Administration and Management of Water Supply Services (A)

Country Reports

FY2022

Japan International Corporation of Welfare Services (JICWELS)

Table of Contents

1. MALAWI (1)

Administration and Management of Water Supply Services

Inception Report Presentation

Name: Jennings Stephen Samu
Position : Senior Administration Officer
Organization: Blantyre Water Board

Outline of Water Supply Services

- Legal Basis of Water Supply Services: Provision of water supply services is governed by the Waterworks Act 1995. Extraction of water from water bodies is governed by the Water Resources Act 2013.
  Demarcation of Water Supply Services: The Ministry of Water and Sanitation is the line Ministry for Water Boards in Malawi.
- Main Actor of Water Supply Utilities: In Malawi, Water Supply Utilities are wholly owned by the Government of Malawi.
  Mission of Water Supply Utilities: To provide reliable and affordable water supply services to our customers. Vision: To be a dynamic, reliable, efficient and good quality water supply and sanitation services provider.

Whole Country:

Area : About 118,484 km^2

Population : 18.6 million

Coverage Water Supply: 86%

Selected Water Supply System/City:

Service Area : 850 km^2 (equivalent to 85,000 hectares)

Population Served: 1,228,080

Water Supply Service Levels

INDICATORS	2000	2018	Goals for 2025
Staff/1,000 connections	22	12	8
Production capacity (m^3/day)	65,000	122,000	167,000
Water quality standards	None	Malawi Standard MS 214; 2013 Edition	Malawi Standard for Drinking Water MS 214; 2013 Edition
Coverage area	20%	86%	100%
Supply duration (hour/day)	10	20	23
Supply pressure	0.2 bar	0.2	
Number of connections	26,88	60,989	100,000
Population Served	8000	853,500	1,228.080
NRW	72%	54%	30%
Collection ratio	48%	75%	90%
Staff number	4,200		718

Management of Water Quality

- Major challenges are classified as follows: raw water and treated. For raw water, the challenges are contamination due to poor waste management, improper land use and deforestation. Current action taken include re-afforestation program (planting more trees), recruited security guards to be chasing people that are dumping waste and we also conducted sensitization campaign on waste management.
- For treated water, the challenge is contamination that occurs within the distribution system due to burst pipe, aged supply pipeline and vandalism. Current action taken include flushing and sterilization after repair works, aged pipe replacement and encouraging customers to be reporting faults.
- Water Quality Standards for Drinking Water: We use Malawi Standard for drinking water MS 214; 2013 Edition.
- Monitoring System or Plans for Safety of Drinking Water: Monitoring system starts from raw water pollution control program through sampling and testing to treatment plant on hourly basis to distribution system to check residual chlorine
- Regulatory Body: Malawi Bureau of Standards
- Implementation of Water Safety Plans or Similar Efforts: Water safety plan is a guideline for implementation in case of a water quality emergency. We are in the process of formulating the plan. However, currently, we are doing continuous monitoring.

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Reduction of Non-Revenue Water

System input volume	Authorized consumption	Revenue water	Billed authorized consumption	46.0%
		Non Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	0.4%
	Water losses		**Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)**	28.9%
			Real losses (Leakage)	24.7%

- Leakage Detection Measures
- Countermeasures for NRW

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Accounting System of Water Supply Services

- Water Tariff in your Organization: We use step tariff
- Balance Sheet of your Organization: This will be provided later
- Profit and Loss Statement of your Organization: This will be provided later because we are still working on the budget.

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Major Recent Achievement in improvement of water supply services

- Improved production capacity from 84,000 cubic metres per day to 123,000 cubic metres per day.
- Expanded service coverage from 70% to 86%.
- Number of active customers grew from 43,568 to 60,989 representing 40% customer base growth.
- Rehabilitated and upgraded pumping equipment at Walkers ferry, Chileka, Mudi, Chichiri, Zomba Road and Midima Pumping stations to improve water supply reliability and distribution to all areas in the supply area.
- Pipeline rehabilitation, lowering, upgrading and replacement to improve water supply reliability and reduce water losses.
- ICT innovations such as prepaid metering, mobile and bank bill payments and on spot billing.
- Organisational restructuring to come up with a structure that supports the demands and expectations of customers in delivering quality services.

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Recent challenges of Water Supply Services

- High non revenue water due to aged infrastructure resulting in high water losses.
- High energy cost due to high pumping heads. Electricity bills rose from about K260 million per month in 2015 to around K1.1 billion per month in 2020 representing 323% rise in five years.
- Increase in debtors from K2.6 billion in 2015 to K8.9 billion in 2020.
- Low tariff which is far below the cost of producing and supplying water.
- Intermittent power supply that affected water production and interrupted water supply to customers.
- High cost of borrowing due to overreliance on bank loans to cover infrastructure development and operations.

2. MALAWI (2)

Administration and Management of Water Supply Services

Inception Report Presentation

Name: Felix Kazinkambani
Position : Maintenance Engineer
Organization : Lilongwe Water Board

Outline of Water Supply Services

- Water supply services in Malawi are provided for by Water Works Act (1995)
- The act provides for establishment of water boards and water areas and for administration of such water areas and for development, operation and maintenance of water works and water-borne sewerage systems in Malawi and for matters incidental thereto or connected therewith
- Ministry of Water and Sanitation is responsible for water supply services in Malawi
- All water utilities are statutory corporations
- The mission of these water utilities is to provide potable water in their demarcated areas
- The mission of Lilongwe water Board ,for instance , is to provide potable water within the city of Lilongwe

Whole Country: Malawi

Area : 118,480 km^2

Population : 19.6 Million

Coverage Water Supply: 80 %

Selected Water Supply System/City: Lilongwe

Service Area : 728 km^2

Population Served: 850,000 million

Water Supply Service Levels

INDICATORS	2022	Goals for 2025
Staff/1,000 connections	5.5	5.5
Production capacity (m^3/day)	125,000	150,000
Water quality standards	MS 214:2005 & WHO	MS 214:2005,ISO9001, WHO
Coverage area	85%	95%
Supply duration (hour/day)	18	20
Supply pressure	0.5-1 bar	0.5 -1bar
Number of connections	106,000	150,000
Population Served	850,000	1,000,000
NRW	40	28
Collection ratio	85%	95%
Staff number	550	650

Management of Water Quality

- Catchment degradation worsening raw water quality
- Informal settlements and farming along the river bank
- Catchment management strategy and water safety plan, ISO 9001 in place to deal with the challenges
- Stakeholder engagement
- MS 214: 2005-Drinking water specification
- Internal monitoring system – Water quality & environment division –External- MBS and Water association of Malawi- samples sent outside Malawi for quality assurance i.e SA at Magalies water
- Water safety plan is being implemented under Institution modernization plan which has enabled LWB to attain ISO 9001 certification

Reduction of Non-Revenue Water

System input volume	Authorized consumption	Revenue water	Billed authorized consumption	22.8M m^3 /year (60.0%)
		Non Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	304,000 m^3 /year (0.8%)
	Water losses		**Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)**	8.74Mm^3 /year (22.2.0%)
			Real losses (Leakage)	6.46 Mm^3/year (17.0 %)

- Leakages are detected through Zero pressure test, DMA, surveys

Accounting System of Water Supply Services

- Average Water Tariff – 1.1 USD/CUM
- Operating revenue per year – 28,800,000.00 USD
- Profit and Loss Statement – 1,200,000.00 USD

Major Recent Achievement in improvement of water supply services

- Rehabilitation and raising of Kamuzu Dam I to increase storage
- Rehabilitation and extension of pipe network within Lilongwe city to reach out to areas not supplied by LWB
- Construction of ground water facilities – boreholes
- Implementation of SCADA to improve in monitoring of water facilities
- Establishment of hydrological stations along the main river channel and major tributaries to monitor flows and capturing of water quality data

Recent challenges of Water Supply Services

- High non-revenue water
- Lack of alternative raw water sources
- Lack of reliable alternative sources of power hindering production
- Catchment area and environment degradation which in turn result in poor raw water quality and in turn increases treatment cost
- Lack of advanced skills and modern technologies in maintaining and managing water supply utilities
- High demand resulting in reduced supply hours , currently LWB supply for18hours
- Aged infrastructure

3. MOROCCO (1)

Administration and Management of Water Supply Services

Inception Report Presentation

Name: Mrs ASSADKI Rajaa

Position : Studies and Works Engineer

Organization : National Office of Electricity and Drinking Water- Water Branch (ONEE-BO)

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Outline of Water Supply Services

- Legal Basis of Water Supply Services:
  - Water Law 10-95: The law's main objective was to rationalize water use, provide universal access to the resource, reduce disparities between cities and villages and ensure water security across the country
- Demarcation of Water Supply Services :
  - **The Ministry of Equipment, Transport, Logistics and Water** for promoting and coordinating the protection of water resources, pollution abatement and legislation enforcement.
  - **The Supreme Council for Water and Climate** to reinforce coordination among the different actors, including ministries, public agencies and water users, as well as non-governmental stakeholders.
  - **River basin agencies (RBAs)** for managing and regulating water resources, monitoring water use and quality, and planning for water-related emergencies such as flood control.
  - **The Ministry of the Interior** is involved in water management through the Water and Wastewater Directorate (DEA) and the General Directorate of Local Authorities (DGCL).
  - **The General Directorate of Hydraulics (DGH)** is responsible for developing water resources for all uses, including major dam construction and operation.
  - **The Ministry of Health** is mainly responsible for drinking water quality control.
  - **The Ministry of Agriculture and Fisheries** is tasked with supervising irrigation management.
  - **ONEE, municipally owned public operators called regies and private concessionaires** for the management of drinking water and sanitation services.
- Main Actor of Water Supply Utilities:
  - National Office of Electricity and Drinking Water is the main actor in the drinking water sector in Morocco. ONEE is fully involved in major structuring projects for Morocco's sustainable development, providing the country with infrastructure for the production, transport and distribution of potable water.

Outline of Water Supply Services

- Mission/Vision of Water Supply Utilities:
  - Planning the supply of drinking water throughout the country and programming of investments; Study and infrastructure equipment for drinking water - Management on behalf of the municipalities of drinking water distribution in ONEE intervention zones; Quality control of produced and distributed water as well as water sources likely to be used for the supply of drinking water; Assistance in the elaboration of legislative and regulatory texts and participation in the studies related to the drinking water as well as providing technical assistance to third parties.
  - Your Mission/Vision in your organization:
  - The coordination of drinking water supply studies and projects

Whole Country:

Area : 710 850 km²

Population : around 36 Million citizen

Coverage Water Supply: 100% in urban area and 98,2% in rural area

Selected Water Supply System/City: Province of Sefrou

Service Area : 4008 km²

Population Served: 289 605 citizens

Water Supply Service Levels (Province of Sefrou in the north of Morocco)

INDICATORS of ONEE-BO	2021	Goals for 2025
Staff/1,000 connections	10	10
Production capacity (m^3/day)	721 l/s	721
Water quality standards	YES	YES
Coverage area	98% in urban area 30% in rural area	100% in urban area 50% in rural area
Supply duration (hour/day)	20	20
Supply pressure	Under 6 bar	Under 6 bar
Number of connections (domestic connections)	40 000	48 000
Population Served	200 000	240 000
NRW	20%	20%
Collection ratio	0,5	0,7
Staff number	200	200

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Management of Water Quality

- Current Situation and Major Challenges/Problems:

- Search for new perennial resources before saturation;
- Strengthening production capacity and the main water supply systems;
- Improve the connection rate in rural areas;
- Reduce the rate of dysfunction in rural areas;
- Involve the rural population in the design of projects;
- Finance research

- Current Actions against Those Challenges/Problems:

- master plan studies for definitions of needs-resources and service plan;
- programming of projects by priority and funding proposal to the funder;
- participatory approach applied to the rural areas;
- Water Quality Standards for Drinking Water:
- N.M. 03.7.001" Morrocan standard quality of human drinking water.

- Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others:
  - launch of the national drinking water supply and irrigation program
  - Water desalination

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Management of Water Quality

- Implementation of Water Safety Plans or Similar Efforts:
  - 3 levels of monitoring are required: the resource, the system entry and the distribution.
  - An annual monitoring schedule is drawn up on the basis of the monitoring standard in force, carried out thanks to the network of decentralized laboratories set up. For the conformity of the quality of water produced and distributed, national regulations are taken as a reference.
  - The water quality monitoring strategy is based on several elements:
    - Knowledge of the environment of Drinking water system.
    - Thorough knowledge of this system.
    - The processing implemented.
    - Control tools
    - Monitoring of parameters in a preventive framework for algal toxins, toxicity tests

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Reduction of Non-Revenue Water (Province of Sefrou in the north of Morocco)

System input volume	Authorized consumption	Revenue water	Billed authorized consumption	2,2 Million m^3 /year (80%)
		Non Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	438 000 m^3 /year (20%)
	Water losses		**Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)**	210 000 m^3 /year (10 %)
			Real losses (Leakage)	

- Leakage Detection Measures: Passive techniques (Generally these are curative actions) and Active techniques.
- Countermeasures for NRW : renewal of aged meters and rehabilitation of distribution or production networks

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Accounting System of Water Supply Services

- As of August 1, 2014 and in accordance with the provisions of Ministerial Order No. 2682.14 of July 21, 2014 published in Official Bulletin No. 6275 Bis of July 22, 2014, the drinking water sale prices in DH (HT) are as follows:

	Fixed monthly fee in (DH HT)	Tranche 1 [0 - 6] m3	Tranche 2] 6 - 12] m3	Tranche 3] 12 -20] m3	Tranche 4] 20 – 35] m3	Tranche 5 Over to 35 m3
Domestic Use	6	2,37	7,39	7,39	10,98	11,03

	Fixed monthly fee in (DH HT)	Administration	Preferential	Industrial	Hotels
Other Uses	10	11,03	7,52	6,98	6,98

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Major Recent Achievement in improvement of water supply services

- Realization of structuring and integrated urban-rural projects Future projects of transferring water from the surplus water basins in the Northwest to the deficit basins in the Center-West (from Sebou to Bouregreg).
- Establishment of a strategy for the generalization of access to drinking and sustainable water on a national scale;
- Use of water desalination for security of supply

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Recent challenges of Water Supply Services

- Lack of funding;
- rehabilitation cost and strategy
- Inefficient water use and water losses
- Climate change and sustainable access to drinking water in Africa
- Negative impact of climate change on access to drinking water

4. MOROCCO (2)

Administration and Management of Water Supply Services

Inception Report Presentation

Name: Mrs Ellouxe Hanan

Position : Head of Service

Organization : National Office of Electricity and Drinking Water- Water Branch (ONEE-BO)

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Outline of Water Supply Services

- Legal Basis of Water Supply Services:
  - Water Law 10-95: its main objective was to rationalize water use, provide universal access to the resource, reduce disparities between cities and villages and ensure water security across the country (under review by Law 36.15).
- Demarcation of Water Supply Services :
  - **The Ministry of Equipment, Transport, Logistics and Water** for promoting and coordinating the protection of water resources, pollution abatement and legislation enforcement.
  - **The Supreme Council for Water and Climate** to reinforce coordination among the different actors, including ministries, public agencies and water users, as well as non-governmental stakeholders.
  - **River basin agencies (RBAs)** for managing and regulating water resources, monitoring water use and quality, and planning for water-related emergencies such as flood control.
  - **The Ministry of the Interior** is involved in water management through the Water and Wastewater Directorate (DEA) and the General Directorate of Local Authorities (DGCL).
  - **The General Directorate of Hydraulics (DGH)** is responsible for developing water resources for all uses, including major dam construction and operation.
  - **The Ministry of Health** is mainly responsible for drinking water quality control.
  - **The Ministry of Agriculture and Fisheries** is tasked with supervising irrigation management.
  - **ONEE, municipally owned public operators called regies and private concessionaires** for the management of drinking water and sanitation services.
- Main Actor of Water Supply Utilities:
  - National Office of Electricity and Drinking Water, as a financially autonomous public electricity, water and sewerage enterprise, is considered as the major national water producer and also the dominant national water distributor.

Outline of Water Supply Services

- Mission/Vision of Water Supply Utilities:
  - Assure the satisfaction of the water demand of the populations and support for socio-economic development expressed by sectoral development strategies and plans.

- Your Mission/Vision in your organization:
  - ONEE plays an important role in planning and executing the government's strategic water and electricity goals. For the water sector, ONEE's responsibilities include potable water planning and security at a national level, providing potable water supply services in medium and small towns on behalf of the local municipalities and wastewater services.

Whole Country:

Area : 710 850 km²

Population : around 36 Million inhabitant

Coverage Water Supply: around 100% in urban area and 98,2% in rural area

Selected Water Supply System/City: THE CITY O KELAA SRAGHNA CENTER AND NEARBY Villages

Service Area : 4 214 km²

Population Served: 173 357 inhabitant

Water Supply Service Levels (THE CITY O KELAA SRAGHNA CENTER AND NEARBY Villages)

INDICATORS of the system	2021	Goals for 2025
Staff/1,000 connections	**5**	**3**
Production capacity max (m^3/day)	**70 934**	**73 613**
Water quality standards	**YES**	**YES**
Coverage area	**98% in urban area 60% in rural area**	**100% in urban area 70% in rural area**
Supply duration (hour/day)	**12 hours of reservoir autonomy (hence the need for reinforcement)**	**24**
Supply pressure	**around 3 bar**	**around 3 bar**
Number of connections (domestic connections)	**34 671**	**40 019**
Population Served	**173 357**	**200 095**
NRW	**30%**	**20%**
Collection ratio	**0,7**	**0,8**
Staff number	**170**	**120**

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Management of Water Quality

- Current Situation and Major Challenges/Problems:
  - Deteriorating surface water quality is one of the major problems facing Morocco's water sector.
  - The scarcity of water resources and the accentuation of extreme climatic phenomena (floods and droughts) under the effect of climate change, to the inadequacy of resources with continuously growing water needs due to demographic growth and socio-economic development.
  - Problems of high-energy costs.
- Current Actions against Those Challenges/Problems:
  - Rnewable energies: research, training, development of rural areas ; implementation of desalination projects.
- Water Quality Standards for Drinking Water:
  - "N.M. 03.7.001" Morrocan standard quality of human drinking water.
- Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others:
  - In accordance with our strategic axes relating to the sustainability, security and strengthening of drinking water supply in urban and rural areas, the office implements all the necessary means to guarantee a "quality" service to users both in terms of continuity and water quality. This monitoring of water produced and distributed quality, is a regulatory requirement by the decree of water for food use N° 2-05-1326 of 29 Jumada II 1427 (July 25, 2006) and standards relating to the quality of water for food use (V2020) and Moroccan standard relating to control and monitoring of water in public supply networks03.7.002 (V.2011)

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Management of Water Quality

- Implementation of Water Safety Plans or Similar Efforts:
  - 3 levels of monitoring are required: the resource, the system entry and the distribution.
  - An annual monitoring schedule is drawn up on the basis of the monitoring standard in force, carried out thanks to the network of decentralized laboratories set up. For the conformity of the quality of water produced and distributed, national regulations are taken as a reference.
  - The water quality monitoring strategy is based on several elements:
    - Knowledge of the environment of Drinking water system.
    - Thorough knowledge of this system.
    - The processing implemented.
    - Control tools
    - Monitoring of parameters in a preventive framework for algal toxins, toxicity tests

Reduction of Non-Revenue Water (KELAA SRAGHNA CENTER AND NEARBY Villages)

<table>
<tr><td rowspan="4">System input volume</td><td rowspan="2">Authorized consumption</td><td>Revenue water</td><td>Billed authorized consumption</td><td>12,7 Million m^3 /year (70%)</td></tr>
<tr><td rowspan="3">Non Revenue Water (NRW)</td><td>Unbilled authorized consumption (ex. fire fighting, cleaning)</td><td>1,8 Million m^3 /year (10%)</td></tr>
<tr><td rowspan="2">Water losses</td><td>Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)</td><td rowspan="2">3,6 Million m^3 /year (20 %)</td></tr>
<tr><td>Real losses (Leakage)</td></tr>
</table>

- Leakage Detection Measures: Passive techniques (Generally these are curative actions) and Active techniques.
- Countermeasures for NRW : renewal of aged meters and rehabilitation of distribution or production networks

Accounting System of Water Supply Services

- As of August 1, 2014 and in accordance with the provisions of Ministerial Order No. 2682.14 of July 21, 2014 published in Official Bulletin No. 6275 Bis of July 22, 2014, the drinking water sale prices in DH (HT) are as follows:

	Fixed monthly fee in (DH HT)	Tranche 1 [0 - 6] m3	Tranche 2] 6 - 12] m3	Tranche 3] 12 -20] m3	Tranche 4] 20 – 35] m3	Tranche 5 Over to 35 m3
Domestic Use	6	2,37	7,39	7,39	10,98	11,03

	Fixed monthly fee in (DH HT)	Administration	Preferential	Industrial	Hotels
Other Uses	10	11,03	7,52	6,98	6,98

- **1 DH =0,1 USD**

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Major Recent Achievement in improvement of water supply services

- Construction of many seawater desalination plants : Agadir, Laayoune,,,etc
- Future projects of transferring water from the surplus water basins in the Northwest to the deficit basins in the Center-West (from Sebou to Bouregreg).
- Wastewater reuse projects are in operation and supplying good-quality water for the following uses:
  - Irrigation of green spaces, parks and golf courses (69.3%)
  - Agriculture, which currently accounts for 13%
  - Industry, specifically phosphate mining (16.6%)
  - Groundwater recharge (1.1%)

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Recent challenges of Water Supply Services

- Inefficient water use and water losses
- Public awareness and education campaigns in relation to water scarcity
- Climate change and sustainable access to drinking water in Africa
- Negative impact of climate change on access to drinking water (Flood, Droughts…)

THANK YOU FOR YOUR ATTENTION !

5. MOZAMBIQUE

Administration and Management of Water Supply Services

Inception Report Presentation

Name: Evelyn Andrea Mangove

Position : Technician

Organization: Administration of Infrastructre of Water and Sanitation (AIAS)

Outline of Water Supply Services

- Legal Basis of Water Supply Services
  The National Water Policy and the Regulation of the Public Systems of Water Distribution and Wastewater Drainage Systems
- Demarcation of Water Supply Services
  The Ministry of Public Works Housing and Water Resources is responsible for Water Services in the country.
- Main Actor of Water Supply Utilities
  In Mozambique, most water utilities are public institutions under local government.
- Mission/Vision of Water Supply Utilities
  Efficiently manage the assets of secondary public water supply and urban sanitation systems, providing for the development of human capital, investments and autonomous, financial and environmentally sustainable exploration
- Your Mission/Vision in your organization :Work in the Water Supply Department in the construction and management of water supply systems.

Whole Country:

Area : 801,590 km^2

Population : 31,693,239

Coverage Water Supply: 52%

Selected Water Supply System/City:

Service Area : 761,280 km^2

Population Served: 3,500,000 million

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Water Supply Service Levels

INDICATORS	2000	2023	Goals for 2025
Staff/1,000 connections	22	11	
Production capacity (m^3/day)	65,000	400,000	
Water quality standards	None	Water Quality Regulation	
Coverage area	20%	45%	
Supply duration (hour/day)	10	12	
Supply pressure	0.2 bar	10 bar	
Number of connections	26,88	700,000	
Population Served	8000	3,500,000	
NRW	72%	40	
Collection ratio	48%	70%	
Staff number	4,200	700	

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Management of Water Quality

- Current Situation and Major Challenges/Problems
- Current Actions against Those Challenges/Problems
- Water Quality Standards for Drinking Water
- Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others
- Implementation of Water Safety Plans or Similar Efforts

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Reduction of Non-Revenue Water

System input volume	Authorized consumption	Revenue water	Billed authorized consumption	xx m^3 /year (%)
		Non Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	xx m^3 /year (%)
	Water losses		**Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)**	xx m^3 /year (%)
			Real losses (Leakage)	xx m^3 /year (%)

- Leakage Detection Measures
- Countermeasures for NRW

6

Accounting System of Water Supply Services

- Water Tariff in your Organization
- Balance Sheet of your Organization
- Profit and Loss Statement of your Organization

7

Major Recent Achievement in improvement of water supply services

- Capacity building Project for Water Operators financed by The Kingdom of Netherlands.
- Investments to improve aging infrastructure.

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Recent challenges of Water Supply Services

- Aging Infrastructure.
- Lack of operators with financial capacity to manage the systems.
- Saline intrusion in the catchment of some systems, which results in the need of investments in desalination technology.
- Limited human resources to attend to the high demand.
- Low coverage in rural areas.

6. PALESTINE

Administration and Management of Water Supply Services

Inception Report Presentation

Name: Alaa R. Masri
Position : Water resources Engineer
Organization: Palestinian Water Authority (PWA)

Outline of Water Supply Services

- Legal Basis of Water Supply Services
  Palestinian water authority was established under Presidential Decree.
- Demarcation of Water Supply Services
  Palestinian Water Authority (PWA) is responsible for the domestic water in cooperation with other stakeholders such as the Ministry of Agriculture is responsible for agricultural water.
- Mission/Vision of Water Supply Utilities
- Mission of PWA

  A public institution working to manage, develop and protect water sources with integrated and sustainable water supply to citizens valid for different uses and ensure the protection of the environment and the achievement of the development goals of Palestinian society.
- Vision of PWA

  Sustainable water sources able to achieve development and basic needs of the Palestinian people.

Outline of Water Supply Services –ctu.

West Bank:

Area : 5844 km^2

Population : 2,785,653

Coverage Water Supply: 95 %

Selected Water Supply System/City:

Service Area : km^2

Population Served: million/ thousand

Water Supply Service Levels

- Data of PWA_ WEST BANK "the water supplier for PWA" to below table.

INDICATORS	2020
Staff/1,000 connections	4.6-6
Production capacity (m^3/day)	263,680
Water quality standards	Palestinian Institution Standards
Coverage area	95%
Supply duration (hour/day)	Average 20 hr/day
Supply pressure	between 25 - 40 bar
Number of connections	18 connection/1000
Population Served	296 (Municipalities, local services, indiv...)
NRW	34%
Collection ratio	Not available
Staff number	130

Management of Water Quality

- Most of our groundwater resources (almost 85%) fit the standards in the West Bank while about 97% of the costal aquifer in Gaza is deteriorated (NO3, Nitrate, Salinity...).
- Current Actions against those Challenges/Problems: The action taken to face the problem is to make water reallocation in in most regions in Palestine.
- Water Quality Standards for Drinking Water: Water Institutional Standards.
- Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others: Internal monitoring program carried out by PWA laboratory.
- Implementation of Water Safety Plans or Similar Efforts: Conducting a piloting projects of water safety plans.

Reduction of Non-Revenue Water

<table>
<tr><td rowspan="4">System input volume</td><td rowspan="2">Authorized consumption</td><td>Revenue water</td><td>Billed authorized consumption</td><td>20,198,432 m^3 /year</td></tr>
<tr><td rowspan="3">Non Revenue Water (NRW)</td><td>Unbilled authorized consumption (ex. fire fighting, cleaning)</td><td>839,045 m^3 /year</td></tr>
<tr><td rowspan="2">Water losses</td><td>Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)</td><td>9,358,495 m^3 /year</td></tr>
<tr><td>Real losses (Leakage)</td><td>3,039,597 m^3 /year</td></tr>
</table>

- This data was taken from Gaza Strip as a case study from the report (Assessment and Management of Non-Revenue Water in Gaza City), since these data is not available for the West Bank region.
- Countermeasures for NRW: bucket and stop watch method

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Accounting System of Water Supply Services

- Water Tariff in PWA
- Water tariffs for (0-5) m^3 / Month = 3.31 NIS/m^3
- Water tariffs for (5.1 - 10) m^3 / Month = 3.32 NIS/m^3
- Water tariffs for (10.1 - 20) m^3 / Month = 3.83 NIS/m^3
- Balance Sheet of your Organization
- Palestinian Water Authority is a governmental organization and it does not have any profit or loss statement, and also there is no balance sheet in PWA.

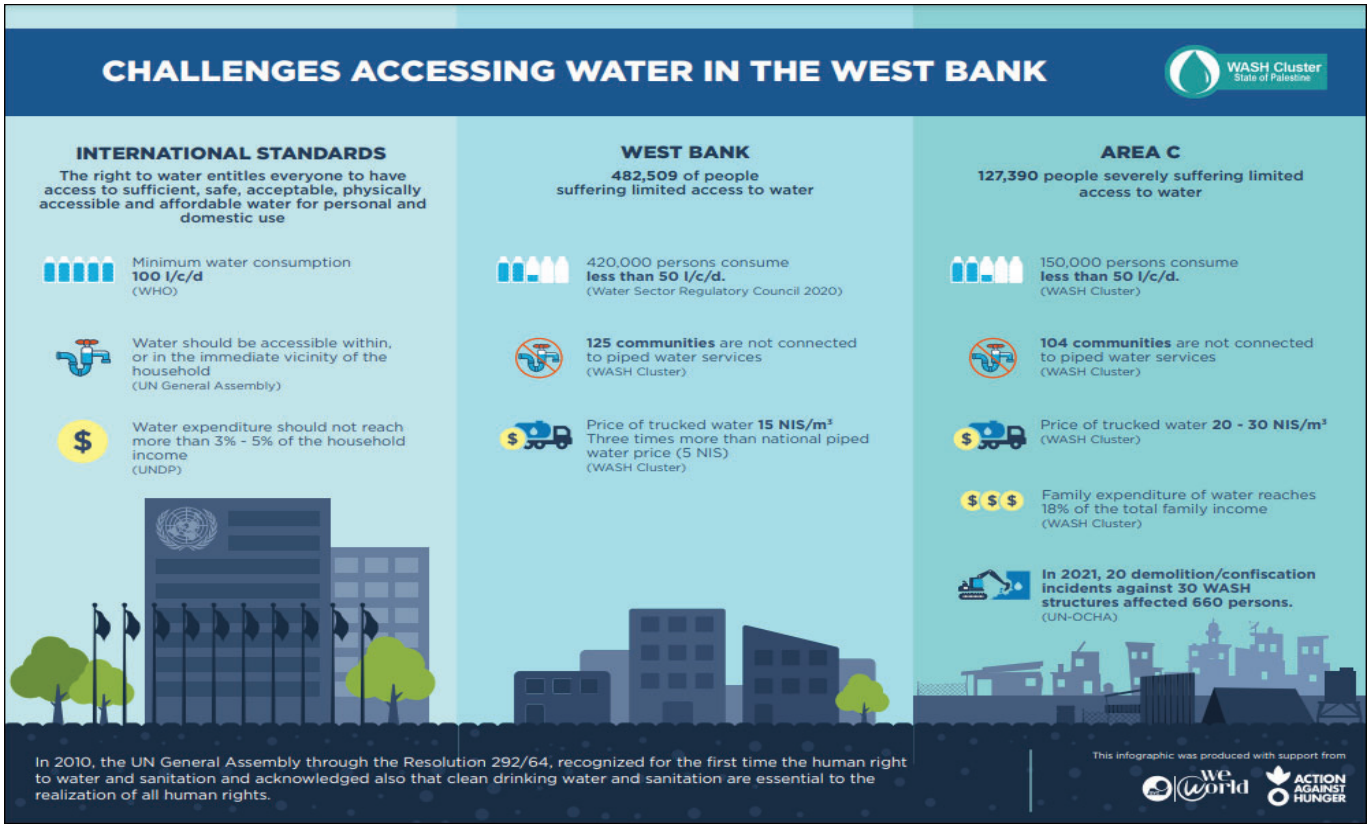
8

Major Recent Achievement in improvement of water supply services

- the achievement of water security at the short and long range requires developing and protecting the water resources and maintaining its sustainability. In addition, protecting the usage and the quality of water resources according to the principles of integrated management .This by itself is considered a main goal that the PWA seeks to achieve within the next yeas through the following strategic objectives:

1. Improve the effectiveness of water usage and supply.
2. Protect water resources from pollution and depletion.
3. Enhance and promote the principles of sharing and cooperation in planning, operation, management and knowledge.

Recent challenges of Water Supply Services



7. SOUTH SUDAN (1)

Administration and Management of Water Supply Services

Inception Report Presentation

Name: Pareng Philip

Position : Ass Inspector Water Distribution

Organization: South Sudan Urban Water Corporation

2

Outline of Water Supply Services

- Legal Basis of Water Supply Services
  (What kind of laws and regulations are Water Supply Services based on?)
- Demarcation of Water Supply Services
  (Which ministry is in charge of what kind of field of water?)
- Main Actor of Water Supply Utilities
  (e.g. In Japan, most water utilities are public bureau under local government.)
- Mission/Vision of Water Supply Utilities
- Your Mission/Vision in your organization

<u>Whole Country:</u>
Area : km^2
Population :
Coverage Water Supply: %
<u>Selected Water Supply System/City:</u>
Service Area : km^2
Population Served: million/ thousand

3

Water Supply Service Levels

INDICATORS	2000	2018	Goals for 2025
Staff/1,000 connections	3		5
Production capacity (m^3/day)	65,000		18000
Water quality standards	None		High
Coverage area	20%		80
Supply duration (hour/day)	10		24
Supply pressure	0.2 bar		2bar
Number of connections	26,88		1million
Population Served	8000		4million
NRW	72%		40%
Collection ratio	48%		90%
Staff number	4,200	>500	1000

4

Management of Water Quality

- Current Situation and Major Challenges/Problems
- Current Actions against Those Challenges/Problems
- Water Quality Standards for Drinking Water
- Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others
- Implementation of Water Safety Plans or Similar Efforts

5

Reduction of Non-Revenue Water

System input volume	Authorized consumption	Revenue water	Billed authorized consumption	1277500 m^3 /year (%)
		Non Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	365000 m^3 /year (%)
	Water losses		**Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)**	m^3 /year (%)
			Real losses (Leakage)	m^3 /year (%)

- Leakage Detection Measures. **Customer reports**
- Countermeasures for NRW. **NO**

6

Accounting System of Water Supply Services

- Water Tariff in your Organization. **Meter reading and flat rate**
- Balance Sheet of your Organization. **Not Share**
- Profit and Loss Statement of your Organization. **Not Share**

7

Major Recent Achievement in improvement of water supply services

- Recruitment and training of engineers.
- Establishment of O&M plan
- Streamlining job descriptions

8

Recent challenges of Water Supply Services

- Lack of skills for leakage detection
- Lack of motivation of staffs especially the technical staffs
- Unsupervised duties
- Lack of records for reference eg GIS system

8. SOUTH SUDAN (2)

Administration and Management of Water Supply Services

Inception Report Presentation

Name: Gatkuoth Martin Nyang Kic
Position : Inspector for Irrigation & Drainage
Organization Ministry of water resource & irrigation

Outline of Water Supply Services

- Legal Basis of Water Supply Services
  (What kind of laws and regulations are Water Supply Services based on?)
- ✓ South Sudan urban water corporation (SSUWC)
- Demarcation of Water Supply Services
  (Which ministry is in charge of what kind of field of water?)
- ✓ Ministry of water resources and irrigation
- Main Actor of Water Supply Utilities
  (e.g. In Japan, most water utilities are public bureau under local government.)
- ✓ South Sudan urban water corporation (SSUWC)
- Mission/Vision of Water Supply Utilities
- ✓ To develop and provide adequate ,safe and affordable water services in efficient sustainable and environmentally friend to our stakeholders delight .
- Your Mission/Vision in your organization

Whole Country:

Area : 644,329 km^2

Population : 14,000,000

Coverage Water Supply: %

Selected Water Supply System/City:

Service Area : 40 km^2

Population Served: 800,000 million/ thousand

3

Water Supply Service Levels

INDICATORS	2000	2018	Goals for 2025
Staff/1,000 connections	22	10	7
Production capacity (m^3/day)	65,000	7.2(m3/day)	237,000m3/day
Water quality standards	None	None	
Coverage area	20%	40km2	
Supply duration (hour/day)	10	15(hour/day)	24(hour/day)
Supply pressure	0.2 bar	0.2Mpa	0.1Mpa
Number of connections	26,88	2,292	111.716
Population Served	8000	406,000	1,16,000
NRW	72%	60%	64%
Collection ratio	48%	84%	64%
Staff number	4,200	412	824

4

Management of Water Quality

- Current Situation and Major Challenges/Problems
  - ✓ The existing water facility has the capacity of 7000m3/day and supply duration of 15hours/day that serves over 800,000 people40%
  - ✓ No GIS system installed
- Non revenue water (NRW) is 60% where as Revenue waters is
- Current Actions against Those Challenges/Problems
  - ✓ The existing facility is expanded to have production capacity of 10.800m3/day with help of JICA and will be opened in February 2023
  - ✓ The water meter installation is increased and Revenue water is improved to 70%
  - ✓ GIS system is planned to be installed in the new facility
- Water Quality Standards for Drinking Water
  - ✓ WHO guidelines for Drinking water quality
- Monitoring System or Plans for Safety of Drinking Water in Your Organization / Regulatory Body / Independent Institution /Others
- Implementation of Water Safety Plans or Similar Efforts
  - ✓ It planned to carry out the above activities /plans regularly and include the result in monthly report

5

Reduction of Non-Revenue Water

System input volume	Authorized consumption	Revenue water	Billed authorized consumption	xx m^3 /year (40 %)
		Non Revenue Water (NRW)	Unbilled authorized consumption (ex. fire fighting, cleaning)	xx m^3 /year (10 %)
	Water losses		**Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies)**	xx m^3 /year (10%)
			Real losses (Leakage)	xx m^3 /year (40 %)

- Leakage Detection Measures
- Countermeasures for NRW

6

Accounting System of Water Supply Services

- Water Tariff in your Organization

✓ 1m3 of =1.5USD

- Balance Sheet of your Organization
- Profit and Loss Statement of your Organization

7

Major Recent Achievement in improvement of water supply services

- ✓ New water facility with JICA help
- ✓ GIS system was being install

8

Recent challenges of Water Supply Services

- ✓ Lack of field
- ✓ Water losses (leakage)
- ✓ Lack of motivation to the staff

9. TANZANIA

January-2022

PRESENTER: MR.OTHMAN M.OTHMAN

TITTLE: DISTRICT WATER OFFICER

ORGANIZATION: ZANZIBAR WATER AUTHORITY

INCEPTION REPORT PRESENTATION

Table of Contents

Introduction:

About Zanzibar Water Authority (ZAWA)

The Zanzibar Water Authority (ZAWA) was established by Water Act No. 4 of 2006 as follow-up of the recommendations of the Zanzibar National Water Policy of 2004, with jurisdiction of managing water resources and provision of clean, reliable and good quality water supply to Zanzibar.

Vision

To become a leading water service provider in the region that addresses socio-economic needs of the society for sustainable development.

Mission

To support socio-economic development through provision of accessible, affordable and quality water services in a modern, sustainable and environmentally friendly manner within Zanzibar.

Water Sources in Zanzibar

The principal source of water supply in Zanzibar is groundwater, which is found in various places under differing aquifer conditions, amongst which are:-

- Natural springs,
- Boreholes and
- Caves.

Exploitation has been through drilled boreholes and hand dug wells.

Currently, there are 303 operational boreholes

- 172 - Unguja and
- 131- Pemba

5 main springs

- 2 - Unguja and
- 3 - Pemba

3 main caves in Unguja.

Zanzibar Population

Zanzibar ⇒ Unguja & Pemba About 50 Smaller Islets.

Capital: Zanzibar Town

Total Area : 2,580 km²
Unguja : 1,600 km²

Pemba : 980 km²

Population (2022 census):1.8 million

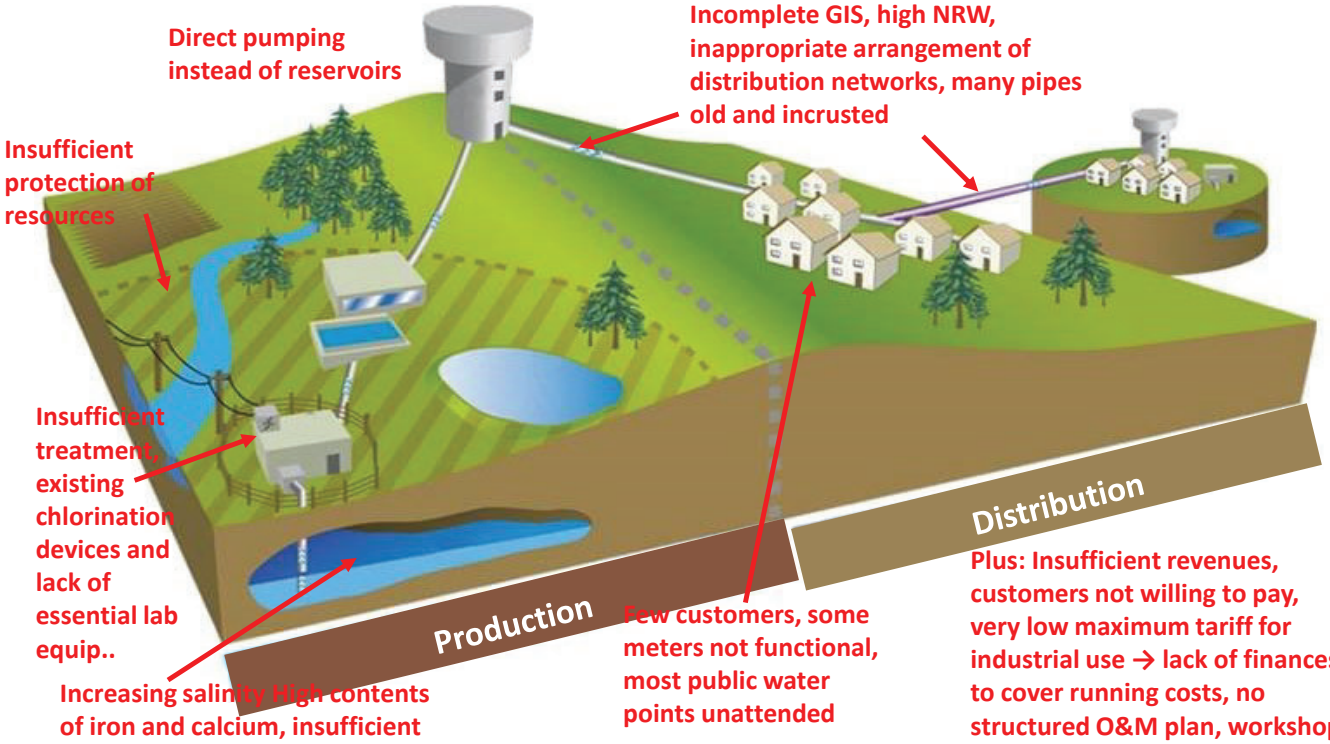
Location : 5 – 6°S Of Equator
40 km East Coast Of Africa

Current Water Productions

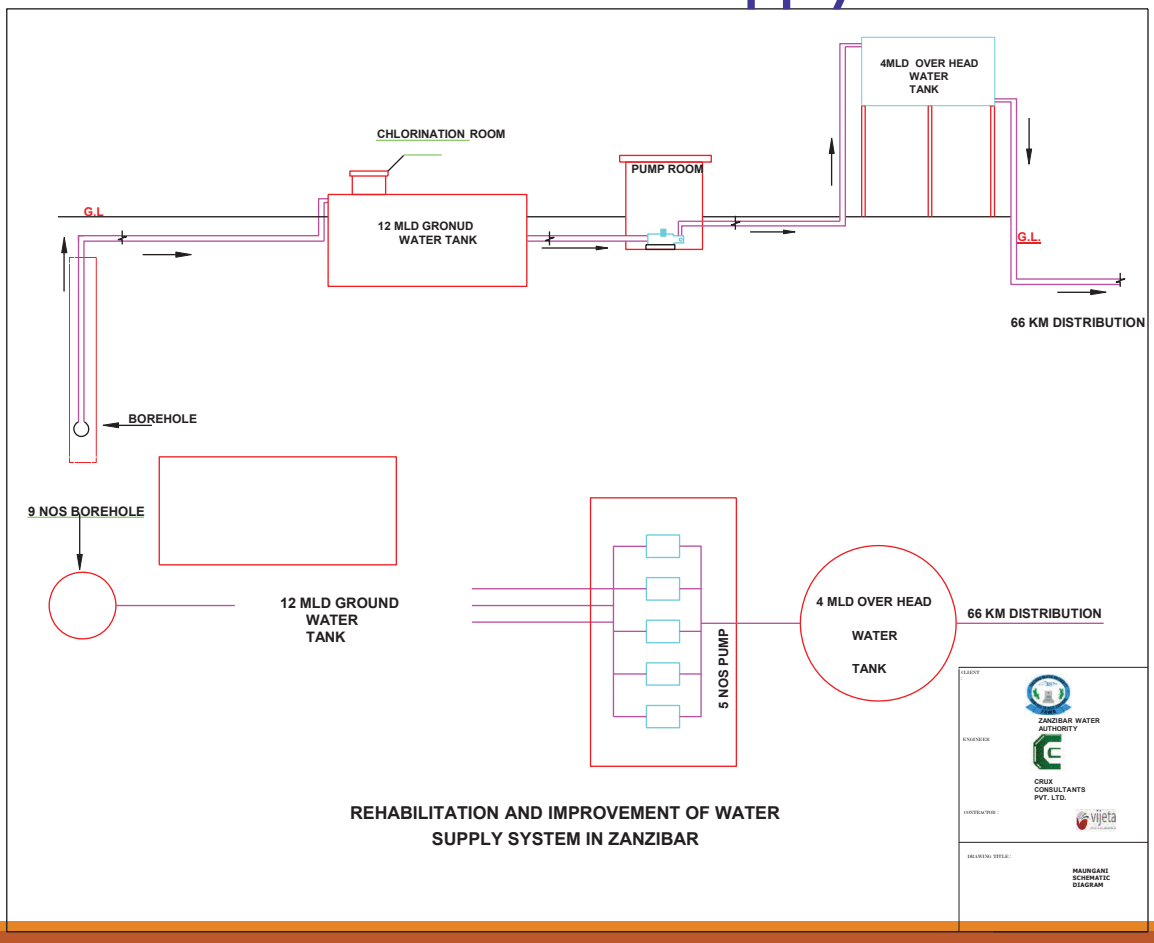
REGIONS	ESTIMATED POPULATION	TOTAL DEMAND (Litre/day)	WATER PRODUCTION (Litre/day)	DEFICIT/DIFFERENCE (Litre/day)	PERCENTAGE OF WATER PRODUCED (%)
Urban West	750,033	105,004,620	51,890,440	(53,114,180)	49%
North Unguja	237,505	33,250,700	22,423,620	(10,8272,080)	67%
South Unguja	140,821	19,714,940	14,716,828	(4,998,112)	75%
North Pemba	306,173	42,864,220	22,218,067	(20,646,153)	52%
South Pemba	283,076	39,630,640	25,814,880	(13,815,760)	65%
	1,717,608	240,465,120	137,063,835	(103,401,285)	62%

Demand per person (Litre/day) :140

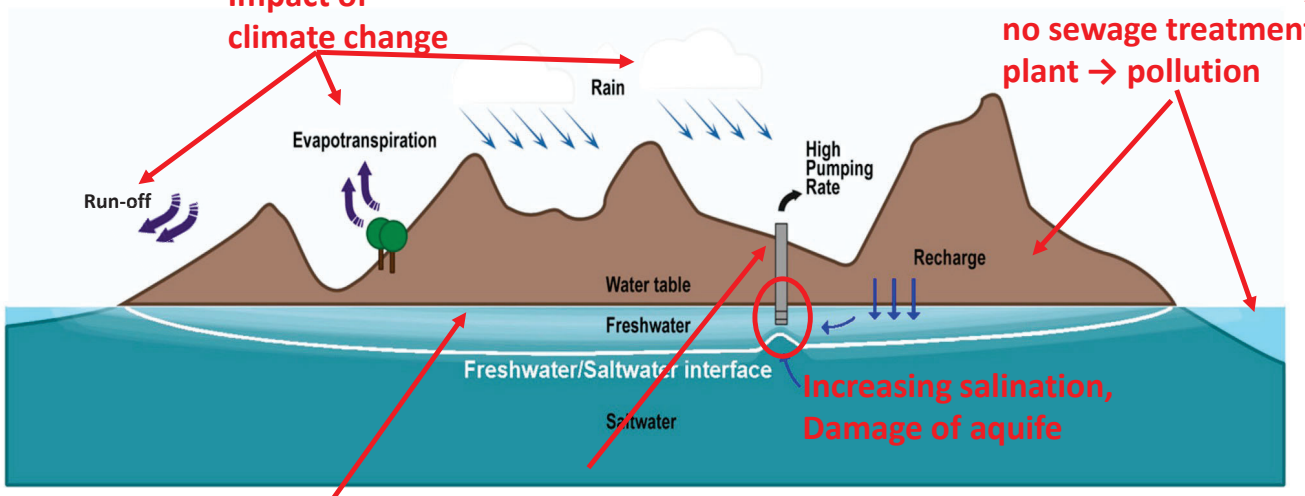
Typical Diagram on Current Water Supply Situation



Best Practice of Water Supply Scheme



Existing Water Resources Management



Long Term Strategies (2021 – 2025)

Description	Unit	2025
Volume of Water to be produced	M^3/day	265,516.4
Water Demand	M^3/day	265,516.4
Non-Revenue Water	%	30
Population Projection 2025 (1 household 5.2)	Nr	1,896,546
Water Service Coverage – No. of Total Connections	Nr	364,720
Metering Ratio	%	100
Water Service Coverage	%	100
Response Time to Water Leaks and Bursts	Hrs.	6
Percentage samples of supplied water passing bacteriological and physical quality	%	100
Customer care – Response Time to complaints	Hrs.	4
Customer care – percentage of customer complaints handled	%	85

Challenges

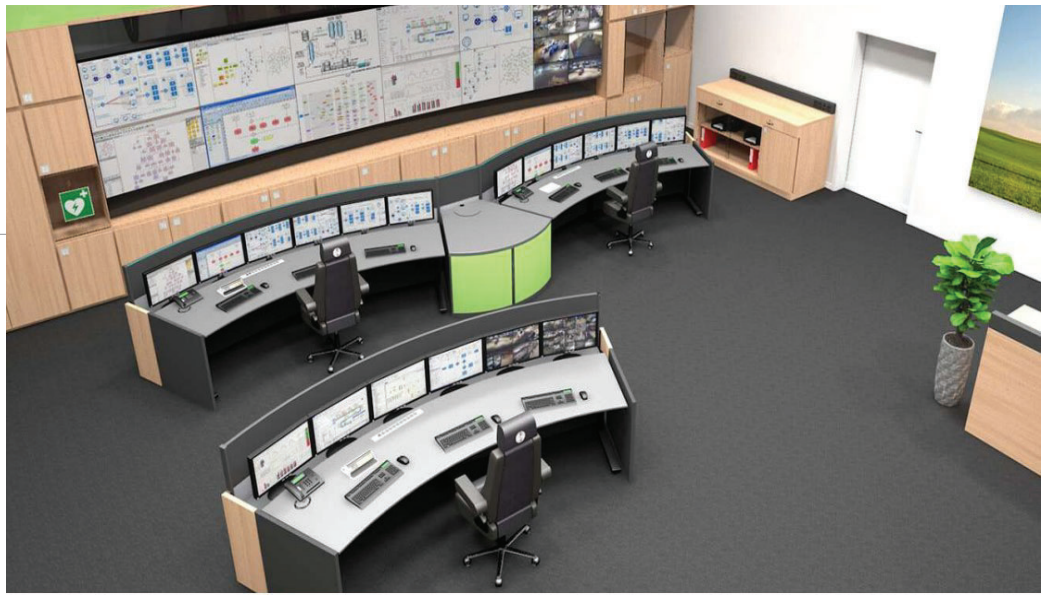
- High operation Cost approx. TZS 600Mil (Especial electricity for 303 Boreholes).
- Power fluctuation.
- Inadequate alternative sources of power (Solar, wind mill).
- High rate of non revenue water (Old infrastructures)

Challenges

- In sufficient working Capital (enough fund to buy water equipment including water pumps, pipes & fittings and water meters).
- Depletion of borehole yield. (No alternative source such as rain water harvesting and Desalination).
- High demand of clean and safe water.
- Shortage of storage tanks and existing tanks are old.

Medium Term Priorities (2021-2025)

Strengthening of water resources management	Improving of water service provision	Improving of commercial and customer services	Enhancing of financial sustainability .	Strengthening of Institutional capacity
Strengthen management of water abstraction, water resource conservation initiatives and rainwater harvesting	Improve water infrastructure, reliability of water services, reducing Non-Revenue Water, undertaking and monitoring of water supply projects and water quality	Increase the current customer and revenue base, enhance credit control mechanisms and customer satisfaction.	Enhance collection and management of funds and sound financial management practices	Strengthen visibility, marketing and promotion of ZAWA services compliance to laws, regulations, circulars and government pronouncements, water District Offices, use of modern facilities and equipment, teaching, research and dissemination of research output.



The Way Forward

1) Integrated Water Management System
2) Capacity Building to the ZAWA Staff
3) Maintenance and Repairs of the Infrastructure
4) Building of New Water Schemes

Ongoing Projects

Rehabilitation And Improvement Of Water Supply System In Zanzibar (RIWSSZ) – Exim Bank India Project--USD 92.18 Million.

Rehabilitation And Improvement Of Water Supply Services In Zanzibar – IMF Covid-19 Funds Project -- TZs 34.2 Billion.

Projects which are in initial stage:

- ✓ **Zanzibar Urban Water Distribution Facilities Improvements-JICA Project - USD 100 Million.**
- ✓ **Strengthening Of Water Supply And Services Sustainability In Zanzibar (SWSSSZ) - Exim Bank India Project-- 35 USD Million.**
- ✓ **Sustainable Water Supply In Zanzibar (Feasibility Study) – KfW Germany Funds Project- USD 0.600 Million.**

Ongoing Projects….

S.No.	Item Description	Exim Bank India Project			IMF Covid-19 Project	
		Actual Progress				
		LOT1 [Mfenesini & Dole Schemes]	LOT 2 [Mkorogo, Maungani & Dimani Schemes]	LOT 3 [Kidutani, Masingini & Maji House Scheme]	LOT 1 [Unguja]	LOT 2 [Pemba]
1	Drilling of Boreholes	64			11	27
2	Transmission Main Line	473.853km			319km	
3	Distribution Network					
4	Ground Tank Constructions	7			2	
5	Elevated Tank Constructions	8			8	
Project Average %		59.6%	49.5%	86.12 %	35%	13.6%

Ongoing Projects Sites

Ground Water Sources

Spring

Borehole

Cave


AHSANTE

出典：2022 年度 JICA 課題別研修「水道管理行政及び水道事業経営(A)」カントリーレポート

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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