

4. Implement Strategic Initiatives

Objective: Execute the strategic initiatives effectively, ensuring alignment with the training objectives.

- **Action Steps:**
  - **Assign Responsibilities:** Designate project leads and teams for each initiative, ensuring clear roles and responsibilities.
  - **Allocate Resources:** Ensure that necessary resources (e.g., budget, personnel, technology) are allocated to support the initiatives.
- **Oversee Implementation:** Monitor the progress of implementation, providing guidance and support as needed to address challenges.

5. Monitor and Evaluate Performance

Objective: Track the progress of strategic initiatives and assess their impact.

- **Action Steps:**
  - **Set KPIs:** Establish key performance indicators (KPIs) for each initiative to measure success.
  - **Regular Reviews:** Schedule regular progress reviews to assess performance against KPIs and objectives.
  - **Adjust Strategies:** Based on performance data and feedback, make necessary adjustments to strategies and action plans.

6. Promote Continuous Improvement

Objective: Foster a culture of continuous improvement and innovation within the organization.

- **Action Steps:**

- **Encourage Feedback:** Create channels for ongoing feedback from staff and stakeholders regarding the initiatives and overall strategy.
- **Share Successes:** Communicate successes and best practices within the organization to encourage a culture of learning and improvement.
- **Explore Innovations:** Stay abreast of emerging technologies and management practices that could enhance water supply services.

7. Document and Report

Objective: Maintain comprehensive records and report on the progress and outcomes of strategic initiatives.

- **Action Steps:**
  - **Document Processes:** Keep detailed records of the implementation process, challenges encountered, and solutions applied.
  - **Prepare Reports:** Create regular reports for the board, senior management, and other stakeholders, highlighting progress, achievements, and any issues.
  - **Share Lessons Learned:** Document and share lessons learned from the initiatives to contribute to organizational knowledge and future projects.

8. Plan for Future Development

Objective: Identify opportunities for further development and strategic enhancement.

- **Action Steps:**
  - **Identify Future Training Needs:** Assess if additional training or development is needed for yourself or the team to support ongoing and future initiatives.
  - **Explore Partnerships:** Look for opportunities to collaborate with other organizations, agencies, or experts to enhance capabilities and resources.
  - **Develop Long-Term Strategy:** Integrate insights from the training into long-term strategic planning for the Water Authority of Fiji, considering evolving needs and future challenges.

END

ADMINISTRATION AND MANAGEMENT OF WATER SUPPLY SERVICES(B) INCEPTION REPORT PRESENTATION

1. Country: Fiji
2. Name: Sekove Uluinayau
3. Position: Chief Customer Officer
4. Organization: Water Authority of Fiji

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CONTENTS

1. OUTLINE OF WATER SUPPLY SERVICES IN FIJI

The Water Authority of Fiji Act 2007

The Water Authority of Fiji (WAF)

- The Ministry of Public Works, Transport & Meteorological Services

The Water Authority of Fiji Vision.

Vision: Clean water and sanitation for a better life.

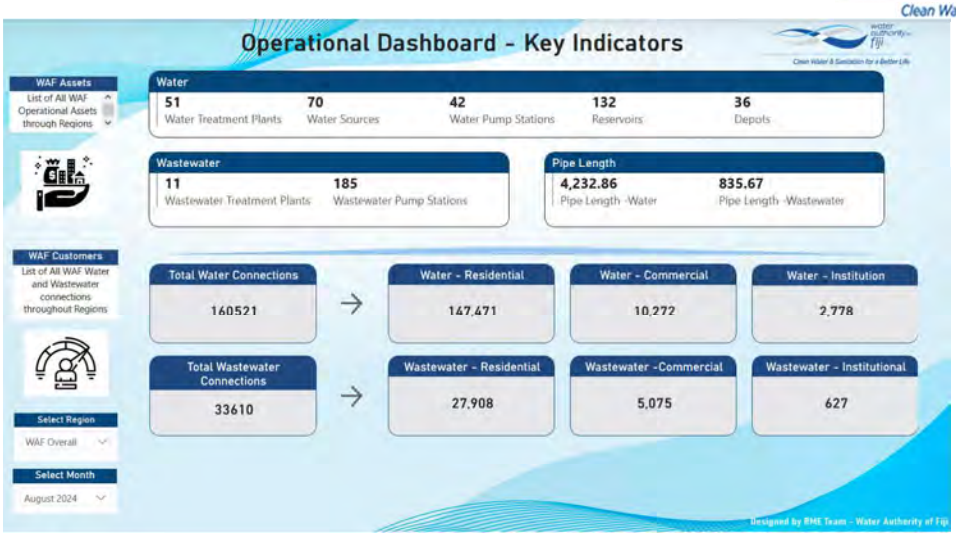
The Water Authority of Fiji Mission

Mission: We are committed to optimizing water and wastewater services through resilience, innovation, safe working practices, engaging stakeholders, capacity building, being environmentally focused and modernization.

2. WATER SUPPLY SERVICE LEVELS AT THE WATER AUTHORITY OF FIJI (WAF)

Performance Indicators

Coverage area	**18,274 (sq. km)**
Population Served	829,110 people
Collection ratio	90 (%)
Production capacity	134,000,000 (m3/day)
Supply duration	22 (hr/day)
Supply pressure	Minimum 10m head
Non-Revenue Water	47 (%)
Water quality	98% (WHO standard)
Staff number	1,071 staff
Number of water connections	160,521
Staff/1,000 connections	6.7 (people/1,000connections)



2. WATER SUPPLY SERVICE LEVELS AT THE WATER AUTHORITY OF FIJI (WAF)

Performance Indicators

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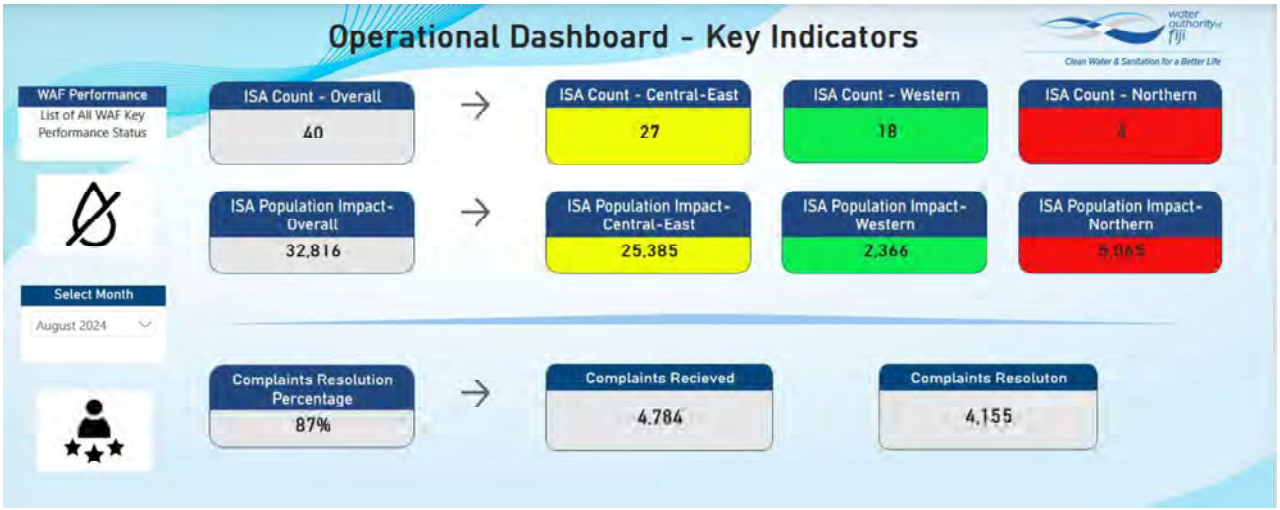
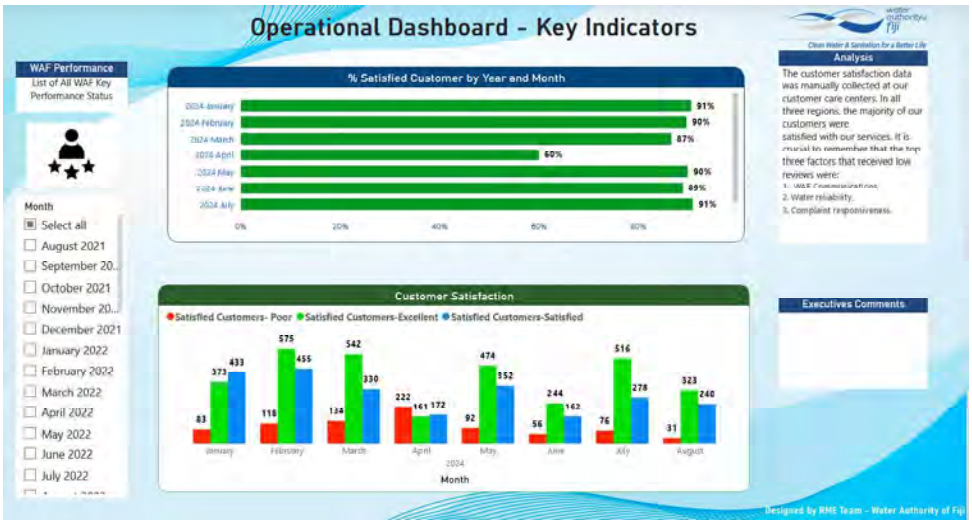


2. WATER SUPPLY SERVICE LEVELS AT THE WATER AUTHORITY OF FIJI (WAF)

Performance Indicators



2. WATER SUPPLY SERVICE LEVELS AT THE WATER AUTHORITY OF FIJI (WAF)

Performance Indicators

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3. Management of Water Quality at the Water Authority of Fiji (WAF)

Current Situation: The Water Authority of Fiji (WAF) is responsible for supplying clean and safe drinking water to Fiji's population. The organization operates a network of water treatment plants, pipelines, and distribution systems across various regions of the country, including urban and rural areas.

Major Challenges/Problems:

Aging Infrastructure: Many of WAF's assets, including pipelines and treatment facilities, are outdated and require significant upgrades or replacement. This can lead to inefficiencies and increased risk of contamination.

Climate Change and Natural Disasters: Fiji is prone to extreme weather events such as cyclones and heavy rainfall, which can impact water sources and treatment processes, potentially leading to water quality issues.

Source Water Contamination: Agricultural runoff, industrial activities, and inadequate sanitation in some areas pose risks to the quality of source water, requiring stringent treatment measures.

Resource Constraints: Limited financial and human resources can affect the ability to implement comprehensive water quality management practices and infrastructure improvements.

Regulatory Compliance: Adhering to both national and international water quality standards can be challenging, especially with evolving regulations and standards.

3. Management of Water Quality at the Water Authority of Fiji (WAF)

Current Actions against Those Challenges/Problems

Infrastructure Upgrades: WAF is investing in modernizing and upgrading aging infrastructure. This includes replacing old pipelines, enhancing treatment facilities, and improving the overall reliability of the water supply system.

Climate Adaptation Strategies: Implementing climate adaptation strategies to enhance the resilience of water supply systems to extreme weather events. This includes improving flood protection measures and diversifying water sources.

Enhanced Water Treatment: Upgrading water treatment processes and technologies to better address contaminants and ensure the safety of drinking water. This includes investing in advanced treatment technologies and improving source water protection.

Capacity Building: Strengthening human resources through training programs and capacity-building initiatives to enhance the skills and knowledge of WAF staff in water quality management.

Regulatory Compliance: Regularly reviewing and updating procedures to ensure compliance with national and international water quality standards and working closely with regulatory bodies.

3. Management of Water Quality at the Water Authority of Fiji (WAF)

Any Achievements

Improved Water Quality: Improved overall water quality through upgraded treatment processes and enhanced monitoring.

Infrastructure Projects: Completed several major infrastructure projects, including the construction of new treatment plants and the replacement of outdated pipelines.

Community Engagement: Increased public awareness and engagement through customer forums, community outreach programs and educational campaigns about water conservation and safety.

Certification: Achieved certification for water quality management systems under recognized standards, demonstrating a commitment to quality and safety.

Response to Emergencies: Effectively managed responses to natural disasters and other emergencies, ensuring continued provision of safe drinking water during challenging times.

3. Management of Water Quality at Water Authority of Fiji (WAF)

•**Water Quality Standards for Drinking Water**

WAF adheres to the following water quality standards:

- **National Standards:** Compliance with Fiji's national drinking water quality standards, which include limits for microbial, chemical, and physical parameters as set by the Ministry of Health and Medical Services.
- **World Health Organization (WHO) Guidelines:** Aligning with WHO's guidelines for safe drinking water, which include limits for various contaminants to ensure safety and health.
- **Specific Parameters:** Regular monitoring and adherence to standards for key contaminants such as bacteria, nitrates, fluoride, and disinfection byproducts.

Monitoring System or Plans for Safety of Drinking Water

Monitoring System:

1. **Routine Testing:** Regular sampling and testing of water at various points, including source water, treatment facilities, and distribution networks, to ensure compliance with quality standards.
2. **Advanced Technologies:** Use of modern monitoring technologies and real-time sensors to track water quality parameters and detect any deviations promptly.
3. **Quality Assurance:** Implementation of quality assurance protocols to ensure the accuracy and reliability of water quality data.
4. **Data Management:** Integration of data management systems to analyze and manage water quality information effectively.

Plans for Safety:

1. **Emergency Preparedness:** Developing and maintaining comprehensive emergency preparedness plans to address potential water quality incidents and natural disasters.
2. **Public Health Collaboration:** Working with public health agencies to ensure timely responses to any water quality issues and to maintain public health safety.
3. **Continuous Improvement:** Regular review and enhancement of monitoring and safety plans based on emerging risks, technological advancements, and feedback.

Implementation of Water Safety Plans or Similar Efforts

Water Safety Plans (WSPs):

1. **Risk Assessment:** Conducting thorough risk assessments to identify and evaluate potential hazards in the water supply chain, from source to delivery.
2. **Control Measures:** Implementing control measures and preventive actions to mitigate identified risks, including improvements in treatment processes and source water protection strategies.
3. **Monitoring and Verification:** Establishing robust monitoring and verification programs to ensure the effectiveness of control measures and compliance with safety standards.
4. **Emergency Response:** Developing and updating emergency response plans to address potential incidents or contamination events effectively.
5. **Stakeholder Engagement:** Engaging with stakeholders, including local communities and regulatory bodies, to promote awareness and collaboration on water safety issues.
6. **Training Programs:** Providing ongoing training and capacity-building for staff to ensure effective management of water safety and quality challenges.

4. REDUCTION OF NON-REVENUE AT THE WATER AUTHORITY OF FIJI (WAF)

<table>
<tr><td rowspan="2">Authorized consumption
69,406,151 m3/year
54%</td><td>Revenue water
67,264,873
53%
m3/year</td><td>Billed authorized consumption</td><td>67, 264,873 (m3 /year)
97 (%)</td></tr>
<tr><td rowspan="3">Non-Revenue Water (NRW)
60,780,319 m3/year
47%</td><td>Unbilled authorized consumption (ex. fire fighting, cleaning)</td><td>2,141,278 (m3 /year)
3 (%)</td></tr>
<tr><td rowspan="2">Water losses
58,639,041 m3/year
46%</td><td>Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)</td><td>10,481,798 (m3 /year)
18 (%)</td></tr>
<tr><td>Physical losses (Leakage)</td><td>48,157,243 (m3 /year)
82 (%)</td></tr>
</table>

Current Situation: Non-Revenue Water (NRW) at the Water Authority of Fiji (WAF) remains a significant challenge, impacting both operational efficiency and financial performance. NRW encompasses water that is produced but not billed to customers, leading to lost revenue and inefficiencies in water management.

Major Challenges/Problems:

Aging Infrastructure:

Many of WAF's pipelines and distribution networks are old and prone to leaks and breaks, resulting in significant water losses.

Unaccounted-for Water Losses:

A considerable amount of water is lost due to leaks in the distribution system, unauthorized connections, and inaccuracies in metering.

Metering Issues:

Problems with outdated or malfunctioning meters lead to discrepancies between actual water consumption and billed amounts.

Limited Resources:

Financial and human resource constraints limit the ability to implement extensive NRW reduction measures and maintain existing infrastructure.

Lack of Real-Time Monitoring:

Inadequate real-time monitoring systems make it challenging to promptly detect and address water loss issues.

4. REDUCTION OF NON-REVENUE AT WATER AUTHORITY OF FIJI (WAF)

Current Actions against Those Challenges/Problems

1. **Infrastructure Improvements:**
   - **Pipe Replacement and Rehabilitation:** Ongoing projects to replace old and damaged pipelines and rehabilitate the distribution network with modern materials.
   - **Asset Management:** Implementing an asset management system to track the condition and maintenance needs of infrastructure.
2. **Leak Detection and Repair:**
   - **Advanced Leak Detection Technologies:** Utilizing acoustic sensors, ground-penetrating radar, and other technologies to identify and locate leaks more effectively.
   - **Leak Repair Teams:** Establishing dedicated teams to respond quickly to leak reports and conduct repairs.
3. **Metering Enhancements:**
   - **Meter Replacement Program:** Replacing outdated meters with new, more accurate models to improve billing accuracy.
   - **Regular Calibration:** Implementing regular calibration schedules for meters to ensure accuracy and reliability.
4. **Data Management and Monitoring:**
   - **Real-Time Monitoring:** Installing real-time monitoring systems to track water flows and pressure, enabling quicker detection of anomalies.
   - **Data Analytics:** Using data analytics to assess water usage patterns, identify discrepancies, and inform NRW reduction strategies.
5. **Customer Engagement:**
   - **Awareness Campaigns:** Conducting public education campaigns to raise awareness about water conservation and encourage reporting of leaks.
   - **Reporting Tools:** Providing customers with accessible tools and platforms to report water issues and unauthorized connections.

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4. Reduction of Non-Revenue at Water Authority of Fiji (WAF)

Any Achievements

Reduction in NRW:
Achieved a measurable reduction in NRW through effective implementation of leak detection and repair programs, as well as infrastructure upgrades.

Successful Infrastructure Projects:
Completed significant infrastructure improvement projects, including pipeline replacements and upgrades, resulting in reduced water loss.

Enhanced Metering Accuracy:
Improved billing accuracy and customer satisfaction by replacing outdated meters and implementing regular calibration.

Increased Customer Participation
Elevated customer engagement and participation in conservation efforts and leak reporting through targeted outreach and communication strategies.

4. Reduction of Non-Revenue at Water Authority of Fiji (WAF)

Leakage Detection Measures

District Metered Areas (DMAs):

Implementation: Dividing the distribution network into District Metered Areas to monitor and manage water consumption and leakage within smaller, manageable sections.

Benefits: Allows for targeted detection of leaks and more precise analysis of water loss within each DMA.

Advanced Technologies:

Acoustic Sensors: Using acoustic sensors to detect and locate leaks based on sound waves generated by escaping water.

Ground-Penetrating Radar: Employing radar technology to detect and map leaks beneath the surface.

Real-Time Monitoring Systems:

Flow and Pressure Monitoring: Installing sensors to monitor flow rates and pressure throughout the distribution network, enabling early detection of potential leaks or pressure drops.

Data Integration: Integrating real-time monitoring data with GIS and data analytics tools for better leak management.

Leak Detection Teams:

Dedicated Teams: Establishing specialized teams trained in leak detection and repair, equipped with advanced tools and technologies.

Rapid Response: Implementing procedures for rapid response to detected leaks to minimize water loss and service disruption

5. Accounting system of Water Supply Services

Water Tariff at Water Authority of Fiji

Current Water Tariff Structure: The Water Authority of Fiji (WAF) utilizes a tiered water tariff structure designed to promote conservation and ensure equitable pricing for different levels of water consumption. The tariff is typically structured as follows:

1. **Residential Tariffs:**
   - **Tiered Rates:** Customers are billed at different rates based on their water consumption levels. Lower usage levels are charged at a lower rate with incremental rates applied as consumption increases.
   - **Current Tariff:** 15 cents per unit for 1-50 units, 44 cents per unit for 51-100 units and 84 cents per unit for consumption exceeding 100 units. Wastewater services is charged at 20 cents per unit of water consumption.
2. **Commercial Tariffs:**
   - **Standard Fixed Rates:** Commercial customers are charged based on the volume of water consumed, are charged at standard fixed rate of $1.06 per unit and 20 cents per unit for wastewater services
3. **Institutional Tariffs:**
   - **Subsidized Rates:** Schools and place of worships are current charged at 53 cents per unit of water consumed and 20 cents per unit for wastewater services.

5-2. Audited Financial Statements are available on the Water Authority of Fiji website in the Annual Report on the URL https://waterauthority.com.fj/annual-reports/

6. MAJOR RECENT ACHIEVEMENTS IN IMPROVEMENT OF WATER SUPPLY SERVICES

1. **Infrastructure Upgrades:**
   - **Pipeline Replacement Projects:** Completed several major pipeline replacement projects, reducing leaks and improving water distribution efficiency.
   - **New Treatment Facilities:** Commissioned new water treatment plants, enhancing capacity and reliability in water supply.
2. **Enhanced Water Quality:**
   - **Advanced Treatment Technologies:** Implemented state-of-the-art treatment technologies that have significantly improved water quality and safety.
   - **Certification and Compliance:** Achieved certification for compliance with international water quality standards, ensuring high standards of water safety.
3. **Customer Service Improvements:**
   - **Enhanced Communication Channels:** Introduced new customer service channels, including online platforms and mobile apps, improving accessibility and response times.
   - **Public Awareness Campaigns:** Successfully launched public education campaigns on water conservation and safety, increasing community engagement.
4. **Technological Advancements:**
   - **Smart Metering Systems:** Rolled out smart metering technology, leading to more accurate billing and better management of water resources.
   - **Real-Time Monitoring:** Implemented real-time monitoring systems for improved detection of leaks and operational issues.
5. **Operational Efficiency:**
   - **Operational Restructuring:** Reorganized operational processes and workflows to enhance efficiency and reduce costs.
   - **Staff Training and Development:** Invested in staff training programs to improve skills and operational capabilities.

7. RECENT CHALLENGES TO IMPROVEMENT OF WATER SUPPLY SERVICES

Aging Infrastructure:
- **Maintenance Needs:** Ongoing issues with the maintenance and replacement of old infrastructure, leading to frequent repairs and potential service disruptions.

Climate Change Impacts:
- **Extreme Weather Events:** Increased frequency of extreme weather events, such as cyclones and heavy rainfall, which affect water sources and distribution systems.

Funding Constraints:
- **Budget Limitations:** Limited financial resources impacting the ability to undertake comprehensive upgrades and improvements.

Regulatory Compliance:
- **Evolving Standards:** Challenges in keeping up with evolving national and international water quality standards and regulations.

Customer Engagement:
- **Behavioral Change:** Difficulties in changing customer behavior related to water conservation and the reporting of issues.

8. Expectations toward Japan

Expectations toward Japanese Government and JICA:

Technical Assistance:

- **Expertise Sharing:** Provide technical assistance and expertise to support infrastructure projects, water management strategies, and capacity building.

Funding Support:

- **Grants and Loans:** Offer grants or low-interest loans for major infrastructure projects and improvements in water supply systems.

Policy Guidance:

- **Regulatory Support:** Assist in developing and implementing best practices and policies for water management and quality standards.

Expectations toward Japanese Water Utilities

Knowledge Exchange:

- **Best Practices:** Share best practices and operational experiences in managing water supply and improving service delivery.
- **Training Programs:** Conduct training programs and workshops for WAF staff on advanced water management and treatment techniques.

Collaborative Projects:

- **Joint Ventures:** Engage in collaborative projects or pilot programs to test new technologies and methodologies in water management.

Technical Support:

- **Consultancy Services:** Provide consultancy services to help resolve specific technical challenges and optimize water supply systems.

Expectations toward Japanese Private Companies

Investment Opportunities:

- **Partnerships:** Explore opportunities for investment in water infrastructure projects and technological advancements.

Innovative Solutions:

- **Technology Transfer:** Introduce innovative technologies and solutions that can improve water treatment, distribution, and conservation.

Capacity Building:

- **Training and Development:** Offer training and development programs for WAF staff to enhance their skills in using new technologies and managing complex systems.

9. Expectations toward the Program

Expectations of my supervisor toward my participation in the program.

Knowledge Acquisition:

- **Skill Development:** Expect you to acquire advanced knowledge and skills that can be applied to improve water supply management at WAF.

Implementation of Best Practices:

- **Application of Learning:** Anticipate that you will apply best practices and insights gained from the program to enhance operational efficiency and service delivery.

Reporting and Sharing:

- **Knowledge Sharing:** Expected to share knowledge and insights with colleagues and contribute to organizational learning and development.

My Expectation from the Program:

Comprehensive Training:

- **Practical Training:** Request practical, hands-on training that addresses real-world challenges and provides actionable solutions.

Collaborative Opportunities:

- **Networking:** Look forward to opportunities for networking and collaborating with peers from other countries to exchange experiences and ideas.

Support and Resources:

- **Ongoing Support:** Seek continued support and resources post-program to assist in implementing new strategies and technologies effectively.

Feedback Mechanism:

- **Constructive Feedback:** Appreciate a feedback mechanism to evaluate the effectiveness of the training and ensure continuous improvement in program delivery.

THE END


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3. JORDAN

Inception Report

Country: Jordan

Name: Hamza Al Yaseen

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1. Outline of Water Supply Services

1-1. Legal Basis of Water Supply Services

Refer to Water Jordanian law *8811*

1-2. Demarcation of Water Supply Services

Jordanian Ministry of Water and Irrigation

1-3. Main Actor of Water Supply Utilities

most water utilities are public bureau under local government in Jordan.

1-4. Mission/Vision of Water Supply Utilities

Excellence, leadership, and sustainability in providing water and Wastewater services to recipients of the Global Practices Tool , with high efficiency

1-5. Your Mission/Vision in your organization

To be a model in management, operation and investment regionally

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2. Water Supply Service Levels

2-1. Main Performance Indicators (PI)

Coverage area	6905 (sq. km)
Population Served	242000
Collection ratio	84.8(%)
Production capacity	65000 (m3/day)
Supply duration	24(hr/day)
Supply pressure	2-7 Bar
Non-Revenue Water	34.7(%)
Water quality	
Staff number	412

Number of connections	11200
Staff/1,000 connections	36.8(people/1,000connections)

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

None

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3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems

Stable and and Combatble with Jordanian Water Standerds , and challenges some wells reduce Radiation ratio

3-2. Current Actions against Those Challenges/Problems

Mixing with Wells combined low Radiation ratio

3-3. Any Achievements

Best Quality Ground water Regionally

3-4. Water Quality Standards for Drinking Water

Atteached Jordanian Water standers with report Attached With Report (Annex 2- Jordanian Water Standers)

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

Atteached Jordanian Inspection Program for Aqaba Region with report Attached With Report (Annex 3- Jordanian Inspection Program for Aqaba Region)

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

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4. Reduction of Non-Revenue Water

4-1. Current Situation and Major Challenges/Problems

NRW in Aqaba region about 34.72 % , and challenges :

1- Illegal Water use .
2- Reducing Real or phiscyal losses

4-2. Current Actions against Those Challenges/Problems

Installition Smart Meter Ultrasonic

4-3. Any Achievements

Reducing NRW from 40% in last to 34.7 % now

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

Authorized	Revenue	Billed authorized	

consumption **17557536**	water **17190301**	consumption **17190301**	(m3 /year) (%)
	Non-Revenue Water (NRW) **9145711**	Unbilled authorized consumption (ex. fire fighting, cleaning) **90000**	(m3 /year) (%)
Water losses **8778476**		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies) **4527855.5**	(m3 /year) (%)
		Physical losses (Leakage) **4527855.5**	(m3 /year) (%)

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

Aqaba Region Combined 42 DMAS

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5. Accounting system of Water Supply Service

5-1. Water Tariff in your Organization

Average tariff per unit volume in USD 1.67 USD/M3

5-2. Balance Sheet of your Organization

Tariff collection ratio 84.8 %

5-3. Profit and Loss Statement of your Organization

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

(2) Capital Income and Expenditures of your Organization)

Operating revenue per year 1967783 USD/year

Net profit/loss per year 230175 USD/year

Atteached Financial Statements for Aqaba water company 2022 with report (Annex 4 - Financial Statements 2022)

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

Most information in Annual report for Aqaba water Company (Annex 5- Annual report for Aqaba water Company)

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7. Recent Challenges to Improve Water Supply Services

Most information in Annual report for Aqaba water Company (Annex 5- Annual report for Aqaba water Company)

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8. Expectations toward Japan

8-1. Expectations toward Japanese Government and JICA

Support Water Sector in Jordan by best techniqes and Technollegies for Water Supply Services/Management

8-2. Expectations toward Japanese Water Utilities

Exchange knowlleege between Jordanian an Jaban Experineces In for Water Supply Services/Management

8-3. Expectations toward Japanese Private Companies

Exchange knowlleege between Jordanian an Jaban Experineces In for Water Supply Services/Management

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9. Expectations toward the Program.

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

The Applicant expected to use all information , skills , and Knowledge to expand it throws his colleges and the team he leads , also , comparing and analyze any difference in type and ways of work between Aqaba water Company and Japan and try to maximize any benefit that he can from this course .

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

None

END.

مياه العقبة
Aqaba Water

Inspection Report Presentation

Aqaba Water

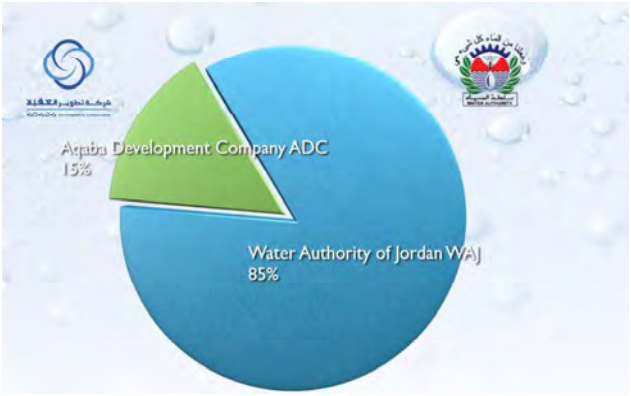
Administration and Management of Water Supply Services (B)

Japan 2024

Prepare : Eng. Hamza AL- Yaseen ,
Water Resources an Stations Head

Share holder

- The company was established in 2004 to deal with the water situation in the Kingdom to raise the operational efficiency of water and sanitation sectors in the Aqaba Special Economic Zone in particular, and the Aqaba Governorate
- Share holder of 85% to WAJ and 15% to ADC



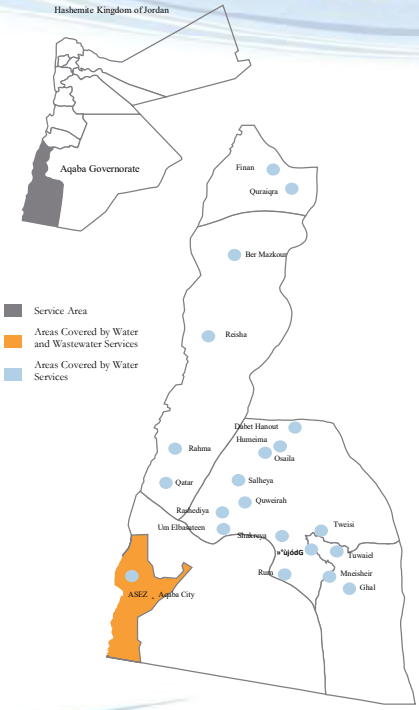
Vision

Pioneering in Management and operation the sectors of water, and wastewater, and excellence in service Customers .

مياه العقبة
Aqaba Water

Service Area

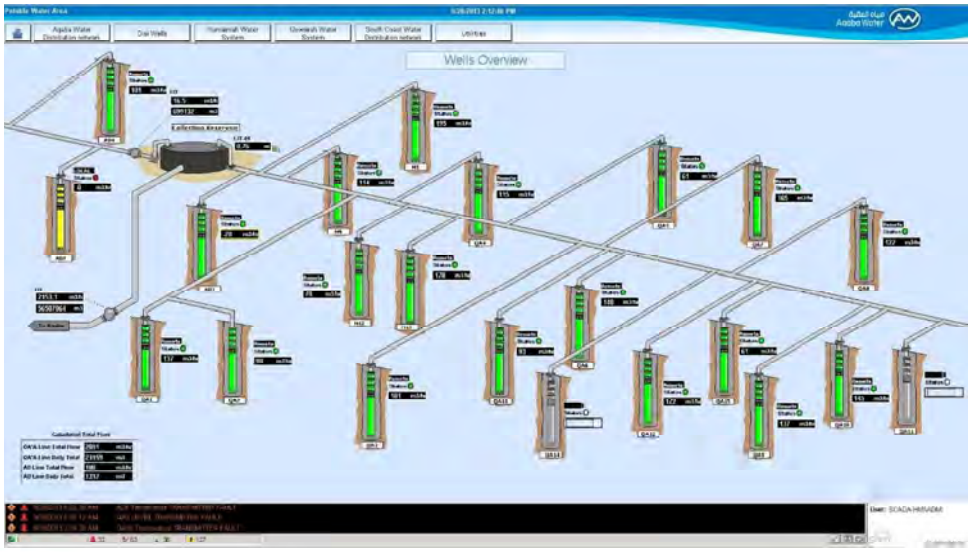
- The Company provide water services to city of Aqaba, The districts of Quwaira, Wadi Araba, and Disi.
- Total Population: 188,160 Inhabitants
- Water customers: 40,338
- Sewage subscriber : 34,291
- Wastewater coverage: 82%
- Daily per capita consumption: 380 l/day



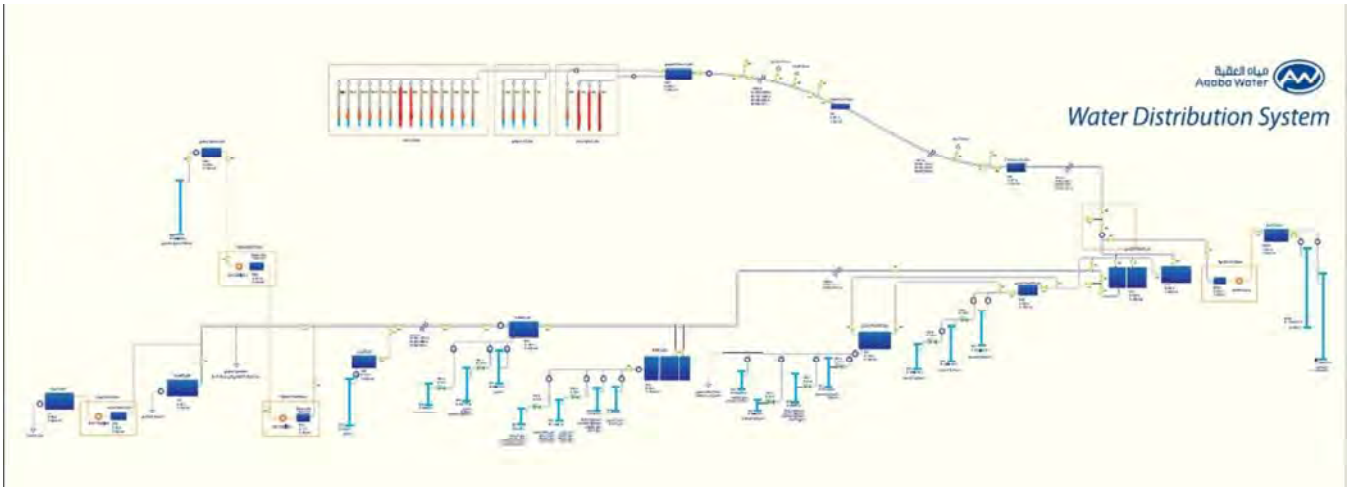
Management Contract

- Wadi Mousa Wastewater Treatment Plant which has a total capacity of 3500 cubic meters per day and is run by the Company since 2006.
- Ma'an Wastewater Treatment Plant which has a total capacity of 7000 cubic meters per day and is run by the Company since September 2009.
- Al-karak Wastewater Treatment Plant which has a total capacity of 7000 cubic meters per day and is run by the Company since January 2015.

Water Resources



Water Distribution system



Changes Made

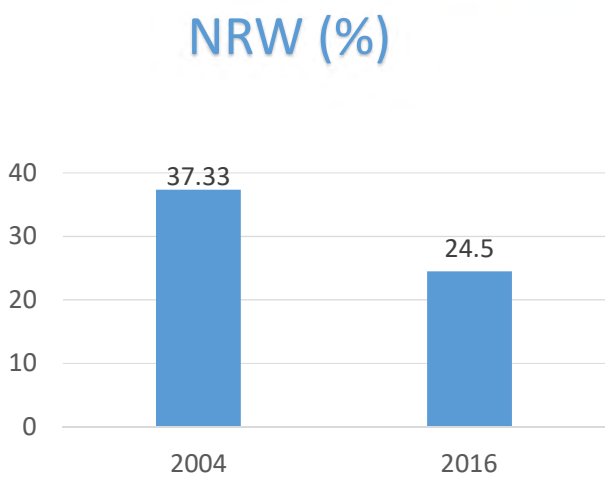
Human Resources

- Higher efficiency: From 12.3 employees per 1000 customers in 2004 to 10.6 in 2017. Given an increase of 54% in water and wastewater customers.
- Female employees increased by 57%, now holding technical and field positions.
- Degree holders increased from 15% of employees to 32%.

Changes Made

Operations

- Purchasing was centralized. All part of entire kingdom, wait in line. Approved by central WAJ. Bounded with materials in stock. Now, AW independently specifies specs, and choses vendor.
- NRW reached 37% in 2004. Efficiency in the use of water resources resulted in NRW of 24% in 2016.
- Capital spending was bound to WAJ national priorities, now AW plans an executes infrastructure projects as required.



Changes Made

Operations

- Freedom of applying and developing technical solutions resulted in adopting:
  - Customer information system that automated customer services operations.
  - HHU for metering and billing.
  - AMR mag meters for large consumers.
  - MS Sharepoint application for business intelligence.
  - SCADA control system that includes full control of networks and resources.
  - Data infrastructure that connects systems and employees within all parts of AW.

Changes Made

Services

- Customer applications and procedure were manual, lengthy and the customer had to see many employees. The average period was 7 days.Now, AW offers a computerized single-window service, increasing the speed of the service delivery. Now the average period is 2 days.
- The customers once had to wait up to 24 hours to receive response for their complaints. Now, the time for solving the customer's problem is about 1 hour 20 minutes.
-

Changes Made

Services

- Facing new challenging customers, AW helps studying their technical needs in water and wastewater, and offers special service agreements.
- AW is now spreading awareness of the need and methods of water use efficiency, and promoting treated wastewater reuse.
- AW adopts environment friendly

Changes Made

Financial

- The pre-feasibility study anticipated the AW would make losses in its early years; AW started making steady profit since the first year.
- Previously dependent on government funding, AW is now covering its expenses.
- After AW started, new ventures, such as the sales of reclaimed water (1.2MJD), provided additional revenue.
- From low collection ratio and 5.4 Million of arrears, AW has collected about 5 million of the arrears, and maintained high collection ratios.
- Despite the increase in energy costs, the average production variable cost has fallen from 0.23 JD/m^3 to 0.22 JD/m^3.
- The average revenue per cubic meter increased from 0.92 JD/m^3 to 1.13 JD/m^3.
- The assets increased from 17.3 Million 58.2

Achievements

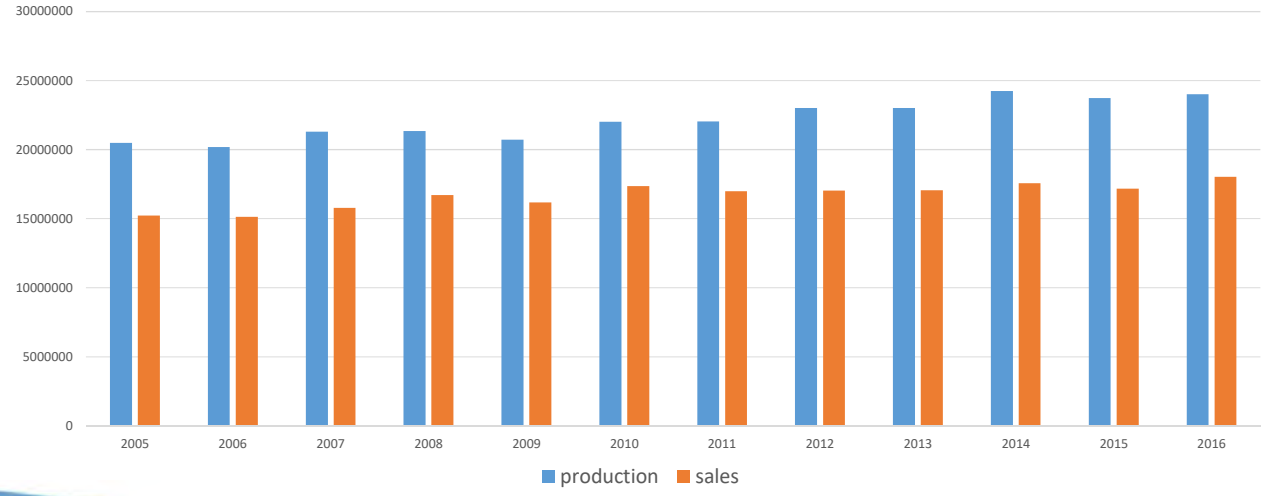
	Criteria	2004	2017
1	Human resources	Bound to Social Services Regulations	Salaries, incentives, bonuses, life and health insurance, etc.
2	Human Development	Far from attention of center	Promote training, workshops and conferences locally and abroad, & education
3	Employee efficiency	12.3 per 1000 customer	10.6 per 1000 customer (54% increase in customers)
4	Degree holders	15%	32%
5	Female employees	Increased by 57% to include technical and field positions	
6	Purchasing	Centralized governmental system	Independent and provides speed and quality
7	NRW	37%	24%
8	Capital investment	Centralized political priorities	Meets local needs and priorities
9	Technical solutions	Slow and weak	Applying and developing tailored technical solutions (FDMS, SCADA, modeling, AMR, GIS, Sharepoint, etc.)

Achievements

	Criteria	2004	2017
10	Customer transactions	Manual and time consuming. 7 days average.	Automated through single window. 2 days average.
11	Service orientation	Supply management	Demand management
12	Customer complaints	Response time within 24 hours	Average response time 80 minutes
13	Awareness	Poor activities	Promoting water demand management and water reuse. (Campaigns, media, etc.)
14	Environment	Stricter control over water quality, wastewater discharge and odors.	
15	Funding	Government	Own funding
16	Collection	5.4 MJD arrears	High collection ratio
17	production variable cost	0.23 JD/m^3	0.22 JD/m^3
18	Average revenue	0.92 JD/m^3	1.13 JD/m^3

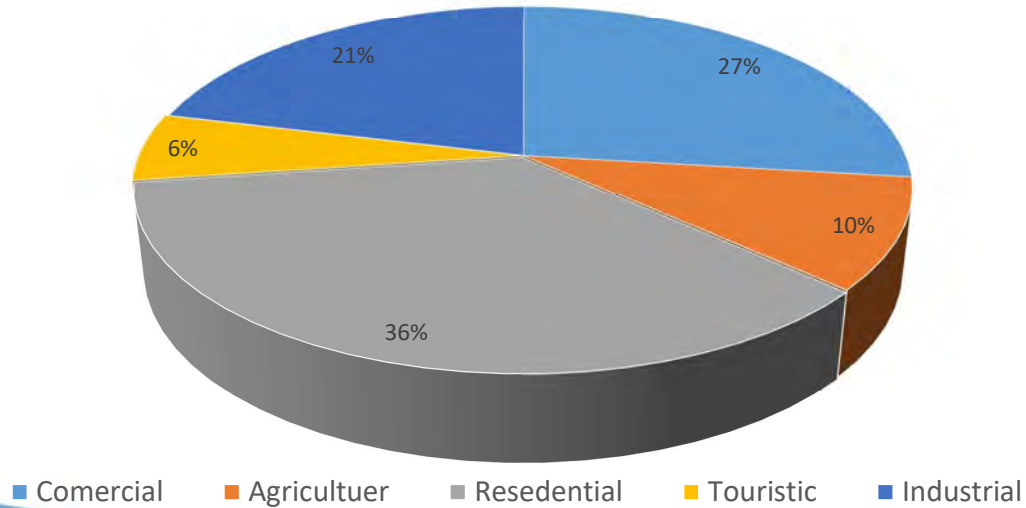
Performance

Production and Sales (cubic Meter)



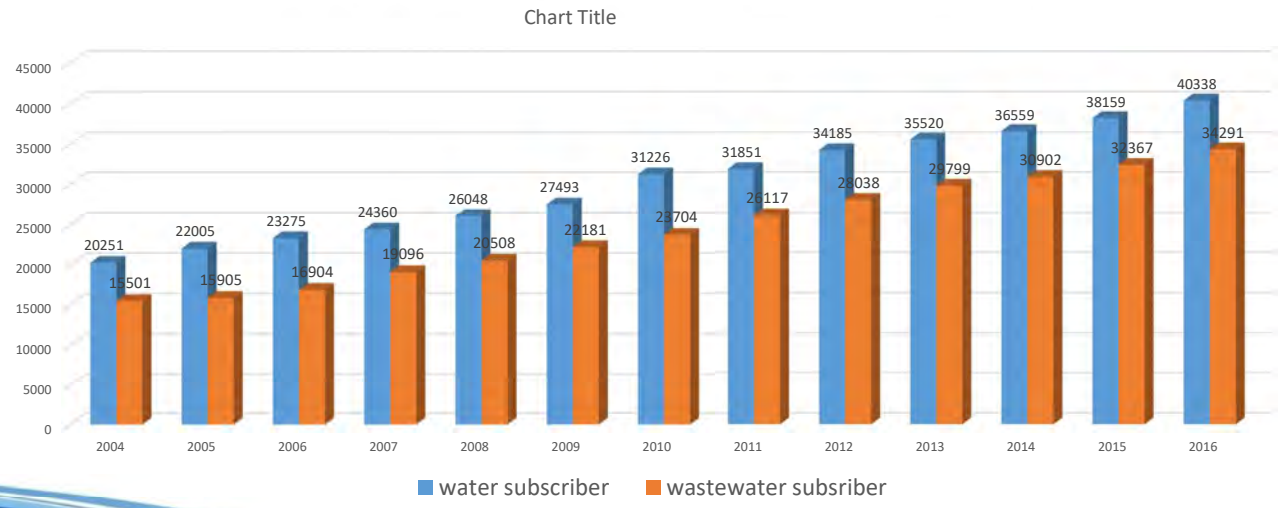
Performance

Billed Consumption by sector



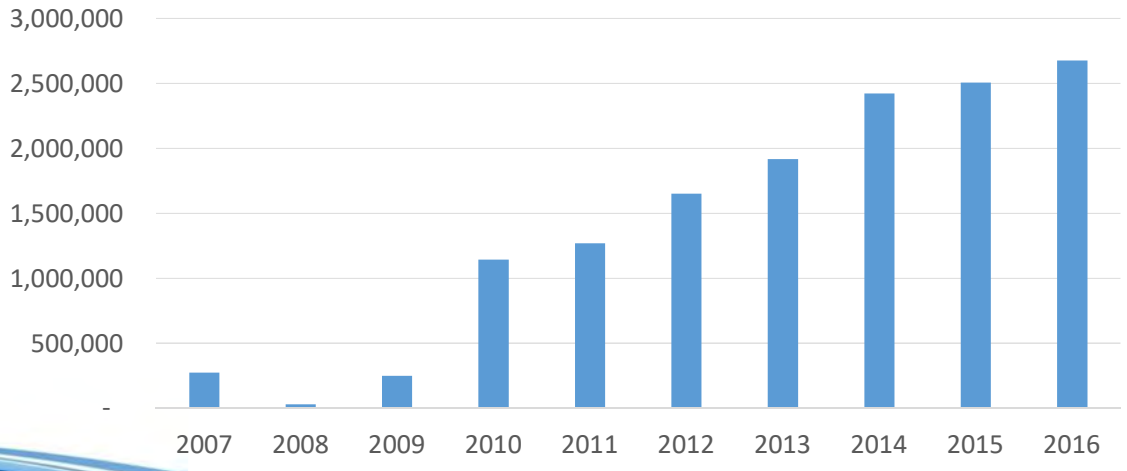
Performance

Water and Wastewater subscribers



Performance

Reclaimed Water Sales (JOD)



Production Disi Wells

Well	Production (CMH)	Status	Capacity 2016 (CMH)
AD3	115	Working	115
M01	90	Dysfunctional	(200 to 90 to 0 in 2016)
M12	136	Working	136
M13	110	Working	(180 down to 110)
M9	100	Working	100
QA01	135	Working	135
QA02	125	Working	125
QA03	100	Working	100
QA04	100	Working	100
QA05	60	Working	60
QA06	150	Working	150
QA07	170	Quality	Emergency
QA08	100	Quality	Emergency
QA09	120	Working	120
QA10	130	Working	130
QA11	20	Dysfunctional	0
QA12	150	Working	150
QA13	60	Dysfunctional	0
QA14	150	Working	150
Total	2101		1681

Aqaba Water Demand

Year	2015	2016	2017	2018	2019	2020
Population Projection (2016 census)	149500	153985	158605	163363	168264	173311
Domestic Demand (CMH)	1,028	1,059	1,090	1,123	1,157	1,192
Leakage Estimation (CMH)	150	150	150	150	150	150
Non-Domestic Demand (CMH)	1,365	1,365	1,365	1,365	1,365	1,365
Marsa Zayed (CMH)	-	-	26	26	84	153
Ayla (CMH)	-	-	8	64	64	64
Saraya (CMH)	-	-	11	67	67	67
Natural Demand of Aqaba City (CMH)	2,543	2,574	2,606	2,638	2,672	2,707
Demand of Mega Projects (CMH)	-	-	45	157	215	284
Demand of Village Connections (CMH)	235	243	252	261	270	279
Total Demand of Aqaba System (CMH)	2,778	2,817	2,903	3,056	3,156	3,270

Strategic Plan

- Short time

1- Three New wells Drilling , produce about 500 m3/hr

2- Two wells pay from Rum Agriculture Company , about 500 m3/hr

3- Additional Desalination Unit For KAMERA Plant , increase production from 250 m3/hr to 500 m3/hr

- Long time

- Huge Desalination Plant Building In Dead-Red Project , Production about 30 MCM

Expectations toward Japan

Expectations toward Japanese Government and JICA

Support Water Sector in Jordan by best techniques and Technologies for Water Supply Services/Management

Expectations toward Japanese Water Utilities

Exchange knowledge between Jordanian an Jaban Experiences In for Water Supply Services/Management

Expectations toward Japanese Private Companies

Exchange knowledge between Jordanian an Jaban Experiences In for Water Supply Services/Management

Expectations toward the Program

The Applicant expected to use all information , skills , and Knowledge to expand it throws his colleges and the team he leads , also , comparing and analyze any difference in type and ways of work between Aqaba water Company and Japan and try to maximize any benefit that he can from this course .

THANK YOU

4. LAOS

Attachment 1: Statistical Data

I. Introduction

1. Name of applicant: Khonesavanh VINAVONG
2. Name of country: LAOS

II. Country Information

1. Geographic location:

   Laos is a landlocked country in Southeast Asia, bordered by Thailand, Cambodia, Vietnam, China, and Myanmar. Its terrain is largely mountainous, with the Annamite Range running parallel to its eastern border with Vietnam. The Mekong River forms a natural boundary with Thailand and is a vital part of the country's geography and culture. The capital city, Vientiane, is located along the banks of the Mekong. There's a lot more that shapes Laos rainforests, plateaus, and limestone karsts all add to the diversity.

2. Population:

   As of mid-2024, the population of Laos is estimated to be around 7,769,8191

   The population density is approximately 34 people per square kilometer (87 people per square mile.

3. Economy (Main industries, GDP, etc.):

   Economic instability and challenges in social services are threatening the gains Laos has made in poverty eradication, education, nutritional status, and other key human development indicators. The World Bank is supporting efforts to restore progress and protect the most vulnerable.

4. Climate (Annual rainfall, seasons, etc.)

   Laos has a tropical monsoon climate with two distinct seasons: the wet season and the dry season. The wet season, influenced by the southwest monsoon, runs from May to October, bringing heavy rainfall and high humidity. The dry season is from November to April, with cooler temperatures and much less rainfall. Average temperatures range from 20°C (68°F) in the cooler months to around 30°C (86°F) during the hot season. It's a climate that shapes everything from the country's agriculture to daily life.

5. Total number of cities:

   There are 18 Provinces

6. The three (3) largest waterworks in the country (Please fill in the **Table1**)

[Table 1] (Data from annual Water Supply Report in 2022)

Name of City	Name of Organization	Capital (Public/ Private/ Public-Private-Partnership)	Total Population	Supplied Population
Vientiane Capital	Water supply enterprise of Vientiane Capital	State enterprise	864.960	771.486
Champhasack	Water supply enterprise of Champasack Province	State enterprise	251.647	157.971
Savanhnakhet	Water supply enterprise of SavanhnaKhet Province	State enterprise	173.440	135.306

III. Organizational Framework and Job Description

1. Name of applicant's organization
   DEPARTMENT OF WATER SUPPLY, MINISTRY OF PUBLIC WORKS AND TRANSPORT, LAOS
2. The established year of the organization
   The organization has established in 2015
3. Applicant's occupation （Please choose from the followings.)
   (a) Staff in charge of the formulation of waterworks plan in a water supply utility
   (b) Staff in charge of the formulation of waterworks plan in the national government or a local government
   (c) Staff who is expected to be in charge of the formulation of waterworks plan
   (d) Civil engineer
   (e) Sanitary engineer
   (f) Environmental engineer
   (g) Other (Specify your background: inspection works)☑
4. Type of the applicant's organization (Please choose one option from the followings.)
   (a) Part of government department ☑
   (b) Government corporations
   (c) Independent authority

(d) Others (Please describe: division of inspection)

5. Capital formation (Financial resource) of the applicant's organization
   - National government (100%)
   - Local government (30%)
   - Investor (Private) (70%)
   - Others (Please describe: (%)

6. Governmental control: (Please select all options which are subject to governmental instruction.)
   (a) Staff number
   (b) Staff salaries
   (c) Tariff ☑
   (d) Appointment of top management
   (e) Budget for O&M
   (f) Budget for development ☑
   (g) Disconnection for non-payment

7. Cost (Budget) for operation/management of the applicant's organization, (LuangNamtha Province water Supply, Data in 2023);
   (1) Personnel: (143,272,824 USD) = 3,152,002,148 Kip
   (2) Power/Fuel: (40,047,835 USD) = 881,052,389 Kip
   (3) Chemicals: (13,606,818 USD) = 299,350,000 Kip
   (4) Other materials: (63,347,267 USD) = 1,393,639,8761 Kip
   (5) Transport: (USD)
   (6) Others (describe:)(USD)
   (7) Total O&M cost: (7,621,642 USD) = 167,676,130 Kip

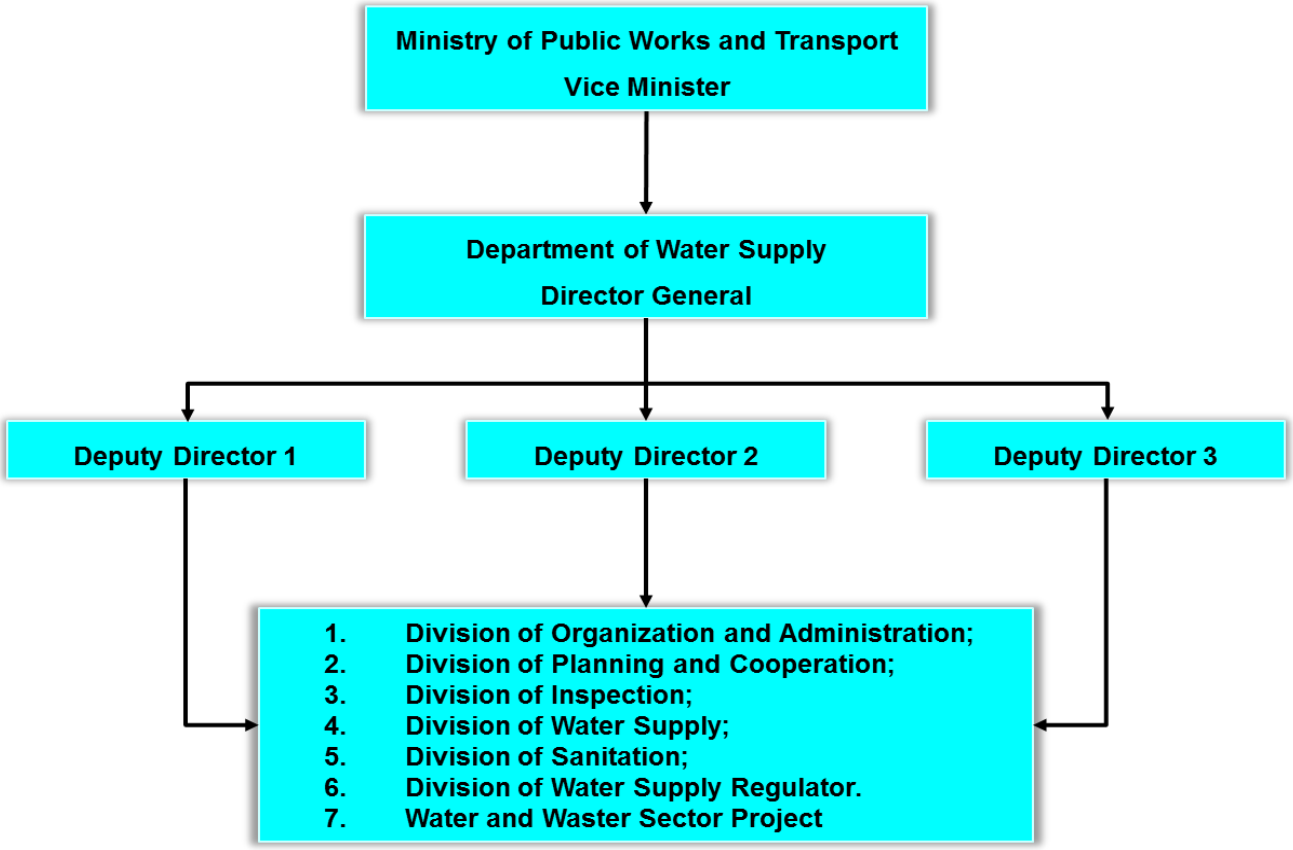
8. The number of cities/towns which an applicant's organization has responsibility for The number of cities which an applicant's organization has responsible is 18 provinces;

9. Service area of the applicant's organization (km^2) **The Government organization (Ministry does not supply water directory to people;**

10. Total population of the applicant's city (service area?)
11. Total population served by the applicant's organization
12. Number of staff members
    (1) Clerical staff: 35 persons
    (2) Engineer:
    (3) Technical staff:
    (4) Laborer:
    (5) Total: 35 people

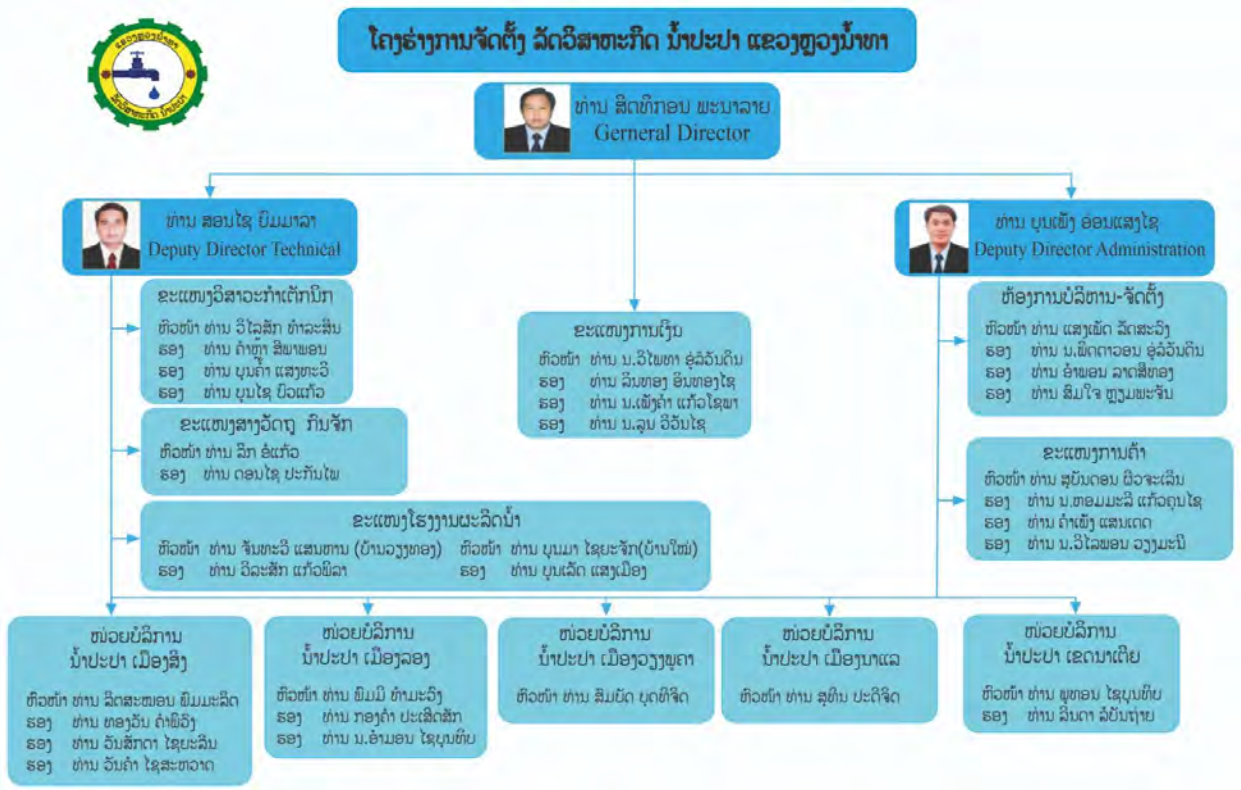
13. Organization chart 1

(Please attach the chart of applicant's organization)



14. Organization chart 2

(The organization chart of LuangNamtha Province Water Supply)



IV. Water Supply

1. Name of waterworks in which applicant is engaged Luangnamtha Province
2. Total amount of annual water abstraction (intake) volume (3,151,000m^3/year)
3. Proportion of water resources (%)
   - Surface water : (90%)
   - Groundwater: (10%)
   - Others: (%)
4. Total amount of annual water supply (1,080,101 m^3/year)
5. Total amount of annual water consumption (995,794 m^3/year)
6. Maximum daily water supply demand (100,663 m^3/day)
7. Average water supply demand (90,003 m^3/day)
8. Number of purification plants: 01
9. Total capacity of purification plants (15,780m^3/day)
10. Water quality (Please fill in the **Table2**) data of Luang Namtha water supply enterprise in 2023

[Table 2]

	Raw water (Average)	Tap (Treated) water (Standards of water quality)
Turbidity (degree)	340	0,44
Color (degree)	30,0	5
pH	7,5	7,1
Hardness (ppm)	75,0	75
Iron (ppm)	0,3	0,02
Manganese (ppm)	0,0580	0,021
Nitrate Nitrogen (ppm)	1,5	2,9
Others(Please describe:) (ppm)		

11. Main treatment process (Please choose one option from the followings.)
    (a) Conventional ☑
    (b) Slow Sand Filter
    (c) Others (Please describe: Rapid sand Filter)
12. Chlorination method (Please choose one option from the followings.)
    (a) Gas injection
    (b) Powder injection ☑
    (c) Other disinfection method (Please describe:)
13. Frequency of bacteriological tests
    (1) daily (times/day)

(2) weekly (times/week)

(3) monthly (01 times/month)

(4) annually (01 time/year)

14. Distribution pipes

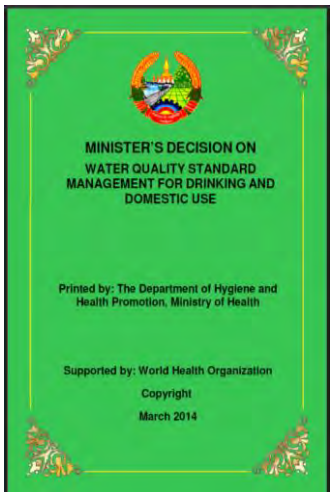
(1) Length (97,64 km)

(2) Pipe size (25-250 mm)

(3) Materials GSP, PE

(4) Inventory of pipe size

15. Storage capacity (m^3)



16. Non-revenue Water

System input volume 1,431,916 m3/year	Authorized consumption 1,121,169 m3/year	Revenue water 1,120,550 m3/year	Billed authorized consumption	1,120,550 m^3 /year (%)
		Non Revenue Water (NRW) 311,366 m3/year	Unbilled authorized consumption (ex. fire fighting, cleaning)	619 m^3 /year (%)
	Water losses 310,746 m3/year		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	493m^3 /year (%)
			Real losses (Leakage)	265,534m^3 /year (%)

17. Countermeasures for Leakage control, Currently Nampapa Luangnamtha has working with World Waternet to Implementing the GIS system to colleting the information of the infrastructure such as intake, pipeline, water treatment plant, distribution pipe, water quality, pressure and leakage.

18. Annual number of repaired leakage points:

19. Typical problems:

Please fill in the **Table 3** describing three typical problems, classified into 3 categories (i.e. big, middle and small) of current issue of unaccounted-for water and their

countermeasures.

[Table 3]

	Name of City	Unaccounted-for Water Conditions	Countermeasure
Big (Serious problem)	- Luangnamtha	Real losses (Leakage)	265,534m3 /year (22%)
Middle	- Luangnamtha	- Label cost	54% of the total cost
Small (Minor problem)	- Luangnamtha	- Electrical cost	17% of the total cost

---

V. Customer Service

Please describe the followings concerning the largest water utility in applicant's jurisdiction.

1. Number of house connections: 4,881
2. Number of public taps (PT) / Standpipes (SP)
3. Number of people per PT / SP
4. Custom of water usage for drinking (Please choose one option from the followings.)
   (a) Directly from tap
   (b) After boiling
   (c) After filtering
5. Coverage of 24-hour water supply (100%)
6. Average hours of water availability to most people (24 hrs/day)
7. Number of industrial connections
8. Number of commercial connections: 731
9. Number of other connections:4,150
10. Annual number of customer complaints: 1,580
11. Annual public relations expenditure

VI. Water Billing

1. Estimated unaccounted-for water (311,366 m^3/day);
2. Meter installation rate in each household (100%);
3. Annual number of meters replaced or repaired: N/A;
4. Name of authority which determined the water rate: LuangNamtha Provincial

Government;

5. Average unit cost per cubic meter (0,22 USD)= 5,054 Kip
6. Average unit tariff per cubic meter (0,19 USD)= 4,362 Kip
7. Year of the implementation of the current water rate: in 2018
8. Name of the system used for the calculation of water rate: On 21st October 2021.
9. Water rate structure against the amount of consumption (Please choose one option from the followings.)
   (a) Progressive
   (b) Digressive ☑
10. Frequency of reading of water meter (every days) Once a month
11. Billing period (months) Once a month
12. Collection method of water bill (Please describe: Hire outside collection, pay by bank transfer)
13. Water bill collection rate (88%)
14. Average amount of water consumption by domestic (residential) customers
    (1) Volume (6,10 m^3/month)
    (2) Water rate (USD/month) 175,596,262 Kip/month
15. Percentage of water charges against the total living expenses for the average domestic customers (%) N/A
16. Please attach the table of the present water tariff
17. Relevance between sewerage bill and water bill (Percentage of sewerage bill surcharge on water bill) N/A (No any sewerage systems in LuangNamtha Province yet).. (% of water bill)

VII. Relevant Laws, Regulations and Master Plan

1. Laws and regulations (Please describe the outline of the relevant laws and regulations regarding water supply in **Table 4**.)

[Table 4]

Name of Law or Regulation	Year of Legislation	Purpose/Description
- Law on Water Supply no. 04/NA, dated 9 July 2009; - Ministerial Agreement on Water Supply Sector Management and Development no. 37/PM, dated 30 September 1999; - Ministerial Agreement on Water Supply Price Policy of Lao PDR no. 5336/MCPTC, dated 26 April 2004; - Ministerial Agreement on Water Supply Business Adjustment no.191/PM, dated 1 July 2005; - Notice of Recommendation (revised) on Provider Operating Objectives and Monitoring of Water Supply Business Services no.022/ຄຄນປ, dated 25 July 2011; - Guidelines for Calculating and Using Indicators on Water Supply Service Operation Targets no.068/ຄຄນປ, dated 20 July 2014; - Training Manual on Safe Water Supply Planning, 2016; - Training Manual on Water Supply Information Management of the Department of Water Supply, dated 28 April 2017; - Guidelines for the Management and Evaluation of Water Supply Services of the Department of Water Supply, dated 26 May 2017; - Guidelines for Safe Water Supply Planning of the Department of Water	2009	

Supply, dated 12 June 2017; - Training Manual on Safe Climate Resilient Water Supply Planning, 2020; - Price structure for the construction and improvement of water supply systems and guidelines for using prices in construction and improvement of water supply systems no.21121/MPWT, dated 21 October 2021; - Guidelines for Managing and Evaluating Water Supply Services (23 indicators), dated 30 December 2021; - Agreement on the Appointment of the Water Supply and Sanitation Business Adjustment Committee no.25030/MPWT, dated 8 December 2021. * Legislation established in collaboration with the Ministry of Public Health includes: - Agreement on Quality Standard Management of Drinking Water and Consuming Water no.561/MPH, dated 27 February 2014; - Ministerial Agreement on the Adoption and Promulgation of the National Policy on Water, Sanitation and Hygiene no.0215/MPH, dated 30 January 2019; - Law on Hygience, Disease Prevention and Health Promotion (revised) no.08/NA, dated 21 December 2011. * Legislation established in collaboration with the Ministry of Natural Resources and Environment includes: - Regulations on Monitoring, Inspecting and Controlling the Discharge of Wastewater no.1122/ඉඍඅ, dated 1998; - Law on Environmental Protection (revised) no.29/NA, dated 18 December		

2010; - Agreement on National Environmental Standards (revised) no.81/GOV, dated 21 February 2017; - Law on Water and Water Resources (revised) no.23/NA, dated 11 May 2017; - Agreement on Groundwater Management no.1509/MONRE, dated 21 March 2019; - Law on Meteorology and Hydrology no.36/NA, dated 13 November 2017.		

2. National development plan and its sector plan in waterworks

Please describe the outline of plan(s) in the **Table 5** and attach a copy of Sector Plan in English.

[Table 5]

Name of Plan	Target Period	Outline of Content
Workplan 1 The legal framework includes reviewing, revising and formulating policies and regulations under various laws, as well as the guidelines and manuals set out in the Water Supply Law are developed.		

VIII. Foreign Assistance

Please describe the outline of foreign assisted programs in the last 10 years in **Table 6**.

[**Table 6]**

Name of Donor	Year	Grant/Loan	Amount of Fund	Outline of Program/Project
For the last 11 years, the Water Supply and Sanitation Sector has received financial assistance and expert advice from various development partners including: ADB,EXIMBANK				

(China), EDCF, EU, KfW, WB, NORINCO, AFD, JICA, KOICA, GGGI, NORAD, NEDA, BTC,WHO, UN-HABITAT, SEDIF, EMWF, World Waternet Amsterdam (WaterWorX), etc.				

IX. Priority Needs

1. Major constraints

[Table 7]

Constraints	Rating of constraints		
	Very Severe	Severe	Moderate
1. Lack of definite government policy for the sector			✓
2. Funding limitations	✓		
3. Inadequate or Outmoded legal framework		✓	
4. Inappropriate institutional framework		✓	
5. Inadequate water resources	✓		
6. Insufficient knowledge of water resources	✓		
7. Inadequate cost-recovery framework	✓		
8. In sufficiency of trained personnel	✓		
(1) Professional			✓
(2) Sub-professional			✓
9. Lack of planning and design criteria		✓	
10. Inappropriate technology		✓	
11. Intermittent water service		✓	
12. Operation and maintenance		✓	
13. Logistics		✓	
14. Import restrictions			✓
15. Non-involvement of communities		✓	
16. Insufficient health education efforts		✓	
17. Others (specify):			

2. Technical/Management problems (Please explain technical or management problems your department/organization currently experiencing in **Table 8**.)

[Table 8]

Outline of Problem	Applied Countermeasure
- The Improve and upgrade the capacity of the Water Supply Vocational Training Center to be able to provide technical and management training to the staff of the Water Supply and Sanitation Department throughout the country - Water lost Management; - Budget management.	

3. Problems to be solved at present and in the future (Please describe concretely as many items as possible including even minutia. This information will be utilized for formulating improvement plan.)

[Table 9]

Outline of Problem	Background to Efforts	Present Status, etc
Deploy public-private partnerships in the water supply and sanitation sector as a rule under the law to attract all sectors of the economy to participate in development, as well as to encourage existing private sectors to strictly abide by government policies, laws and regulations		
Create a database by collecting, gathering, researching and compiling information, technical, economic, financial and accounting information to support the development of monitoring, evaluation of policy implementation, strategic plans and operations on water supply and		

sanitation		
Create opportunities for women to receive education and upgrade their knowledge and skills in management, leadership and raise the role of women to have the opportunity to be in public administration at both central and local levels, as well as in enterprises;		

X. Expectation toward the Program.

These expectations reflect a focus on tangible outcomes and the direct application of knowledge gained from the training to benefit my organization and its stakeholders, Such as:

• Technical Expertise: Supervisors would expect me to gain advanced technical knowledge and skills that can be directly applied to improve water supply services within my organization.

• Best Practices: Learning about global best practices, particularly from Japan, that can be adapted and implemented in my home country.

END.

Country Report Presentation

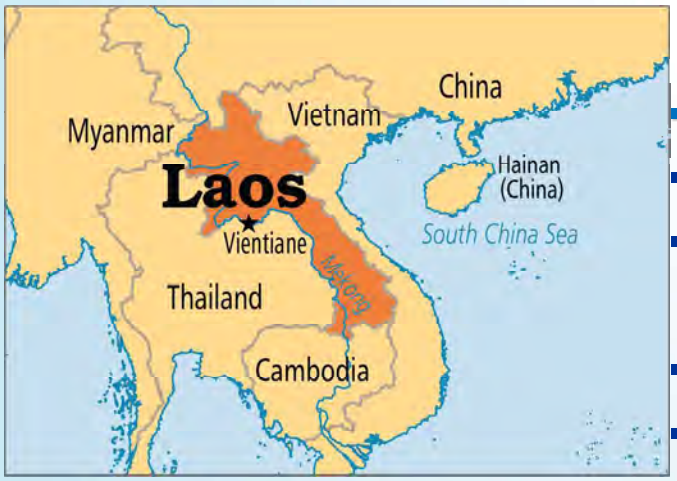
Topic:
Administration and Management of water supply services

NAME: KHONESAVANH VINAVONG
COUNTRY: LAO PDR

COUNTRY REPORT PRESENTATION

1. General country profile
2. Management of Water Quality
3. Reduction of Non-Revenue Water
4. Customer Service
5. Water Billing
6. Major Recent Achievement in Improvement of Water Supply Services/Management

1. GENERAL COUNTRY PROFILE



- **Whole Country, Area:** 236,800 Km2
- **Population : 7.6 million people (in 2023)**
- **Coverage Water Supply: 84% (in 2022)**

Selected Water Supply Province

- **LuangNamtha Province In 2021**
- **Population in Service area: 78,853 people**
- **Population Served: 63,474 people**




MY MISSION

- The Water Supply and Sanitation Sector Development Strategy for the period until 2030 aims to ensure that all people living in urban areas have access to safe and comprehensive water and sanitation services at a reasonable price.
- This will be achieved by ensuring that 90% of the population residing in provincial and district municipalities have access to safe and secure water supply,
- that 100% of the population in these areas have access to hygienic latrines,
- and that 50% of the wastewater in provincial and district municipalities is treated.
- Additionally, effective sanitation management practices will be implemented to ensure the safety of the society and the environment.

MY MISSION…CONTINUE..

- My responsibility of inspection division is to follow and support the activities of Water supply infrastructure development under Ministry of Public works and Transport, that related with Law and regulation. Particularly, Technical specification;
- Legislations completed in 2021 includes The Unit Price Structure for Construction and Improvement of Water Supply System,

2. MANAGEMENT OF WATER QUALITY

- THE WATER QUALITY : REFER TO WATER THAT MEETS THE HYGIENE AND SAFETY STANDARDS FOR CONSUMPTION IN ACCORDANCE WITH THE REGULATIONS ENDORSED BY THE MINISTRY OF HEALTH;
- BASE ON AGREEMENT OF MINISTRY OF HEALTH STANDARDS NO. 561/MOH, DATED FEBRUARY 27, 2014, WE CAN INSPECT FOR 23 PARAMETERS OF WATER QUALITY,
- ESPECIALLY ...TURBIDITY, COLOR, PH, HARDNESS, IRON, MANGANESE, NITRATE NITROGEN…AND OTHER…

3. Reduction of Non-Revenue Water

Example: LUANGNAMTHA Province State Owned Enterprise, 2023

<table>
<tr><td rowspan="4">System input volume 1,431,916 m3/year</td><td rowspan="2">Authorized consumption 1,121,169 m3/year</td><td rowspan="1">Revenue water 1,120,550 m3/year</td><td>Billed authorized consumption</td><td>1,120,550 m^3/year (%)</td></tr>
<tr><td rowspan="3">Non Revenue Water (NRW) 311,366 m3/year</td><td>Unbilled authorized consumption (ex. fire fighting, cleaning)</td><td>619 m^3 /year (%)</td></tr>
<tr><td rowspan="2">Water losses 310,746 m3/year</td><td>Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)</td><td>493m^3 /year (%)</td></tr>
<tr><td>Real losses (Leakage)</td><td>265,534m^3 /year (%)</td></tr>
</table>

7

4. CUSTOMER SERVICE IN WHOLE COUNTRY

Water Supply Infrastructure and Service Development In 2011, there were 87 water supply production factories, with a total design capacity of 354.828 cubic meters/day. Services were provided in 91 areas, of which 73 districts and 823 villages were serviced. The total population being serviced was around 1.003.503 with a coverage ratio of 57,39%.

By the end of 2021, we had 174 water supply production factories (87 increased),with a total design capacity of 681,322 cubic meters/day (326,494 cubic meters/day increased). Total water loss was 27.3%. Services were provided in 111 areas, of which 117 districts (44 increased) and 1,480 villages (634 increased) were serviced.

The total population being serviced was around 1,842,077 (838.574 increased) with a coverage ratio of 77.4% (20,01% increased).

8

5. WATER BILLING

THE STRUCTURE OF WATER TARIFF AS IN BELOW:

- 1. THE AVERAGE PRICE OF RESIDENTIAL PROPERTY; 2,383 KIP IN 2023

2. THE PRICE FOR THE GOVERNMENT USE, 3,700 KIP IN 2023

3. THE AVERAGE PRICE OF CUSTOMERS IN THE BUSINESS CATEGORY AND SALES; 5,550KIP IN 2023

(ຕົວຢ່າງການຄິດໄລ່ຕົວເລກສົມມຸດຖານ)

ປະເພດລູກຄ້າ	ຫົວໜ່ວຍ	ລາຄານ້ຳປະປາ ປີ 2021-2023			
		ປີຖານ 2020	ປີຖານ+1 2021	ປີຖານ+2 2022	ປີຖານ+3 2023
1. ຄົວເຮືອນທົ່ວໄປ					
0-7 ມ^3	ກີບ/ມ^3	1.400	1.550	1.700	1.850
8-15 ມ^3	ກີບ/ມ^3	1.800	2.050	2.200	2.350
>15 ມ^3	ກີບ/ມ^3	2.200	2.400	2.500	2.600
ລາຄາຂາຍສະເລ່ຍຂອງຄົວເຮືອນ	**ກີບ/ມ^3**	**1.928**	**2.137**	**2.256**	**2.383**
2. ສຳນັກງານຫ້ອງການລັດ	ກີບ/ມ^3	2.800	3.100	3.400	3.700
3. ທຸລະກິດ, ບໍລິການ, ການຄ້າ ແລະ ອຸດສາຫະກຳ	ກີບ/ມ^3	4.200	4.650	5.100	5.550
ລາຄາຂາຍສະເລ່ຍລວມ	**ກີບ/ມ^3**	**2.714**	**2.972**	**3.201**	**3.396**
ລາຄາຕົ້ນທຶນສະເລ່ຍ	**ກີບ/ມ^3**	**2.553**	**2.770**	**2.939**	**3.091**

ໝາຍເຫດ: ຕົວເລກລາຄານ້ຳປະປາ ສາມາດປັບເປັນເລກມີນໄດ້ ເພື່ອໃຫ້ສອດຄ່ອງກັບສະກຸນເງິນ.

9

5. WATER BILLING… CONTINUE…

- Average amount of water consumption by domestic (residential) customers volume (1,903m^3/month)
- Average of tariff collection (21USD/month)

10

6. MAJOR RECENT ACHIEVEMENT IN IMPROVEMENT OF WATER SUPPLY SERVICES/MANAGEMENT
(HEAD OFFICE OF LUANGNAMTHA PROVINCE)

INDICATORS	2004 or 2005	2014 or 2015	Goals for 2025
Staff/1,000 connections	7,49	6,83	6,17
Production capacity (m^3/day)	3,000	3,000	6,300
Water quality standards	None	MOH/WHO	MOH/WHO
Coverage area	83%	88%	91%
Supply duration (hour/day)	24	24	24
Supply pressure	0.5 bar	1.7 bars	1.7 bars
Number of connections	13,626	16,112	18,490
NRW	24%	24%	20%
Collection ratio	87%	92%	92%
Staff number	102	110	114

11

Thanks for your Pay attention

5. NIGERIA

Inception Report

Country:**NIGERIA**

Name:**Ms. ANYAKORA NKOLIKA VICTORIA**

---

1. Outline of Water Supply Services

1-1. **Legal Basis of Water Supply Services Water:**

Supply Services for the Federal Capital Territory Administration are based on on its Establishment Act 2017 passed into Law as well as other Laws and Regulations of the Federal Republic of Nigeria on drinking water as recommended by the Federal Ministry of Water Resources, such as the Nigerian Standards for Drinking Water Quality (NSWQ).

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

- The Federal Ministry of Water Resources and Sanitation oversees the management of water resources in Nigeria.
- The Federal Capital Territory Administration is in-charge of provision of potable water to the residents of Federal Capital Territory through infrastructural development and management, water production, supply and collection of revenue.

1-3. **Main Actor of Water Supply Utilities**:

- The Federal Capital Development Authority is in-charge of water infrastructure and construction.
- The Federal Capital Territory Water Board is in-charge of operation and maintenance of all water infrastructure used in the production of potable water.

1-4. **Mission/Vision of Water Supply Utilities**:

- **Mission:** To provide water consumers with potable, adequate and affordable water supply services and effective water resources

management for sustainable development .

- **Vision:** To provide safewater for all, exceeding customer expectations while protecting the environment.

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

- Mission: To provide the residents of the Federal Capital Territory with potable water using the Best of Industry Technology (BIT) and a highly skilled work force to provide exceptional services
- Vision: To be a world class utility service provider that is consistent in excellent service delivery and uncompromising in the quality of its product- potable water.

---

2. Water Supply Service Levels

2-1. Main Performance Indicators (PI)

Coverage area	280(sq. km)
Population Served	1,169,234
Collection ratio	49.6(%)
Production capacity	720,000 (m3/day)
Supply duration	24(hr/day)
Supply pressure	1MPa
Non-Revenue Water	50.3(%)
Water quality	Good
Staff number	1,172
Number of connections	60,459
Staff/1,000 connections	19.39(people/1,000connections)

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

---

3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems:

- Pollution of raw water catchment with solid wastes/plastics at one of the major tributaries
- Lack of new analytical methods and equipment
- Inadequate monitoring kits
- Lack of ISO/IEC17025, 2017 for quality control laboratory

3-2. Current Actions against Those Challenges/Problems:

- Manual evacuation of solid wastes/plastics after rainfall.
- Catchment monitoring
- Articulation of required laboratory equipment for replacement.
- Sensitization of local communities at the catchment of indescrimate dumping of waste and proper waste management practice.

3-3. Any Achievements:

Reduction of solid wastes/plastics at the dam

3-4. Water Quality Standards for Drinking Water:

The Federal Capital Territory Water Board uses the Nigerian Standard for Drinking Water Quality (NSDWQ) and the World Health Organisation (WHO) Regulations.

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

There exists a monitoring system for the safety of drinking water, which will be further strengthened after the development of comprehensive water safety plan for the water treatment plants.

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

There exists a Water Safety Plan that needs to be reviewed to capture all the treatment plants and implementation.

4. Reduction of Non-Revenue Water

4-1. Current Situation and Major Challenges/Problems:

- The JICA Medium Term Plan on Non-Revenue Water is on-going, but needs to be strengthened with current technologies.
- Delay in the release of budgeted funds.
- Lack of inter-departmental/unit cooperation to key-into the objectives of Non-Revenue Water.
- Most of the infrastructure are aged, and strategic plan is needed to be developed for their replacement.

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

- Medium-Term Strategic Plans are being followed while concerted efforts are made to ensure that budgeted funds are released for timely implementation of contents of the Plan.
- Full implementation of Autonomy of the Board as would clearly define the organizational structure and streamline the activites of various units and departments to achieve distinct cooperation.
- Completion of on-going procurement and installation of hard and software for real time pipeline network information/monitoring and transmission project.
- Proposal to develop Strategic Plan and source the funding for the replacement of aged infrastructure.

4-3. Any Achievements:

- Gradual implementation of Medium Term Plan on Non Revenue Water as contained in the budget.

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

Authorized consumption	Revenue water	Billed authorized consumption	(m3 /year) 89.3(%)
	Non-Revenue	Unbilled authorized	

	Water (NRW)	consumption (ex. fire fighting, cleaning)	(m3 /year) 10.7(%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	(m3 /year) 46.1(%)
		Physical losses (Leakage)	(m3 /year) 53.9(%)

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

Phased implementation of Medium Term Plan for the budget year and use of leak detection equipment provided by JICA

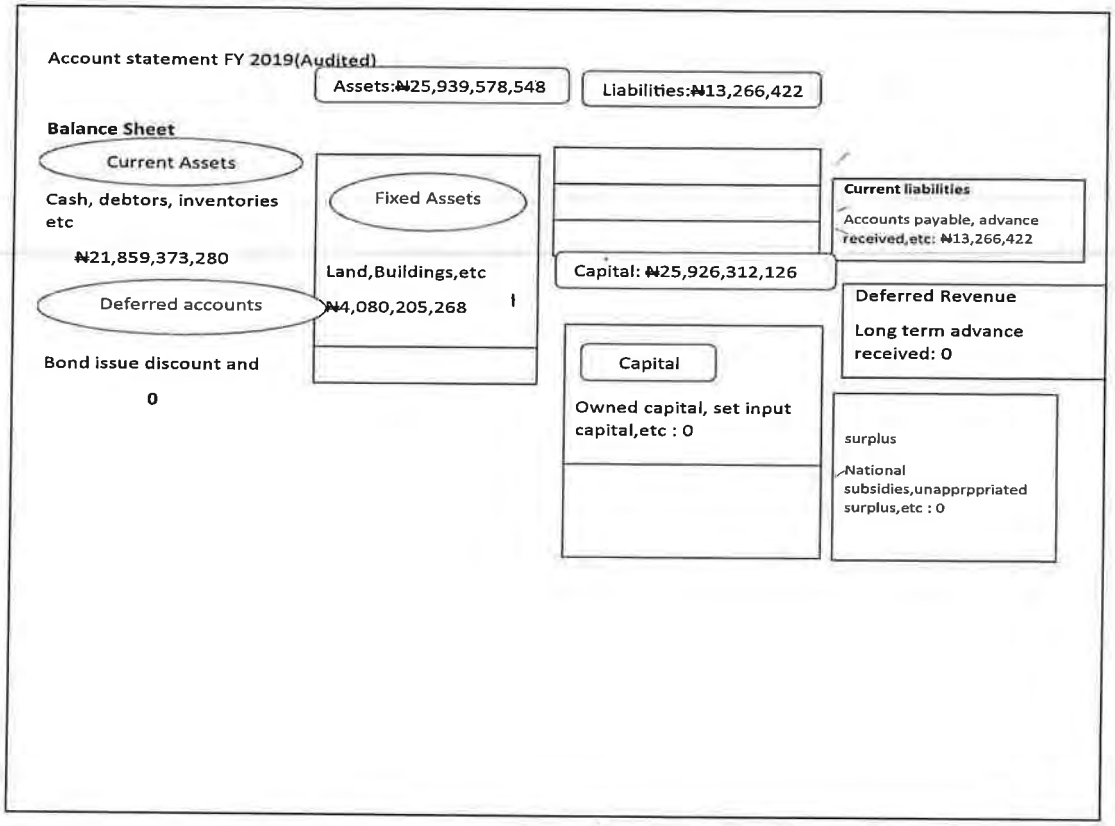
---

5. Accounting system of Water Supply Service

5-1. **Water Tariff in your Organization**:

S/N	DOMESTIC	COMMERCIAL
	₦110/m^3	₦300/m^3

5-2. **Balance Sheet of your Organization**



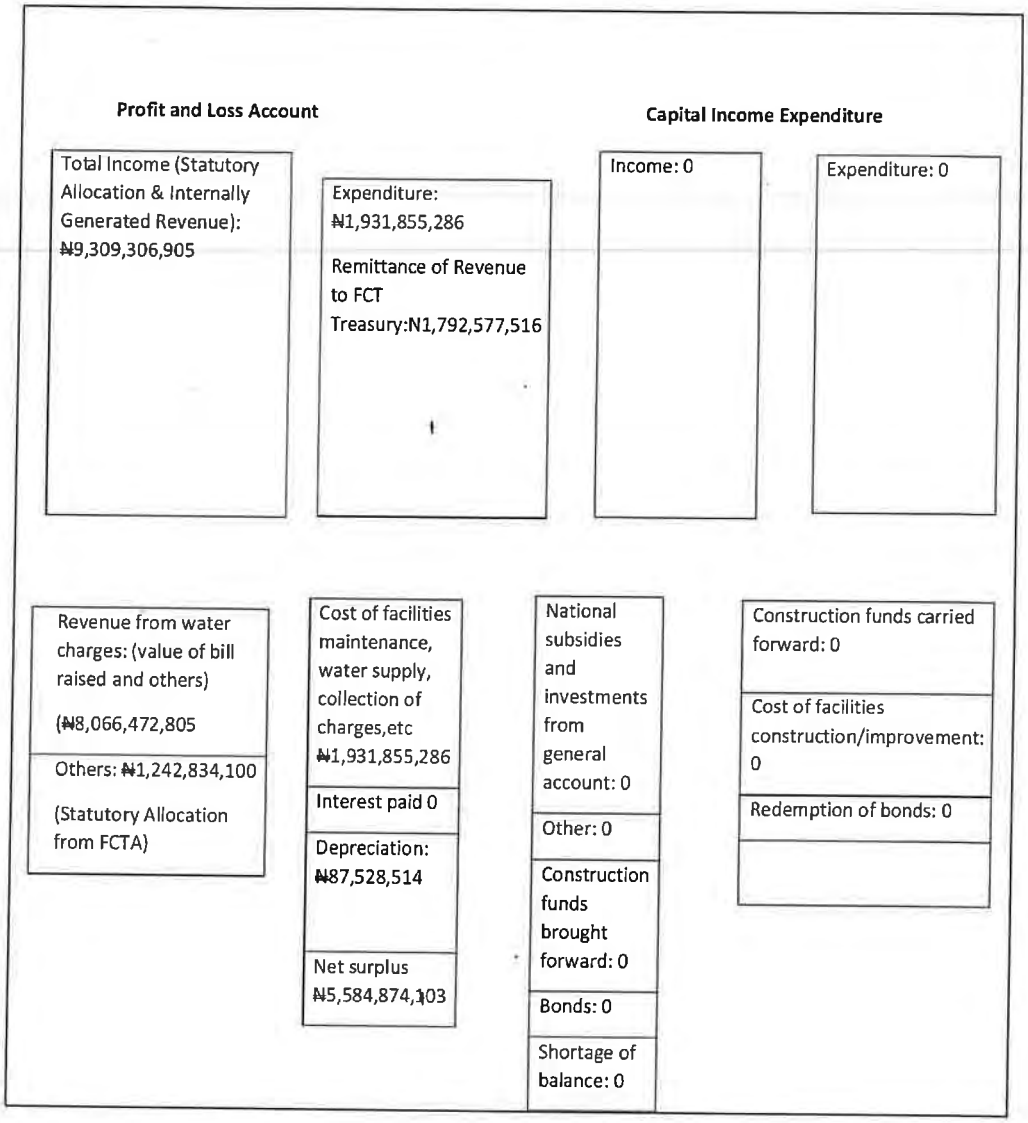
5-3. **Profit and Loss Statement of your Organization**

(*[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:

- Completion of JICA Non-Revenue Water Projects/ and gradual implementatikon of Medium Term Strategic Plan for NRW.
- Completion of JICA for introduction of of 1.2MW Solar electricity generation system for the Water Treatment Plant facility al Lower Usuma Dam.
- Completion of JICA Proof of Concept (POC) Project / Smart Bill project for some Area Offices.

- Completion of JICA Water Supply Business Advisor Project

---

7. Recent Challenges to Improve Water Supply Services:

- Inadequate human resources for the administration and management of water supply systems
- Inadequate measures against Non - Revenue Water (NRW) reduction operations
- Lack of Strategic Plan and funding for the replacement of aged infrastructure
- Poor management and administration capacity of installed facilities
- Lack of maintenance plan and implementation of effective operation guidelines
- Slow implementation of Standard Operational Plan
- Lack of implementation of Technical Cooperation guidelines to attract more development partners.
- Lack of group management operations for public private partnership and collaborationfor enhanced business operations

---

8. Expectations toward Japan

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

Sustained relationship between governments of Nigeria and Japan in the provision of conducive environment for capacity and physical development needed for knowledge acquisition and sharing.

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

Experience and idea sharing, and building of linkages and partnerships for the future.

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

Exploration of provision of Plan development and funding, for the replacement of aged infrastructure and other allied water supply technologies that will improve the administration and management of water supply services in the Federal Capital Territory Water Board, Abuja, Nigeria.

9. Expectations toward the Program.

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

To be pragmatic at the training and capture the needed basics for transfer to other relevant staff of the Federal Capital Territory Water Board, Abuja, Nigeria as would improve and sustain water supply services.

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

- To acquire the requisite knowledge for transfer to other relevant staff, to re-strategise and inject newer ideas for improved water supply services in the Federal Capital Territory Water Board, Abuja, Nigeria.
- To adopt the acquired knowledge in generating improved means of data collection, collation and analysis for the development and implementation of various operations and maintenance plans to achieve effective and efficient monitoring and evaluation of installed facilites and services.
- To expolre alternative means of managing the aged infrastructure while planning for their replacements, including expanding the horrizon that will attract more development partners for improved funding.
- To harness the exposure and linkages from other participants, JICA , Japanese Water Utilities and Private Companies for the efficient and effective production of potable water within the vision and mission of the Federal Capital Territory Water Board, Abuja, Nigeria.
- To promote group management operations for public private partnership and collaboration towards enhanced business operations, mutual collaboration / bilateral communications
- To adopt advanced implementation strategy for smart water meters through introduction of digital technology and optimization of operations to improve customer service and operational efficiency

END.

Nigeria / Dr. Nkolika Victoria ANYAKORA

Organization	FCT Water Board, Abuja (FCTWB)
Position	Deputy Director
Expertise	Water & Environmental Engineering, Process & Materials Engineering, WASH and Project Management

Contact

WhatsApp

Training Program

ADMINISTRATION AND MANAGEMENT OF WATER SUPPLY SERVICES (B)

Inception Report Presentation

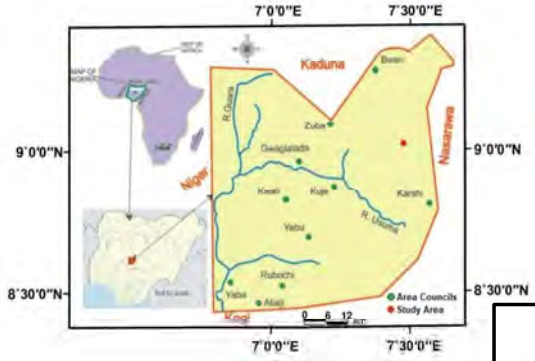
Venue: JICA Tokyo Center, Japan
Date: 19th November 2024

OUTLINE

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 f Water Supply Services
8. Expectations Toward Japan (Government/Jica, Water Utilities, Private Companies)
9. Expectations Toward The Program

Conclusion

1. Outline of Water Supply Services



Source: Map of Nigeria showing the Federal Capital Territory
https://www.researchgate.net/figure/Map-of-abuja-FCT-showing-the-sitelocations-points-at-Lugbe-and-Gosa-communities_fig1_34

Whole Country: Nigeria
Area : 923,768km²
Population : 225,082,083 (2022 est.) (Source: World Fact Book, 2023)
Water Supply System/City: FCT Water Board / Abuja
Service Area : 280 km²
Population Served: 1,169,234

FCT WATER BOARD ABUJA

VISION

To be a world class utility service provider which is consistent in excellent service delivery and uncompromising in the quality of its product-potable water.

MISSION

To provide residents of FCT with potable and affordable water supply services using the best of industrial technology and highly skilled workforce to provide exceptional services

Demarcation of Water Supply Services:

- ❑ The Federal Ministry of Water Resources and Sanitation oversees the management of water resources in Nigeria.
- ❑ The Federal Capital Territory Administration is in-charge of provision of potable water to the residents of Federal Capital Territory through infrastructural development and management, water production, supply and collection of revenue.

.**Main Actor of Water Supply Utilities**:

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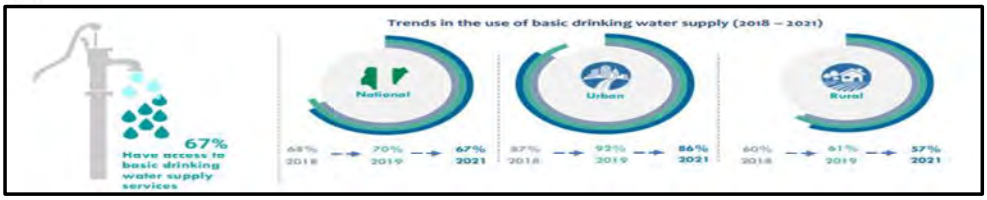
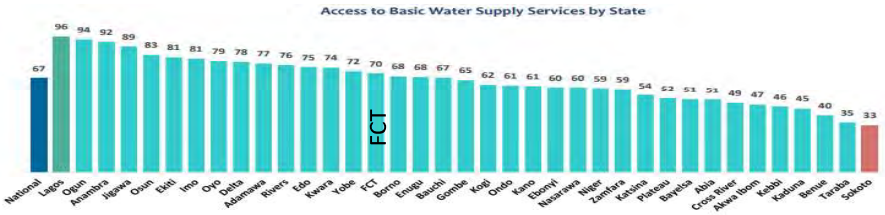


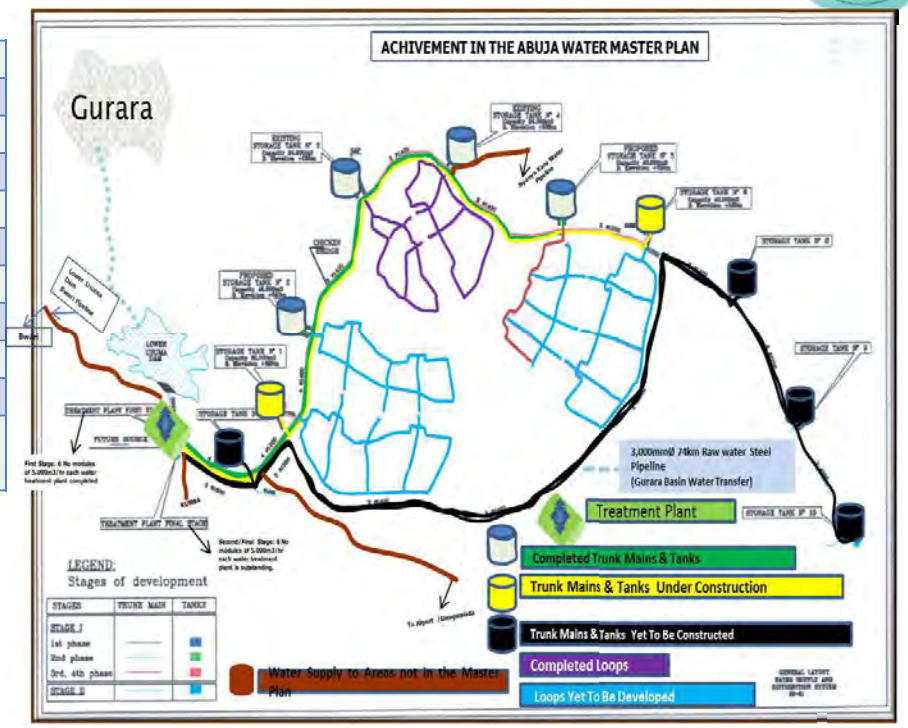


Source: Federal Ministry of Water Resources (FMWR), Government of Nigeria, National Bureau of Statistics (NBS) and UNICEF (2022). Water, Sanitation and Hygiene: National Outcome Routine Mapping (WASHNORM) 2021: A Report of Findings. FCT Abuja. Nigeria.
https://www.unicef.org/nigeria/media/5951/file/2021%20WASHNORM%20Report%20.pdf

2. Water Supply Service Levels

Main Performance Indicators (PI)

Coverage area	**280(sq. km)**
Population Served	**1,169,234**
Collection ratio	**49.6(%)**
Production capacity	**720,000 (m^3/day)**
Supply duration	**24(hr/day)**
Supply pressure	**1MPa**
Non-Revenue Water	**50.3(%)**
Water quality	**Good**
Staff number	**1,172**
Number of connections	**60,459**
Staff/1,000 connections	**19.39(people/1,000connections)**



3. Management of Water Quality

The water quality is good, within acceptable national and international standards

Figure : Water Quality Control Laboratory

Figure: Situation experienced at the Lower Usuma Dam after rainfall

3-1. **Current Situation and Major Challenges/Problems:**

- Pollution of raw water catchment with solid wastes/plastics at one of the major tributaries
- Lack of new analytical methods and equipment for emerging pollutants
- Inadequate monitoring kits

3-2. **Current Actions against Those Challenges/Problems:**

- Manual evacuation of solid wastes/plastics after rainfall.
- Catchment monitoring
- Articulation of required laboratory equipment for replacement.
- Sensitization of local communities at the catchment of indescrimate dumping of waste and proper waste management practice.

3-3. **Any Achievements:**

Engagement with relevant stakeholders on reduction of solid wastes/plastics at the dam

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

The Federal Capital Territory Water Board uses the Nigerian Standard for Drinking Water Quality (NSDWQ) and the World Health Organisation (WHO) Regulations.

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

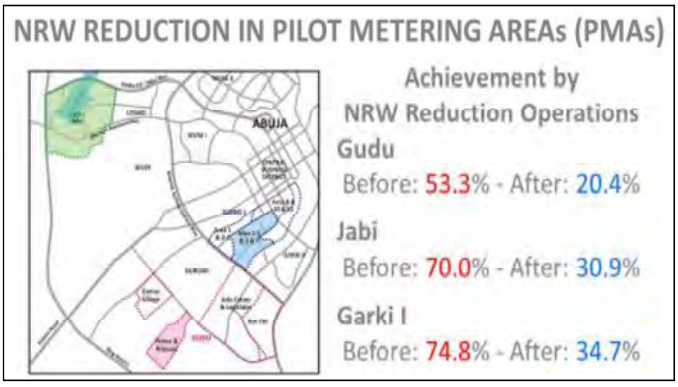
There exists a monitoring system for the safety of drinking water, which will be further strengthened after the development of comprehensive water safety plan for the water treatment plants.

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

There exists a Water Safety Plan that needs to be reviewed to capture all the treatment plants and implementation.

4. Reduction of Non-Revenue Water : Current Situation & Major Challenges

Non Revenue Water Project in Collaboration with JICA (2014 -2018).



4-1. **Current Situation and Major Challenges/Problems:**

- ❑ The JICA Medium Term Plan on Non-Revenue Water is on-going, but needs to be strengthened with current technologies.
- ❑ Delay in the release of budgeted funds.
- ❑ Lack of inter-departmental/unit cooperation to key-into the objectives of Non-Revenue Water.
- ❑ Most of the infrastructure are aged, and strategic plan is needed to be developed for their replacement.

Water Balance of Gudu PMA After NRW Reduction Operations

Item				m³/day	%	%
System Input Volume (SIV) 3,102	Authorized Consumption 2,774	Billed Authorized Consumption	a. Billed Metered Consumption	2,373	76.5	79.6
			b. Billed Unmetered Consumption	97.0	3.1	
			b. Billed Unmetered Consumption (Excess Use)	199.6	6.4	20.4
		Unbilled Authorized Consumption	c. Unbilled Metered Consumption	-	-	
			d. Unbilled Unmetered Consumption	104.0	3.4	
	Water Losses 328	Commercial Losses	f. Customer Metering Inaccuracies	0	0	
			e. Unauthorized Consumption	327.7	10.6	
		Physical Losses	g. Leakage on Distribution Network			
			i. Leakage on Service Connections up to Point of Customer Use			

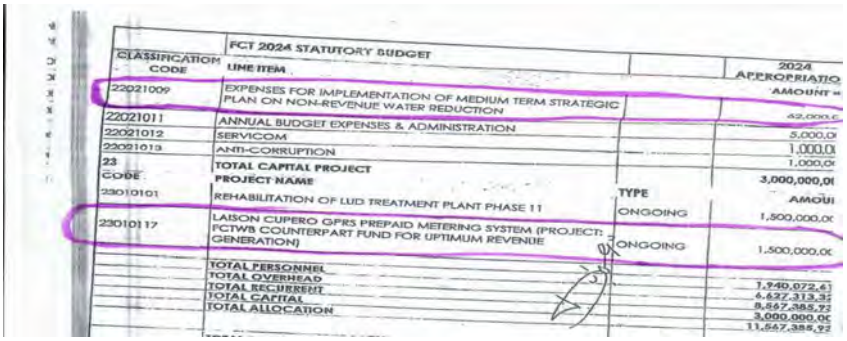
4. Reduction of Non-Revenue Water : Current Action Against those Challenges / Problems

THE MEDIUM-TERM STRATEGIC PLAN ON NRW REDUCTION (2022-2026)

		2022	2023	2024	2025	2026	Total
NRW (Volume)							
Baseline NRW	million m3/annum	54.75	54.75	54.75	54.75	54.75	
Target NRW	million m3/annum	51.59	48.42	45.25	42.09	39.80	
Reduced NRW	million m3/annum	3.16	6.33	9.50	12.66	14.95	
NRW Ratio							
Baseline NRW Ratio	%	48.3	48.3	48.3	48.3	48.3	
Target NRW Ratio	%	45.5	42.7	39.9	37.1	35.1	

- Medium-Term Strategic Plans are being followed while concerted efforts are made to ensure that budgeted funds are released for timely implementation of contents of the Plan.
- Full implementation of Autonomy of the Board as would clearly define the organizational structure and streamline the activities of various units and departments to achieve distinct cooperation.
- Completion of on-going procurement and installation of hard and software for real time pipeline network information/monitoring and transmission project.
- Proposal to develop Strategic Plan and source the funding for the replacement of aged infrastructure

Year	NRW (%)
2022	50.32
2023	49.52
2024	On-going



BUDGET FOR NRW – MTP AND PREPAID METER THROUGH PPP (2024)

4. Reduction of Non-Revenue Water Activities :Achievements

Progress of Work for Implementation of the Medium-Term Strategic Plan on Non-Revenue Water Reduction

S/N	Description	2023 Jan	Feb	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	Update of Network Drawings												
2	Update of Customer List (Enumeration)												
3	Monitoring, Maintenance/ Replacement of Faulty Equipment												
4	Leakage detection and Repair Works												
5	Illegal Connection survey , meter inaccuracy test and Counter measures												
6	Data Collection and analysis (Billed Value, water production, Water sales and SIV)												
7	Water Balance Analysis												
8	Survey on Trunk, Distribution Mains and Reservoirs												
9	Pressure measurement, residual chlorine test at consumer end etc)												
10	In-House Training on NRW reduction Operations etc												
11	Metering of Customers on Estimate/Flat Rate System												
12	Procurement of Utility Vehicles for NRW reduction Operations												
13	Procurement of working tools for												

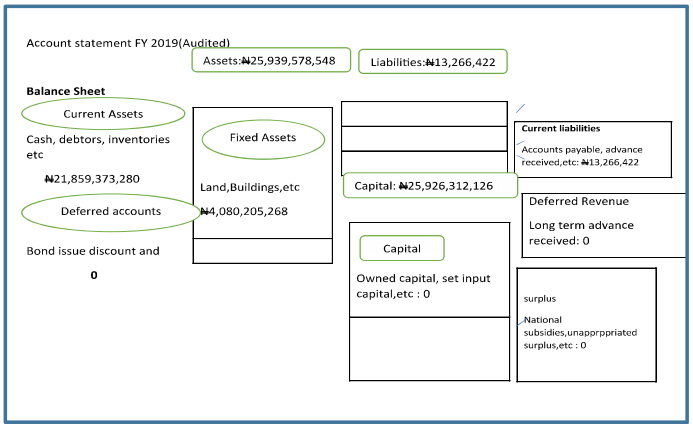
Gradual implementation of Medium Term Plan on Non Revenue Water as contained in the budget

Legend
- On-going
- Executed
- Not commenced

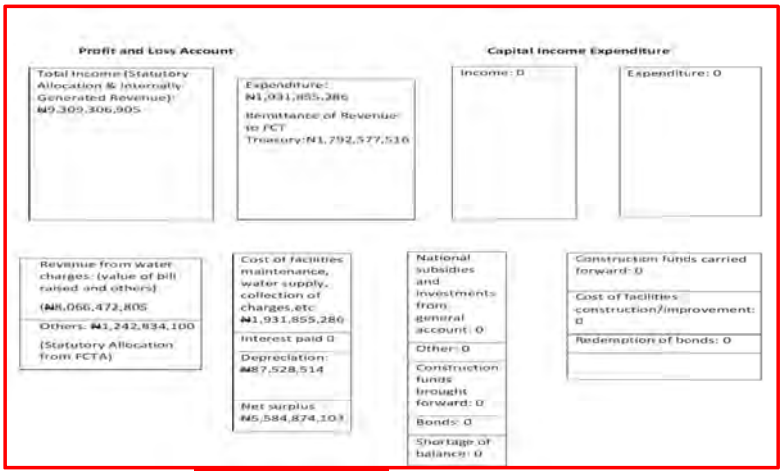
Year	NRW (%)
2022	50.32
2023	49.52
2024	On-going

5. Accounting system of Water Supply Service (FY 2019)

Balance Sheet



Profit and Loss Account



Water Tariff: Revised October 2022

Customer Category	Tariff (₦/m³)
Domestic	110
Commercial	300

METER TYPES

CONVENTIONAL METER

PRE-PAID WATER METER

AUTOMATED METER READING (AMR) METER

6. Major Recent Achievements in Improvement of Water Supply Services

- Completion of JICA Project for introduction of 1.2MW Solar electricity generation system for the Water Treatment Plant facility al Lower Usuma Dam.
- Completion of JICA Proof of Concept (POC) Project / Smart Bill project for some Area Offices.
- Completion of JICA Water Supply Business Advisor Project
- Completion of JICA Non-Revenue Water Projects/ and gradual implementation of Medium Term Strategic Plan for NRW:
  - Active leak detection and repair
  - Meter replacement and installation
  - Disconnection or validation of illegal connections
  - Customer Enumeration, Elimination of flat-rate/Estimate customers, etc.
  - Dedicated budget sub-head for the implementation of NRW Medium Term Strategic Plan and the management and operations of Smartbills, respectively.
  - Replacement of old pipes, dilapidated valves, meters and pumps
- These activities have increased access to potable water that was been wasted as NRW. More people have access to the water been wasted as NRW with increased revenue
- NRW Ratio= 50%

REPAIR OF PHYSICAL LOSSES ON TRUNK MAINS

JICA SOLAR PROJECT

1.2 MW Grid-tied Solar Power generating Plant has helped in the reduction of electricity bill and reduce CO2 emission at WTP

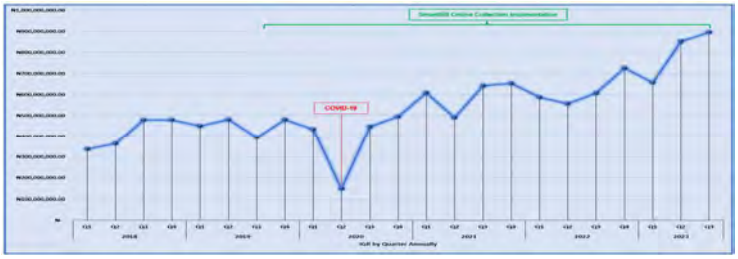
JICA WATER SUPPLY BUSINESS ADVISOR PROJECTADVISOR

Changed the mindset of both the management and middle-level staff towards business operations

CAPACITY BUILDING AND WASH EDUCATION IN SCHOOLS

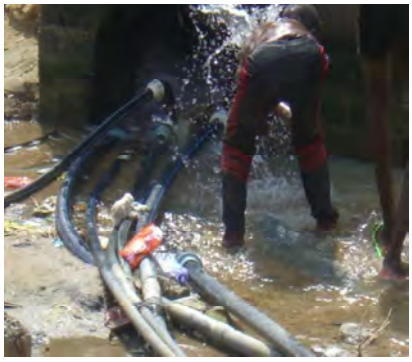
WASH Education and Staff in-house training & re-training by JICA Trained officers in FCTWB for knowledge transfer, career progression and succession plan.

FCTWB REVENUE PROFILE 2018 - 2023



7. Recent Challenges to Improvement of Water Supply Services

- Inadequate human resources for the administration and management of water supply systems
- Inadequate measures against Non - Revenue Water (NRW) reduction operations
- Lack of Strategic Plan and funding for the replacement of aged infrastructure
- Lack of maintenance plan and implementation of effective operation guidelines
- Slow implementation of Standard Operational Plan
- Lack of implementation of Technical Cooperation guidelines to attract more development partners.
- Lack of group management operations for public private partnership and collaboration for enhanced business operations



8. Expectations toward Japan

Expectations toward Japanese Government and JICA:
Sustained relationship between governments of Nigeria and Japan in the provision of conducive environment for capacity and physical development needed for knowledge acquisition and sharing

Expectations toward Japanese Water Utilities:
Experience and idea sharing, and building of linkages and partnerships for the future.

Expectations toward Japanese Private Companies:
Exploration of provision of Plan development and funding, for the replacement of aged infrastructure and other allied water supply technologies that will improve the administration and management of water supply services in the Federal Capital Territory Water Board, Abuja, Nigeria.

9. Expectations toward the Program

Expectations of my supervisors toward my participation in the program:

To be pragmatic at the training and capture the needed basics for transfer to other relevant staff of the Federal Capital Territory Water Board, Abuja, Nigeria as would improve and sustain water supply services in achieving SDG – 6

. **My expectation, comments and requests:**

- ❑ To acquire the requisite knowledge for transfer to other relevant staff, to re-strategise and inject newer ideas for improved water supply services in the Federal Capital Territory Water Board, Abuja, Nigeria.
- ❑ To adopt the acquired knowledge in generating improved means of data collection, collation and analysis for the development and implementation of various operations and maintenance plans to achieve effective and efficient monitoring and evaluation of installed facilities and services.
- ❑ To explore alternative means of managing the aged infrastructure while planning for their replacements, including expanding the horizon that will attract more development partners for improved funding.
- ❑ To harness the exposure and linkages from other participants, JICA , Japanese Water Utilities and Private Companies for the efficient and effective production of potable water within the vision and mission of the Federal Capital Territory Water Board, Abuja, Nigeria.
- ❑ To promote group management operations for public private partnership and collaboration towards enhanced business operations, mutual collaboration / bilateral communications.
- ❑ To adopt advanced implementation strategy for smart water meters through introduction of digital technology and optimization of operations to improve customer service and operational efficiency

SUSTAINABLE DEVELOPMENT GOAL NUMBER 6

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CONCLUSION

- ❑ The adoption of the SDGs by the United Nation's 193 Member States at a historic summit in 2015 is a clarion call for all to be actively involved in transforming our World.
- ❑ SDG(Goal 6) aims to "ensure availability and sustainable management of water and sanitation for all", by year 2030
- ❑ The objective of this JICA KCCP Programme is to enhance the human resources for the administration and management of water supply systems in the developing countries.
- ❑ The role of JICA Trainees (as patriotic citizens) in achieving this quest becomes inevitable in turning the vision of SDG-6, into reality.
- ❑ Through this JICA Training, it is expected that we all are going to be empowered with the requisite knowledge to improve service delivery in the provision of this essential commodity - potable water in our respective countries, thereby "**leaving no one behind".**

THANK YOU VERY MUCH FOR YOUR ATTENTION

FCTWB, ABUJA

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6. PALESTINE

Inception Report

Country: Palestine

Name: Mr. KHARBISH Suleman Khaleel Suleman

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1. Outline of Water Supply Services

1-1. Legal Basis of Water Supply Services

Water supply service is regulated by and based on PWA (Palestinian water authority)

1-2. Demarcation of Water Supply Services

Palestinian water authority

1-3. Main Actor of Water Supply Utilities

The municipality of Jericho which under the ministry of local government

1-4. Mission/Vision of Water Supply Utilities:

Providing citizens with basic services within clear and fair policies formulated by government agencies to ensure fair distribution, quality and sustainability of service.

1-5. Your Mission/Vision in your organization

My mission in the Loss and Control Department is to conduct the necessary studies aimed at developing water networks in Jericho and to carry out the necessary procedures and studies to meet the city's need for water and to follow up on water loss in the drinking water network, whether digital or physical, and to develop the necessary plans and policies to reduce digital loss and determine the necessary specifications and procedures to reduce physical loss and discover it and follow up on the distribution of water quantities in the network in a manner consistent with the pressures and flow standards according to the computerized SCADA system and follow up on network data and its efficiency and follow up on the treatment of errors that would reduce the efficiency of distribution.

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2. Water Supply Service Levels

2-1. Main Performance Indicators (PI)

Coverage area	*45* (sq. km)
Population Served	*40000*
Collection ratio	*60* (%)
Production capacity	12595 (m3/day)
Supply duration	9 (hr/day)
Supply pressure	*2.5* bar
Non-Revenue Water	26(%)
Water quality	Potable water
Staff number	42
Number of connections	7461
Staff/1,000 connections	4(people/1,000connections)

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

TECHNICAL INDICATORS				
1	Average daily per capitawater consumption at domestic level.	Total domestic billed water sales (m^3) during the assessment period * 1000 / number of days * total number of served population	l/c/d	242.03
2	Average daily water sold per capita based on total population.	Total billed water sales (m^3) during the assessment period * 1000 / number of days * total number of served population	l/c/d	256.48
3	**Consumption pattern:**			
3.1	Domestic water consumption as % of total consumption	Domestic billed water sales (m^3) during the assessment period / Total billed water sales (m3) during the assessment period	%	94.37%
3.2	Industrial water consumption as % of total consumption	Industrial billed water sales (m3) during the assessment period / Total billed water sales (m3) during the	%	0.00%

		assessment period		
3.3	Commercial water consumption as % of total consumption	Commercial billed water sales (m3) during the assessment period / Total billed water sales (m3) during the assessment period	%	5.63%
3.4	Touristic water consumption as % of total consumption	Touristic billed water sales (m3) during the assessment period / Total billed water sales (m3) during the assessment period	%	0.00%
3.5	Bulk water consumption as % of total consumption	Bulk water sales (m3) during the assessment period / Total billed water sales (m3) during the assessment period	%	0.00%
4	Non-Revenue Water by volume	100%-(Total billed quantity (m^3) during the assessment period / (Total supplied water during assessment period ± difference in stored quantities in utility reservoirs) * 100%)	%	20. 0%
5	Non-revenue water in (m^3) per km in the network per year	Total non-revenue water during the year (m^3) / Network length (km)	m^3	4,253.92
6	Non-revenue water per connection per day	Total non-revenue water (m^3) during the assessment period * 1000 / number of days * total number of served connections	l/c/d	382.41
7	Wastewater Coverage	Population connected to the sewer systems managed by the utility / Total population served by the utility * 100, at the reference date.	%	26.00%
FINANCIAL INDICATORS				
8	Average selling price per m3 of water	Total billed water sales (NIS) / Total domestic, institutional, touristic and industrial water sales (m^3)	NIS	2.53

9	Operating costs per m3 of water sold	Operation & Maintenance (O&M) and administrative costs (excluding depreciation)/ Total sales (m^3)	NIS	2.58
9.1	Personnel costs per m3 of water sold	Personnel costs/ Total sales (m^3)	NIS	1.06
9.2	Water purchase costs (at purchase point) per m3 of water sold	water purchase costs at purchase point/ Total sales (m^3)	NIS	0.00
9.3	Energy costs per m3 of water sold	Energy costs/ Total sales (m^3)	NIS	0.34
9.4	Other operating costs per m3 of water sold	Other operating costs/ Total sales (m^3)	NIS	1.17
10	Collection efficiency-water service	Water fees collections during the year / total annual water billed sales (NIS) ×100%	%	72.99%
11	Collection efficiency-waste water service	Wastewater fees collections during the year / total annual wastewater billed (NIS) ×100%	%	55.93%
12	Working ratio (Efficiency Ratio) - water service	Operation & Maintenance (O&M) and administrative costs (excluding depreciation) / Operating revenues from water	No.	0.96
13	Liquidity ratio (current ratio)	Current Assets / Current Liabilities	No.	191.67
14	Cash ratio	Cash and cash equivalents / current liabilities	No.	0.00
15	Operating Costs per m3 of Wastewater	Operation & Maintenance (O&M) and administrative costs (excluding depreciation) of Wastewater Systems/ Total wastewater collected (m3)	NIS	0.58
16	Average cost per employee/ month-water service	(Staff costs related to water service/number of employees)/12	NIS	3,190.00

CUSTOMER SATISFACTION				
24	Service Complaints per customer - water service	Number of direct, telephone, and written complaints of quality of service during the assessment period; which have been officially recorded by the utility * 365 / Assessment period); / Number of customers	No.	0.12
25	Service Complaints per customer - wastewater service	Number of direct, telephone, and written complaints of quality of service during the assessment period; which have been officially recorded by the utility * 365 / Assessment period); / Number of customers	No.	0.07
26	Continuity Complaints (%)	Number of continuity complaints regarding the water supply service during the assessment period / Number of service complaints during the assessment period * 100	%	0.56%
27	Water Quality Complaints (%)	Number of water quality complaints during the assessment period; which have been officially recorded by the utility / Number of service complaints during the assessment period * 100	%	0.00%
28	Billing Complaints and Queries (%)	Number of billing complaints during the assessment period; which have been officially recorded by the utility / Number of service complaints during the assessment period * 100	%	85.59%
29	Other Complaints and Queries (%)	Number ofother complaints during the assessment period; which have been officially recorded by the utility / Number of service complaints during the assessment period * 100	%	13.85%

OTHER				
30	Staff productivity index-water service	Total number of working staff (water service) / (number of active water subscribers)/1000 customers	No.	11.05
31	Labor participation by gender-water service:			
31.1	Female workers as % of total staff	No. of female workers/ total number of workers (water service)	%	6.15%
31.2	Male workers as % of total staff	No. of male workers/ total number of workers (water service)	%	93.85%
31.3	Female workers as % of total supervisory/managerial staff	No. of female workers/ total number of workers in supervisory and managerial positions (water service)	%	13.33%
31.4	Male workers as % of total supervisory/managerial staff	No. of male workers/ total number of workers in supervisory and managerial positions (water service)	%	86.67%

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3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems:

Water and sewage department is facing a lot of challenges and problems such as:

1) Division of the city into various supply zones following a specific schedule (non-Continuous supply) due to the shortage of water in the dry months.
2) The number of water consuming inscriptions has increased and the existing network causes a lot of water losses which arrives to 26% of the production from springs and other sources that means less water arrives to the houses.
3) Manual mode operating and monitoring in the domestic network is very difficult to detect the loss immediately what causes a lot of losses before fixing the problem therefore it needs to be assisted by an integrated water network control system developed software.

3-2. Current Actions against Those Challenges/Problems:

- The development of the water network management both in water supply, interventions and maintenance operations.
- The optimal management of the time required for the restoration of the water service in case of accidental interruption.
- The promptness of the technicians to intervene and be aware of everything that happens in the network.
- Total protection of the water network and water service from any element that may vary the quality or quantity.

3-3. Any Achievements

After studying the city's needs, the problems it faces, and the possible solutions to these problems with the aim of developing the service and improving the current primitive distribution method, and studying all the specifications of the devices that were installed in other places such as the villages of West Jenin, in accordance with the network's needs and the weaknesses that need to be overcome, a SCADA tender project was prepared and put forward, and the specifications proposed by the applying company were studied, and the tender was awarded. We are now in the implementation phase of the SCADA project.

3-4. Water Quality Standards for Drinking Water

parameter	value
T.D.S	275-345mg/l
Conductivity	620 – 640 µs
Salinity	0.3 – 0.4 %
Turbidity	1-5 NTU
PH	6- 8
Temperature	21 – 23.3° C
D.O	6.5 mg/l
Cl2	< 0.5 mg/l
Potassium (K)	20.25 mg/l
Sodium (Na)	50.8 mg/l
Calcium (Ca)	26 – 73 mg/l
HCO3	152-278mg/l
So4	24.3 mg/l
T.C	Nil
F.C	Nil

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

Jericho Municipality has laboratories that test water samples on a daily basis to ensure the health of the water and its compliance with international specifications, public safety, and the standards of the Palestinian Ministry of Health. It archives these reports on a daily basis, and specialists are trained continuously to raise their efficiency.

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

A specialized team has been formed in the protection plan from several competent authorities, and work is underway to prepare the plan.

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4. Reduction of Non-Revenue Water

4-1. Current Situation and Major Challenges/Problems:

Jericho has recently seen a marked increase in new buildings that were created and which require the provision of water service and to be connected to the network where the network does not arrive, that constitutes a disability in the delivery service to the citizens, which requires an increase of the network's length to reinforce the existing lines and to increase the water pressure, but increasing the pressure cause many damages in the network especially in winter due to the old pipes in which it consists, and increases the amount of water lost throughout the pipe lines which arrives to 6% of the produces water. This loss is not marked in summer due to the lack of water compared to the water need of the city, but it appears as an important trouble in winter when the consumption of water decreases and the water pressure increases too much, so the pipes don't support all that pressure and explodes underground and needs much efforts to be fixed.

what mintioned before was regarding the fisical losses, indeed the numerical losses is more effective than the first one due to the huge number of the non working meters and and the illigal connections and the low level of the staff cause s alot of reading eerors that raise the numerical losses which arrives to 20% of the produced water.

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

α- LOSSES DETECTION DEVICES

Based on the needs of Jericho City to Improve the quality of water service by solving many problems that occur in winter as a damage of the pipelines which cause the interruption of services continually, to Increase the amount of water which arrives to the houses in summer season and solving the weakness in the pressurized water arrived to the consumers, for the he optimal management of the time required for the restoration of the water service in case of accidental interruption and for promptness of the technicians to intervene and be aware of everything that happens in the network, the water and sewage department after vary consultation of the PWA of the best specification and the best devices in the market to achieve the purposes mentioned before, the team of the department has prepared the necessary documentation for the tendering. After preparing the tendering of the water losses detection devices and the examination of the offers of variuos companies submitted for bid it has been imported

the necessary devices and it will be demonstrated to the trainees the concept of field flow measurement and leakage calculations. This task will introduce to the trainees the techniques used for quantifying leakage in continuous and intermittent water supply. The trainees have to be trained to use the leak detection equipment.

- *Techniques for quantifying leakage*

- Leakage measurement in the distribution network including reservoirs, transmission and distribution pipes.
- Leakage detection using temporary flow meters where there are no existing water flow meters.
- Leakage detection in intermittent water supply networks.

- Leak detection and location

The Consultant - after choosing a certain zone on which focus the training shall use the procured leak detection equipment to conduct a field demonstration and training on the following topics:

i. Leakage detection techniques
   - *Pressure control;*
   - *District meter areas;*
   - *Leak noise surveys;*
   - *Leak correlation surveys;*
   - *Noise logger survey.*

ii. Leak location techniques.

All the devices have been imported as in the specification of the municipality of Jericho (see the attached file) and the training will be held in September 2024 as the season when the damages start.

b- LOSSES ESTIMATION WATER METERS

as an important and essential way for the reduction of NRW it is important to focus on the commercial part of water losses which constitutes a significant part of the amount of non-revenue water, for this reason the municipality of Jericho with the assistance of the municipality of Genin and with the collaboration of the French colleagues followed the most obvious way for the calculation and estimation of commercial losses.

A part from the human error of meter reading, commercial losses depend on two

parts: the first is the age of the meter itself and the second is the air that accumulated in the pipeline due to intermittent water supply.

The project of the losses estimation is based on the installation of two water meters in series after the original one which should be observed, therefore the tendering of the project contains the order of 50 volumetric water meters and 50 ultrasonic water meters and the necessary fittings for the installation.

As planned and after the import of the necessary materials: 50 Ultrasonic water meters Type Zenner & 50 volumetric water meters Type Cem and the necessary fittings for the connection in series after the existing water meters Jericho Municipality Team has acted as following:

1- It have been chosen the suitable zones: 2 zones, where are there lot of complaints of high consumption and low pressure with high percentage of air.
2- It have been chosen the suitable locations in which the water meters to be installed: 16 locations, it have been avoided the locations where there is possibility of damage and the locations with low consumption.
3- After the first inspection we found one non-working volumetric water meters and one non-working ultrasonic water meters and for the accuracy of the experiment these water meters have been replaced.
4- It has been prepared the necessary document for the documentation of the reading which is a bit different from Jenin document, simpler.
5- It was decided that the reading shall be recorded once weekly.
6- Under study other zones and locations to be taken into consideration for the experiment.

				Ex: existing			vol: volumetric			alt: altrasonic		
zone	pos.	sub.er	W.M	04/05/2024			11/05/2024			Date 3		
				acual read	consump.	Cum. Cons	acual read	consump.	Cum. Cons	acual read	consump.	Cum. Cons
kerf El'oud	pos 1	حاتم القشاوي ٨١٦٩	Ex. w.m 52508471	284.00	284.00	284.00	328.00	44.00	44.00			
			vol. w.m 9808745	0.00	0.00	0.00	2.00	2.00	2.00			
			alt. w.m 1056437	0.00	0.00	0.00	43.60	43.60	43.60			
	pos 2	علي سليمان ١٤٧٤	Ex. w.m 7152855	7450.00	7450.00	7450.00	7451.00	1.00	1.00			
			vol. w.m 9808768	0.00	0.00	0.00	26.00	26.00	26.00			
			alt. w.m 1056439	0.00	0.00	0.00	25.40	25.40	25.40			
	pos 3	وفاء وعري ٤٤٩٣	Ex. w.m 7402865	2122.00	2122.00	2122.00	2122.00	0.00	0.00			
			vol. w.m 9808971	0.00	0.00	0.00	0.00	0.00	0.00			
			alt. w.m 1056440	0.00	0.00	0.00	7.80	7.80	7.80			
	pos 4	بلال الجمل ١٤٥٣	Ex. w.m 7152982	2653.00	2653.00	2653.00	2653.00	0.00	0.00			
			vol. w.m 9808726	0.00	0.00	0.00	1.50	1.50	1.50			
			alt. w.m 1061594	0.00	0.00	0.00	0.00	0.00	0.00			
	pos 5	نضال زهور ٩٠٥١	Ex. w.m 7155579	694.00	694.00	694.00	713.00	19.00	19.00			
			vol. w.m 9808795	0.00	0.00	0.00	19.00	19.00	19.00			
			alt. w.m 1054846	0.00	0.00	0.00	19.40	19.40	19.40			
	pos 6	بدر ابوعيه ٣٠٣١	Ex. w.m 9409019	2839.00	2839.00	2839.00	2848.50	9.50	9.50			
			vol. w.m 9808968	0.00	0.00	0.00	1.50	1.50	1.50			
			alt. w.m 1056442	0.00	0.00	0.00	10.70	10.70	10.70			
	pos 7	جميل ابوالاوي ٦١٢٣	Ex. w.m 6658835	1563.00	1563.00	1563.00	1565.50	2.50	2.50			
			vol. w.m 9808713	0.00	0.00	0.00	3.00	3.00	3.00			
			alt. w.m 1056434	0.00	0.00	0.00	2.50	2.50	2.50			
	pos 8	عزالدين جابر ١٤٤٨	Ex. w.m 4411645	8205.00	8205.00	8205.00	8208.00	3.00	3.00			
			vol. w.m 9808778	0.00	0.00	0.00	2.50	2.50	2.50			
			alt. w.m 1056436	0.00	0.00	0.00	2.40	2.40	2.40			
	pos 9	جرس المجروح ١٤٤٠	Ex. w.m 514778	8871.00	8871.00	8871.00	8877.00	6.00	6.00			
			vol. w.m 9808777	0.00	0.00	0.00	4.50	4.50	4.50			
			alt. w.m 1056435	0.00	0.00	0.00	7.10	7.10	7.10			
	pos 10	عادل الديبة ١٤٣٩	Ex. w.m 603500	8099.00	8099.00	8099.00	8104.30	5.30	5.30			
			vol. w.m 9809067	0.00	0.00	0.00	3.40	3.40	3.40			
			alt. w.m 1056438	0.00	0.00	0.00	6.60	6.60	6.60			

4-3. Any Achievements

After studying many areas, the extent to which the age of the meter affects the accuracy of the reading was determined, and thus its relationship to the digital loss, as well as the extent to which the air in the pipes affects the increase in the amount of the water bill in other areas, which helped the Water and Sanitation Department to take the necessary measures to reduce the phenomenon of air and its effect on the loss.

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

Authorized consumption	Revenue water	Billed authorized consumption	3343027 (m3 /year) *74* (%)
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	*0* (m3 /year) *0* (%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	919089 (m3 /year) *20* (%)
		Physical losses (Leakage)	272128 (m3 /year) *6* (%)

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

It have been purchased all the devices needed by water and sewarege department to detect the leakage and illegal connections and soon will be trained a specialist team of tecnition for the detection and documentation of the leakage and determination of cleare policies for the reduction of it.

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5. Accounting system of Water Supply Service

5-1. Water Tariff in your Organization

Residenzial tariff

Class	Category	Price NIS
Class A	(0 – 90 M^3)	1 NIS
Class B	(91 – 115 M^3)	2 NIS
Class C	(116 – 140 M^3)	4 NIS
Class D	(141-190M^3)	8 NIS
Class E	More than 190	10 NIS

Commercial

Class	Category	Price NIS
Class A	(0 – 25 M^3)	3 NIS
Class B	(26 – 50 M^3)	4 NIS
Class C	(51 – 100 M^3)	5 NIS
Class D	More than 101	7.5 NIS

Industrial

FIXED TARIFF 7.5 Nis / M^3

turistical

FIXED TARIFF 7.5 Nis / M^3

Villas tariff

Class	Category	Price NIS
Class A	(0 – 20 M^3)	2.5 NIS
Class B	(21 – 40 M^3)	4 NIS
Class C	(41 – 80 M^3)	5.5 NIS
Class D	(81-120M^3)	6.5 NIS
Class E	More than 120	9 NIS

Temporary residenzial tariff

FIXED TARIFF 7.5 Nis / M^3

5-2. Balance Sheet of your Organization

There is no balance sheet in the municipality, we use cash base of account not accrual base.

5-3. Profit and Loss Statement of your Organization

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

Loss 2929240.37

(2) Capital Income and Expenditures of your Organization)

Capital Income 53499229.10

Expenditures 56428469.47

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

SCADA Modernization

The current management of the drinking water network in Jericho relies exclusively on manual interventions, following reports from users, especially during intermittent supply periods. The implementation of the SCADA system will improve the management of the network and identify the flows in the different sectors. This data will be essential to determine the level of service (pressure in summer) and the performance of each sector.

The project will include:

- The design of a SCADA system allowing the consultation of the monitoring system on station or on mobile (option);
- The installation of solenoid valves;
- The installation of flow meters for monitoring the flows of the different sectors;
- The installation of pressure sensors at different points of the network;
- Installation and connection of electrical cabinets;
- Installation of variable frequency drive (VFD) pumps;
- Installation of gate valves
- Installation of electromagnetic flow meters.

Non-Revenue Water Control and Sectorization

In conjunction with the SCADA part, the project aims at structuring the network into sectors, relevant for the management of the network. This subdivision will allow a fine estimation of the "Non-Revenue Water" sector by sector:

- Authorized but unbilled consumption
- Apparent" losses (unauthorized connections, under-metering)
- Real losses (in production, storage, distribution or connection)

This data will allow Jericho to be able to define investment plans for each sector with a view to improve the performance of its network. These activities will require regular exchanges between the different poles of expertise: the JSCJWV, WSRC and Eau de Paris. An update of the GIS cartography, established during a previous phase of the cooperation, will be carried out on this occasion and will allow the conduct of modelling.

Pre-paid Water Meters (PPWM) installation

The installation of PPWM was part of a pilot action aimed to improve the collection in Jericho city. This device is an efficient tool to fight against unpaid bills, in a district where unpaid bills amount to NIS 16 million, and where the collection rate of bills is between 50 and 70%.

The unit price of these prepaid meters was approximately 115€ (for a 20mm diameter), installation included. It is proposed in this phase to purchase 500 to 600 meters for a total amount of €100,000, to be installed by the Municipality of Jericho

Water Distribution Tariff Structure

Considered to be one of the lowest in Palestine, the price per cubic meter of water is 1 NIS/m3 for the domestic use. In the pricing system currently, the elements of water rate reform do not take into account the actual costs of production and distribution, the evolution of the population, the increase in non-domestic water uses, or the socio-economic context of households.

Jericho Municipality has started lately to adopt The Unified Tariff System for Water and Wastewater, which was approved by the Palestinian Council of Ministers on 02/08/2021, is a system based on studied and approved standards to reach the pricing of water service for various uses and wastewater service. Service Provider: The National Water Company and the Regional Water Utility, including local authorities, joint councils and associations that provide water or wastewater service it aims to:

1- Recover the real cost only and achieve financial sustainability for water and wastewater service providers

2- Unify the bases and standards for calculating water and wastewater prices and service fees for all water and wastewater service providers.

When calculating water and sewage prices and service fees in accordance with the provisions of this system, the following principles shall be taken into account:

1. Achieving financial sustainability for the service provider.

2. Social justice for all different consumption categories.

3. Rationalizing consumption by setting a tariff structure at an appropriate price for higher consumption levels; to encourage the preservation of water resources.

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7. Recent Challenges to Improve Water Supply Services

Water and sewage department is facing a lot of challenges and problems such as:

1- Division of the city into various supply zones following a specific schedule (non-Continuous supply) due to the shortage of water in the dry months.

2- The number of water consuming inscriptions has increased and the existing network causes a lot of water losses which arrives to 26% of the production from springs and other sources that means less water arrives to the houses.

3- Manual mode operating and monitoring in the domestic network is very difficult to detect the loss immediately what causes a lot of losses before fixing the problem therefore it needs to be assisted by an integrated water network control system developed software.

---

8. Expectations toward Japan

8-1. Expectations toward Japanese Government and JICA

JICA and the Government of Japan have always supported the Palestinian people in all ways and means. With regard to the water sector, they have always financed projects that would improve the water service in terms of quantity and quality. Therefore, I expect the Government of Japan and JICA to continue supporting the Palestinian people and financing projects that would improve the water and sanitation sector, especially in these difficult and desperate circumstances.

8-2. Expectations toward Japanese Water Utilities

The technical teams working in the water and sanitation sector are in constant need of raising their level of efficiency and updating their expertise and capacity building to adapt to new challenges and to ensure their readiness to overcome any difficulties they face. Accordingly, I expect the Japanese water Utilities to provide continuous technical support to raise efficiency and exchange expertise to ensure improving the technical level of the Jericho Municipality teams .

8-3. Expectations toward Japanese Private Companies

Japanese companies are famous for their high technological development and technical progress, especially in relation to the water sector. Therefore, my expectations from these companies are to cooperate with Jericho water and sewerage department to provide us with the latest techniques and technology that aim to improve this sector.

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9. Expectations toward the Program.

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

The expectations of the Director of the Water and Sanitation Department and the Mayor are to build my technical and academic capabilities by participating in this course to employ them in improving the policy of the Water and Sanitation Department in managing the water service and employing what I learn in developing the department and raising its level to overcome the obstacles we currently face.

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

My expectations from the course are to learn about the modern methods and policies used in Japan to distribute water and improve the quality of management and raise the level of service quality so that I can raise the technical and technological level in the water and sanitation department in general and the loss and control department in particular to improve the quality of service.

END

Administration and Management of Water Supply Services (B)

(Inception Report Presentation)

Prepared by: Eng. Suleman Kharbish
Head of loss & control section
Jericho Municipality
Jericho / Palestine

1

Outline of Water Supply Services

Location

- 400 meters under sea level.
- 38 Km north east of Jerusalem.
- 8 Km west of Jordan river.
- 14 Km north west of dead sea.
- Area 45 Km2

Climate

- Summer : Hot & dry with average temp 45 C°
- Winter : moderate cold with average temp 5 C°
- Rainfall average 150 mm / year
- Relative Humidity : 35 - 65 %
- Potential evaporation : 4- 15 mm/day

population

- Population of the city at 2024 is 53000 persons
- population growth rate is 1.84%

2

Water reality

WELLS
12%

SPRINGS
85%

Resources
4.5 M
CM/Y

MEKOROT
3%

Water reality
"Usage"

Ein Sultan Spring
5.7M Cm / Year

Domestic Distribution tanks
3.6M Cm / Year

Irrigation Pumping station
2.1M Cm / Year

Outline of Water Supply Services

➢ **Legal Basis of Water Supply Services:**

Water supply service is regulated by and based on PWA (Palestinian water authority)

➢ **Demarcation of Water Supply Services:**

Palestinian water authority

➢ **Main Actor of Water Supply Utilities:**

The municipality of Jericho which under the ministry of local government

➢ **My mission and vision in my organization**

- *conduct the necessary studies aimed at developing water networks*
- *follow up water loss in the network, and to develop the necessary plans and policies to reduce it.*
- *follow up the distribution of water in the network in a manner consistent with the pressures and flow standards according to the computerized SCADA system.*
- *follow up network data and its efficiency & follow up on the treatment of errors that would reduce the efficiency of distribution.*

Whole Country:

Area : 45 km^2

Population :53000 Habitants

Coverage Water Supply: 75 %

Water Supply System/City:

Service Area : 33750 km^2

Population Served: 40000

5

Water Supply Service Levels

Main Performance Indicators (PI)/ any other indicator :

Coverage area	**3750 (sq. km)**
Population Served	40000
Collection ratio	**65** (%)
Production capacity	**12595** (m3/day)
Supply duration	9 (hr/day)
Supply pressure	2.5 Bar
Non-Revenue Water	26 (%)
Water quality	Potable water
Staff number	42
Number of connections	7461
Staff/1,000 connections	4 (people/1,000connections)

6

Management of Water Quality

Current situation and major challenges/problems:

- Division of the city into various supply zones following a specific schedule (non-Continuous supply) due to the shortage of water in the dry months.
- The number of water consuming inscriptions has increased and the existing network causes a lot of water losses which arrives to 26% of the production from springs and other sources that means less water arrives to the houses.
- Manual mode operating and monitoring in the domestic network is very difficult to detect the loss immediately what causes a lot of losses before fixing the problem therefore it needs to be assisted by an integrated water network control system developed software.

Current Actions against Those Challenges/Problems:

- The development of the water network management both in water supply, interventions and maintenance operations.
- The optimal management of the time required for the restoration of the water service in case of accidental interruption.
- The promptness of the technicians to intervene and be aware of everything that happens in the network.
- Total protection of the water network and water service from any element that may vary the quality or quantity.

Management of Water Quality

Water Quality Standards for Drinking Water

parameter	value
T.D.S	275-345mg/l
Conductivity	620 – 640 µs
Salinity	0.3 – 0.4 ‰
Turbidity	1-5 NTU
PH	6- 8
Temperature	21 – 23.3° C
D.O	6.5 mg/l
Cl2	< 0.5 mg/l
Potassium (K)	20.25 mg/l
Sodium (Na)	50.8 mg/l
Calcium (Ca)	26 – 73 mg/l
HCO3	152-278mg/l
SO4	24.3 mg/l
T.C	Nil
F.C	Nil

Monitoring System or Plans for Safety of Drinking Water

Jericho Municipality has laboratories that test water samples on a daily basis to ensure the health of the water and its compliance with international specifications, public safety, and the standards of the Palestinian Ministry of Health.

Note :

For the Implementation of Water Safety Plans a specialized team has been formed in the protection plan from several competent authorities, and work is underway to prepare the plan

Reduction of NRW Accounting system of Water Supply Service

Current Situation

Authorized consumption	Revenue water	Billed authorized consumption	3343027(m3 /year) 74 (%)
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	0 (m3 /year) 0 (%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	919089 (m3 /year) 20 (%)
		Physical losses (Leakage)	272128 (m3 /year) 6 (%)

Major Challenges/Problems

- ✓ *increase of demand due to the increase of subscriptions with limited resources and lack of water*
- ✓ *increasing the pressure to supply farther zones causes pipes damage due to the age of the network.*
- ✓ *huge number of non working water meters need to be replaced*
- ✓ *There is no quick and direct way to communicate leak in a pipeline if not by citizens.*
- ✓ *no simulation programs to test the network basing on pressure and flow.*
- ✓ *capacity building of the people working in water and sewerage department.*

Accounting system of Water Supply Service

Residential tariff

Class	Category (M^3)	Price (NIS)
Class A	0 – 90	1 NIS
Class B	91 – 115	2 NIS
Class C	116 – 140	4 NIS
Class D	141-190	8 NIS
Class E	>190	10 NIS

Commercial tariff

Class	Category (M^3)	Price (NIS)
Class A	0 – 25	3 NIS
Class B	26 – 50	4 NIS
Class C	51 – 100	5 NIS
Class D	>101	7.5 NIS

Villas tariff

Class	Category (M^3)	Price (NIS)
Class A	0 – 20	2.5 NIS
Class B	21 – 40	4 NIS
Class C	41 – 80	5.5 NIS
Class D	81-120	6.5 NIS
Class E	>120	9 NIS

Industrial tariff
Fixed tariff 7.5 Nis / M^3

Touristic tariff
Fixed tariff 7.5 Nis / M^3

temporary residential tariff
Fixed tariff 7.5 Nis / M^3

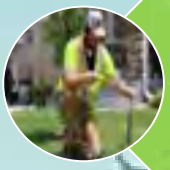
Profit and Loss Statement

- *There is no balance sheet in the municipality, we use cash base of account not accrual base.*
- Capital Income and Expenditures : capital income *53499229.10*
  Expenditures 56428469.47
- Profit and loss account: *Loss 2929240.37*

Major Recent Achievements in Improvement of Water Supply Services

SCADA PROJECT

The complete SCADA water distribution system allows the user to achieve high-efficiency operation of the network, cost-effective use of the equipment and the efficiency of daily operation and maintenance procedure.



LEAK DETECTION

1) Leakage measurement and quantification in the distribution network using the appropriate equipment like the portable flow meter.

2) Leakage detection devices : after choosing a certain zone on which focus the team should use one ore more of the devices imported for: District meter areas; Leak noise surveys; Leak correlation.

LOSSES ESTIMATION

The project is based on the installation of two water meters (one is ultrasonic and the other as the same type of the observed water meter) in series after the original one to study the effect of the air and the age on the measurement of the original one.

PREPAID WATER METERS

It have been installed more than 1000 meters aimed to: the connection of prepaid water meters with Scada system, subscribers complains reduction, maximum collection ,minimum NRW.

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Recent Challenges to Improvement of Water Supply Services

- (non-Continuous supply) :Division of the city into various supply zones following a specific schedule due to the shortage of water in the dry months.
- The number of water consuming inscriptions has increased and the existing network causes a lot of water losses which arrives to 26% of the production from springs and other sources that means less water arrives to the houses.
- the network coverage is about 75% of the city which means that big part of the network has to developed to supply water where does not arrive.
- Manual mode operating and monitoring in the domestic network is very difficult to detect the loss immediately what causes a lot of losses before fixing the problem therefore it needs to be assisted by an integrated water network control system developed software.
- unfortunately the teams of the water department continue to use traditional methods to solve the problems in the network and they need to be updated about the new technologies of water systems and the scientific and academic procedures of the trouble shooting and the problem solving.
- till now we have no Gis system of Hydraulic model for the simulation of the network to find out the zones that suffers of weakness points that should be strengthen.

12

Expectations toward Japan

Expectations toward Japanese Government and JICA

I expect the Government of Japan and JICA to continue supporting the Palestinian people and financing projects that would improve the water and sanitation sector, especially in these difficult and desperate circumstances.

Expectations toward Japanese Water Utilities

I expect the Japanese water Utilities to provide continuous technical support to raise efficiency and exchange expertise to ensure improving the technical level of the Jericho Municipality teams

Expectations toward Japanese Private Companies

my expectations from these companies are to cooperate with Jericho water and sewerage department to provide us with the latest techniques and technology that aim to improve this sector.

13

Expectations toward the Program

Expectations of my supervisors toward my participation in the program

The expectations of the head of Water and Sanitation Department and the Mayor are to build my technical and academic capabilities by participating in this course to employ them in improving the policy of the Water and Sanitation Department in managing the water service and employing what I learn in developing the department and raising its level to overcome the obstacles we currently face

My expectations toward my participation in the program

My expectations from the course are to learn about the modern methods and policies used in Japan to distribute water and improve the quality of management and raise the level of service quality so that I can raise the technical and technological level in the water and sanitation department in general and the loss and control department in particular to improve the quality of service

14


THANK YOU

7. SOUTH AFRICA

Inception Report

Country:South Africa

Name: Malebatse Daniel Raseala

1. Outline of Water Supply Services

1-1. Legal Basis of Water Supply Services

Water supply services in South Africa is centred around 3 fundamental legal frameworks, that is, the constitution of South Africa (no. 108 of 1996), National Water Act (no. 36 of 1998) and the Water Services Act(no. 108 of 1997). Section 27(1)(b) of the constitution of South Africa gives everyone the right to have access to sufficient food and water and further indicate that the state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of this right.

The National Water Act (No. 36 of 1998) recognises that water is a scarce resource that belongs to all South Africans , and that the goal of water resource management is to achieve the sustainable use of water for the benefit of all South Africans. The Act objectively emphasise the need to develop, protect, use, conserve, manage and control water resources overall, promoting the integrated management of water resources with the participation of all stakeholders. Therefore, the National Water Act addresses the development of strategies to facilitate adequate water resource management, alongside related legislations.

The Water Services Act(108 of 1997) provides a framework for the provision of water supply and sanitation services to end users such as households, businesses, and industries, within municipal jusrisdictions. It sets the standards for the local and provincial spheres of government and establishes the norms and standards for tariffs. The main objectives of the Water Services Act are amongst others to provide for the right of access to basic water supply and basic sanitation by securing

sufficient water and an environment not harmful to human health or well-being, Setting of national standards and norms as well as standards for tariffs in respect of water services, Preparation and adoption of water services development plans (WSDPs) by Water Services Authorities (WSAs), A regulatory framework for water services institutions and water services intermediaries.

- Establishment and disestablishment of Water Boards and water services committees and their duties and powers.
- Monitoring of water services, and intervention by the Minister or by the relevant Provincial government departments.
- Financial assistance to water services institutions.
- Gathering information in a national information system and the distribution of that information.
- Accountability of water services providers (WSPs).
- The promotion of effective water resource management and conservation.

Over and above the Constitutional and legislative mandates,the DWS needs to comply with all national and provinciallegislation, regulations, and policy directives, as well as local by-laws applicable to their functions and, in particular, with the National Environmental Management Act (NEMA)(Act No. 107 of 1998) under which the National Water Act (NWA) is defined as a Specific Environmental Management Act (SEMA) and where sections of NEMA apply and enhance the DWS compliance monitoring and enforcement function with its inclusion in the Environmental Management Inspectorate.

There are various regulations that are developed under the National Water Act/ Water Services Act to regulate the water sector, this includes but not limited to;

- Water Use Licence application regulation, 2017
- Water conservation and water demand management regulation, 2016
- Drinking water quality regulations, 2001
- Water quality management regulation, 2017
- Sanitation services regulation, 2011
- National Water Resources Strategy regulations , 2013
- The Regulations relating to Compulsory National Standards and Measures to Conserve Water (GNR.509 of 8 June 2001) u

1-2. Demarcation of Water Supply Services

In terms of National Water Act (1998), the Minster of Department of Water and Sanitaion is entrusted with the responsibility of ensuring that the water resources in South Africa are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all the persons in accodance with the constitutional mandate. The Department of Water and Sanitation (DWS) is the sector leader and has established number of entities/agencies in line with the National Water Act(1998) and Water Services Act(1997) to assist in delivery its mandate. The entities includes catchment management agencies, resource development agencies and water boards.

The Water Services Authorities (WSA), mostly districts and local municipalties are legally mandated in terms of the Water Services Act (1997) to ensure access to water and sanitation services to the consumers within their area of jurisdiction. The act further make provision that the Water Services Authorities may directly provide water to the communities or contract the water service provider to realise the mandate.

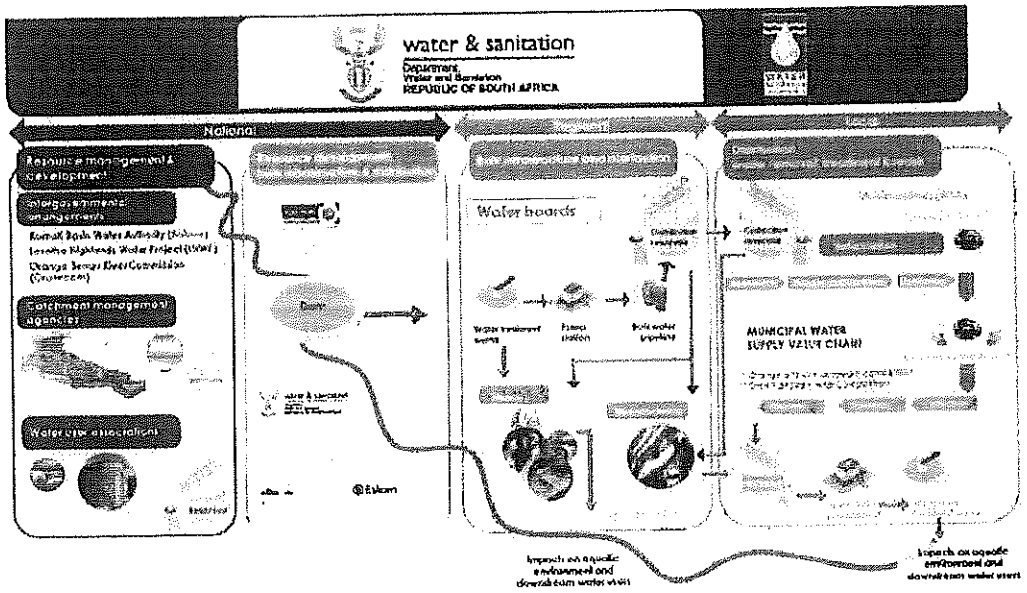

Figure 1: Demacartion of water services in South Africa (*source: Auditor General's consolidated reporton 2020/21 audit outcome*)

1-3. Main Actor of Water Supply Utilities

The department of water and sanitation is the water sector leader and regulator that has the responsibility of setting the national water regulation, policies, tariffs and standards that must be adhered to by the water service authorires and water entities when supplying water to the consumers in South Africa. The department with the following 7 Utilities (Water boards) established under the Ministry of Water and Sanitation plays the significant role in bulk portable water supply services. The established water boards includes;

- **Lepelle Northern Water-** serves the northern parts of Limpopo Province, approximately 44 607 km^2. The WSAs served includes Capricorn district, Mopani district, Vhembe district, Bela-Bela and Polokwane Local Muncipalities. The sources includes De Hoop, Flag Boshielo, Luphephe and Nandoni dams that are supplied from Limpopo, Olifants and Letaba rivers. The population served is around 2.3 million with about 444 000 households
- **Magalies water** – serves North West Province and parts of Gauteng and Mpumalanga Provinces, approximately 41 846 km^2. The WSAs served includes Rusternburg, Kgatleng, Madibeng, Moretele, Temba, Emalahleni Steve Tshwete and Thembisile Hani municipalities. The primary source of water includes Hartebeespoort, Vaalkop, Klipvoor, Rietvlei and Boskop dams supplemented by groundwater
- **Rand water** – serves Gauteng Province, approximately 18 000 km^2 with about 2.5 million households. The WSAs served includes City of Joburg, Tshwane, Ekurhuleni, Sedibeng, West Rand, Lesedi and Midvaal municipalities. The primary source of water includes Vaal, Vaalkop, Sterkfontein, Grootdraai and Kipvoor dams
- **Vaal central** – the utility was formed as a merger between Bloem Water and Sedibeng Water . The utility serve WSAs in Free state and part of Gauteng Province, about 200 000 household within a span of 2700km^2 and part of 900 000 households from disestablished Sedibeng Water. The primary source of water includes Caledon, Wilge and Vaal rivers.
- **Ungeni – Uthugela Water** – the utility was formed as merge between Umgeni and Uthugela water in KwaZulu-Natal Province. The supply area span about 62 000 km^2 with about 1,7 million households and 6,7million people. The source of water

includes Umgeni, Tugela, Mgeni, Nagle, Woodstock, Blood, Buffalo rivers.

- **Overberg water** – serves 5 WSAs in Western Cape Province with the supply area of about 12 000km^2. About 70 000 household and 260 000 people served by the utility. The primary sources of water includes Breede, Hartenbos and Breed rivers
- **Amatola water** – serves 6 WSAs including Buffalo City Metropolitan Municipality in Eastern Cape Province with the supply area of about 21 000km^2. About 350 000 household and 1,5 million people served by the utility Eastern. The primary source of water includes Great Kei, Keiskamma, Nahoon, Tyhume and Xhora rivers.

Water Service Authorities(WSAs) which are mainly the Municipalities (district/Local) are responsible for provision of portable water and sanitation to the consumers within their area of Jurisdiction. The water service authorities may in line with the water services act contract private institution to manage their water services infrastructure in their area of operation.

The President has recently assented to the South African National Water Resources Infrastructure Agency SOC Ltd Bill, which establishes a new agency that will be responsible for developing and managing national water infrastructure, and will be able to mobilise finance for new projects through innovative models to crowd in private investment.

1-4. Mission/Vision of Water Supply Utilities

The Mission/Vision of catchment management agencies in South Africa is to manage and protect water resources through collaborative governance, research and stakeholder engagement to ensure sustainable management of water resources that support economic, social development and environmental protection.

The water services Institutions (WSA/Water Boards/Water entites) in South Africa generally aim to be the leading world-class water utilities enhancing the quality of life through efficient and effective supply of quality water and sanitation services to the consumers within their area of operation in the country.

1-5. Mission/Vision in DWS (my organization)

The Mission and Vision of Department of Water and sanitation is to ensure the sustainable management of water resources and equitable access to water services to achieve " a South Africa where all people have access to sufficient, safe and affordable water and sanitation services.

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2. Water Supply Service Levels

According to statistics 2022, about 82,4% of households in South Africa had access to piped water either in ither inside their dwelling or inside their yard. The trend have been increasing since the dawn of freedom I Limpopo as 1 of the 9 provinces in South Africa recorded 79% of households having access to water and 61.1% accessing water inside their dwelling/ yard. This show an increase in propotion of households with access to piped water inside their dwelling/yard in Limpopo from 52.65 in 2011 to 61.1% in 2022 (*source: Statistics South Africa*).

2-1. Main Performance Indicators (PI) – Limpopo Province, South Africa

Coverage area	125,754 (sq. km)
Population Served	6 572 721
Production capacity	654,176 (m3/day)
Supply duration	24 (hr/day)
Supply pressure	150 -240 (kPa)
Non-Revenue Water	56% (current), 20%(recommended)
Water quality	Fair

2-2. Monitoring by Performance Indicators (PI)

DWS is in the process of developing the 5 years reliability plans that provides information on the reliability of water supply in different Municipalities. The plans will also outline the plans that the sector partnes are to implement to improve access to water in different Municipalities. The plans will serve as the basis for monitoring progress on implementation of the projects to improve reliability of water supply within the 5 year period.

- All WSAs with insufficient capacity appoint a credible and competent Water Services Providers for the next 3 years while building capacity and provide progress
- WSAs to ringfence 10% of their capital funds for repairs and refurbishment of existing water services infrastructure and that is mandatory to poor performing municipalites .
- All WSAs to develop a credible Infrastructure security plan including appropriate technology, remote sensing and rapid response mechanisms to cap vandalism and theft of water services

The WSAs has developed the corrective action plans to address their water services challenges and to improve their compliance to the assessment criteria. The task teams were established on provincial/regional level constituting all role players in government to ensure effective implementation of the developed plans. In Limpopo province, DWS in collaboration with the provincial govenerment has developed the differentiated strategy to address water services challenged in the province

3-4. Water Quality Standards for Drinking Water

The water quality standards for drinking water in South Africa are regulated by the Department of Water and Sanitation and they are based on South African National Standards (SANS) 241 of 2015. These standards are aligned to the World Health Organisation (WHO) guidelines for drinking water quality. The standands covers various parameters with limits that renders the waters suitable for human consumption. the parameters includes;

- Microbilogical requirements (e.g. bateria, parasite and viruses)
- Chemical requirement (e.g. pH, turbidty, total dissolved solids, arsenic, etc.)
- Physical requirements (i.e. odour, color and taste)
- Aesthetic requirements (i.e. acceptability and apperence)

The Water Services Authorities/ Municipalities and utilities which are responsible for the schemes that provides water services must ensure that the final water meet the standards before distributed to the consumers or discharged to the environment in a case of wastewater effluent.

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

The SANS 241:2015 and the Water Services Act (1997) requires that the WSAs develop and implement the Water Safety Plans (WSPs). Availability and implementation of WSPs is part of the blue and green drop incentive programme criteria. The WSAs are expected to develop and implement the water safety plans per scheme to avert the water quality risk associated with the system operations. DWS in collaboration with Water Research Commission (WRC) have developed guidelines and tools to support the WSAs/Water Utilities in development and implementation of WSP. The implementation is however confronted by number of challenges including inadequate data and information management system, lack of capacity and willingness to participate, lack of funding and resources for implementation and maintenance in some WSAs.

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4. Reduction of Non-Revenue Water

DWS have initiated an incentive based programme termed No-Drop with the aim of encouraging the water services institution to implement water conservation and water demand management (WC/WDM) measure and reduce Non-Revenue Water (NRW). National Water Resources Strategy III (NWRS3, 2023) outlines the importance of WC/WDM and NRW management, and that these will be priority programmes for reaching the 15 % demand reduction target in the country. The National Water and Sanitation Master Plan (2018) recognises that building a water secure future will require proactive infrastructure management, effective water infrastructure operations and maintenance, and an overall reduction in future water demand, while considering infrastructure development and augmentation where necessary.

4-1. Current Situation and Major Challenges/Problems

The preliminary 2021/22 national water balance indicates a System Input Volume (SIV) of 4 282.5 million m^3/annum, NRW of 1 988.5 million m3/annum (46.4%) and water losses of 1 744.7 million m3/annum (40.7%). In the past year, NRW and water losses

have increased by a notable 1.3% and 0.9% respectively. Western Cape Provices is the best perfomer with Limpopo Province is the worst performer with 56.7%NRW and 56.5% water loss.

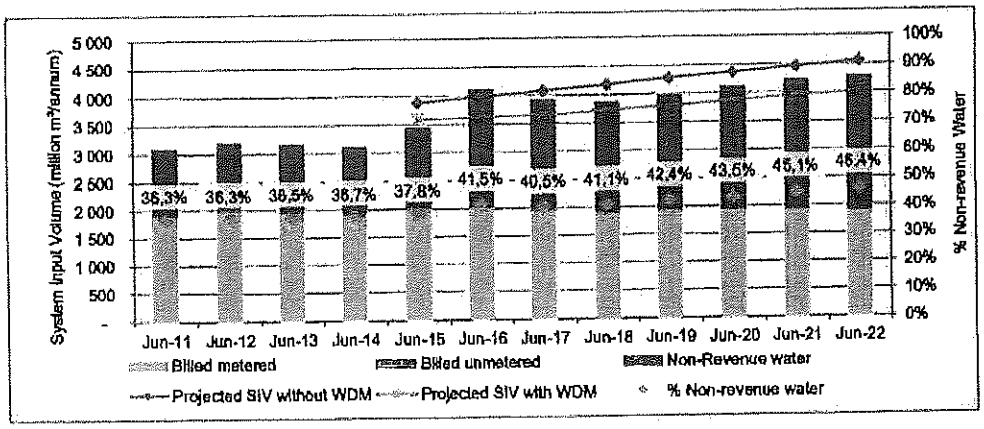

Figure 4: Non-Revenue trend

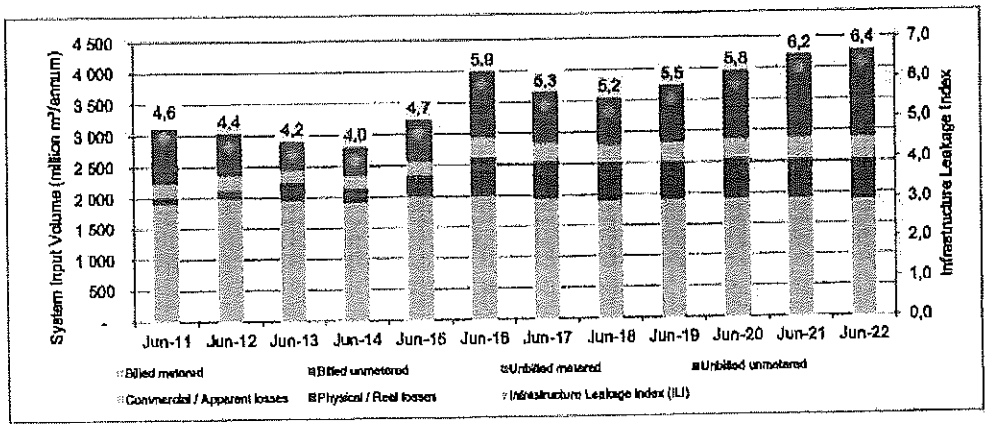

Figure 5: Infrastrucure Leakage Index (ILI) trend

The results further indicate increased NRW, water losses, ILI, and the national per capita consumption (Figure 5). Given the increases on all the key NRW metrics, WC/WDM must be implemented as a matter of urgency in all Regions, especially considering that several Regions have NRW and water losses above 50%. The increase in NRW and water losses are attributed to insufficient metering and poor data management, insufficient budget allocation for operations and maintenance, and lack of capacity in municipalities to undertake repairs.

4-2. Current Actions against Those Challenges/Problems

The reporting structures in well performing Regions like Western Cape are well established and managed by the Regions, and most municipalities are reporting quarterly. The initiative is supported by Regulations and sending directives to municipalities who did not respond. Regional Offices in poor performing provinces to establish reporting templates, schedule meetings with municipalities to confirm targets, analyse the water balance information, and provide feedback.

During the Blue and Green Drop summit with hosted by the Minister of Water and Sanitation with the leadership and executives of water services institutions in January 2024, it was resolved that the WSAs must adopt Ekhuruleni model (best practice) on Non Revenue water and decide on percentage target of water loss. The Municipalities that have not performed well are also expected to;

- increase their efforts to reduce NRW and the negative impact it has on their ability to generate income and operate a viable water service.
- resolve metering and billing issues to increase payment levels, encourage consumer fixing of leaks, prosecute illegal water connections, and reduce theft of water
- implement proactive operations and maintenance programmes to coincide with WC/WDM programmes givent that there is close correlation between operations, maintenance, low water losses and NRW.

4-3. Any Achievements

The Western Cape is the best preforming Region in South Africa with lowest %NRW, l/c/d and ILI compared to other provices. The 2021/2022 water balance shows NRW of 127.2 million m3/annum (29.8%) and water losses of 108.4 million m3/annum (25.4%) was achieved by Western Cape Region. The NWR is still above the recommended 20% but better when compared to other regions that have over 50% NRW such as Limpopo and KwaZulu-Natal. The Western Cape is set as benchmark for other regions to encourage them to adopt the best practices to reduce their NRW and water loss.

4-4. Constitution of NRW

Authorized consumption 2537.867 (59.3%)	Revenue water 2294.071 (53.6%	Billed authorized consumption	**2294.071** **(m3 /year)** **(53.6%)**
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	**243.796** **(m3 /year)** (5.7%)
Water losses 1744.664 (40.7%)	1988.460 (46.4%)	Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	**349.481** **(m3 /year)** (8.2%)
		Physical losses (Leakage)	**1395.183** **(m3 /year)** (32.6%)

Table 1: National IWA water balance

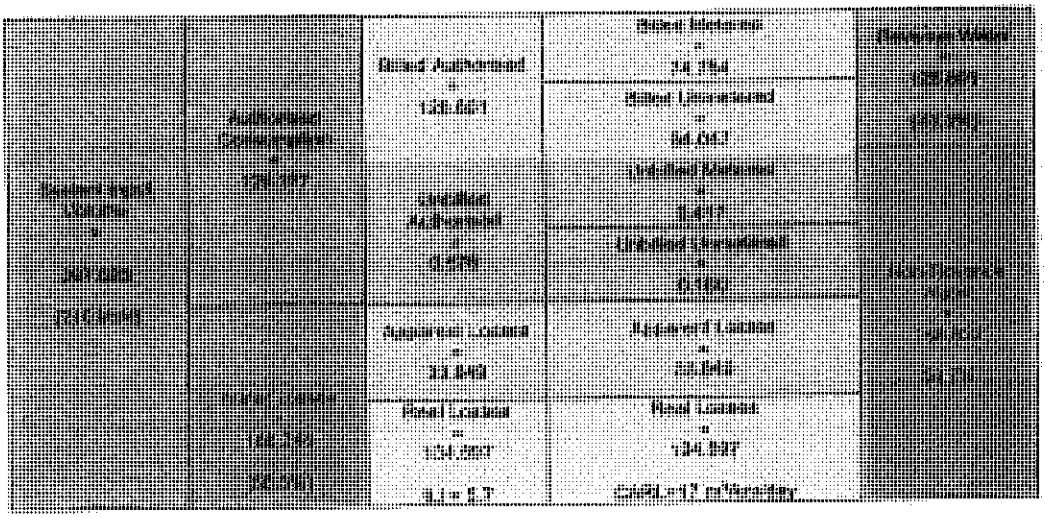

Table 2: Limpopo Province IWA water balance

5. Accounting system of Water Supply Service

5-1. Water Tariff in your Organization

The Minister of water and sanitation in concurance with the Minisiter of Finance is empowered through National Water Act (No.36 of 1998) to set standards and tariffs for the provision of water services in South Africa. The Minister has recently gazetted the revised pricing strategy in June 2024 to provide the transparent and predictable approach for raw water pricing. The pricing strategy aim to ensure that there is effective cost recovery to maintain resource quality objective, develop, operate and maintain government water works withough placing unnecessary financial burden to the water users. The different tariffs are developed for each component in the water value chain as reflected in the figure below;

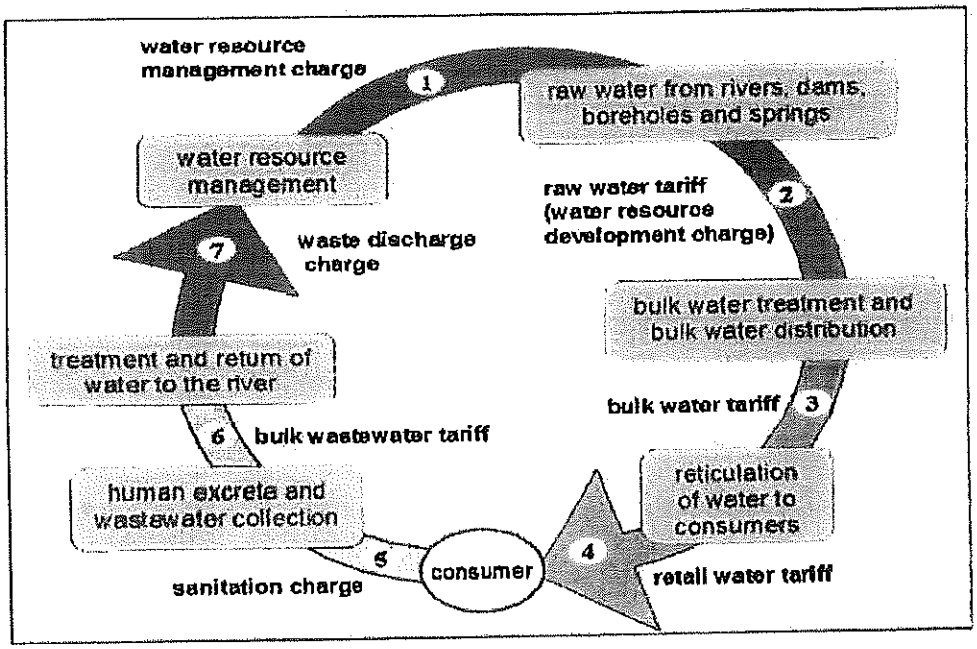

Figure 6. Water value chain

The department of water and sanitation is responsible for water resources management which mainly focus on raw water sources. The pricing strategy for raw water use charge implemented by the department focus on water resource management charges which includes waste discharge charges, water resource development charge and in addition charges for non- consumptive uses such as impeding or diverting of flow, altering the

watercourse characteristics and recreational use.

5-2. Balance Sheet of DWS

5.2.1. Main Account of DWS

STATEMENT OF FINANCIAL PERFORMANCE FOR THE YEAR ENDED 31 MARCH 2023

	Note	[illegible] R'000	[illegible] R'000
REVENUE			
Annual appropriation	1	18 555 010	17 735 057
Departmental revenue	2	26 709	5 775
TOTAL REVENUE		**18 581 719**	**17 740 832**
EXPENDITURE			
Current expenditure		3 643 525	3 215 615
Compensation of employees	3	1 812 887	1 742 236
Goods and services	4	1 830 635	1 473 158
Interest and rent on land	5	3	221
Transfers and subsidies		10 799 400	9 414 312
Transfers and subsidies	7	10 799 400	9 414 312
Expenditure for capital assets		3 249 467	2 573 409
Tangible assets	8	3 203 028	2 532 029
Intangible assets	8	46 439	41 380
Payments for financial assets	6	1 024	178
TOTAL EXPENDITURE		**17 693 416**	**15 203 514**
SURPLUS/(DEFICIT) FOR THE YEAR		**888 303**	**2 537 318**
Reconciliation of net surplus/(deficit) for the year			
Voted funds		**861 594**	**2 531 543**
Annual appropriation		861 594	2 531 543
Departmental revenue and NRF receipts	14	26 709	5 775
SURPLUS/(DEFICIT) FOR THE YEAR		**888 303**	**2 537 318**

5.2.2. Water trading account of DWS

STATEMENT OF FINANCIAL PERFORMANCE FOR THE YEAR ENDED 31 MARCH 2023

	Note	2023 R'000	2022 restated R'000
Revenue		17 672 656	17 959 042
Revenue from exchange transactions	3	15 404 071	15 895 847
Revenue from non-exchange transactions	4	2 268 585	2 063 195
Expenditure		8 444 844	10 127 047
Employee benefit costs	5	1 797 143	1 537 289
Operating expenditure	6	4 270 350	4 249 625
Repairs and Maintenance - *Property, plant and equipment*	7	237 579	180 253
Impairment on financial assets	8	30 263	420 712
Finance cost	9	1 754 519	2 381 505
Depreciation, amortisation and impairment	10	350 378	1 348 705
Loss on disposal of fixed assets	11	4 612	8 958
Surplus/(deficit) for the year		9 227 812	7 831 995

5-3. Profit and Loss Statement of DWS

5.3.1. Main account of DWS

STATEMENT OF FINANCIAL POSITION FOR THE YEAR ENDED 31 MARCH 2023

	Note	[illegible]	[illegible]
		R'000	R'000
ASSETS			
Current assets		287 922	1 939 652
Cash and cash equivalents	9	202 432	1 749 050
Prepayments and advances	10	28 669	138 027
Receivables	11	55 952	52 694
Loans	12	869	881
Non-current assets		356	595
Prepayments and advances	10	-	-
Receivables	11	89	29
Loans	12	267	566
TOTAL ASSETS		**288 278**	**1 940 247**
LIABILITIES			
Current liabilities		881 369	2 532 989
Voted funds to be surrendered to the Revenue Fund	13	861 594	2 531 543
Departmental revenue and NRF Receipts to be surrendered to the Revenue Fund	14	18 920	308
Bank overdraft	15	10	7
Payables	16	845	1 131
Non-current liabilities			
Payables	16	-	-
TOTAL LIABILITIES		**881 369**	**2 532 989**
NET ASSETS		**(593 091)**	**(592 742)**
Represented by:			
Recoverable revenue		48 018	48 367
Unauthorised expenditure		(641 109)	(641 109)
TOTAL		**(593 091)**	**(592 742)**

	Note	[illegible]	[illegible]
		R'000	R'000
Recoverable revenue			
Opening balance		48 367	50 844
Transfers:		(349)	(2 477)
Debts revised		69	(1 867)
Debts recovered (included in departmental revenue)		(2 765)	(2 226)
Debts raised		2 347	1 617
Closing balance		**48 018**	**48 367**
Unauthorised expenditure			
Opening balance		(641 109)	(641 109)
Closing balance		(641 109)	(641 109)
TOTAL		**(593 091)**	**(592 742)**

5.3.2. Water trading account of DWS

STATEMENT OF FINANCIAL POSITION FOR THE YEAR ENDED 31 MARCH 2023

	Note	2023 R'000	2022 restated R'000
ASSETS			
Current assets		21 728 055	16 420 564
Cash and cash equivalents	12	1 780 139	2 141 999
Receivables from exchange transactions	13	16 436 345	13 411 500
Advances to public entities	14	2 863 133	457 155
Inventory	15	129 369	129 467
Construction Work In Progress	16	519 069	280 443
Non-current assets		95 893 811	92 822 807
Property, plant and equipment	17	69 981 640	69 652 216
Intangible assets	18	25 912 171	23 170 591
Total assets		117 621 866	109 243 371
LIABILITIES			
Current liabilities		2 903 192	3 233 590
Payables from exchange transactions	19	2 116 997	2 351 361
Employee benefits	20	243 567	277 552
Finance lease liability	22	1 725	930
Financial liabilities: TCTA	23	540 903	603 747
Non-current liabilities		11 144 281	11 663 201
Provisions	21	494 748	491 610
Finance lease liability	22	1 306	566
Financial liabilities: TCTA	23	10 648 227	11 171 025
Total liabilities		14 047 473	14 896 791
Total net assets		103 574 393	94 346 580
NET ASSETS			
Reserves			
Accumulated surplus		101 031 827	92 563 172
Pumping cost reserve		2 549 185	1 755 229
Net assets		103 581 012	94 318 400

STATEMENT OF CHANGES IN NET ASSETS FOR THE YEAR ENDED 31 MARCH 2023

	Note	Accumulated surplus	Pumping cost reserve	Net assets
Balance at 1 April 2021		**85 230 227**	**1 284 354**	**85 514 581**
As previously stated		82 039 724	1 284 354	83 324 078
Prior period error	34	3 190 503	-	3 190 503
Surplus for the year		7 831 095		7 831 995
As previously stated		7 228 393		7 228 393
Prior period error	34	603 602		603 602
Net movement in reserves		(470 875)	470 875	-
Transfers between reserves		(470 875)	470 875	-
Balance at 31 March 2022		**92 591 352**	**1 755 229**	**94 346 581**
As previously stated		88 797 248	1 755 229	90 552 477
Prior period error	34	3 794 104	-	3 794 104
Surplus for the year		9 227 812	-	9 227 812
Net movement in reserves		(793 956)	793 956	-
Transfers between reserves		(793 956)	793 956	-
Balance at 31 March 2023		**101 025 208**	**2 549 185**	**103 574 393**

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

The Department of Water and Sanitation (DWS) is continuously reviewing strategies to improve access to water and realization of basic right by South Africans as enshrined in the constitution of the country. DWS has recently approved and published the National Water Resources Strategy, 3rd edition (NWRS 3) in March 2023 which is a build up to the preceeding NWRS 1 and NWRS 2 which were published in 2004 and 2013 respectively. The NWRS 3 provides a framework within which water will be managed at local, regional, national or catchment level, in defined water management areas to ensure protection, use, development, conservation, management and control of water resources for the country as a whole. Further to the strategy, DWS has developed the National Water and Sanitation master plan as a call of action for resourcing and implementation of strategies.

Recently, The Presidenct has assented to the South African National Water Resources Infrastructure Agency SOC Ltd Bill, which establishes a new agency that will be responsible for developing and managing national water infrastructure, and will be able to mobilise finance for new projects through innovative models to crowd in private investment. The law seeks to address the current fragmentation in water resource management between the Department of Water and Sanitation, the Trans-Caledon Tunnel Authority (TCTA) and the Water Trading Entity, and to establish an agency that is able to raise funds on its own balance sheet to increase investment in water infrastructure.

DWS in collaboration with private sector coordinated through Lebalelo Water Users Association(LWUA) has recently initiated the Olifants Management Model(OMM) as a significant undertaking to accelerate construction of of bulk raw and portable water infrastructure to supply targeted communities and commercial uses in Sekhukhune, Capricorn and Mogalakwena Municipalities in Limpopo Province. The programme is a 50:50 collaboration between Government and private sector represented by LWUA. The OMM programme will accelerate economic growth in Limpopo province through finalition of the Olifants River Water Resource Development Project (ORWRDP) that will provide water from De Hoop system. The OMM programme was launched by the Minister of Water and Sanition in May 2022 and its currently different stages including planning and implementions with targeted completion date of 2034.

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7. Recent Challenges to Improve Water Supply Services

South Africa is generally a water scares country with increasing demands and that affect the sustainable provision of water service. There are several challenges that also exacerbate the matter, that includes;

- Governance isssues as reflected in the auditor general report– weak councils, poor leadership and mismanagement at water institutions
- Lack technical capacity – shortage of skilled personnel such as engineers, technicans and scientists to effectively manage water services infrastructure

- Inefficienct use of water, water losses and high level of Non-Revenue Water
- Financial sustainability to sustain the water business, revenue collection and cost recovery is a challenge to many WSAs and that affect reinvestment on infrastructure development and maintenance
- Misaligned planning on human settlement and water services infrastructure delivery, specifialy in the rural areas where the land is under tribal authorities.

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8. Expectations toward Japan

8-1. Expectations toward Japanese Government and JICA

Japan's water sector is know for its high standards and innovative approach in ensuring efficient water supply services. My expectation towards Japan Government and JICA is have exposure and lessons on effective administration and management of water supply services by the Japan Government to provide efficient water services to the consumers in Japan. It will also be interesting to have insight on the following aspects;

- Water infrastructure development - The strategies used by the Japanese Government to ensure efficicent water infrastructure development given the challenges in construction sector, e.g. poor performance of contractors, accessibility of materials, social interest and stakeholder management.
- Water scarcity and climate change – strategies developed by the Japanese Government to manage the impact of climate change on water resources
- Public private partnership- involvement of private institution in development and management of infrastructure to ensure water security for both social and economical benefit.

8-2. Expectations toward Japanese Water Utilities

The Japanese Water Utilities seems to be financially viable making it possible to sustain and maintain high level of services in ensuring water services delivery to the consumers. My expectation is to have an insight on the following;

- Financial viability of water utilities - how the entities are able to implement

effective cost recovery measures to sustain their water business.

- Governance - How the water utilities are managed and sustained as goventment entities
- Advanced technologies used by the water utilities in delivering water services to consumers
- Water conservation and demand management- measures implemented by the water utility to manage water demand and reduce Non-Revenue Water.
- Asset management - how the entities manage and maintain their infrastructure to ensure continuity in water supply over years.

8-3. Expectations toward Japanese Private Companies

It is known that in Japan private sector plays a significant role in water supply services particually in various aspects including design and construction of water infrastructure, development and supply of advanced water treatment technologies and water conservation technologies. It will be interesting to learn the new and advanced technologies that are cost and time effective offered by the private companies to improve water supply services.

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

The expectation is that the JICA KCCP will enhance the knowledge of nominated official on Administration and Management of Water Supply Services and that will find reflection in shaping the development of strategies or intervention plans that the government is developing to address water services challenges in South Africa, particularly in Limpopo where the official is based.

9-2. My expectation

The program offers an opportunity to share and learn best practices that water services institutions or government institutions in different countries are implementing to ensure sustainable water provisions to the consumers. My specific interest on the program is to share and learn in the following aspects;

- Effective measures to reduce Non-Revenue Water (NRW)

- Water conservation and demand management measures (leak detection, pressure management, etc.)
- Capacity building and human resource development in the water sector
- Financial management and business viability of water services in public sector
- Water safety plan development and implementation

END.

JICA Knowledge Co-Creation Program

Administration and Management of Water Supply Services (B)

Inception Report Presentation

Presenter : Raseala Malebatse Daniel
Regional Project Manager
DWS- Limpopo Province,
South Africa

Date : November 2024

Venue : JICA Tokyo Center, Japan

WATER IS LIFE - SANITATION IS DIGNITY

water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

JICA

2030 NDP

Contents

1. Outline of Water Supply services

Legal basis of Water supply

- The Constitution of South Africa – bill of rights sec. 27
- National Water Act(no.36 of 1998)
- Water Services Act (no. 108 of 1997)
- Water Resource/ Services Regulations

Demarcation of Water Supply Services

- Department of Water & Sanitation (DWS) - Custodian of water resources- protect, develop, manage water resources & infrastructure for sustainable & equitable access for all
- Water Services Authorities (WSA) – District Municipalities, Local Municipalities – ensure access to water & sanitation services within area of jurisdiction
- Water utilities/Water boards – operate under DWS ministry, provide bulk water service

Other government agencies

- National Water Resources Infrastructure Agency
- Water Research Commission

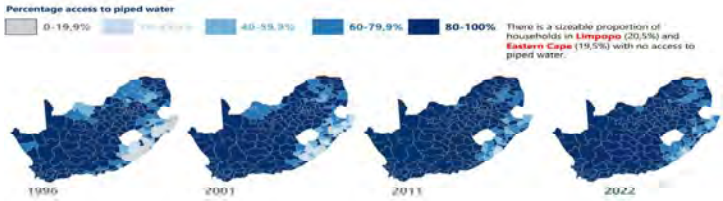
Vision and Mission

- To achieve " a South Africa where all people have access to sufficient, safe and affordable water and sanitation services.
- Ensure the sustainable management of water resources and equitable access to water services

Water delivery value chain

2. Water supply services Levels

- 82,4% of households in South Africa had access to piped water either inside their dwelling or inside their yard
- The trend have been increasing since the dawn of freedom



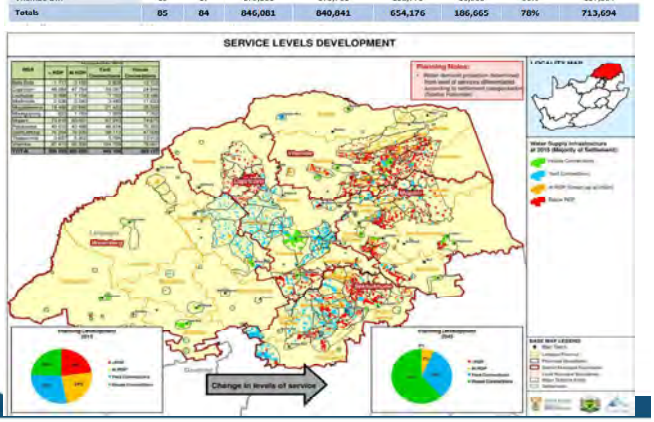
- Limpopo province recorded 79% of households having access to water and 61.1% accessing water inside their dwelling/ yard

Initiatives to improve water services- special focus to Limpopo province

- 5-year reliability plans –outlining programmes per district/ WSA to improve water service levels
- Differentiated Approach to Water and Sanitation Provisioning in Limpopo Province- coordinated approach at provincial level
- Water services infrastructure development programmes – Regional Bulk Infrastructure Grant (RBIG), Water Services Infrastructure Grant (WSIG), Municipal Infrastructure Grant(MIG) – all support to Water Services Institutions

Coverage area	**125,754 (sq. km)**
Population Served	6 572 721
Production capacity	654,176 (m3/day)
Supply duration	12-24 (hr/day)
Supply pressure	150 -240 (kPa)
Non-Revenue Water	56% (current), 20%(recommended)
Water quality	Averaged – 53,1% overall DWQ compliance

WSA & WB Name	# WTWs	# WSSs	Design Capacity (kl/d)	Available Design Capacity (kl/d)	Average Daily Production (kl/d)	Available Variance* (kl/d)	% Use Available Capacity	Total SIV towards the WSS (kl/d)
Lepelle Northern Water	17	24	323,800	323,600	340,865	-17,265	105%	294,847
Bela-Bela LM	3	3	8,470	6,970	6,347	623	91%	13,131
Capricorn DM	4	7	6,500	6,500	0	6,500	0%	6,500
Greater Sekhukhune DM	11	20	36,150	36,150	0	36,150	0%	28,036
Lephalale LM	2	2	63,000	63,000	22,200	40,800	35%	13,000
Modimolle/Mookgophong LM	5	5	17,100	17,100	2,000	15,100	12%	12,300
Mogalakwena LM	None	1						
Mopani DM	17	18	190,000	190,000	121,784	68,216	64%	148,832
Polokwane LM	4	7	14,760	14,760	2,209	12,551	15%	19,547
Thabazimbi LM	3	4	7,000	7,000	0	7,000	0%	19,937
Vhembe DM	19	17	179,301	175,761	158,771	16,990	90%	157,564
Totals	**85**	**84**	**846,081**	**840,841**	**654,176**	**186,665**	**78%**	**713,694**



3. Management of Water Quality

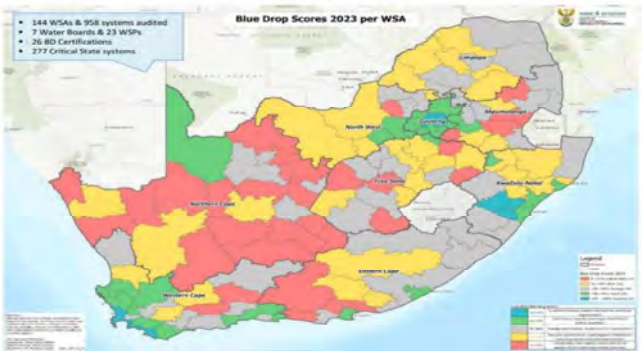
- DWS initiated incentive based programs to assess and recognize excellence in water & wastewater management by Water Services institutions (WSIs)
  - ✓ Blue Drop(BD) – focusing on drinking water
  - ✓ Green drop(GD) – focusing on wastewater management
- DWQ compliance is measured against the requirements of SANS 241:2015 under KPA 5 of the BD audit

- The recent BD report (2023) and the GD Progress Assessment Tool (GDPAT) 2023 indicates that most WSIs are facing challenges, the following are key & common;
  - ✓ Compliance with quality standards (drinking water & wastewater discharge)
  - ✓ Lack of technical capacity in the WSIs
  - ✓ Poor financial management
  - ✓ Poor or no risk management plans

Government initiatives to address drinking water quality

- Interventions at Ministry level to address deficiencies at Municipal level
- Directives & penalties imposed on non-complying WSIs
- WSIs required to develop BD & GD improvement plans, allocate resources, implement & report on progress- DWS providing support and monitoring progress

National overview of municipal water management



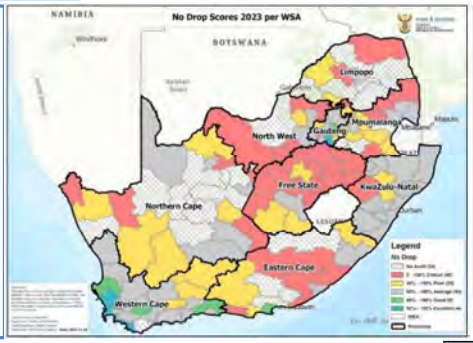
National Summary of the 2023 Blue Drop Audit key performance Areas

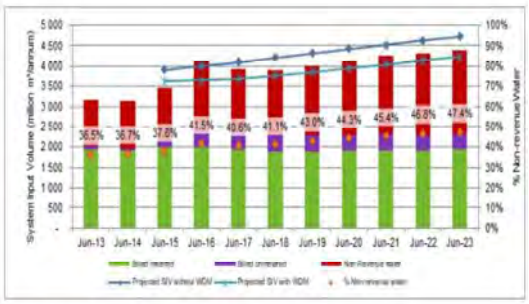
Province	KPA 1 Capacity Management	KPA 2 DWQ Risk Management	KPA 3 Financial Management	KPA 4 Technical Management	KPA 5 DWQ Compliance
Eastern Cape	67.5%	58.3%	62.6%	32.4%	41.5%
Free State	53.3%	37.6%	49.3%	28.1%	39.5%
Gauteng	75.8%	72.4%	78.5%	65.3%	80.4%
KwaZulu Natal	72.8%	63.7%	65.0%	37.4%	54.3%
Limpopo	55.3%	29.8%	44.5%	23.2%	53.1%
Mpumalanga	62.9%	51.6%	49.0%	35.3%	43.3%
Northern Cape	38.0%	19.9%	29.8%	14.2%	31.4%
North West	63.2%	52.2%	48.9%	30.1%	55.2%
Western Cape	70.9%	62.3%	70.7%	56.3%	73.7%
Totals	**62.2%**	**49.8%**	**55.4%**	**35.8%**	**52.5%**

4. Reduction of Non-Revenue Water

Overview of NRW in South Africa

- Steady increase on National NRW & water loss over the past 10 years
- The Infrastructure Leakage Index (ILI) deteriorated drastically from 2016 to date
- The Western Cape(WC)- best preforming province with lowest % NRW, l/c/d and ILI
- WC 2021/22 IWA shows NRW of 127.2 Mm3/a (29.8%) & Water loss of 108.4 Mm3/a (25.4%)
- Limpopo Province is the worst performer with 56.7%NRW and 56.5% water loss.

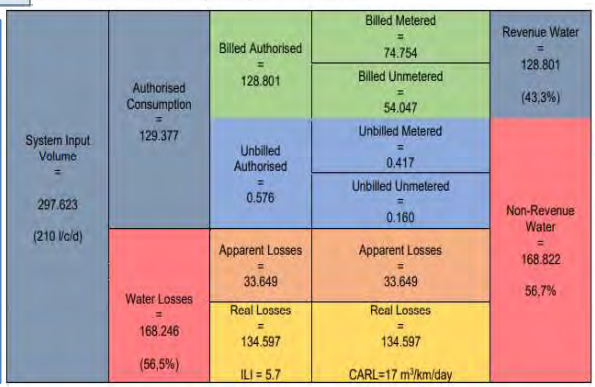




National Water Balance Trend (2022/23) in millions m³/annum

Initiatives by South Africa government to address NRW

- DWS have initiated an incentive based No-Drop programme
- Aim to encourage Water Services Institutions(WSIs) to implement water conservation and water demand management (WC/WDM) strategies & reduce NRW
- DWs taking a lead at executive level to ensure that WSI prioritize & increase efforts to reduced NRW- set targets, dedicate resources & report regularly
- Lesson sharing with best performing WSIs
- National Water Resources Strategy III (NWRS3, 2023) developed outlining the importance of WC/WDM & NRW management & setting priorities to attain 15 % demand reduction target in the country



Limpopo Province IWA water balance

5. Accounting System of Water Supply

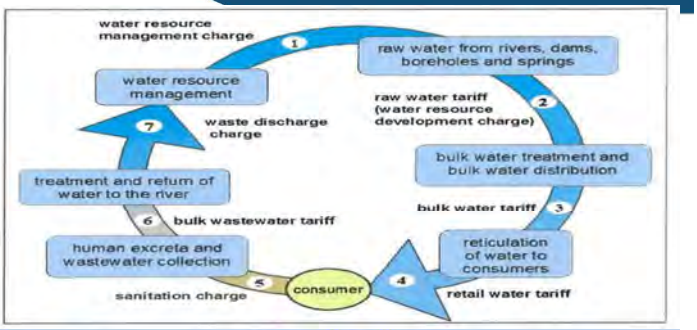
Water Tariff structure in South Africa

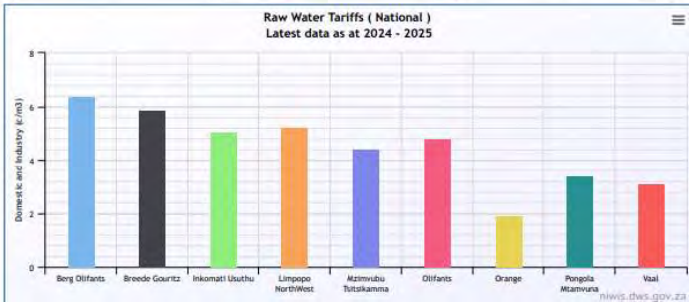
- Standards & tariffs for the provision of water services in South Africa set by the DWS Minister in concurrence with Finance Ministers
- The revised pricing strategy published in June 2024 to provide the transparent and predictable approach for raw water pricing
- **Tariffs are developed for each component in the water value chain & implemented by the relevant institution**
  - ✓ DWS- focus on raw water tariff – water resource charge (abstraction from water resource) and water discharge charge(return flow to water resources)
  - ✓ Water Utilities – focus on bulk water tariffs (account for bulk water supply to Water Services Authorities)
  - ✓ Water Services Authorities – focus on retail water tariffs, sanitation charges and bulk wastewater tariffs (accounts for water services to the consumers)- tariffs differ related to the area, but reasonably within prescribed standards

Financials for DWS trading

STATEMENT OF FINANCIAL PERFORMANCE FOR THE YEAR ENDED 31 MARCH 2023

	Note	2023 R'000	2022 restated R'000
Revenue		17 072 936	15 939 042
Revenue from exchange transactions	3	15 404 871	13 875 847
Revenue from non-exchange transactions	4	2 268 585	2 063 195
Expenditure		8 444 844	10 127 047
Employee benefit costs	5	1 797 143	1 537 289
Operating expenditure	6	4 270 350	4 249 625
Repairs and Maintenance - Property, plant and equipment	7	237 579	180 253
Impairment on financial assets	8	20 263	620 712
Finance cost	9	1 754 519	2 381 509
Depreciation, amortisation and impairment	10	350 378	1 348 709
Loss on disposal of fixed assets	11	4 612	8 958
Surplus/(deficit) for the year		9 227 612	7 811 995





Typical example of water tariff structure for Polokwane City- Limpopo

		Approved tariff from 1/07/2023	Approvedtariff from 1/07/2024
(i)	For the first 5KI; per KI:	R11.18	R11.85
(ii)	For the following 10KI; per KI:	R18.08	R19.71
(iii)	For the following 15KI; per KI:	R20.95	R22.84
(iv)	For the following 20KI; per KI:	R27.94	R30.46
(v)	For the following 50KI; per KI:	R33.20	R36.18
(vi)	Thereafter, for consumption in excess of 100KI, per KI:	R40.19	R43.81

6. Major Recent Achievement in Improvement of Water Supply Services and Challenges

Recent Challenges to Improve Water Supply Services

South Africa is generally a water scares country with increasing demands Some of the challenges that exacerbate the matter, that includes;

- Governance issues at institution level
- Technical capacity challenges
- Inefficient use of water, water losses and high level of Non-Revenue Water
- Business viability of public water services institutions (cost recovery matters)
- Rapid increase in population and lifestyle transitions versus rate of infrastructure development

Olifants Management Model (OMM)

Major Recent Achievement in Improvement of Water Supply Services

- approved and published the National Water Resources Strategy, 3rd edition (NWRS 3) in March 2023
- National Water and Sanitation master plan as a call of action for resourcing and implementation of strategies.
- South African National Water Resources Infrastructure Agency SOC Ltd Bill, establishes a new agency that will be responsible for developing and managing national water infrastructure and mobilize finances new projects through innovative models to crowd in private investment
- Water Resources Management Models as significant undertaking to accelerate infrastructure delivery through Public Private Partnership model, e.g. OMM

7. Expectation towards Japan and JICA programme

Expectations toward Japanese Water Utilities

From the premise that Japanese water utilities & private sector plays a significant role in water supply services particularly in various aspects including design and construction of water infrastructure, the expectations are to witness;

- The new advanced and cost-effective technologies that are used to improve water supply services in Japan
- The advanced methodologies used for water infrastructure development and asset management practices
- The business model used for effective public private partnership
- Governance - How the water utilities are managed and sustained as government entities
- Funding models for infrastructure delivery

Expectation towards Japan Government and JICA programme

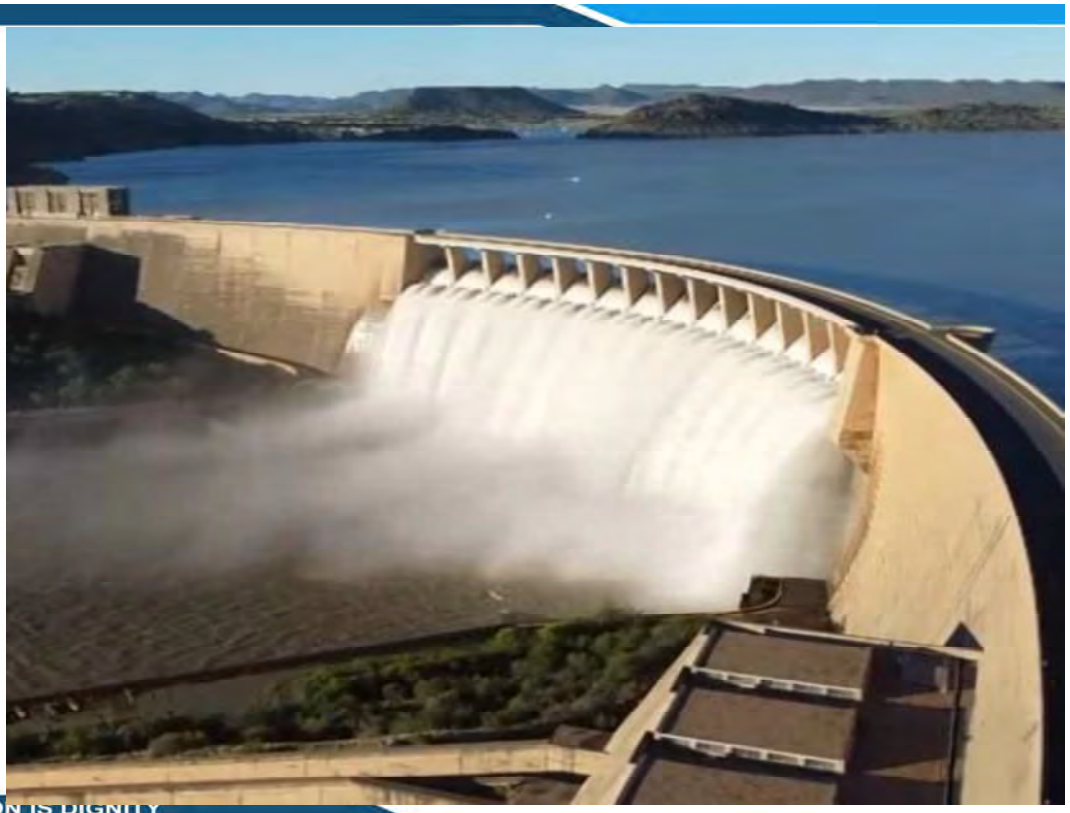
From Japanese government, expectation is to learn about;

- The strategies used for efficient water infrastructure development given the challenges in construction sector, e.g. poor performance of contractors, accessibility of materials, social interest and stakeholder management
- strategies developed to mitigate the impact of climate change on water resources
- Support programmes for other courtiers including South Africa

From JICA programme, as it provide a platform for lesson sharing from different countries on water services issues, **specific expectation towards the program is to share & learn in the following aspects**;

- Effective measures to reduce Non-Revenue Water (NRW)
- Water conservation and demand management measures (leak detection, pressure management, etc.)
- Capacity building and human resource development in the water sector
- Financial management and business viability of water services in public sector
- Water safety plan development and implementation

THANK YOU



8. SUDAN

The Republic of Sudan

Red Sea State

Training Program:

Administration and Management of water supply services

Training Institution: JICA Tokyo Center

Course Period in Japan: November 17 to November 30,

2024 **Name: Hanadi Hassan Mohammed Khalil**

Organization: Red Sea State Water Corporation.

Introduction

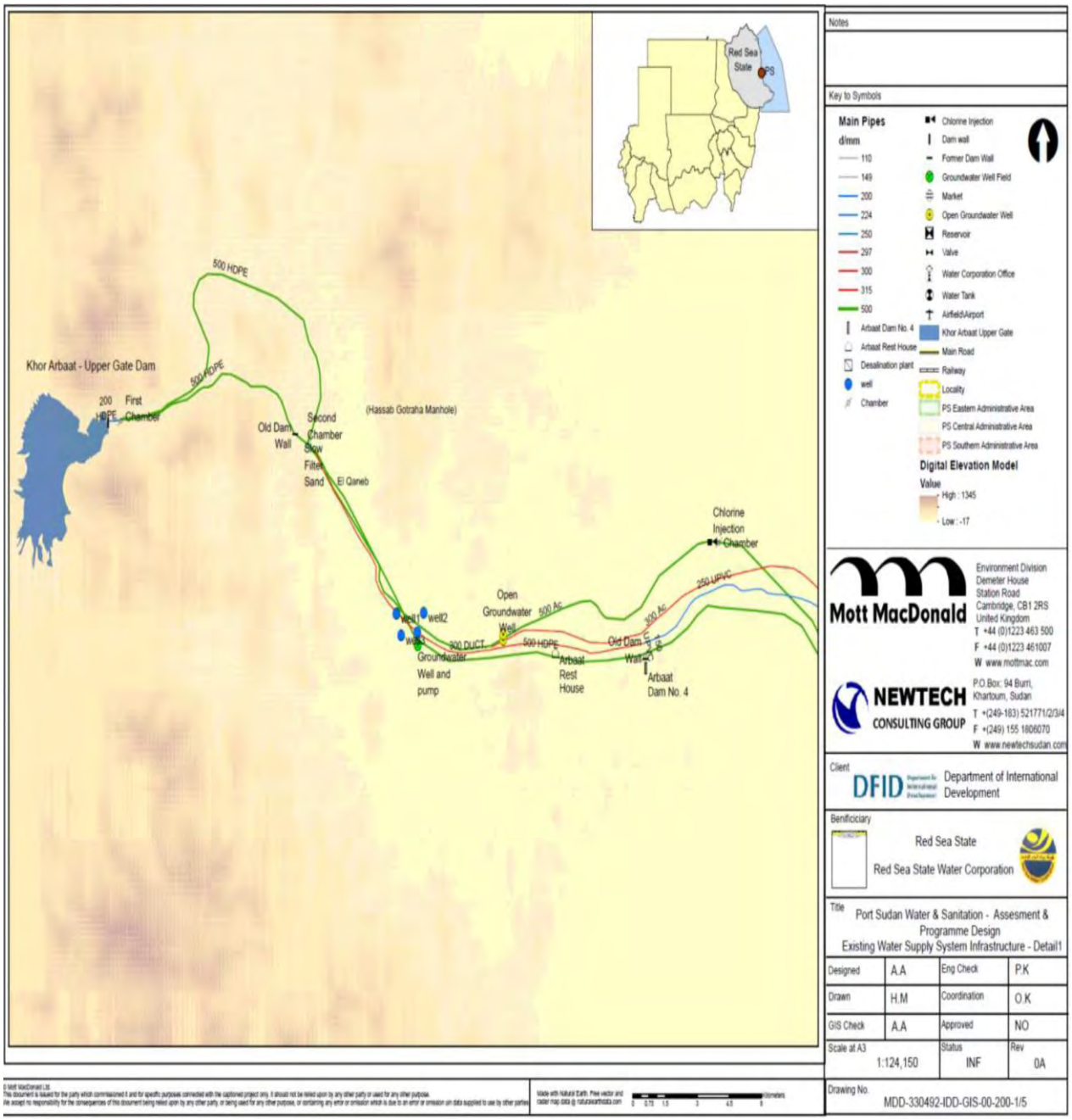
• Red Sea State is considered to be a typical arid region. Port Sudan City is the main Sudan Harbour and largest commercial center. It is located between:

37° 10` to 37° 15` E and 19° 35` to 19° 40` N. The Population is estimated at 600,000 people.

• Table below shows the increase demand of water in Port Sudan City due to increase population, and currently the population increased due to the recent war in Sudan.

Year	Population (at rate 3%)	Water demand m^3/d	Other demand m^3/d	Total demand m^3/d
2010	423,447	38,103 (at 90 L/C/D)	11,430 (at 20% losses)	49,532
2020	569,077	85,361 (at 100 – 150 L/C/D)	17,072	102,433
2030	764,792	114,718 (at 150 L/C/D)	22,944	137,662

Population of the City is estimated at: 600,000 people and the average consumption is estimated at: 80 L/C/D. Total need for human consumption is estimated at: 48,000 m^3/d. Other uses are estimated at: 46,000 m^3/d, so Total demand is 94,000 m^3/d, while available water 65,000 m3/d (groundwater 19,000 m^3/d, surface water 41,000 m^3/d, plus others sources 5,000 m^3/d), ♦ The demand for water exceeds its availability and the overall situation of the City is characterized by regular shortages. And the existing facilities for water supply show serious deficiencies. The problem is increasing from day to day due to increasing demands, which resulted from the rapid increase in population, fast growing industry and recently as result of war in Sudan. This deficit grows if we go to the international standards that say the minimum amount of drinking water in city is 120 L/C/D (water poverty limit).



The main lines from Arbaat source.

♦The City is served from: groundwater, Surface water and Desalinization Plants (governmental and private sector).

♦ Consumers feeding water through:

Networks, Trucks, Motor Cycle, and Donkey car.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HARD GEAR

1-Outline of Water Supply Services:

1-1. Legal Basis of Water Supply Services.

The Emergency Technical Committee for Water has drafted specifications for drinking water in Sudan (see Table 3.1). The membership of this committee includes:

- The Sudanese Standards and Metrology Authority.
- World Health Organization.
- The Federal Ministry of Health.
- University of Khartoum- College of Public Health and Environmental Health.
- National Water Authority (DWSU).
- Super Council for Environment and Natural Resources.

Water for cooking and maintaining public health requires water supply services to be paid for. However, it is necessary to take into account the ability of people to pay for water. In consideration of this, consumers are divided into three categories: the third class, which is charged by monthly of 1.6 USD, the second lass, which is charged by the month at an amount of 2 USD, and the first class, which is charged by the monthly at an amount of 2.4 USD. So, high fees for water

consumption should not be applied to meet the basic human needs. Including the issue of obtaining basic water needs as a social good and a human right within policies. A water right is the right to use water not owns it.

1-2. Demarcation of Water Supply Services:

Two organizations in Sudan deal with water supply services, the urban water corporation and rural water corporation, and each state responsible for operation, maintenance and managing the water system s, and the Drinking Water and Sanitation Unit is responsible of foreign fund for planning, designing, and constructing of national projects among states levels.

1-3. Main Actors of Water Supply Utilities:

Ministry of Infrastructure and Urban Development at state level is the ministry in charge. In Sudan, most water utilities are public bureau under local government.

1-4. Mission of Water Supply Utilities:

The mission of water supply utilities is to: produce, operation, maintain, and distribute drinkable water and then collect water return.

1-5. My Mission in my Organization:

- Provide guidance on the optimal operation and timing for boreholes pumping in Arbaat Water Sources area.
- Oversee the replacement of old pipes (asbestos and UPVC) with HDPE pipes. - Contribute to the annual development program at state level.

2- Water Supply Services Levels

2-1. Main Performance Indicators (PI)

Table (2.1):

Coverage area	75 (sq.km)
Population Served	600,000
Collection ratio	40%
Production capacity	65,000 (m^3/day)
Supply duration	24 (hr/day)
Supply pressure	not applicable

Non – Revenue Water	0.303 %
Water quality	Within Sudanese standard
Staff number	512
Number of connections	44,000
Staff/1,000 connections	0.512

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

The monitoring is applied by the following Performance Indicator: -

Water quality

- Collection ratio.

- Number of connections.

- Production capacity.

3. Management of Water Quality

3-1. Current Situation and major challenges:

The State Water laboratory is doing the physical tests like PH, EC, TDS and the chemical tests in which the percentage chemical elements of the water analyzed, to know whether the water is drinkable or not . Also the lab used to do the Biological tests to assess the contamination of water, but for a while it stopped due to the device breakdown, so the biological test is not available which will expose the people to the problems of water borne diseases and furthermore also the lack of materials and devices would lead to expose people to other health problems like poisoning, kidney, eyes blueness for kids, …etc.

So one can conclude the current major challenges are as follows: -

Most of the devices are not functioning well.

- The tests agents (chemical materials) are not available. Also there is challenge regarding securing purification such as chlorine.

- Maintaining water quality due to insufficient monitoring systems and limited capacity of technical expert.

- Customer management regarding the usage of purification water.

- No safety equipment for staff and labors, in particular the lab techniques and chlorination labors.

3-2. Current Actions against those challenges:

- Rehabilitation slow sand filters to reduce strong color and water contamination.

- Activate chlorination system to reduce the risk from microbiological contamination.

3-3. Achievements:

- Collaborate with UNOPS Organization to supplying equipments and rehabilitate laboratory.
- Agreement with UNICEF to rehabilitate chlorination stations in the main reservoirs, in addition to supplying safety equipments for laboratory workers.

3-4. Water quality standards for Drinking Water:

Table (3.1) below showing the maximum permissible limits for various substances that may affect consumer acceptance of water:

Table (3.1):

Parameter	Levels likely to give Rise to consumer complaints
Physical Parameters:	
- Colour	15 TCU(True Colour Unit)
- Taste and Odour	Acceptable
- Temperature	Acceptable
- Turbidity	5 NTU(Nephlometric Turbidity Unit)
- PH	6.5 – 8.5

Inorganic Constituents :	
- Aluminum	0.13mg/l
- Ammonia	1.5 mg/l
- Chloride	250 mg/l
- Hydrogen Sulphate	0.05 mg/l
- Iron (total)	0.3 mg/l
- Manganese	0.27 mg/l
- Sodium	250 mg/l
- Sulfate	250 mg/l
- Total Dissolved Solids	1000 mg/l
- Zinc	3.0 mg/l

3-5. Monitoring system for safety of drinking water:

The normal routine work for the laboratory is to supervise the water quality at the sources and delivery points like reservoirs. The chlorine used to be added manually. There is collaboration between the State water lab and the ministry of health to control the private wells and commercial tanks. The Ministry of Health has regular campaigns to check the water quality, and the samples are taken to the State Water lab.

3-6. Implementation of water safety plans:

Improvement of human health is dependent on water supply in many ways, so improved physical and bacteriological quality of water supplies, access to improved sources of water (rehabilitate of slow sand filter and chlorination dosage).There are no any measures regarding water safety plan under consideration at least at the present time.

4. Reduction of Non- Revenue Water

4-1. Current Situations and major challenges:

Non - Revenue water is considered a loss, and this loss occurs in the transmission

lines and the internal network. The challenges lie in:

- Loss significant amount of water from the transmission lines and from network. -

The network is made of old materials, asbestos and UPVC.

- Network clogged with roots of mesquite trees.

- Loss significant amount of water by water theft.

4-2. Current Actions against those challenges:

- Replace the old pipes (asbestos and UPVC) with HDPE one.

- Organizing regular campaigns to review home connections.

4-3: Achievements:

- There were small projects to replace the network with HDPE pipes, which funded by states development budget, but unfortunately they were on a limited scale.

4-4. Constitution of NRW

Authorized consumption	Revenue Water	Billed authorized consumption	23,400,000 m^3/year %
	Non – Revenue Water (NRW)	Unbilled authorized consumption (ex. Fire fighting, cleaning)	m^3 / year not applicable %
Water losses		Apparent losses (unauthorized consumption)(i.e. Illegal use, Customer metering inaccuracies)	2,400,000 m^3/year 0.103 %
		Physical losses (Leakage)	4,680,000 m^3/year 0.2 %

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

- It cannot be applied at least at the present time.

5. Accounting system of Water Supply Service.

5-1. Water Tariff:

It is flat rate per household (consumer's uses case) and also at fixed metric tariff system according to volume of water used (commercial uses case).

5-2. Balance sheet:

Revenues		Expenditures	
Statement	amount	Statement	amount
Commercial definition	195,960,000	Salaries (labor and manpower costs including VWC remuneration)	952,882,000
Residential tariff	1,416,000,000		
Ports corporation	165,600,000		
Armed forces	240,000,000		
Sudan railways	18,456,000		
The reservoir	480,000,000	Goods and services (Fuel, Lubricants and electricity costs, routine repair and maintenance costs, water treatment costs, network and connections, Debit and other expenses)	1,700,000,000
Rural areas	48,000,000	Total	**2,652,882,000**
Other	88,866,000		
Total	**2,652,882,000**		

5-3. Profit and Losses Statements:

1- Profit and Loss Account:
Because the organization is based on service, it does not look at profits.
2- Capital Income and Expenditures:
The Revenues is equal to the Expenditures.

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

The Government of Sudan, represented by the Ministry of Finance and Economic Planning, and the African Development Bank agreed to implement the Institutional Capacity Building Project to improve Water and Sanitation Services in port Sudan City and build the capacity of workers in the Red Sea State Corporation in November,2017, with the Bank financing the project in accordance with terms of the Banks agreements protocol and the Ministry of Water Resources and Electricity, represented by the Drinking Water and Sanitation Unit, the State Water Corporation, implementing it through an independent executive unit for the project whose mandates and responsibilities are consistent with the laws of regulations of Sudan . And the program is consisting of:

- Rehabilitation of boreholes in Arbaat area.
- Maintenance and Rehabilitation Transmission lines.
- Construction of a raw water treatment plant at 14 kilometre from port Sudan city - Replacing the old network pipes in the main City with new one(HDPE).

7. Recent Challenges to Improve Water Supply Services.

- Removing silt from dams.

- Optimal operation of the well field.

- Treating leakages and losses of water in transmission lines and network. -

Maintenance of seawater desalination plants.

- Water Tariff management.

- Weak development budgets at the federal and state levels.

- Laws and legislation related to the state Water Authority.

8. Expectations toward Japan.

8-1. Expectation toward Japanese Government and JICA.

- The continuing of technical and capacity building to improve local water management practices, policy and strategic guidance and technology transfer through Technical Cooperation Projects and KCCP.
- The recent war in Sudan destroyed many of the achievements made by the Japanese government represented by JICA program in different parts of Sudan. Accordingly, after peace, we expect a double effort for the infrastructure, including equipment, supplies, etc.

- Continuing on the agreement between the government of Japan and Republic of Sudan for human resources development program in Sudan, under the supervision of JICA, accordingly, JICA provides technical supports and dispatch Japanese Experts.

- Support Drinking Water and Sanitation Unit, especially after the devastation that occurred due to the recent war in Sudan.

8-2. Expectation toward Japanese Water Utilities.

- Twinning program with state bodies to transfer experiences and knowledge.

8-3. Expectation toward Japanese Private Companies.

-Japanese Private Companies may contribute with their counterparts in Sudan to advance and contribute to the field of water production and supply water units and needs (equipments, materials, etc).

9. Expectations toward the program.

9-1. Expectations of my supervisors toward my participation in the program. - I will Gain new knowledge.

- Shared with Applicants experiences, problems, and Solutions. -

Transfer all these to my colleagues.

9-2. My Expectation.

- Transferee the experiences of others who participated in the training course. - Take advantage of the new information
- Reflect that information and knowledge to colleagues and apply it. ♦ If it is possible, to give the applicants an idea about the Kaizen method, because

it is a model to be emulated in addressing many of the shortcomings and deficiencies in water facilities.

The Republic of Sudan

Red Sea State

Training Program:

Administration and Management of water supply services

Training Institution

JICA Tokyo Center

Course Period in Japan: November 17 to November 30, 2024

Hanadi Hassan Mohammed Khalil

Organization: Red Sea State Water Corporation.

1

Location-Population-Demand :

Red Sea State is located between:

37˚ 10` to 37˚ 15` E

19˚ 35` to 19˚ 40` N.

The Population is estimated at 600,000 people.

Water demand for Port Sudan :

Year	Population	Water demand m^3/d	Other demand m^3/d	Total demand m^3/d
2010	423,447	38,103	11,430	49,532
2020	569,077	85,361	17,072	102,433
2030	764,792	114,718	22,944	137,662

2

1-Outline of Water Supply Services:

1-1. Legal Basis of Water Supply Services.

It's the responsibility of the legislature to create laws and regulations. In light of this users are divided into three categories :

- Category III, which is charged a monthly amount of $1.6 USD,

-Category II, which is charged a monthly amount of 2 USD.

-Category I, which is charged a monthly amount of 2.4 USD.

1-2. Demarcation of Water Supply Services:

We have two organizations in Sudan deal with water supply services:

- Red Sea Water Company is responsible for the provision of water in both urban and rural areas. This include the operation of underground drilling units and external stations, such as desalination plants situated in urban villages. The company is accountable for the connection of main water lines, while the remaining internal connections are the responsibility of the customer.
- the Drinking Water and Sanitation Unit (DWSU) is responsible of foreign funds, planning, designing, and constructing of national projects among state level.

1-3. Main Actors of Water Supply Utilities

- Ministry of Infrastructure and Urban Development at state level .
- Drinking Water and Sanitation Unit (DWSU) at Federal level.

1-4. Mission of Water Supply Utilities:

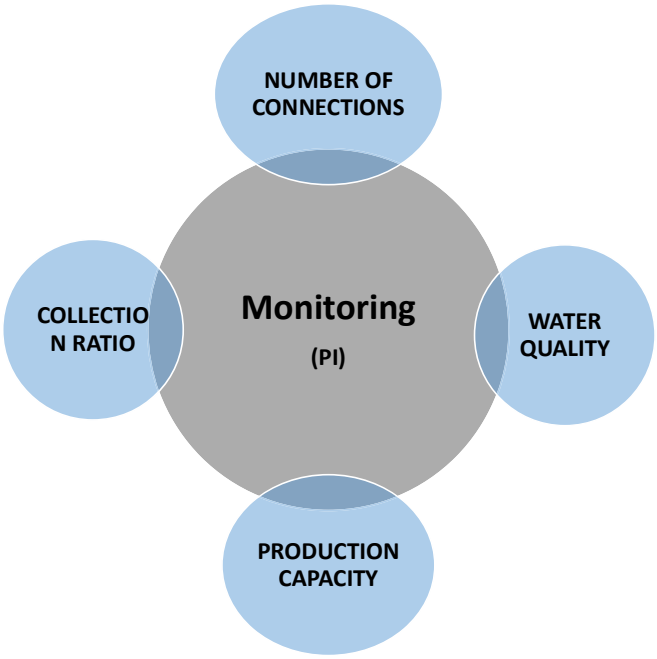
1-5. My Mission in my Organization:

I am the head of the civil engineering department and have many key responsibilities and tasks, such as supervision, planning, design, monitoring and evaluation. In addition to these duties, I am also the Commercial Director.

2- Water Supply Services Levels

2-1. Main Performance Indicators (PI)

Coverage area	**75 (sq.km)**
Population Served	**264,000**
Collection ratio	**25%**
Production capacity	**60,000 (m^3/day)**
Supply duration	**24 (hr/day(average 4hr/day))**
Supply pressure	**0.1**
Non – Revenue Water	**75 %**
Water quality	**Potable according to Sudanese standard**
Staff number	**512**
Number of connections	**44,000**
Staff/1,000 connections	**11.6**



5

3. Management of Water Quality

The major challenges and Action Against them

	3.1 THE MAJOR CHALLENGES	*3.2 ACTIONS AGAINST*
1	THE STATE WATER LABORATORY IS DOING THE PHYSICAL, CHEMICAL AND BIOLOGICAL TESTS TO KNOW WHETHER THE WATER IS DRINKABLE OR NOT.	➢ *SUPPLY NEW LAB ROTARY TOOLS, EQUIPMENT'S AND MATERIALS.* ➢ *CUSTOMER MANAGEMENT REGARDING THE USAGE OF PURIFICATION WATER.*
2	MAINTAINING WATER QUALITY DUE TO INSUFFICIENT MONITORING SYSTEMS AND LIMITED CAPACITY OF TECHNICAL EXPERT	➢ *MORE CAPACITY BUILDING PROGRAMS*
3	CUSTOMER MANAGEMENT REGARDING THE USAGE OF PURIFICATION WATER.	➢ *ADD MORE AWARENESS PACKAGES.*

3-3. Achievements:

- Collaborate with UNOPS Organization to supplying equipment's and rehabilitate laboratory.

- Agreement with UNICEF **to rehabilitate chlorination stations in the main reservoirs, in addition to supplying safety equipment's for laboratory workers.**

6

3-4. Water quality standards for Drinking Water:

Parameter	Levels likely to give Rise to consumer complaints
Physical Parameters:	
- Colour	15 TCU(True Colour Unit)
- Taste and Odour	Acceptable
- Temperature	Acceptable
- Turbidity	5 NTU(Nephlometric Turbidity Unit)
- PH	6.5 – 8.5
Organic Constituents :	
- Aluminum	0.13mg/l
- Ammonia	1.5 mg/l
- Chloride	250 mg/l
- Hydrogen Sulphate	0.05 mg/l
- Iron (total)	0.3 mg/l
- Manganese	0.27 mg/l
- Sodium	250 mg/l
- Sulfate	250 mg/l
- Total Dissolved Solids	1000 mg/l
- Zinc	3.0 mg/l

3-5. Monitoring system for safety of drinking water:

It's The responsibility of the laboratory and the Ministry of Health.

3-6. Implementation of water safety plans:

Improvement of human health is depending on water supply in many ways, so improved physical and bacteriological quality of water supplies, access to improved sources of water by adding filtration and chlorination system. There is no any measurements for water safety plan.

4. Reduction of Non- Revenue Water

4-1. Current Situations and major challenges:

Non - Revenue water is considered a losses in the transmission mains and the distribution network.

The challenges are:

- the material of the pipes(transmission mains and network)
- The illegal connections.
- Not issued, distributed or paid bills.

4-2. Current Actions against those challenges:

- Replace the pipes of (asbestos and UPVC) with HDPE one.
- Organizing regular campaigns to review home connections.
- Activate the rules and lows to conserve the water sullies from illegal actions.

4-3: Achievements:

There where small projects to replace the network with HDPE pipes, which funded by state's development budget, but unfortunately they were on a limited scale.

4-4. Constitution of NRW

Authorized consumption	Revenue Water	Billed authorized consumption	5,475,000 m3/year 25%
	Non – Revenue Water (NRW)	Unbilled authorized consumption (ex. Fire fighting, cleaning)	0 m3 / year 0 %
Water losses		Apparent losses (unauthorized consumption)(i.e. Illegal use, Customer metering inaccuracies)	5,475,000 m3/year 25%
		Physical losses (Leakage)	10,950,000 m3/year 50 %

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

It cannot be applied at least at the present time.

5. Accounting system of Water Supply Service.

5-1. Water Tariff:

It is flat rate per household (consumer's uses case) .

5-2. Balance sheet:

Revenues		Expenditures	
Statement	amount USD	Statement	Amount USD
Commercial definition	391,920	Salaries (labor and manpower costs including remuneration)	1,905,764
Residential tariff	2,832,000		
Ports corporation	331,200		
Armed forces	480,000		
Sudan railways	36,912		
The reservoir	960,000	Goods and services (Fuel, Lubricants and electricity costs, routine repair and maintenance costs, water treatment costs, network and connections, Debit and other expenses)	34,000,000
Rural areas	96,000	Total	**5,305,764**
Other	177,732		
Total	**5,305,764**		

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5-3. Profit and Losses Statements:

1- the Decision Maker thought that the organization is based on community serving , they does not care about profits and lost (State government cover gab in expenditure (for both Operation and maintenance Cost's and remuneration).

2- Capital Income and Expenditures:

The Revenues is less than Expenditures.

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

The Project of the African Bank to implement the Institutional Capacity Building to improve Water and Sanitation Services in port Sudan city

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7. Recent Challenges to Improve Water Supply Services.

- reducing leakages and losses in transmission mains and distribution network.
- Rehabilitation of seawater desalination plants.
- Water Tariff management and insufficient development budget at the federal and state levels.
- Laws and legislation related to the state Water corporation.

8. Expectations toward Japan

8-1. Expectation toward Japanese Government and JICA

Technical Support:

- Continued technical and capacity-building assistance through JICA and Japanese experts.
- Reconstruction of water infrastructure.

Human Resource Development:

- Support for capacity development programs to improve Sudanese state water corporation's.

8-2. Expectation toward Japanese Water Utilities.

- Twinning program with state bodies to exchange experiences and knowledge.

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8-3. Expectation toward Japanese Private Companies.

We expect smart partnership between Japanese and Sudanese private to share in the development or with the Sudanese government through ppp (public private partnership) method to achieve prosperity and well- being for the both nations.

9. Expectations toward the program.

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

- I will Gain new knowledge.
- Shared with Applicants experiences, problems, and Solutions.
- exchange the experiences and knowledge I gain with my colleagues during the program and after (my organization colleagues) .
- Know more about Japanese nation and cultural norms .

9-2. My Expectation.

- Transferee the experiences of others who participated in the training course.
- the application of the program finding in my daily works.

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Thank You

9. TIMOR-LESTE

Inception Report

ADMINISTRATION AND MANAGEMENT OF WATER SUPPLY SERVICES

Country : Timor-Leste
Name : Maria Imaculada da C. Soares dos Reis Pires

Contents

1. OUTLINE OF WATER SUPPLY SERVICES

1-1. Legal Basis of Water Supply Services

Following are the laws and regulation for water supply services in Timor-Leste.

Laws and Regulations	Summary of Core Requirements
Timor – Leste Strategic Development Plan 2011–2030	Outlined government's plan to set until 2030, as one of its priorities, the universal and equitable access to a drinking water supply system for all citizens.
Decree Law No 50/2023 Statute of the Ministry of Public Works	Approved the statute for the Ministry of Public Works (MOP) and sets out its responsibility to oversee the supply, distribution and management of water. This Decree sets out the responsability of the MOP to supervise the Stated-owned Company for water, Bee Timor-Leste. The Decree-Law also establishes General Directorate and National Directorate under the MOP responsible for the creation of regulation for water sector.
Decree Law 41/2020 on the Creation of Bee Timor-Leste	Created and approved the State-owned Company Bee Timor-Leste (BTL). It establishes the role of BTL to provide water supply, sanitation and drainage services to all communities of Timor-Leste.
Decree Law 4/2004 on Water Supply for Public Consumption	Established the conditions for water distribution for public use in Timor-Leste. It places the responsibility on the State to provide Timorese communities with access to water for public consumption and provides for the creation of water management groups. The Water Supply for Public Consumption Law also provides for the setting of fees and charges for water supply services.
Decree Law 31/2020 – Water Quality for Human Consumption	Established the concentration limits for controlled parameters in water sources for human consumption.
National Water Supply Policy	Provides guidance on the provision of drinking water to meet the population's needs. It sets out system ownership, responsibilities for establishing tariffs for provision of

	service, requirements for inclusive and participatory planning for public water supply, service and design standards, and guidance on capacity development and monitoring and evaluation.
National Water Resources Management Policy	Guides the provision of water for all other purposes. The policy provides guidance on the creation of administrative, institutional, and WRM structures.
Decree Law No. 3/2016 on The Statutes of the Municipal Administrations and Municipal Authorities	Established the competence of the municipal government for the management of water, sanitation and environment.
Decree-Law n.5 / 2009 Regulation of licensing, commercialization and quality of drinking water.	Established procedures for the licensing related to bottled water business intended for human consumption. The provisions are applicable to bottled water production.
National Drinking Water Quality Standards and Monitoring Guidelines	Provides details of the methods and procedures for routine sampling and testing of water quality and the standards which apply.

Table 1. Legal basis of water supply services in Timor-Leste

1-2. Demarcation of Water Supply Services

In Timor-Leste, various ministries are responsible for different aspects of water management and supply. Following are the key ministries and their areas of responsibility.

Ministry	Field	Responsibility
Ministry of Public Works (MOP)	Water Supply and Sanitation	Overseeing the development and maintenance of water supply infrastructure, including treatment plants and distribution networks.
Ministry of Agriculture and	Irrigation and Agricultural Water Management	Managing irrigation systems and supporting agricultural water needs.

Fisheries (MAF)		This includes developing and maintaining irrigation infrastructure and promoting efficient water use in agriculture.
Ministry of Health (MoH)	Water for Health Center	Responsible for the provision of water to the health center.
Ministry of Education	Water for Schools	Responsible for the provision of water to schools
Institute of Geoscience	Hydrogeology Knowledge	Responsible for improving knowledge on and undertaking investigations into the geological structure of soils, sub-soils, and hydrogeological resources.
The Ministry of Foreign Affairs and International Cooperation (MNEC)	Bilateral and multilateral agreements	Rsponsible for any treaties and bilateral and multilateral agreements concerning shared water resources with any other states.
The Ministry of Petroleum and Mineral Resources (MPRM)	Extraction on riverbeds and banks	Responsible for activities related to the extraction of minerals and petroleum, including sand and gravel mining on the riverbeds and banks.
The Vice-Prime Minister and Minister Coordinator for Economic Affairs and Minister of Tourism and Environment	Environmental Protection	Responsible for protecting the environment by assessing the environmental impact of developments and by establishing environmental licensing and prevention measures and monitoring of pollution.

Table 2. Ministries responsible for water management and supply

1-3. Main Actor of Water Supply Utilities

In Timor-Leste, the main actors involved in water supply utilities include a combination of government agencies, local authorities, community organizations, as well as private sectors. These actors work together to ensure that water supply services are available and sustainable across Timor-Leste, with an emphasis on improving access in both urban and rural areas. The main actors are as follow:

Actors	Role
Ministry of Public Works (MOP)	MOP oversees the development, maintenance, and regulation of water supply infrastructure across the country. It sets policies, standards, and guidelines for water distribution.
Bee Timor-Leste (BTL)	BTL is the Stated-owned Company responsible for the operation and maintenance of water system for all territory of Timor-leste. However, since BTL is established very recently, therefore, has not been able to cover all the territory. At the moment, BTL provides water supply services mostly in urbal areas, particularly in the capital city of Dili and other major towns.
Municipal Government	Municipal Government, through the Municipal Department for Water, Sanitation and Environment (SMASA), is responsible for the operation and maintenance of water supply in the municipality in rural and less urbanized areas. They play important role in facilitating access to water in underserved communities.
Community-based Water Management Committee (GMF)	In rural areas, community-based Water Management Committees (GMF) manage local water resources, including small-scale water suppy systems. They ensure equitable water access and typically make minor maintenance at the community level.
International Organisations and donors	Various International organisations provide funding, technical assistance, and policy guidance for water infrastructure development and capacity building in Timor-

	Leste.
Non-Governmental Organizations (NGOs)	NGOs often support water supply projects in rural areas, focusing on improving access to clean water. They may provide technical assistance, education, and infrastructure development.
Private retail	In Timor-Leste there are also private retailers supplying water to different part of the country.

Table 3. Main Actors involved in water supply utilities in Timor-Leste

1-4. Mission/Vision of Water Supply Utilities

BTL's Business Plan 2023 – 2027 states that BTL **envisions to become an excellent Water supply and Sanitation Public Enterprise.**

To achieve this vision, BTL is working to:

- Increase universal and equitable access to safe drinking water and sanitation services to all populations in all territories;
- Maintain regular, continuous and efficient water supply and sanitation services;
- Promote affordable water and sanitation services that contribute to economic development, social, environmental and technological advancement;
- Improve public health; and
- Promote industrial, commercial and research development.

For the period of 2023-2027 the goal and focus of BTL is to:

1) Building Good Governance and Institutional Strengthening
2) Improving water system, sanitation and drainage

Therefore, by 2027, BTL will have:

1) Commenced or completed construction of water supply, sanitation or drainage projects in Baucau, Lospalos, Viqueque, Same, Suai, Aileu, Dili, Gleno, Maliana, Liquica, and Ainaro.
2) More than 35,000 customers connected to its water supply networks across Timor-Leste.

3) Lifeline tariffs applied to vulnerable customers who have registered with BTL.
4) Achieved a bill payment rate of more than 20%
5) Annual revenues of more than US$12m

1-5. Your Mission/Vision in your organization

Since I am currently working at BTL, therefore, the Mission/Vision of the organization is as described in section 1-4 above.

2. WATER SUPPLY SERVICE LEVELS

2-1. Main Performance Indicators (PI)

Coverage area	15.006 (sq. km)
Population Served	277,490
Collection ratio	45.8 (%)
Production capacity	12040 (m3/day)
Supply duration	16 (hr/day)
Supply pressure	0.1 bar
Non-Revenue Water	91 (%)
Water quality	WHO
Staff number	181
Number of connections	17.287
Staff/1,000 connections	10.5 (people/1,000connections)

Table 4. Main Performance Indicator

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

Timor-Leste has begun to use performance indicators to monitor and manage water supply services. BTL has set 6 Key KPI in corporation with JICA technical corporation project and is currently monitoring them. The KPIs are as follow.

1. Non-revenue water ratio
2. Tariff collection ratio
3. Metered Customer Ratio
4. Meter Reading Ratio
5. Billing Ration
6. Population Served by Water Supply

3. MANAGEMENT OF WATER QUALITY

3-1. Current Situation and Major Challenges/Problems

The Timor-Leste Water Sector Assessment and Roadmap Report (World Bank, 2018) found that Bacteriological contamination of water sources is widespread in urban and rural areas and within some public water supply systems, and it is not known whether inorganic pollutants are present in Timor-Leste's water resources, as there are no testing facilities for inorganic chemistry in Timor-Leste. This contamination of water sources can lead to waterborne diseases.

In many areas of Timor-Leste, especially in rural regions, there is a lack of adequate water treatment facilities. The report (World Bank, 2018) found that water treatment is limited and irregular, such as infrequent chlorination. BTL (2023) noted that assets like water treatment facilities do not produce water meeting the National Water Quality standards, and BTL has little to no sanitation infrastructure. As a result, the community is often left to rely on untreated or minimally treated water.

Seasonal variability and droughts, exacerbated by climate change, can worsen water quality issues. During the dry season, which often leads to water scarcity in many parts of Timor-Leste (ACAPS, 2024), communities frequently resort to using unsafe water sources that may not be safe to drink.

3-2. Current Actions against Those Challenges/Problems

The government of Timor-Leste continues to prioritize water quality improvement. Furthermore, BTL (2023) has identified, in its priority areas for 2023-2027, the continued investment in water treatment technology as a key focus, alongside other priorities.
The Government of Timo-Leste has approved and implemented the Decree Law No. 31/2020 on Water Quality for Human Consumption. The implementation of this Decree Law is underway.

In July 2022, Timor-Leste signed an agreement with the Millennium Challenge Corporation (MCC), a U.S. foreign aid agency, for a $420 million grant for major infrastructure development aimed at enhancing water quality in the capital, Dili, and other

major towns.. This grant includes $308 million allocated for the Water, Sanitation, and Drainage (WSD) Project. Among its various objectives, the WSD project will upgrade water treatment facilities to ensure a consistent supply of clean and safe drinking water, particularly in Dili and other major urban centers.

3-3. Any Achievements

The government of Timor-Leste has made progress in management of water quality. The implementation of the Decree Law No. 31/2020 on Water Quality for Human Consumption on is underway to enforce these standards through regular testing and compliance measures. BTL set up a water quality monitoring plan called PCQA in accordance with this Decree Law. The Department of Environment and Quality Control of BTL is conducting the daily and monthly monitoring based on the PCQA.

The Government of Timor-Leste also securing funding for major infrastructure development to enhance water quality. The WSD project will be implemented in Dili and other urban centers. This project is particularly significant for improving water quality, as it addresses challenges such as contamination, water scarcity, and inadequate sanitation infrastructure. The project will design and construct water treatment facilities, supply disinfected water to communities, implement household and business wastewater connections, and, importantly, support capacity building and institutional development of the water utility. This support will focus on strengthening asset management expertise and operations and maintenance capacity, as well as providing community training and household awareness programs.

3-4. Water Quality Standards for Drinking Water

BTL has identified the increase access to safe drinking water as one of its main goals and priorities for 2023-2027. Therefore, BTL is committed to continue allocating resources to achieve this goal. Decree Law No. 31/2020 on Water Quality for Human Consumption has been approved to set the requirement for the standard of drinking water.

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

Timor-Leste has been working on improving its monitoring systems and plans for the safety of drinking water. The country has made strides in developing frameworks and initiatives to enhance water quality monitoring and management. Efforts are ongoing to strengthen the monitoring infrastructure, ensure compliance with water safety standards, and improve overall water quality management.

BTL set up a water quality monitoring plan called PCQA in accordance with this Decree Law. The Department of Environment and Quality Control of BTL is conducting the daily and monthly monitoring based on the PCQA.

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

Timor-Leste has been working toward developing and implementing Water Safety Plan (WSP), although progress is still in its very early stages. The development of the Decree Law on Water Quality Control for Human Consumption in 2020 is a step toward ensuring water safety in line with international standards. This law outlines the microbiological, physical, and chemical standards for water safety.

Also, Timor-Leste has received support from organizations to develop and implement Water Safety Plans in both urban and rural areas. These plans include risk assessments, improvements in water treatment, and monitoring systems to maintain water quality. These collaborations are helping to build the capacity of local governments and water utilities to develop sustainable water management practices, including the establishment of WSP.

In cities like Dili, pilot projects have been initiated to improve water quality monitoring and treatment through WSPs. These projects focus on reducing contamination risks, upgrading infrastructure, and ensuring that water treatment facilities meet the required standards for safe drinking water.

In rural areas, where access to formal water treatment systems is limited, efforts are being made to introduce community-based water safety planning. This involves local

water committees managing water sources and implementing basic safety practices to ensure that water remains free from contaminant (World bank, 2018).

4. REDUCTION OF NON-REVENUE WATER

4-1. Current Situation and Major Challenges/Problems

In Timor-Leste, the existing water supply infrastructure is degraded because of a lack of historical investment and damage during pre-independence conflict. Thus, there is a significant leakage from the network (BTL, 2023).

In addition to this, in Timor-Leste there are also many illegal connections to the water system. According to the Final Report of the Dili Urban Metropolitan Water Supply Master Plan, the water supply system covered 50% of the Dili city population, but only 30% had legal connections, of which 20% were paying clients (1,68% of Dili population), covering only 3% of operational costs of the system. This means that 70 to 95% losses of produced water in the system, mostly illegal connections.

Both degraded infrastructure and illegal connection contributes to high rates of Non-Revenue Water (NRW). The NRW is estimated to partly be as high as 90 percent of the total volume supplied (World Bank, 2018), thus contributing to the efficiency of water supply system performing far below standard.

4-2. Current Actions against Those Challenges/Problems

BTL continues to prioritize investing in new water supply, drainage, and sanitation infrastructure, as well as maintaining and repairing existing infrastructure. Over the period 2022-2031, BTL has forecasted a capital investment program amounting to $862 million.

The planned Dili Urban Water Supply Project will actively monitor and work to reduce Non-Revenue Water as the new infrastructure is constructed, including plans to monitor each District Metered Area. However, this project has not yet been implemented.

Municipality	Water Supply Infrastructure	Sanitation	Value	Construction Period
Ainaro	Upgrading & extension of water infrastructure	New FSTP[1]	$525.000,00	2024-27
Aileu	Upgrading & extension of water infrastructure	New FSTP	$1.194.647,00	2024-27
Atauro[2]	"Minor" capital investment in water system		$0	2023-27
Baucau	Upgrading & extension of water infrastructure	New FSTP	$1.200.000,00m	2023-26
Bobonaro	Maliana - Upgrading & extension of water infrastructure	New FSTP	$805.000,00	2024-27
Covalima	Suai - Upgrading & extension of water infrastructure	New FSTP	$940.000,00	2024-27
Dili	Construction of New/Refurbished Bores and Water Treatment systems in East and West Dili water supply zones. Construction of water distribution and reticulation networks to serve an ultimate 45,000 customers in 2030 (30,000 in West Zone, 15,000 in East Zone[3]). Construction of chemical disinfectant plant	Sewerage, drainage & UASB[4] sewage treatment plant	Water: $210m[5] Sanitation: >$420m Other $7m	2023-29
Ermera	Gleno - Upgrading & extension of water infrastructure	New FSTP	$1.033.735,00	2024-27
Lautém	Los Palos - Upgrading & extension of water infrastructure	New FSTP	$1.131.322,82	2023-26
Liquiçá	Liquica - Upgrading & extension of water infrastructure	New FSTP	$855.594,00	2024-27
Manufahi	O&M of Water Supply Infrastructure only		$1.350.467,83	2023-26
Manatuto	Same - Upgrading & extension of water infrastructure	New FSTP	$0	
Oecusse[6]	To be determined	New FSTP	$0	-
Viqueque	Upgrading & extension of water infrastructure		$1.195.304,68	2023-26
	TOTAL[7]		**$862m**[8]	2022-2031

Source: BTL Business Plan 2023-2027

Table 5. Budget Forecast for BTL's Capital Investment Program for 2022-2031

BTL will also take action to identify and remove illegal connections. BTL will work to identify where this illegal connection may be occurring and remove any illegal connections that are found, and actively inspecting customer water connections as part of the meter reading program.

4-3. Any Achievements

By 2022, BTL (2023) reported the following achievements, which are critical factors contributing to the reduction of the NWR.

- BTL is currently working together with JICA Technical Cooperation to create a block system to measure water distribution and consumption, hence to detect leakage easily.
- Registered 2,155 new customers, to bring the total number of customers to 33,085 (6456 customers in Dili, and 16,629 customers in the Municipalities).
- Designed upgrades and repairs to the Metinaro desalination system
- Continued to manage the Wastewater Treatment Station System in Tibar – Liquica.
- Designed of upgrades to wastewater treatment in Baucau and Suai will start in 2023
- Concluded data collection in 48 Sub-District Administration Capitals
- Collected data in 8 sucos and aldeis in rural areas
- Continued projects carried over from 2021, including water system improvements in Mehara-Tutuala, Maubisse, Soibada and Luro.
- Finalised the feasibility study for water, wastewater and drainage projects in Dili and neighboring Municipalities.

4-4. Constitution of NRW

Authorized consumption	Revenue water	Billed authorized consumption	(m3 /year) 9.0 (%)
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	(m3 /year) 0.1 (%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	(m3 /year) 56.6 (%)
		Physical losses (Leakage)	(m3 /year) 39.3 (%)

Table 6. Non Revenue Water

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

In Timor-Leste, efforts are underway to improve the leakage detection measures, and to overall improve water distribution system. Smart meters have been installed in both urban and rural areas to better track water consumption and detect leaks early. These meters improve the accuracy of billing and help water authorities manage demand more effectively (World Bank, 2022).

Also, BTL is currently working with JICA Technical Cooperation Project to create a block system in Manleuana Village in Dili. This block system measures water distribution and consumption. Therefore, it can detect leakalge easily.

5. ACCOUNTING SYSTEM OF WATER SUPPLY SERVICE

5-1. Water Tariff in your Organization

In Timor-Leste, water tariff collection were jointly established in 2004 by the MOP and the Ministry of Finance, and has since never been revised. In 2006, Water tariffs were suspended after the civil unrest and only reinstated in July 2013. But, water tariffs currently apply mostly only to the urban areas of Dili and only to metered customers. Yet, in Dili urban area, there are only about 27 percent of connections are registered and billed and normally, there are no penalties for customers who do not pay their bills (World Bank, 2018).

In rural areas, water tariff is collected by the water management committee, GMF, however very few GMFs are able to recover costs for basic O&M, and many are not functioning sufficiently well to collect any payment for water services (World Bank, 2018).

World Bank (2018) recommended to review of the tariff policy to rationally set the prices for water to allow for progressively sustaining the recovery of O&M costs and building on the tariff-setting activities. However, BTL' Annual Report for 2023 said that water tariff is very low. It barely sustaining the O&M cost.

In 2021, the National Authority for Water and Sanitation (ANAS) established a Technical Tariff Committee as an important step forward to resolve to improve the sustainability of water service delivery. The Committee has membership from BTL, ANAS, the Consumers' Association, Ministry of Finance, Ministry of State Administration, the NGO Forum for Timor-Leste, and academia to review and propose a new tariff structure and develop guidelines for the establishment of water tariffs. In 2022, a new tariff structure is drafted for approval by the Council of Ministers

5-2. Balance Sheet of your Organization

BTL Annual Report 2023 showed that BTL equity and liability equivalent to $73,844,359.98 (compared to 2022=$61,299,536.89). Therefore, there is an increase of $7,579,974.54 compared to 2022.

	Notas	Exercício 12/31/2023	Exercício 12/31/2022
ATIVOS			
Ativos não correntes			
Ativos fixos tangíveis	5	$ 17,601,402.73	$ 10,021,428.19
Ativos intangíveis	5	$ -	$ -
		$ 17,601,402.73	$ 10,021,428.19
Ativos correntes			
Inventários	6	$ 1,558,876.80	$ 6,590.00
Capital subscrito e não realizado	12	$ 12,880,000.00	$ 12,880,000.00
Outras contas a receber	8	$ 1,038,705.53	$ 569,090.16
Caixa e depósitos bancários	10	$ 40,765,374.92	$ 37,822,428.54
		$ 56,242,957.25	$ 51,278,108.70
Total do ativo		**$ 73,844,359.98**	**$ 61,299,536.89**
CAPITAL PRÓPRIO			
Capital próprio			
Capital social	12	$ 48,885,780.62	$ 12,880,000.00
Outros instrumentos de capital	12	$ -	$ 35,005,780.62
Resultados transitados		$ -1,527,603.83	$ -1,655,334.07
		$ 47,358,176.79	$ 47,230,446.55
Resultado líquido do período		$ 690,028.74	$ 127,730.24
Total do capital próprio		**$ 48,048,205.53**	**$ 47,358,176.79**
PASSIVOS			
Passivos não correntes			
Outras contas a pagar	14	$ 643,045.67	$ 945,732.42
Subsídios diferidos	17	$ 9,787,909.58	$ 3,599,546.09
		$ 10,430,959.25	$ 4,545,278.51
Passivos correntes			
Fornecedores	13	$ 1,758,674.80	$ 1,245,547.09
Estado e outras entidades públicas	9	$ 187,712.08	$ 150,534.50
Outras contas a pagar	14	$ 337,629.60	$ -
Subsídios diferidos	17	$ 13,081,178.72	$ 8,000,000.00
		$ 15,365,195.20	$ 9,396,081.59
Total do passivo		**$ 25,796,154.45**	**$ 13,941,360.10**
Total do capital próprio e do passivo		**$ 73,844,359.98**	**$ 61,299,536.89**

Source: BTL Annual Report 2023 in Portugues

Figure 1. BTL's Balance Sheet as 31 December 2023

5-3. Profit and Loss Statement of your Organization

BTL's Annual Report 2023 showed that in 2023, BTL's revenue is still very small compared to BTL's operational expenses. BTL continue to receive subsidy from the Govenrment for most of it operational expenses. Nevertheless, in 2023, BTL has positive profit and loss statement. The BTL's profit in 2023 is $690,028.74 compared to only $ 127,730.24 in 2022.

	Notas	Exercício 12/31/2023	Exercício 12/31/2022
Operações em continuidade			
Receitas	15	$ 1,155,209.61	$ 748,689.24
Subsídios do Governo e Outros	11	$ 6,995,482.57	$ 5,400,453.91
Custos com pessoal	16	$ -3,802,310.51	$ -3,303,300.83
Fornecimentos e serviços externos	17	$ -3,349,519.58	$ -2,791,103.68
Resultados antes de juros, impostos e depreciações		$ 998,862.09	$ 54,738.64
Gastos / reversões de depreciações e amortizações	5	$ -643,870.97	$ -99,157.14
Resultado operacional		$ 354,991.12	$ -44,418.50
Juros e rendimentos similares	18	$ 335,037.62	$ 172,148.74
Juros e gastos similares		$ -	$ -
Custos de financiamento líquidos		$ 335,037.62	$ 172,148.74
Ganhos obtidos em associadas, líquido de imposto		$ -	$ -
Resultado antes de imposto		$ 690,028.74	$ 127,730.24
Imposto sobre o rendimento		$ -	$ -
Resultado do ano de operações em continuidade		$ 690,028.74	$ 127,730.24
Resultado do ano de operações descontinuadas		$ -	$ -
Resultado líquido do período		$ 690,028.74	$ 127,730.24
Outro rendimento integral		$ -	$ -
Rendimento integral total, líquido de imposto		$ 690,028.74	$ 127,730.24
Resultado por ação das operações em continuidade		$ -	$ -

Source: BTL Annual Report 2023 in Portugues

Figure 2. BTL's profit and Loss Account as 31 December 2023

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

- The government of Timor-Leste has enacted several important laws and regulations in water sector. This can resulted in broadening the enabling environment to improve the water supply service (Water and Sanitation for All et al., 2022).
- The recent institutional reform in 2020 formed BTL as the semi-autonomous entity for water services under the tutelage of MOP. This new structure will help better focus on service quality under the BTL (Water and Sanitation for All et al., 2022).
- The Government of Timor-Leste has already identified the contribution of the water sector to the overall development of the country. This showed that investing in the water services can impact greatly on economic growth, poverty reduction and environmental sustainability (ADB, 2018).

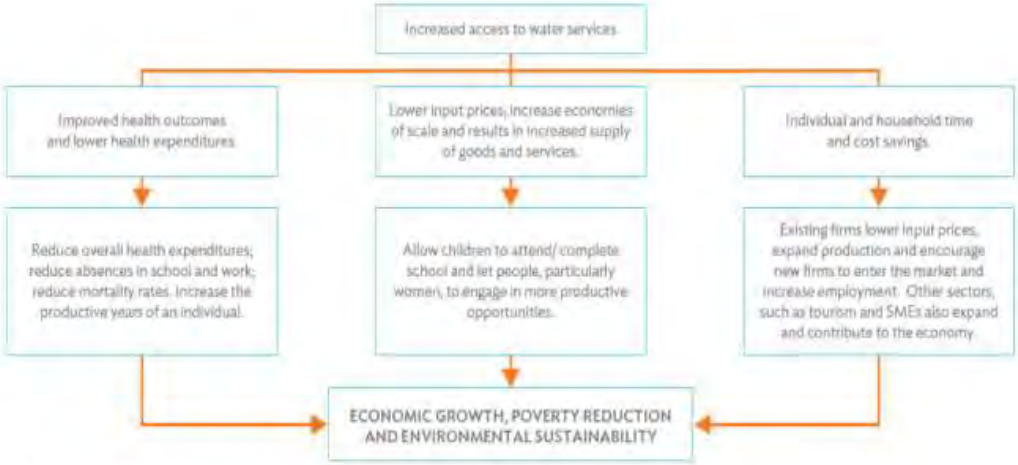
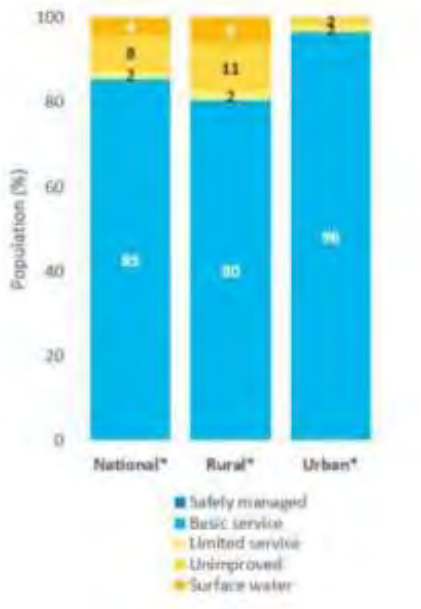


Figure 3. Benefit of investing in water services

- The Government of Timor-Leste has developed a medium and long term investment plan for water supply. Having this investment plan can ensure sustained funding for infrastructure development, maintenance, and innovation, and can help secure long-term water availability and efficiency while addressing future challenges like climate change and population growth (Water and Sanitation for All et al., 2022).

- Timor-leste has been in the process of reaching the last stage of water accessibility. The national coverage of basic water is 85% (Water and Sanitation for All et al., 2022).



Source: Sanitation and Water for All, Ministry of National Development Planning, Unicef, 2022, Sector Minister's Briefing

Figure 4. Drinking Water Coverage

- Timor-Leste has started introducing smart meter, both in urban and rural areas, that allow for better monitoring of water consumption. These meters help reduce **Non-Revenue Water (NRW)** by improving billing accuracy, effective demand management and leak detection in the network (World Bank, 2022).

7. RECENT CHALLENGES TO IMPROVE WATER SUPPLY SERVICES

- Despite the Government of Timor-Leste positioning water and sanitation as one of the country's four main priorities, competing demands have led to a compromise in optimal investment in water. It is evident that water and sanitation infrastructure accounts for less than 0.5% of all government infrastructure investments (Water and Sanitation for All et al., 2022).
- Timor-Leste is still not able to report on its safe water coverage due to a lack of data and assurance on water availability and quality (Unicef, 2022). Since safe water directly impacts health, poverty reduction, gender equality, and environmental sustainability, the absence of safe water coverage data can hinder Timor-Leste's ability to achieve the Sustainable Development Goal (SDG) 6 targets on water and sanitation by 2030 (Water and Sanitation for All et al., 2022).
- Despite overall progress in access to water supply in Timor-Leste, there is still a disparity between urban and rural areas (World Bank, 2018). Water supply in urban areas is already covered at 96%, but only 80% in rural areas (Water and Sanitation for All et al., 2022).
- There appears to be a lower priority for O&M funding, particularly in rural areas. In these areas, the government allocates funding for capital investment through various decentralization development programs; however, the allocation for O&M is insufficient to meet the needs (World Bank, 2018). Since O&M ensures the reliable and continuous delivery of water, prevents system breakdowns, and extends the lifespan of infrastructure, insufficient funding for O&M can impact the long-term operability and sustainability of water systems
- There is still lack of coordination in water supply management (World Bank, 2018). This can cause fragmented oversight and unaligned efforts among various government agencies, NGOs, and local authorities result in inefficient resource use, overlapping initiatives, and gaps in service delivery.

8. EXPECTATIONS TOWARD JAPAN

8-1. Expectations toward Japanese Government and JICA

Expectations toward the Japanese Government and JICA include providing comprehensive expertise and sharing information on best practices in water management from Japan to enhance participants' understanding of water supply administration, management, operation, and maintenance, particularly on water quality control, measures against non-revenue water, and water supply standards. This knowledge will help clarify future challenges and be utilized to draft feasible improvement plans.

8-2. Expectations toward Japanese Water Utilities

Expectations toward the Japanese water utilities include sharing of practical, hands-on experience and best practices in the administration and management of water supply services. It is anticipated that the Japanese water utilities will share detailed insights into effective water quality control, efficient measures to reduce non-revenue water, and adherence to high water supply standards, as well as operational successes and challenges faced by Japanese utilities. This will help the participants address local issues and develop actionable improvement plans tailored to their country's specific needs.

8-3. Expectations toward Japanese Private Companies

Expectations toward the Japanese private companies include providing practical insights and expertise in the administration and management of water supply services, including innovative technologies, efficient operational practices, and effective strategies for maintaining high standards of service. It is anticipated that the Japanese private companies will share lesson learn about successful private sector approaches to water quality management, customer service, and cost efficiency. The experience and knowledge shared by Japanese private companies can help the participants to implement sustainable and effective solutions tailored to the local context, ultimately enhancing the overall management and performance of water supply systems in the participants' country.

9. EXPECTATIONS TOWARD THE PROGRAM.

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

Participants' expectations toward their supervisor include providing clear guidance and support in their roles during the water supply service program. It is anticipated that the supervisor will facilitate access to expert knowledge and best practices in water supply management, tailor training to address specific local challenges, and assist in implementing advanced technologies. Additionally, participants hope for ongoing support in building their capacity, promoting sustainable practices, and developing effective monitoring and evaluation frameworks. They also expect the supervisor to encourage resource sharing and collaboration to improve the administration and management of water supply services in the participants' country.

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

Participants attending this program expect to gain in-depth knowledge and practical skills relevant to managing water supply systems. Participants anticipate receiving targeted training that addresses their specific challenges, learning about advanced technologies and sustainable practices, and developing effective strategies for monitoring and evaluation. Participants also expect to build their capacity, collaborate with experts and peers, and gain insights that will enable them to enhance the efficiency and effectiveness of water supply services in their own contexts in their own country.

9.3. Last Comment

Lastly, as an applicant to this program, I want to say that since I am working in BTL, the company responsible for the water supply management in Timor-Leste, I will gain great benefit from this program. Timor-Leste is still in very early stage of development of many areas in the management of water supply including water quality control, measure agains the non- revenue water, water supply standard and other important aspect of water administration. Therefore, being able to be given this opportunity will give me the opportunity to come back to Timor-Leste and implement improvement in Timor-LEste's current water supply management, that can contribute to the overall improvement of water sector in Timor-Leste.

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INCEPTION REPORT 2024

ADMINISTRATION AND MANAGEMENT OF WATER SUPPLY SERVICES (B)

NAME : MARIA IMACULADA PIRES
POSITION : JUNIOR OFFICER FOR CLIENT SUPPORT SERVICES
ORGANIZATION : BEE TIMOR-LESTE, EMPRESA PUBLICA

General Information

Timor-Leste is located in the eastern half of the island of Timor, between Indonesia and Australia, and it includes the enclave of Oe-Cusse, which is located within West Timor (Indonesian). Timor-Leste occupies a land area of 14,874 km2

Nationality: Democratic Republic of Timor-Leste
Terrain : Mountainous
Population: 1,341,737 (2022 census).
Religion: Catholic 96 %.
Languages: Portuguese, Tetum (official); English, Bahasa Indonesia (working languages).

Outline of Water Supply Services

The creation of BTL is a part of Timor-Leste's strategic development plan 2011-2030.

1-1 BTL was established in 2020 and responsible to provide water supply, water management, sanitation and drainage services to all communities of Timor-Leste under Ministry of Public Works

1-2 There are 11 ministries which is also responsible for different aspect of water management supply such as MOP, MAF, MOH, Minister of education, institute Geoscience, MNEC, MPRM etc..)

1-3 There are main actors involved in water supply utilities in Timor-Leste such as:

MOP, BTL, Municipal Government, GMF, International organization and donors, NGOs and Private retail.

1-4 BTL's Business plan 2023-2027 states that BTL envisions to become and excellent water supply and sanitation Public enterprise.

Whole Country:

Area : 14,874 km2

Population : 1,341,737 Habitants

Coverage Water Supply: 88 %

Water Supply System/City:

Service Area : 15,006 km2

Population Served: 277,490 million/ thousand

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2. Water Supply Service Levels

Coverage area	15,006 km2
Population served	277,490
Collection ratio	45.8 (%)
Production capacity	12040 (m3/day)
Supply duration	16 (hr/day)
Supply pressure	0.1 bar
Non-Revenue Water	91 (%)
Water quality	WHO
Staff number	181
Number of connections	17.287
Staff/1,000 connections	10.5 (people/1,000connections)

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3. Management of Water Quality

3-1. Current Situation and Major Challenges/Problems

- **Lack of testing facilities for inorganic chemistry in Timor-Leste leads to** widespread Bacteriological contamination of water sources in urban and rural areas and within some public water supply systems (world bank report, 2018)
- lack of adequate water treatment facilities.
- Seasonal variability and droughts

Current Actions against Those Challenges/Problems

- implemented the Decree Law No. 31/2020 on Water Quality for Human Consumption.
- Timor-Leste signed an agreement with the Millennium Challenge Corporation (MCC), a U.S. foreign aid agency, for a $420 million grant for major infrastructure development aimed at enhancing water quality in the capital, Dili, and other major towns

Water quality Standard for drinking water

- Established the concentration limits for controlled parameters in water sources for human consumption.

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

- BTL set up a water quality monitoring plan called PCQA in accordance with this Decree Law.

Implementation of Water Safety Plans or Similar Efforts

- progress is still in its very early stages
- support from organizations to develop and implement Water Safety Plans in both urban and rural areas.
- pilot projects have been initiated to improve water quality monitoring and treatment through WSPs.
- In rural areas, where access to formal water treatment systems is limited, efforts are being made to introduce community-based water safety planning.

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

In Timor-Leste, the existing water supply infrastructure is degraded because of a lack of historical investment and damage during pre-independence conflict. Thus, there is a significant leakage from the network (BTL, 2023).

In Timor-Leste there are also many illegal connections to the water system. According to the Final Report of the Dili Urban Metropolitan Water Supply Master Plan, the water supply system covered 50% of the Dili city population, but only 30% had legal connections, of which 20% were paying clients (1,68% of Dili population), covering only 3% of operational costs of the system. This means that 70 to 95% losses of produced water in the system, mostly illegal connections.

Current Actions against Those Challenges/Problems

- BTL continues to prioritize investing in new water supply, drainage, and sanitation infrastructure, as well as maintaining and repairing existing infrastructure.
- The planned Dili Urban Water Supply Project will actively monitor and work to reduce Non-Revenue Water as the new infrastructure is constructed, including plans to monitor each District Metered Area.
- BTL will also take action to identify and remove illegal connections. BTL will work to identify where this illegal connection may be occurring and remove any illegal connections that are found, and actively inspecting customer water connections as part of the meter reading program.

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

Authorized consumption	**Revenue water**	**Billed authorized consumption**	**(m3 /year) 9.0 (%)**
	Non-Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	(m3 /year) 0.1 (%)
Water losses		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)	(m3 /year) 51.6 (%)
		Physical losses (Leakage)	(m3 /year) 39.3 (%)

5. Accounting system of Water Supply Service

5-2. Balance Sheet of your Organization

BTL Annual Report 2023 showed that BTL equity and liability equivalent to $73,844,359.98 (compared to 2022=$61,299,536.89). Therefore, there is an increase of $7,579,974.54 compared to 2022.

BTL's Annual Report 2023 showed that in 2023, BTL's revenue is still very small compared to BTL's operational expenses. BTL continue to receive subsidy from the Government for most of it operational expenses. Nevertheless, in 2023, BTL has positive profit and loss statement. The BTL's profit in 2023 is $690,028.74 compared to only $ 127,730.24 in 2022.

6. Major Recent Achievements in Improvement of Water Supply Services

- The government of Timor-Leste has enacted several important laws and regulations in water sector.
- recent institutional reform in 2020 formed BTL as the semi-autonomous entity for water services under the tutelage of MOP.
- The Government of Timor-Leste has already identified the contribution of the water sector to the overall development of the country.
- The Government of Timor-Leste has developed a medium and long term investment plan for water supply.
- Timor-leste has been in the process of reaching the last stage of water accessibility. The national coverage of basic water is 85% (Water and Sanitation for All et al., 2022).
- Timor-Leste has started introducing smart meter, both in urban and rural areas, that allow for better monitoring of water consumption

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7. Recent Challenges to Improvement of Water Supply Services

- Despite the Government of Timor-Leste positioning water and sanitation as one of the country's four main priorities, competing demands have led to a compromise in optimal investment in water.
- Timor-Leste is still not able to report on its safe water coverage due to a lack of data and assurance on water availability and quality
- Still a disparity between urban and rural areas. Water supply in urban areas is already covered at 96%, but only 80% in rural areas
- There appears to be a lower priority for O&M funding, particularly in rural areas.
- There is still lack of coordination in water supply management

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8. Expectations toward Japan

Through comprehensive expertise and sharing information on best practices in water management from Japan will help the participants to clarify future challenges and be utilized to draft feasible improvement plans.

sharing of practical, hands-on experience and best practices in the administration and management of water supply services will help the participants to address local issues and develop actionable improvement plans tailored to their country's specific needs.

The experience and knowledge shared by Japanese private companies can help the participants to implement sustainable and effective solutions tailored to the local context, ultimately enhancing the overall management and performance of water supply systems in the participants' country.

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9. Expectations toward the Program

- Access to expert knowledge and best practices in water supply management, tailor training to address specific local challenges, and assist in implementing advanced technologies.
- ongoing support in building their capacity, promoting sustainable practices, and developing effective monitoring and evaluation frameworks.
- encourage resource sharing and collaboration to improve the administration and management of water supply services in the participants' country.
- targeted training that addresses their specific challenges, learning about advanced technologies and sustainable practices, and developing effective strategies for monitoring and evaluation. Participants also expect to build their capacity, collaborate with experts and peers, and gain insights that will enable them to enhance the efficiency and effectiveness of water supply services in their own contexts in their own country.

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THANK YOU FOR
YOUR ATTENTION

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(B)」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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