

*Water Supply Administration
For Better Management of Water Supply Services
Course (A)*

Country Reports

Japan International Corporation of Welfare Services (JICWELS)

Contents

1 .AFGHANISTAN.....	5
2 .EGYPT	17
3 .ETHIOPIA	29
4 .GUINEA	45
5 .JORDAN	55
6 .MALAWI	61
7 .NIGERIA	69
8 .PALESTINA	89
9 .RWANDA	99
10.SUDAN	109
11.TANZANIA.....	123

Water Supply Administration
For Better Management of Water Supply Services
Course (A)

AFGHANISTAN

Water Supply Administration
For Better Management of Water Supply Services
Course (A)

EGYPT



Holding Company for Water and Wastewater

INCEPTION REPORT (JULY 2017)

Holding Company for Water and Wastewater



Holding Company for Water and Wastewater

Official Population No. for year 2017=92 million capita



248 cities

4766 villages



Most of the population is allocated in only 5% of the total area of Egypt in the Delta and Nile Valley.

Water Resources (57.0 BCM/yr)

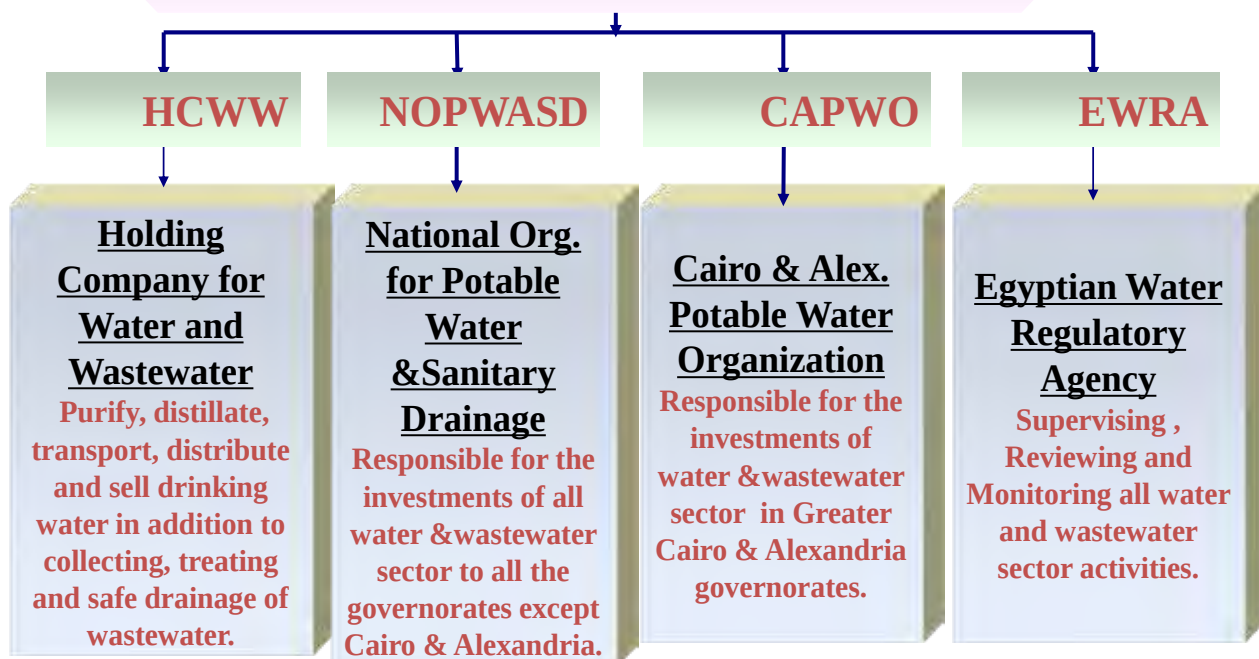
River Nile (55.5 BCM/yr)•

Groundwater (0.5 BCM/yr)•

Rainfalls (1.0 BCM/yr)•



Water and Wastewater Sector Reform





Number of Subsidiary Companies

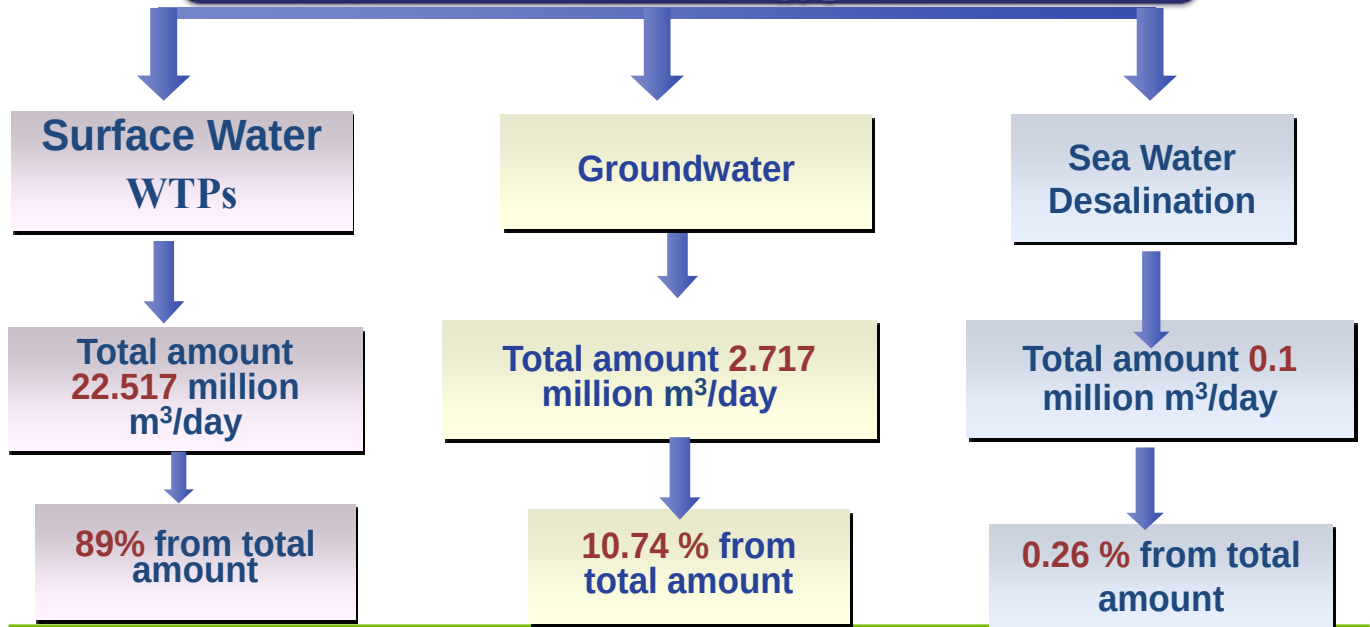
25 Company •

Service Region

27 Governorates •

**ATKINS**

Drinking Water Production from Different Sources in Egypt



General Information About Water Sector In Egypt

Water Production (Millions m ³ /day)	25.3	Coverage Percentage 97%
Number of Water Treatment Plants	2715 227 Filtration + 830 Compact + 1610 Well Plants + 48 Desalination	
Water Distribution Networks (km)	165000	
WasteWater Networks (km)	52000	

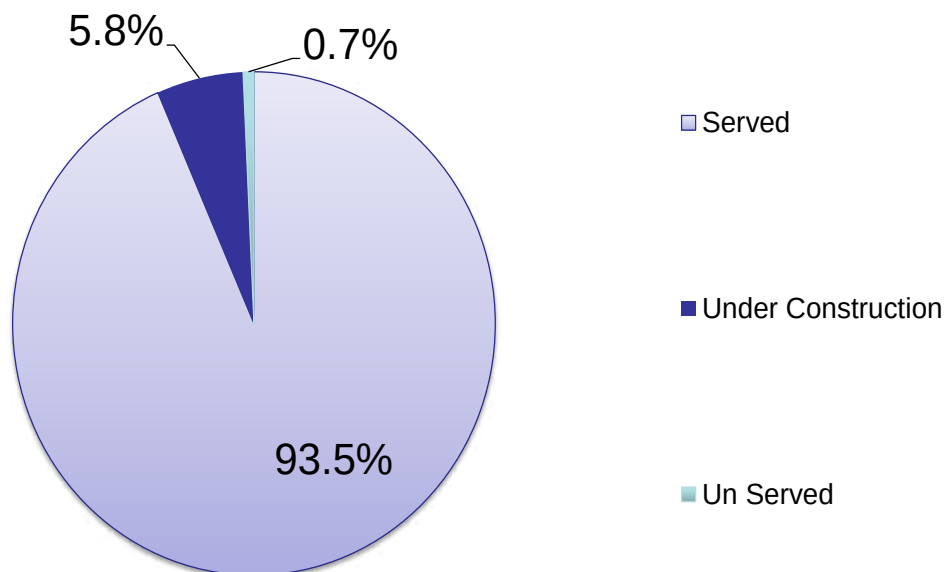
Number of Wastewater 409 with total Design capacity 13.5 million m³/day

Triple treatment
2%

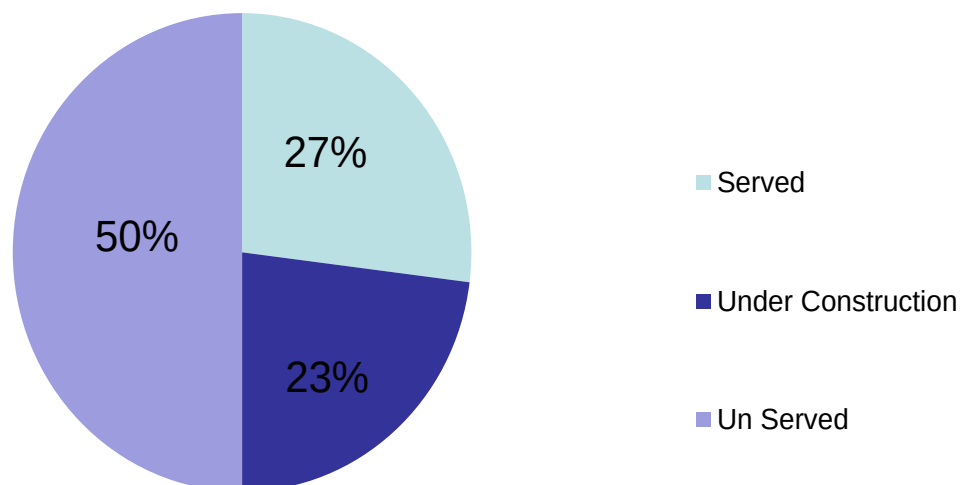
Secondary treatment
85.3%

Primary treatment
12.7%

Urban Service ratio (According to Population)



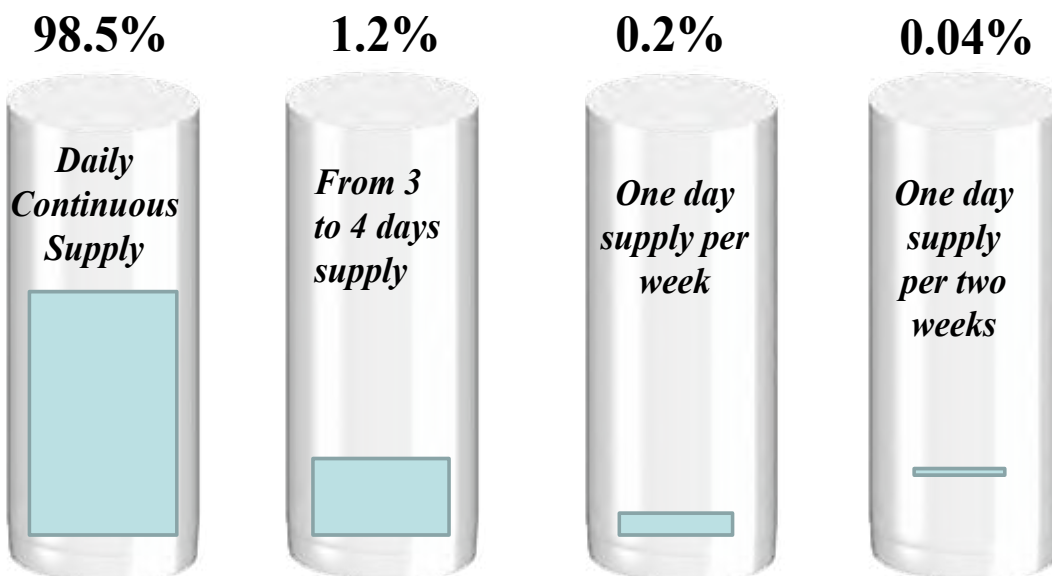
Rural Service ratio (According to No. of Population)



11

Continuity of Water Supply -Water Networks (2016)

Measured by Population



Total Population for Water Networks =90Million Capita

2. Water Quality Control

□ Upgrading of Labs



2005: 0 mobile lab 2012: 225 mobile labs
2005: 3 central labs 2012: 14 central labs
A Reference laboratory established for HCWW.

3. Performance Quality Control

□ Performance Indicator System

- 63 indicators used to measure and analyze performance of water and wastewater operations on a quarterly basis covering five areas:



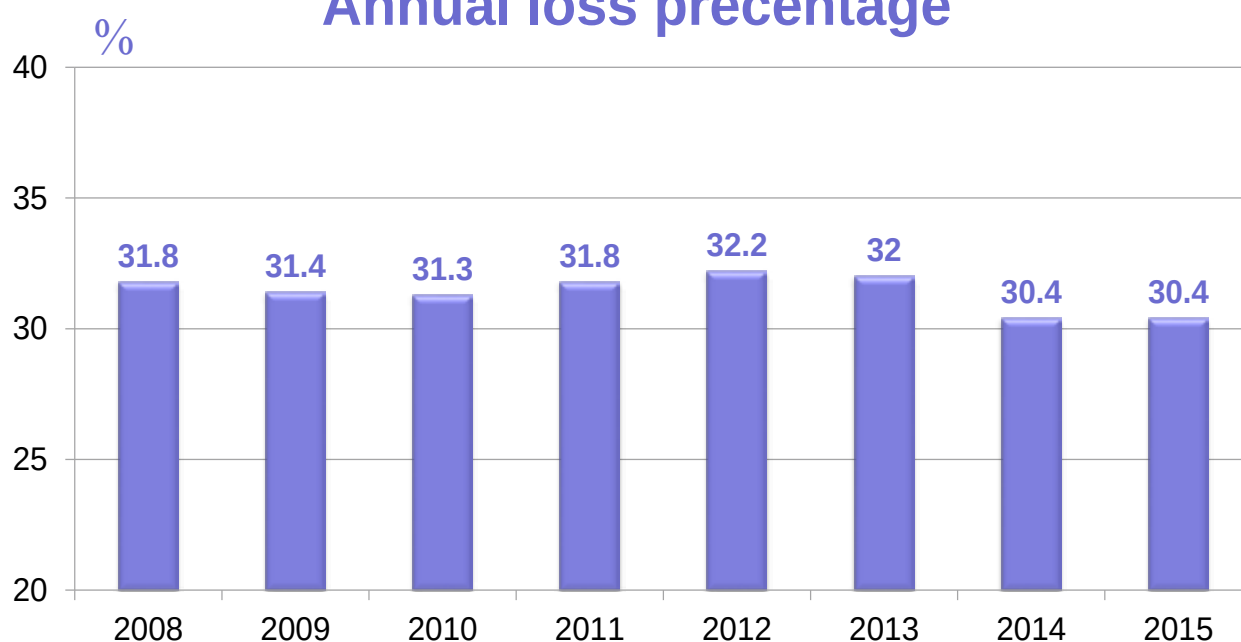
4. Technical Support

□ Replacement and Renovation



- Replacement and Renovation program for W&WW networks
- Integrated plan to address old pipes and valves
- Allocation annual budget of 2 billion LE for rehabilitation projects

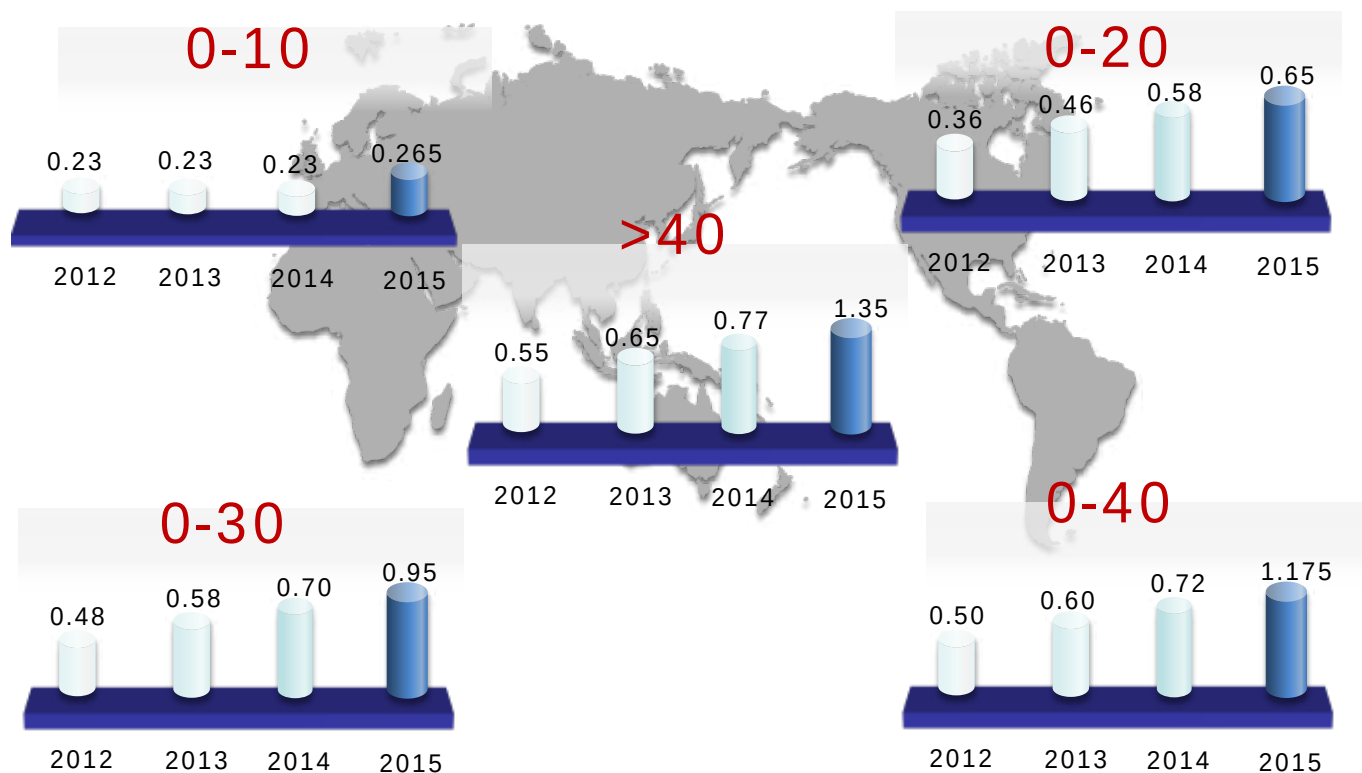
Reduction of Non-Revenue Water Annual loss percentage



Real Loss Reduction Strategy Funded By USAID, KfW, JICA, EU, GIZ, ... etc

Company	District Metered Areas Data				
	No.	Networks Lengths Km	House Connections No.	Area Km2	Loss %
Alex.	3	10	1510	1.3	18
Beherah	2	50	7652	13	31
Giza	7	43	6035	3.69	22
Cairo	4	195	6213	3.8	40
Sharqiah	12	112	14057	7	31
Bani Swief	3	73	8452	3.7	37
Luxor	1	4	854	0.2	34

Different tariff with different segments of consumption (L.E)



Recent Challenges to Improvement of Water Supply Services

Firstly: Rationalization of water uses:-

- Reduce the leakage in water networks.
- Reduce the average water consumption to be 200 lit/cap/day.(280 lit/cap/day for the current).

Secondly: Development of Water Resources:-

- Expansion of dependence on Desalination.
- Dependence on Ground Water.
- Increase coverage of wastewater treatment plants to reuse the water in agriculture.

19

Water Supply Administration
For Better Management of Water Supply Services
Course (A)

ETHIOPIA

Water Supply Administration for Better Management of Water Supply Services

Inception Report Presentation

- 1. Country: Federal Republic of ETHIOPIA**
- 3. Position: Branch Office Manager**
- 4. Organization: AAWSA**

Content of Presentation

- 1. Back ground of AAWSA**
- 2. Success Story of AAWSA**
- 3. Recent Challenges to Improvement of Water Supply Services**

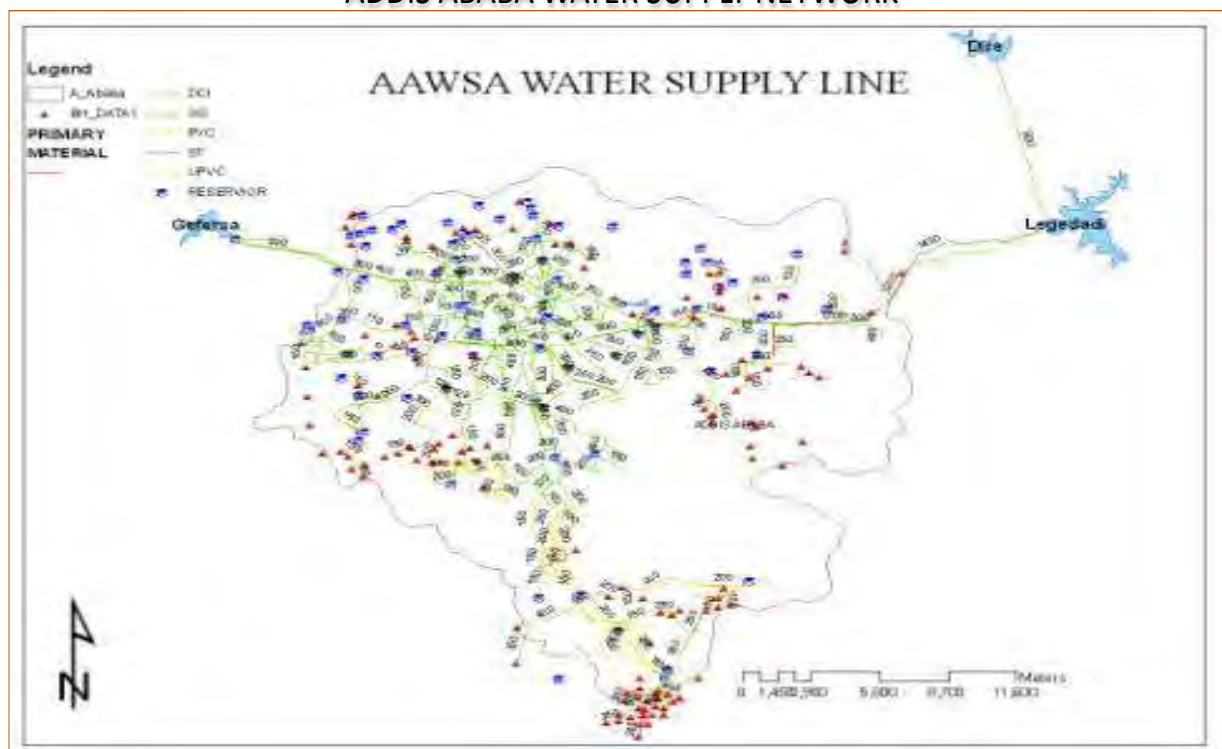
Back Ground

FEDERAL STATES OF ETHIOPIA



Cont...

ADDIS ABABA WATER SUPPLY NETWORK



Cont...

- The Addis Ababa Water and Sewerage Authority (AAWSA) was established as an autonomous body by order No. 68/1971 issued on 26 February 1971, and re - established by Proclamation No. 10/1995 with more mandates and power as an autonomous Public Authority under Region 14.
- This followed the formation of regional states. Region 14 is now converted to the Addis Ababa City Government, which is one of the two independent city administrations established by the Federal Government.
- The scope and dimension of water supply planning and management in Ethiopia has changed rapidly in the last couple of years due to a number of realities.

Cont...

- Addis Ababa City is at present supplied with surface water from the Legadadi, Dire and Gefersa reservoirs as well as groundwater pumped from Akaki and Legedadi wellfield located to the south of Addis Ababa and other shallow wells and springs located within the city.
- The current total daily production is estimated to be more than 523,000 m³/day. Out of the total production 200,000 M³/day is from the surface water sources and the remaining 323,000 M³/day is from ground water.

Basic Information

- **Water supply Area:** Addis Ababa City
- **Municipal Area:** 540 Km²
- **Service Area:** 540 Km²
- **Total Household:** 628,154
- **House Connection:** 450,462
- **Municipal Population:** 3,250,768
- **Served Population:** 2,061,635
- **Water Supply Coverage Ratio:** 71%
- **Water quality:** WHO guideline

2. Success Story of your Water Supply Services

AAWSA achieved the following goals:-

- The daily water production rate increased from 301,000 m³/day in 2010 to 523,000 m³/day in 2017
- Improved the water supply service delivery system by implementing business processing reengineering and balanced score card
- Improve water meter reading efficiency to 96%
- Improve collection efficiency to 93%

Cont...

Picture: Construction of reservoir in Hanamariam area



Cont...

Picture: Legedadi water treatment plant



3. Recent Challenges to Improvement of Water Supply Services

The major recent challenges to improvement of water supply services are:-

- The major portion of the existing water supply network is very much aged and needs extensive work and capital to renew it,
- Now a day the Addis Ababa City is expanding horizontally as well as vertically dramatically, hence the socio-economic development of the city is much more faster than the water supply development works,
- The rate of NRW is high, 40%, that exposed the water supply service to be poor since the NRW in other side could cause the water contamination,
- Lack of application of appropriate technology in operational activity,
- The water supply coverage is below the demand for water of the people. This case suppressed the satisfaction of the customers.
- Lack of competent personnel to cop up the prevailing challenges in water supply service,



WATER SUPPLY ADMINISTRATION FOR BETTER MANAGEMENT OF WATER SUPPLY SERVICE

INCEPTION REPORT PRESENTATION

- 1. Country: Federal Democratic Republic of *Ethiopia***
- 3. Position: *Water Customer Service Sub-Process Owner***
- 4. Organization: *Addis Ababa Water And Sewerage Authority (AAWSA)***



Outlines

- ✓ **Back Ground of AAWSA**
- ✓ **Water supply service level**
- ✓ **Reduction of NRW**
- ✓ **Accounting system of water supply system**
- ✓ **Success story**
- ✓ **Recent challenges to improve water supply system**
- ✓ **Expectation to wards Japan**
- ✓ **Expectation to wards the program**



INCEPTION REPORT



➤ WATER SUPPLY ADMINISTRATION FOR BETTER ANAGEMENT OF WATER SUPPLY SERVICE

- ✓ *Addis Ababa is the capital city of Ethiopia established in 1886 G.C*
- ✓ *currently the population of Addis is nearly 4 million*
- ✓ *Addis Ababa live at an elevation of 2,700 m meter high above sea level*
- ✓ *The city divided in to 10 sub- city with different area coverage & population density*

Whole Country:

Area: 540 km²

Coverage Water Supply: 71%

Your Water Supply System/City:

Service Area : 540 km²

Population Served: 2,250,000



GENERAL INFORMATION ABOUT MY ORGANIZATION



- *The name of the organization AAWSA*
- *Have an employee of more than 3000*
- *Use decentralized administration*
- *Having 8 branch offices under head quarter*
- *One of the important service to be given is supplying of clean potable water*
- *AAWSA is an autonomous governmental organization*
- *The water supply distribution system of Addis are both gravity & pressure*



WATER SUPPLY SERVICE LEVEL



NO	Description	Date	Remark
1	Water supply area coverage	540 km ²	
2	Number of customer /Taps/	459,264	
	2.1. domestic	386,264	
	2.2. Non domestic /commercial/	70,000	
	2.3. public tap/fountains	3000	
3	24 hours supply or not	70%	
4	By shift two or three times per week	30%	

The level of water supply is stated in tabulation



WATER SUPPLY SERVICE LEVEL



INDICATORS	2008or 2010	2015 or 2017	Goals for 2027
Staff/1,000 connections			
Production capacity (m ³ /day)	350,000	608,000	1000,000
Water quality	WHO Guidelines	WHO Guidelines	WHO Guidelines
Coverage area	20%	95%	100%
Supply duration (hr/day)	10	On average 16	24
Supply pressure	0.2 bar	1 bars	2.5 bars
Number of connections			
NRW		40%	20%
Collection ratio	48%	99.9%	99.9%
Staff number		Above 3000	5000

The level of water supply is stated in tabulation



MANAGEMENT OF WATER QUALITY



I want to separate the water quality problem in two categories:-

- ***Raw water &***
- ***supplied water***



AAWSA USE WORLD HEALTH ORGANIZATION WATER QUALITY STANDARD



Quality table

<i>No</i>	<i>water quality table</i>	<i>Raw water</i>	<i>Tap water/treated water</i>	<i>Remark</i>
1	<i>Turbidity /degree/</i>	<i>300-1600 /NTU//</i>	<i>< 1 NTU</i>	
2	<i>Color /Degree/</i>	<i>1500-400 /NTU/</i>	<i>< 5 TCU</i>	
3	<i>PH</i>	<i>7.4-7.8</i>	<i>7.4-7.8</i>	
4	<i>Hardness /PPM</i>	<i>34</i>	<i>34</i>	
5	<i>Iron /PPM/</i>	<i>0.2-0.4</i>	<i>0.01</i>	
6	<i>Manganese /PPm/</i>	<i>0.033</i>	<i>0.008</i>	
7	<i>Nitrate nitrogen /PPm/</i>	<i>0.004</i>	<i>0.004</i>	
8	<i>Others phosphate /PPm/</i>	<i>0.15</i>	<i>0.15</i>	
9	<i>Sulfate /PPm/</i>	<i>0.2</i>	<i>0.2</i>	



Reduction of non revenue water /NRW/



NRW is one of the most harmful thing to AAWSA but it doesn't give full attention to reduce NRW by my observation now a days the NRW is about 40% of the total production. If the organization can control this NRW it is like constructing big dam so to prevent this severe problem AAWSA state strategy & future plan in GTP -2 Reduce NRW to 20% until 2015 - 2020 and also effective system maintenance strategies.



Reduction of non revenue water /NRW/



Some of the activates which are held by AAWSA to control & reduce NRW are:-

- Installation of Efficient flow measurement equipment***
- Bulk meter installation unto main supply lines***
- Replacement of aged transition lines***
- Maintenance of reservoir and son on***



ACCOUNTING SYSTEM OF WATER SUPPLY SERVICE

The final goal of all the activities done in the authority is to give better water supply service by the reward getting service charge. Now a day the organization is self budgeted but previously the city administration was allocate budget in addition to the money collected from water fee but not now so AAWSA facing budget shortage due to this and some reason tariff improvement is made for the second time with in 4 or 5 years. And also implement modern bill & accounting system. As I mention previously the AAWSA Customers are Categorized in to 3 main division According to the category the water fee also vary as mention below in the table. The billing or water fee collection work is done by outsource company.



ACCOUNTING SYSTEM OF WATER SUPPLY SERVICE

Payment /water Tariff Non – Domestic customers

Tariff Block	Monthly water consumption	Revised tariff in Birr/m³	Charge for solid waste management	Remark
Block 1	1. 7m³	1.75m³	42%	Non –domestic customers shall pay additional charge which is equivalent of 42% total water consumption of or sold water management service non-domestic customers shall pay the amount in the block they are grouped for their total consumption. For example, if a certain organization consumers 150m³ water in a month ,it will be grouped under block5. Accordingly it is expected to pa birr 7.45/m³ for the whole consumption
Block 2	8- 20m³	3.80 m³	42%	
Block 3	21 -40m³	4.75 m³	42%	
Block 4	41 - 100m³	5.95m³	42%	
Block 5	101 -300m³	7.45m³	42%	
Block 6	301 -500m³	9.30m³	42%	
Block 7	>500/ E.g.600/	11.60/m³	42%	



ACCOUNTING SYSTEM OF WATER SUPPLY SERVICE

Domestic customers

<i>Tariff Block</i>	<i>Monthly water consumption</i>	<i>Revised tariff in Birr/m³</i>	<i>Charge for solid waste management</i>	<i>Remark</i>
<i>Block 1</i>	<i>1-7m³</i>	<i>1.75m³</i>	<i>20%</i>	<i>Non –domestic customers shall pay additional charge which is equivalent of 20% of their total water consumption or solid waste management service. Domestic customers are treated in a progressive tariff system. For instant</i>
<i>Block 2</i>	<i>8- 20m³</i>	<i>3.80 m³</i>	<i>20%</i>	
<i>Block 3</i>	<i>21 -40m³</i>	<i>4.75 m³</i>	<i>20%</i>	
<i>Block 4</i>	<i>41 - 100m³</i>	<i>5.95m³</i>	<i>20%</i>	



MAJOR RECENT ACHIEVEMENTS IN IMPROVEMENT OF WATER SUPPLY SERVICE.

- *Increase the total treated water supply from 350,000 m³/day 608,000 m³/day*
- *To improve water supply service increase the number of branches from 8-12*
- *150,000 m³/day water extract from sewerage disposal to construction or road washing & plantation purpose so it support potable water usage.*



SERVICE

- *To implement modern technology because of skilled man power shortage*
- *The water supply increased time to time but the distribution system is still traditional and old enough so it cannot handle the pressure & the volume of water causes pipes are broken a every where and results physical loss & pollution.*
- *Interruption of electric power related to pressure distribution Case customer dissatisfactions.*

Water Supply Administration
For Better Management of Water Supply Services
Course (A)

GUINEA



Republic of Guinea

Ministry of Energy and Water

Guinea Water Company (SEG)

**“Water Supply Administration for Better Management of Water
Supply Services (A)”**

Inception Report Presentation



Overview of Guinea

The Republic of Guinea is a country located in West Africa. It covers an area of 245,847 km² and a population of 11 million inhabitants of which 3 million in the capital Conakry. The annual growth rate is 3%.





Overview of the drinking water supply

In addition to Conakry, the Guinea Water Company (Société des Eaux de Guinée-SEG) covers 25 urban centers over 33. The rate of access to drinking water in urban areas is about 70 %.



Overview on Guinea water Company (SEG)

Organizational Framework

STATUS:

- SEG is a Public Service Company.
- SEG is under the supervision of Ministry of Energy and Water.
- Relations between SEG and the Guinean state are governed by a triennial contract plan

MISSION

- Production and supply of drinking water in urban areas;
- Operation, maintenance, rehabilitation, renewal and development of the sector;
- Asset management



Department and Participants Missions

The Department Production, Distribution and Network (DPR) is responsible for the production and supply of drinking water and also the management of water supply facilities and the quality of water distributed and network maintenance.

The mission of the **Division of Supplying and Pipeline Network** :

- Monitoring of the pipeline for transmission and distribution;
- Monitoring of the level of reservoirs and their service areas ;
- Maintenance coordination of network pipeline and reservoirs



WATER SUPPLY SYSTEM IN CONAKRY

PRESENTATION OF THE SITUATION OF DRINKING WATER SUPPLY IN CONAKRY

In 2015, the population in the city of Conakry is **3 000 000 inhabitants** which is estimated by SEG and the demand for safe drinking water is about **300 000 m³/day**

The water supply in the capital Conakry currently consists of **80% (133 700 m³/day)** by the surface waters and **20% (33 300 m³/day)** by the underground waters.

Since 2001, the water supply in the city of Conakry has been strongly disrupted because of a **Significant deficit of the production in relation to the demand.**

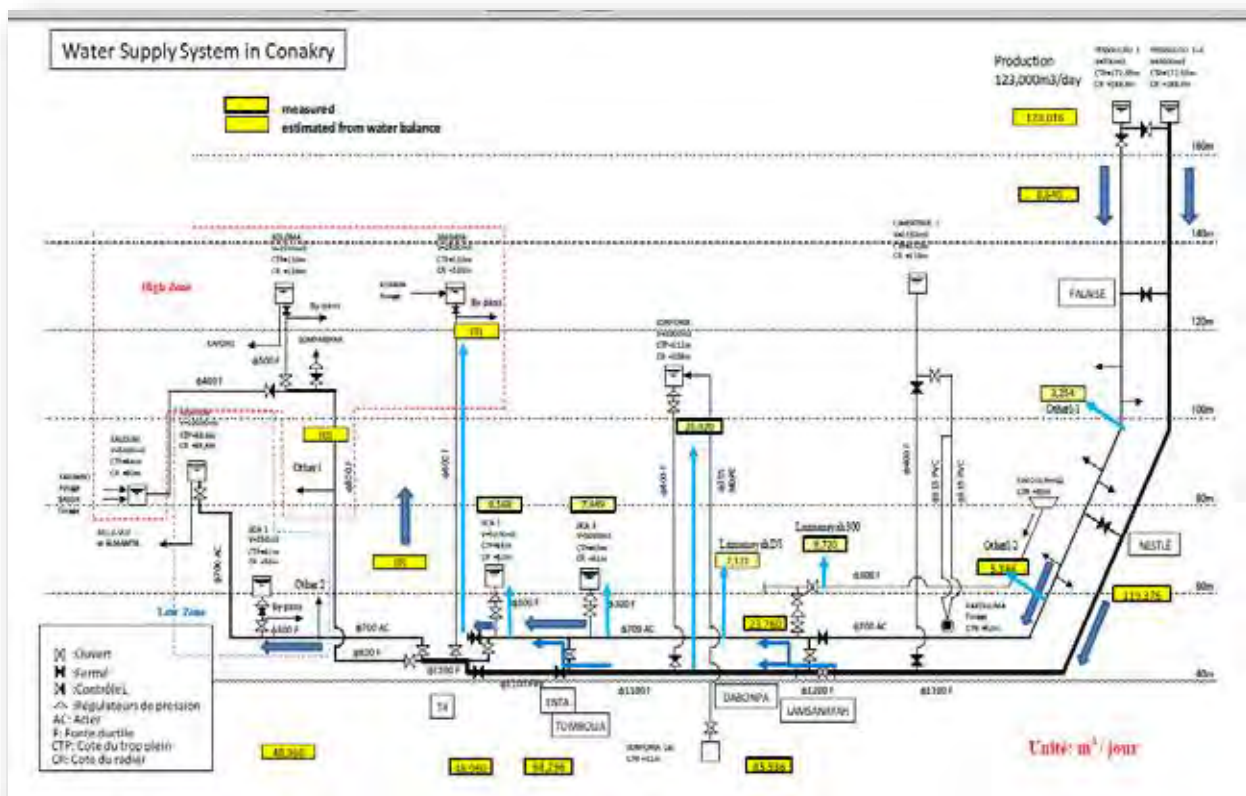


WATER SUPPLY SYSTEM IN CONAKRY

Both this **deficit and the topography** of the city of Conakry have created a situation of **water shortage in the upper districts**, some of which have not been supplied for ten years.

All these negative factors have contributed to decrease the continuous access to drinking water by majority of the population and require **a rotational water supplying**:

So the high areas are supplied Tuesday, Thursday and Saturday. Low areas are other days





MANAGEMENT OF WATER QUALITY

Management of water quality or self control is carried out by the Water Quality Division under the responsibility of the Production and Network Manager.

This department has a **central laboratory in Conakry** and **4 laboratories in the regional capitals**.

The implementation of an annual schedule of the quality of raw treated and distributed water by SEG.

This department is composed of the following members:

- 1 Deputy Manager
- 1 Head of Service ,
- Head Section Physico- chemical control ;
- Head Section Microbiological control ;
- 4 itinerants Chemist based in regional capitals;
- 12 laboratory workers and field



SEG WATER BALANCE (Conakry-2014)

System input volume 54 883 971 m3/year	Authorized consumption 29 661 736 m3/year	Revenue water 29 621 536 m3/year	Billed authorized consumption 29 621 536 m3/year	29 621 536 m³ /year (53.97%)
		Non Revenue Water (NRW) 25 262 435 m3/year	Unbilled authorized consumption (ex. fire fighting, cleaning) 40 200 m3/year	40 200 m³ /year (0.07 %)
	Water losses 25 222 235 m3/year		Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies) 11 764 777 m3/year	11 764 777 m³ /year (21.43%)
			Real losses (Leakage) 13 457 458 m3/year	13 457 458 m³ /day (24.52 %)



ANY ACHIEVEMENTS

To improve the indicators and the situation of drinking water supply, we have initiated some actions and projects:

1. Project of improvement of the Technical and Commercial Indicators (PACT)

The activities of PACT include the following:

- Normalization of the branching;
- Installation of water meters for customers;
- Repair of the leakages on connection;
- Research and destroy of the illegal connections...



Evolution of the main management indicators for the last 10 years

YEAR	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
INDICATOR											
PRODUCTION (millions M3)	30,5	32,6	35,8	44,9	51,2	57,9	58,8	60,3	61,2	62,6	61,97
BILLING Ratio	50%	52%	51%	55%	57%	72%	73%	72%	55%	64%	59%
Collection Ration Privat Customer	59%	63%	52%	42%	37%	42%	56%	72%	73%	67%	77%
Collection Ration Public Customer	63%	54%	48%	77%	60%	65%	60%	50%	64%	61%	46%
Global	60%	59%	50%	58%	49%	57%	59%	54%	67%	62%	58%
Number of connections	85 351	92 261	96 805	101 702	106 103	111 378	119 792	124 383	130 758	133 161	137 555
Out of service	16 573	3 468	3 440	3491	3 526	3 532	3 257	2 541	1 189	1 999	1 959
Ratio Evolution	19%	4%	4%	3%	3%	3%	3%	2%	1%	2%	1%



ACCOUNTING SYSTEM OF WATER SERVICE

A- Tariff situation of SEG is presented as follows:

- - Domestic consumption
 - From 1 m³ to 7m³ the price is : 0,08 D US/m³
 - From 7 m³ to 23m³ the price is : 0,28 D US/m³
 - Over 23 m³ the price is : 0,44 D US/m³
- Public fountain 0,4 D US/m³
- Commercial activities 0,6 D US/m³
- General Administration 0,61 D US/m³
- Industry, International Organizations, Embassy 1,14 D US/m³

B- Balance Sheet of SEG:

- - Asset : 46 442 396 D US
- - Liabilities: 43 802 695 D US
- Profit : 2 639 701 D US
- Capital Income : 32 279 892 D US
- Expenditures : 29 640 191 D US

Note: 1 Dollar US = 9 300 GNF



MAJOR RECENT ACHIEVEMENTS IN IMPROVEMENT OF WATER SUPPLY SERVICES/MANAGENT

- 1. Strengthening the drinking water supply system of the city of Conakry
Funded by JICA**
 - Replacement FRPM pipeline DN 1100 by DN 1100 Steel pipe (3,5 Km)
Funded by Islamic Development Bank- BID
 - Rehabilitation of the WTP Yessoulou-1 built in 1964;
 - Renewal steel pipe DN 600 (1,6km) mm and DN 700 mm (7,7km) built in 1964;
 - Rehabilitation of 15 000 connections and construction of 1 200 new social connections;
 - Achieving four boreholes for 40 00m³/day
- 2. Supply project of drinking water for the cities of Boké and Téliélé
(Funded by Arab Bank for Economic Development in Africa- BADEA)**
- 3. Supply project of drinking water for 5 cities: Gaoul, Lélouma, Tougué, Lola and Yomou (Funded by Arab Bank for Economic Development in Africa- BADEA)**



RECENT CHALLENGES TO IMPROVEMENT OF WATER SUPPLY SERVICE

Realization of the fourth (4th) project:

Production capacity 160 000 m³/day

- Intake Water
- Raw water Pipeline
- Construction of Water treatment plant
- Treated water Pipeline
- Construction Service Reservoirs
- Pipeline Network
- Connections

Studies already carried out

Financing to be sought



EXPECTATIONS TOWARD JAPAN

- ☐ Advocating for the financing of the water supply project in the towns of Fria, Koubia and Beyla
- ☐ Obtaining a technical assistant specializing in NRW
- ☐ Partnership with the fitting and faucet manufacturing companies

EXPECTATIONS TOWARD THE PROGRAM

- ☐ Acquiring Japanese experience in water services
- ☐ Through the workshops to acquire the experience of the other participants
- ☐ Deepen my knowledge of network sectoring , pressure management and leak detection
- ☐ Improvement of my knowledge in water quality monitoring

Water Supply Administration
For Better Management of Water Supply Services
Course (A)

JORDAN

For
Accepted Participants Only <by 14th July (Fri), 2017>

Attachment 2

Water Supply Administration for Better Management of Water Supply Services

Inception Report Presentation

1. Country: Jordan
3. Position: Projects Manager
4. Organization: MWI - PMU



Inception Report Presentation

- Each applicant is kindly requested to make presentation of Inception Report (M/S Power Point file with **less than 15 slides**) which cover the following 7 topics about the individual water supply company/public water supply authority to which the participant belongs.
- Presentation time: **15 minutes including Q/A**
- **3 topics:**
 - 1. Outline of Water Supply Services of your Organization
 - 2. Success Story of your Water Supply Services
 - 3. Recent Challenges to Improvement of Water Supply Services



1. Outline of Water Supply Services of your Organization

- Body sentence of the profile / Background

Whole Country:

Area : 90000 km²

Population : 11 Million Habitants

Coverage Water Supply: 97 %

Your Water Supply System/City:

Service Area : 11000 km²

Population Served: 9.5 million/ thousand



1. Outline of Water Supply Services of your Organization

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

(Example)

INDICATORS	2004 or 2005	2014 or 2015	Goals for 2025
Staff/1,000 connections	22	3.2	2
Production capacity (m3/day)	65,000	300,000	400,000
Water quality	None	WHO Guidelines	WHO Guidelines
Coverage area	20%	90%	95%
Supply duration (hr/day)	10	24	24
Supply pressure	0.2 bar	2.5 bars	2.5 bars
Number of connections	26,88	191,092	300,000
NRW	72%	17.2%	6.5%
Collection ratio	48%	85%	95%
Staff number	3,200	4611	5000



2. Success Story of your Water Supply Services

- ✿ There are projects that have achieved very good results that can be considered success stories:
 - 1- Al-Aqab Water Project: The objective of this project is to collect all the results of the wells in the northeastern region of Jordan and increase the quantity of water supplied to the four northern governorates
 - 2 - The project of the carrier line HOFA - Beit Ras: providing additional water quantities and lifting the pressure in many areas that were suffering from lack of water access to it as well as providing great power
 - 3- The main transmission pipe line from Dissi Wells in the south of Jordan to carry the water to the middle and the North



3. Recent Challenges to Improvement of Water Supply Services

- ✿ 2 million refugees is the biggest challenge that we face it during the last 6 years , And in the same time Jordan is the second poor country in the world for water .
The main source of drinking water in Jordan is wells. And extraction and pumping is very expensive and this is another challenge



Management of Water Quality :

Water quality in Jordan is managed according to national standards and international laws and WHO Guide lines .

Many types of water are monitored and managed are: 1_drinking water 2; waste water 3: industrial water 4; irrigation water.

All type of water should be complied with Jordanian standards

IF any deviation from standards control limits for drinking water...Water sources must be stopped , taking corrective actions , corrective measures and finally testing more samples until complying

Other points in water management are;

1: water protection by implementation of the Jordanian guides for water protection and desalination if water zones

2- WATER TREATMENT TO IMPROVE WATER QUALITY FOR SAFE CONTINUOUS WATER SUPPLY

3- Water safety plan implementation to insure SAFE water from source to consumer's meters

4- Reuse of reclaimed waste water in irrigation to save drinking water for human consumption



Water Supply Administration
For Better Management of Water Supply Services
Course (A)

MALAWI



Lilongwe Water Board

Potable water all the time for all

WATER SUPPLY ADMINISTRATION FOR BETTER MANAGEMENT OF WATER SUPPLY SERVICES

Attachment2: Inception Report Presentation

JICA Tokyo International Center

Lilongwe Water Board
Malawi

Outline

- *Introduction*
- *Water supply services and service levels at LWB*
- *Management of water quality*
- *Reduction of Non-Revenue Water*
- *Major recent achievements in improving water supply services*
- *Recent challenges to improvement of WSS*
- *Expectation toward Japan and the program*





Introduction



E-mail: madzi@lwb.mw

Website: www.lwb.mw



Lilongwe Water Board at a glance

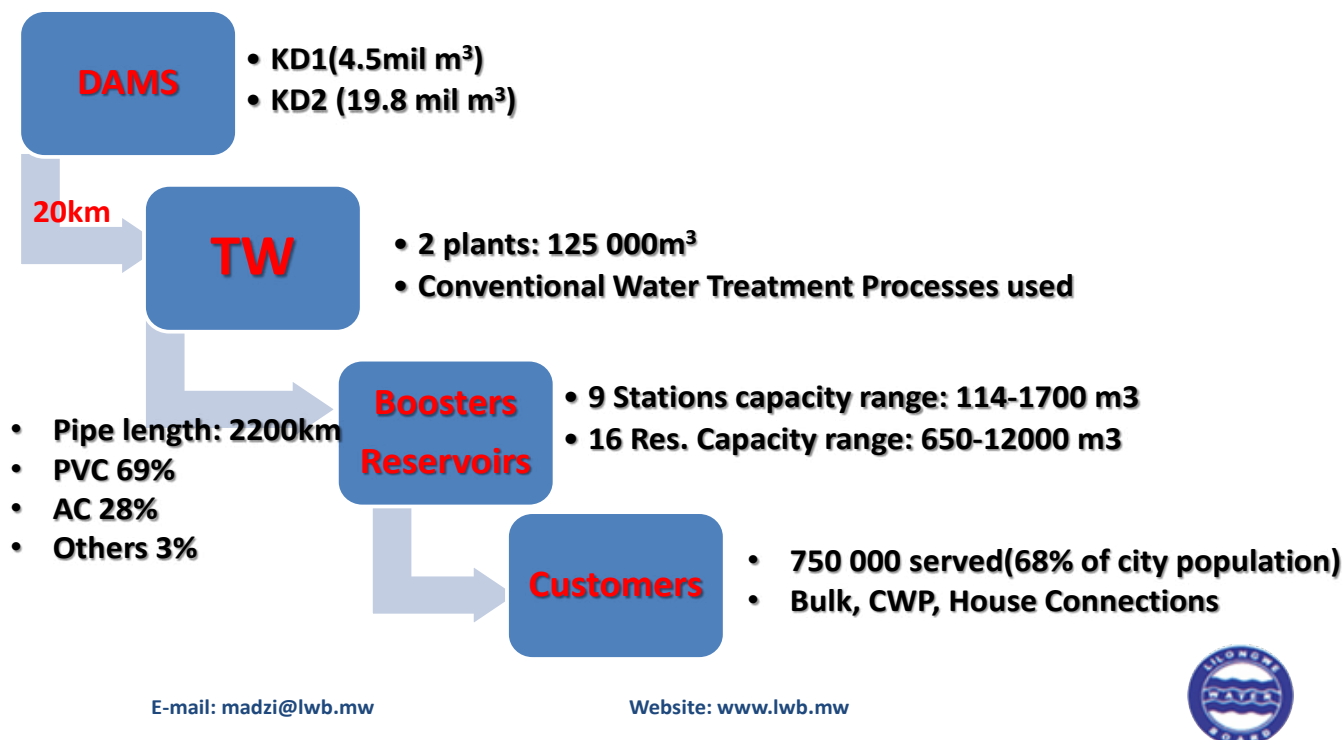
- Sole supplier of potable water in Lilongwe city
- Established in **1947**
- Mainly relies on surface water source
- Has staff compliment of **482**
- Divided into **3** Zones
- Currently has 4 departments: General Management, Finance, Human Resource and Administration and Technical Services

E-mail: madzi@lwb.mw

Website: www.lwb.mw



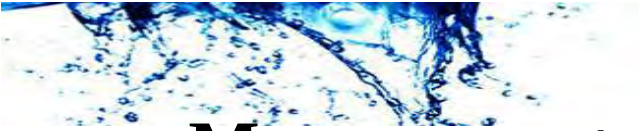
Water Supply Services and Service Levels



Water Supply Services and Service Levels Cont'd

Investment Plans:

- Lake Malawi Project
- Raising of Dam I
- Extension of Treatment Works
- Studies on groundwater development



Management of Water Quality

- Quality generally good except in rainy season (turbidity 17000NTU)
- Conventional water treatment methods used
- Water sample analyses for compliance with standards
- Plans to construct sediment trap at intake points
- Plans to reclaim the lost vegetative cover for Lilongwe River catchment area

E-mail: madzi@lwb.mw

Website: www.lwb.mw



Reduction of Non - Revenue water

- Serious challenge mainly attributed to aged pipes and illegal connections
- Rolling average of 36% for the past five years
- 12.8mil m³ lost yearly; translating to about \$9mil
- Target is to reach 25% in 2019
- Climate variability needs resilient facilities

E-mail: madzi@lwb.mw

Website: www.lwb.mw



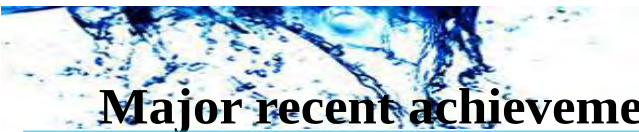


Interventions put in place to fight NRW

- Establishment of Water Balancing System-underway
- DMA establishment-progress at 80%
- Caretaker Area establishment-done
- Pipe and meter replacement program
- Pressure management
- Metering and meter accuracy – state of the art meter lab just installed

E-mail: madzi@lwb.mw

Website: www.lwb.mw



Major recent achievements in improvement of WSS

- Extension of Treatment works(2016) -30 000m³/day added
- Implementation of GIS – working 90%
- Development of a Hydraulic Model – 20%(underway)
- Commissioning of 2 reservoirs (2015) – combined capacity 6,650m³

E-mail: madzi@lwb.mw

Website: www.lwb.mw





Recent Challenges to improvement of WSS

- Inadequate and aged water infrastructure
- High NRW levels
- Environmental degradation
- Intermittent water supply and power failure interruptions
- Limited financial capacity for infrastructure development

E-mail: madzi@lwb.mw

Website: www.lwb.mw



Expectation towards Japan and the program

- To acquire better skills in water supply administration
- To appreciate and adopt achievable practices of Japanese water utility companies in NRW reduction activities
- To get equipped with necessary skills and knowledge that would be used to address water supply challenges
- To learn cultures of other participants
- To learn water supply practices of other participating countries

E-mail: madzi@lwb.mw

Website: www.lwb.mw



Water Supply Administration
For Better Management of Water Supply Services
Course (A)

NIGERIA

Inception Report presentation

Water Supply Administration for Better Management of Water Supply Services.

Country	:	Nigeria
State	:	Ondo State
Position	:	General Manager
Organization	:	Ondo State Water Corporation.

OUTLINE OF WATER SUPPLY SERVICES

Institutional Framework and Ondo State Water Corporation(ODWC) Organization

The Ondo State Water Corporation (ODWC) was formally established in May 1976. The legal Edict providing for the establishment was signed into law on 4th November, 1977 and was published in an official gazette No. 17 Vol. 3 of 25th May, 1978.

Water supply to the population in the urban areas of Ondo State is the task of the State Water Corporation(ODWC). The major Urban areas are the area of Akure(the State Capital city) Ondo, Owo, Ikare and Okitipupa.

DEPARTMENTS - The Corporation is having 9 department and 4 unit

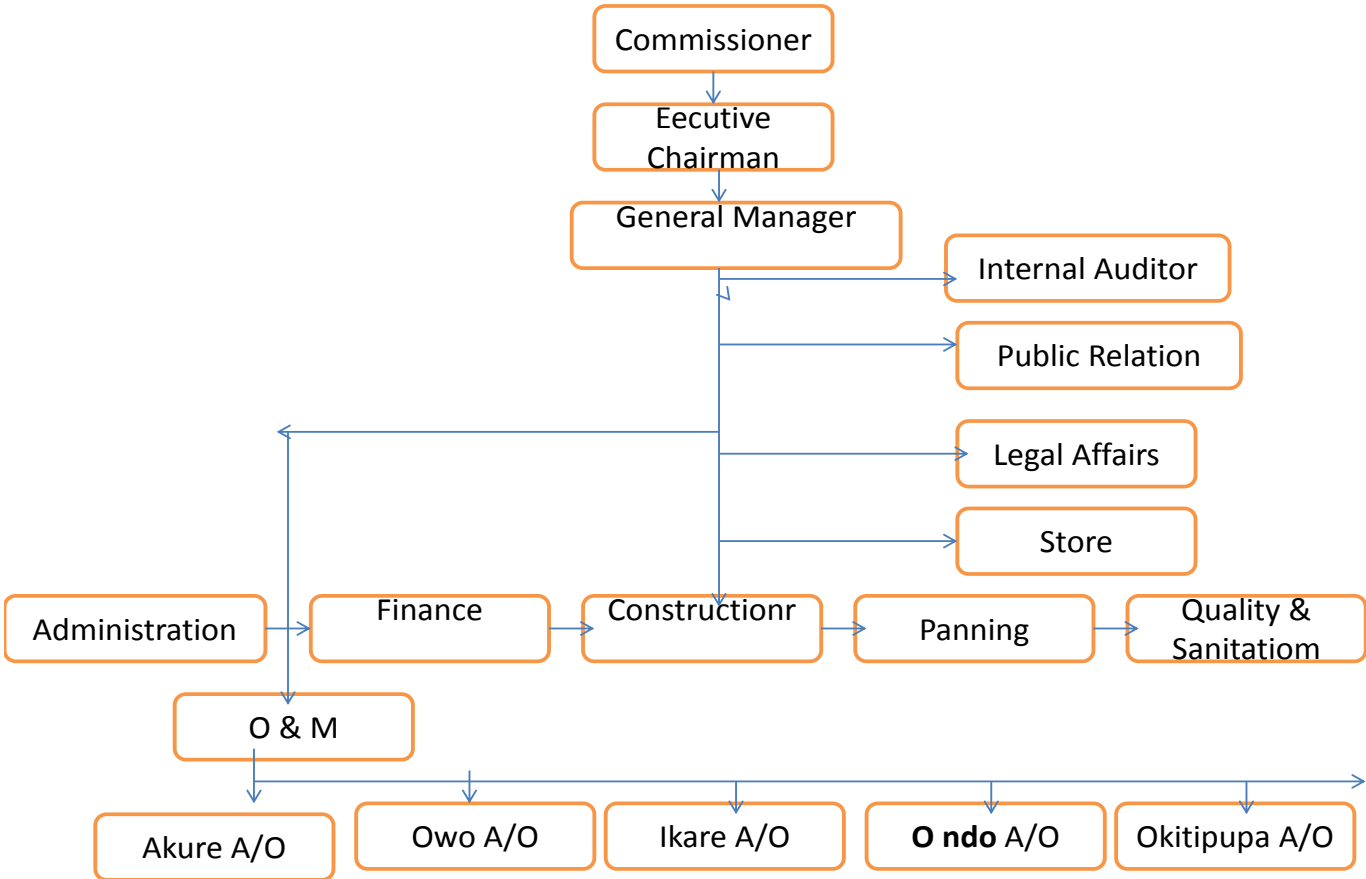
- (i) Planning, Design & Statistic Department,
- (ii) Operation & Maintenance Department
- (iii) Construction Department (iv) Rural Water Supply Department
- (iv) Quality Control & Sanitation Department
- (v) Commercial Service Department
- (vi) Finance Department
- (vii) Administrative Department

Units :-

- (i) Stores/Supplies Units (ii) Public Relation Units (iii) Internal Audit Unit (iv) Legal Unit.

The Corporation is further divided into five operational Zones for administrative convenience

Institutional frame work and ODWC Continued



Outline of Water Supply services continued

Country	:	Nigeria
Area	:	923,769km2
Population	:	185,000,000
Coverage Water Supply	:	54%
Water Supply System/City	:	Urban Communities of the State
Service Area	:	15,820Km ²
Population Served	:	3,460,877

Key Performance indicators

No	Total Connections	Unit	2011	2012	2013	2014
1	Total connections	Nos	15,466	16,144	16,471	16,469
2	Active Connections	Nos	4,211	3,444	2,954	2,137
3	New Connections	Nos	222	276	64	40
4	Inactive connections	Nos	11,255	12,700	13,517	14,332
5	Billing	Naira	80,773,166	73,744,502	13,525,898	15,169,155
6	Collection	Naira	50,819,926	50,135,417	9,292,292*	10,810,094
7	Collection efficiency	%	62.9	68	68.7	71.2

Key Performance Indicators

No	Total Connections	Unit	2011	2012	2013	2014
8	Water Production	M3	5,773,681.25	6,475,191.25	3,036,461.95	1,973,700.27
9	Water sold	M3	4,038,658.30	3,687,225.10	676,294.91	758,457.75
10	Non Revenue Water	%	30.05%	43.06%	77.73%**	61.57%**
11	Staff	Nos	962	902	868	729
12	Staff Productivity	Staff/1000 Connection	62	56	53	44

•The State Government used to pay bulk from source for MDAs which was stopped late 2012 based on the policy of the State Government. Policy that MDAs should be responsible for the Payment of their [utility](#) Bills

** The above stated reason is responsible for high non revenue water as it became difficult for the corporation to collect its revenue from MDAs despite that they received water supply

Outline of Water supply Services Continued

INDICATORS	2005	2014	Goals for 2025
Staff/1000 Connections	35	44	20
Production Capacity(M3/day)	6,475,191.25	1,973,700.27	
Water Quality		Low	High
Coverage Area		4%	30%
Supply Duration (hr/day)	8hrs	4hrs	12-15hrs
Supply Pressure	123m	Lot of leakages b/c of urban renewal	To arrest all leakages.
Number Of Connections		16,467	
NRW	30.05%	61.57%	
Collection Ratio	55%	71.2%	95%
Staff Number			

Success Story of Water Supply Services

- (1). Formulation of the State Water and Sanitation Policy and passing into law the Water Sector Bill to drive the policy.
- (2). This has create an enabling environment for investor to come in and protect the right of Investor of recouping his/her investment.

With the availability of the State Water and Sanitation Policy document and the sector law the initial overburdened on the Corporation with the responsibility for water supply to the urban, rural and small towns has been shed to 3 agencies. Rural Water supply and sanitation agency (RUWASA), Small town Water Supply agency (yet to be fully implemented and Urban Water supply agency been handled by ODWC

Moreover, according to the law, the Corporation is in charge of its own affairs. All expenses need is to be covered by the revenue generated through the sales of water. The Corporation is now responsible for its:

Financial Management, based on approved annual budget

Technical Management of the water supply infrastructure;

Commercial management, including customers affairs, billing, collection, disconnection and Setting of water tariff.

Human resources management, including recruitment, training, compensation.

The law makes it possible to introduce performance based compensation.

Recent Challenges to Improvement of Water Supply Services

The Corporation is faced with a lot of challenges which hinder its operational performance. These challenges can be classified under three domains, namely

(i) Institutional Framework;

Government interference and control is seen to be high as the Corporation has to run to the Government most of the time for funds needed to do minor maintenance and repair. Lack of autonomy is one of the most important constraint confronting the corporation to improve its performance.

(ii) Cost Recovery/Revenue Generation;

Revenue generated is too meagre to recover operational cost, with the cost recovery ratio calculated approximately as 1.4%. The billing is still being manually generated which makes the billing system prone to errors of not capturing all the available customers thereby not giving the true picture of what is to be billed and what is to be collected.

Recent Challenges to Improvement of Water Supply Services Continued

(iii) Production/NRW/Network management.

Most of the water supply schemes are not in good state. The Corporation is just managing through strenuous effort of the management and staff to supply water to few customers thereby leaving a wide gap in demand and supply. The situation has forced the populace to look for alternative sources of water supply thereby seriously hindering the performance of the Corporation.

The pipeline network is inadequate and the existing ones are faced with the problem of fatigue and aging, leading to frequent bursts and leakages. The Corporation finds it very difficult to maintain most of its facilities due to shortage of fund for maintenance and running cost.

Water supply service quality and cost recovery are low. Water tariffs are low and many users do not pay their bill. ODWC rely mostly on occasional subsidies from the State Government to cover the operational costs

Conclusion

From the table on slide 5 and 6 it can be seen at a glance obvious challenges faced by the Corporation

- i. Active connections have been declining
- ii. Similarly the number of new connections has not improved over years
- iii. There has been an increase in un-active connections
- iv. The collection efficiency is high because some accounts have been suppressed
- v. The non-revenue Water started rising when Government stopped bulk deduction of MDAs arrears from source.

Water Supply Administration for Better Management of Water Supply Services

Inception Report Presentation

1. Country: Nigeria
3. Position: Head Monitoring and Evaluation
4. Organization: Lagos Water Corporation



1. Outline of Water Supply Services of Lagos Water Corporation

Nigeria:

Area : 923,683 km²
Population : 192 Million Habitants
Coverage Water Supply: less than 68.5 %

Lagos:

Area : 3,577 km²
Population : over 23 million Habitants
Coverage Water Supply: less than 10%

Your Water Supply System/City:

Service Area : 44 km²
Population Served: 3.65 million/ thousand



Outline of Water Supply Services of Lagos Water Corporation

INDICATORS	2000	2016	Goals for 2025
Staff/1,000 connections	16	17	6
Production capacity (m3/day)	681,000	954,660	1,409,260
Water quality	None	NWQ Guidelines	NWQ Guidelines
Coverage area	20%	44%	80%
Supply duration (hr/day)	10	18	24
Supply pressure	-	-	-
Number of connections	108,224	75,000	180,000
NRW	98%	66%	40%
Collection ratio	32%	34%	80%
Staff number	1812	1300	1000



Vision:

“Sustainably meeting potable water demand in Lagos State through international best practice”

Mission:

“To provide safe drinking water in sufficient and regular quantity, maintain good quantity service through revenue generation to sustain operations, meet customer expectation by planning sustainable growth



- The First 2.4 MGD Iju Water Works was constructed in 1910 and was commissioned in 1915 by Lord Lugard to service Colonial residents of Ikoyi .
- In order to meet the continuous demand of water supply the corporation has continued to expand its capacity and this has lead to the construction of 4MGD Ishasi to service the south west of the state in 1976 and 70MGD Adiyin Water works in 1991.
- Recently is the construction of 4MGD Otta-Ikosi to serve the residents of the Ikorodu which is the
- Lagos Water Corporation now has a total installed capacity of 210MGD(954.66MLD)
- 4 Major Water Works of total Capacity of 123MGD(559.16MLD)
- 48 Mini and Micro water works 87MGD(395mld)



- The Lagos State Water Corporation (LSWC) was formally launched in 1986 by the then Military Administrator of Lagos State, Group Captain Gbolahan Mudashiru.
- Later, His Excellency, Asiwaju Bola Ahmed Tinubu, the Third Executive Governor, Lagos State, rechristened it Lagos Water Corporation (LWC) in the year 2004, by virtue of Lagos State Water Sector Law (No. 14).
- The Corporation operates as an effective and efficient state government Parastatal, charged with the responsibility of providing potable and safe water, to over 23 million people in Lagos State.



Summary services

- Lagos Water Corporation Total Asset: 40.34 billion naira.
- No of Regional Business District within Lagos Water Corporation – 8
- Major water works – 4 (123mgd) Mini water works – 48 (87mgd)
- New water works under construction – 8 (16mgd) Transmission mains (ND 200 – 600mm) – 180km Distribution Mains (ND 500 – 75) – 2,500km Additional 200km distribution mains ongoing in 2 service areas
- Total connections (size 5 – 19mm) – 75,000
- 12.15 M Independent Power Plant for Iju, Adiyin, and Akute Level of service before IPPs – 21.6% Level of Service after IPP – 57.2% Network coverage – 44%
- Unaccounted for water – 60%



Projections show that the demand for water will increase tremendously to close to 780 million gallons of water per day by the year 2025. LWC has used a projected population growth of 5% per annum to calculate the projected demand for water giving a population of 32 million for Lagos by the Year 2025. The demand gap estimates are as

Year	Population (Millions)	Water Demand(M GD)	Water Production (MGD)	Demand Gap(MGD)
2010	18	540	210	330
2016	24	724	317	407
2018	26	664	577	88
2020	29	733	745	(12)
2025	32	780	800	(20)



LWC MASTER PLAN

Short Term (2012 - 2017)		Medium Term (2017 – 2018)		Long Term (2019 – 2020)	
Treatment plant	Expected Yield(mgd)	Treatment plant	Expected Yield(mgd)	Treatment plant	Expected Yield(mgd)
Adiyan II	70	Odomola II	90	Yewa III	50
Odomola I	25	Adiyan III	70	Odomola III	95
Ishasi Expansion	8	Yewa I (Desalination)	50	Upgrading Ishasi	23
Ota Ikosi	4	Ibeshe(Desalination)	50		



Recent Challenges to Improvement of Water Supply Services



- Lack of power supply
- Supply service unreliable
- Supply service not cost effective
- Heavy system losses up to 66%
- Mini water works – 42 (75.9mgd)
- Level of service before IPP– 21.6%,Level of service– 57.2% Network coverage – 44%
- Rampant water theft and illegal connections
- Transmission: Developing efficient networks, storage reservoirs and operational and financial systems.
- Ageing water plants and facilities
- Aging Workforce



- Lack of data for water management - 50% of customer database is available
- Increase access and reliability
- High operating costs
- Challenges in resource mobilization
- Inefficient cost recovery mechanisms
- Inefficient revenue collection system (80% of water users on flat billing syste



Water Supply Administration for Better Management of Water Supply Services.

INCEPTION REPORT PRESENTATION

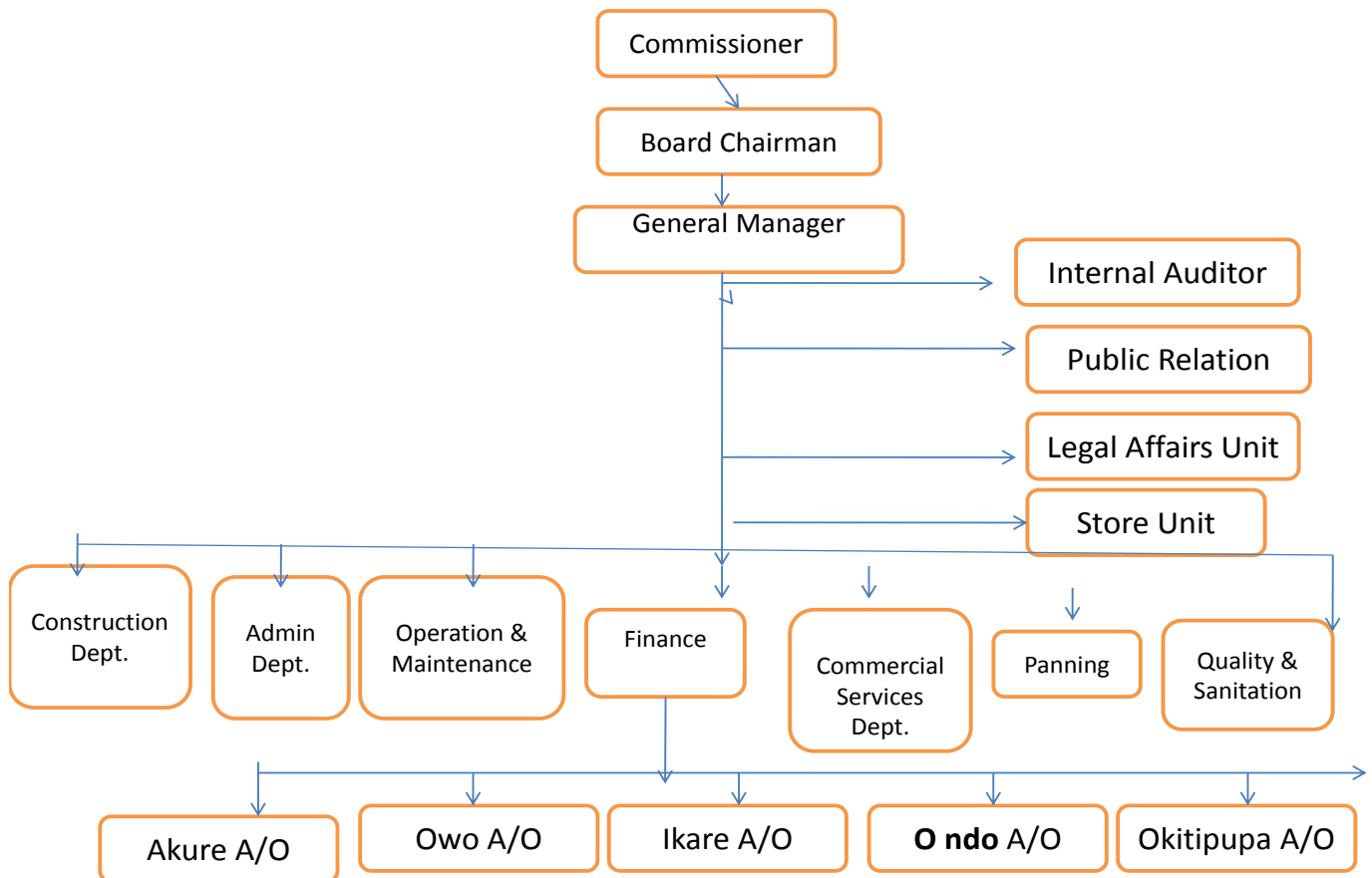
Country	:Nigeria
State	:Ondo State
Position	:Director of Engineering (Operation & Maintenance)
Organization	:Ondo State Water Corporation.

OUTLINE OF WATER SUPPLY SERVICES:

Introduction:

Ondo State Water Corporation (ODWC) is the main Agency of Ondo State Government responsible for water delivery services in the Urban towns. The Corporation was established in May 1976. The Legal Edict that established the Agency was signed into law on 4th November, 1977 Towns that fall into urban areas of Ondo State are: Akure (State Capital), Ondo, Owo, Okitipupa and Ikare.

Water Corporation Organogram



Continuation of Outline of Water Supply services

Country	:	Nigeria
Area	:	923,769km ²
Population	:	185,000,000
Water Supply Coverage	:	54%
Urban Cities of Ondo	:	Population Above 100,000
Present Service Area	:	15,820Km ²
Population Covered	:	3,460,877

Key Performance indicators

No	Total Connections	Unit	2011	2012	2013	2014
1	Total connections	No	15,466	16,144	16,471	16,469
2	Active Connections	No	4,211	3,444	2,954	2,137
3	New Connections	No	222	276	64	40
4	Inactive connections	No	11,255	12,700	13,517	14,332
5	Billing	Naira	80,773,166	73,744,502	13,525,898	15,169,155
6	Collection	Naira	50,819,926	50,135,417	9,292,292*	10,810,094
7	Collection efficiency	%	62.9	68	68.7	71.2

Key Performance Indicators continue

No	Total Connections	Unit	2011	2012	2013	2014
8	Water Production	M3	5,773,681.25	6,475,191.25	3,036,461.95	1,973,700.27
9	Water sold	M3	4,038,658.30	3,687,225.10	676,294.91	758,457.75
10	Non Revenue Water	%	30.05%	43.06%	77.73%**	61.57%**
11	Staff	No	962	902	868	729
12	Staff Productivity	Staff/1000 Connection	62	56	53	44

•The State Government used to pay bulk from source for MDAs which was stopped late 2012 based on the policy of the State Government. Policy that MDAs should be responsible for the Payment of their Utility Bills

** The above stated reason is responsible for high non revenue water as it became difficult for the corporation to collect its revenue from MDAs despite that they received water supply

Outline of Water supply Services Continued

INDICATORS	2005	2014	Goals for 2025
Staff/1000 Connections	35	44	20
Production Capacity(M3/day)	6,475,191.25	1,973,700.27	
Water Quality		Low	High
Coverage Area		4%	30%
Supply Duration (hr/day)	8hrs	4hrs	12-15hrs
Supply Pressure	123m	Lot of leakages b/c of urban renewal	To arrest all leakages.
Number Of Connections		16,467	
NRW	30.05%	61.57%	
Collection Ratio	55%	71.2%	95%
Staff Number			

Recent Achievements (Success Story) of Water Supply Services in Ondo State

(1) The State Water and Sanitation Policy was formulated with the law to drive the policy for Water Sector.

(2) This development has created the enabling environment for investors to come in, and this protects the right of Investors recoup their investments.

The State Water and Sanitation Policy document and the sector law have provided for the sharing of responsibilities among the three water supply agencies: Urban, Small towns and Rural Water. Namely Rural Water and Sanitation Agency (RUWASA), Small Towns Water Supply Agency (yet to be fully implemented) and Urban Water Supply Agency, which is Ondo State Water Corporation, ODWC.

Moreover, according to the provision of the law, the ODWC will be in charge of its own affairs (autonomous). This means that incurred expenses, particularly on operation and maintenance, must be recovered by the revenue generated through the sales of water. The Corporation is rightly expected to stand on its own (independent), executing Financial Management, based on approved annual budget; Technical Management of the water supply infrastructure; Commercial management, including customers' care / affairs, billing, collection, disconnection and tariff Setting; Human resources management, including recruitment, training, compensation. The law makes it possible to introduce performance based compensation.

Recent Challenges to Improvement of Water Supply Services

The Corporation is currently facing a lot of challenges which are hindering its operational performance. These challenges can be classified under three categories, namely :

(i) Institutional Framework

Government interference and control are high. The Corporation has to run to the Government all of the time for funds needed, even to do minor maintenance and repair works. Lack of autonomy is one of the most important constraint confronting the Corporation to improve its performance.

(ii) Cost Recovery/Revenue Generation

Revenue generated is too meager to recover operational cost, with the cost recovery ratio calculated approximately as 1.4%. The billing is still being manually generated which makes the billing system prone to errors. It is still very difficult to capture all the available customers and this has not enabled the Corporation to have true picture of billing and collection.

Recent Challenges to Improvement of Water Supply Services Continued

(iii) Inadequate Production / Non Revenue Water (NRW) / Poor Network management.

Most of the water supply schemes are not in good state. The Corporation is just managing through strenuous effort of the management and staff to supply water to few customers thereby leaving a wide gap in demand and supply. The situation has forced the populace to look for alternative sources of water supply, and this has been hindering the performance of the Corporation.

Township Distribution networks are grossly inadequate, while the existing ones are aged thereby leading to frequent pipe bursts and leakages. The Corporation finds it very difficult to maintain most of its facilities due to shortage of fund for maintenance and running cost. Similarly, the past Government officials and offices were very reluctant to pay.

Water supply service quality and cost recovery are low. Water tariffs are low and many users do not pay their bill. ODWC rely mostly on occasional subsidies from the State Government to cover the operational costs

Expectation from JICA Training Program

To training is aimed at availing the to acquire better knowledge on the Concept of Public Utility Sustainability and Water Projects Management for improved service delivery.

Conclusion

Water Supply situation in Ondo State Nigeria is presently far from where it is expected to be, but as earlier mentioned, the current government is really planning to break away from what it used to be. Investors are being sourced for Urban Water Supply. It is on this note that JICA is enjoined to come and expend the scope of its activities in the state by investing in Urban Water Supply with a very high prospect of recovering investment.

*Water Supply Administration
For Better Management of Water Supply Services
Course (A)*

PALESTINA



Water Situation in Jericho municipality

Prepared by :

Eng.

“Head of Water and sewer Dept.”

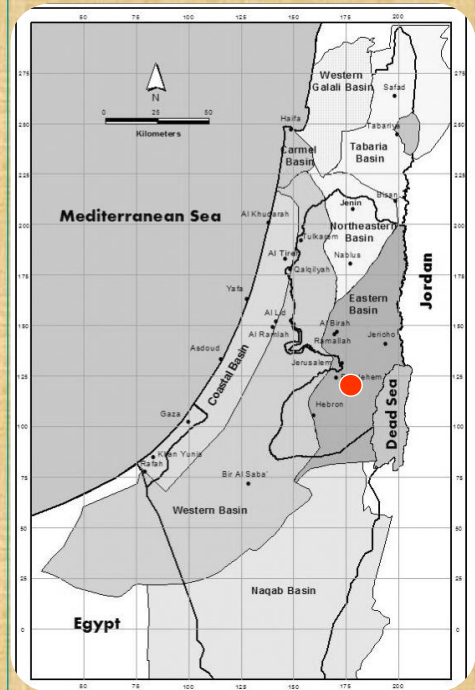
1

Jericho City

Jericho City has a very special feature being situated in the Jordan valley near the Dead Sea which is the lowest point on earth. (- 250-350 m below S.L.) and it is the oldest city in the world.

Location of Jericho:

- 38 km to the north east of Jerusalem
- 8 km to the west of the Jordan River
- 14 km to the north west of the Dead Sea
- The area of the city is about 45 km².
- The average maximum temperature is about 45°C in summer.
- Average minimum temperature is 5°C in winter
- The average rainfall is about 150mm per year.



2

Population :

The estimated population of Jericho at 2016 was 25000 people.

Note: the actual population of Jericho City should be more than the above estimated residents by considering the 1 million of tourists and passengers visiting or passing through Jericho during the year.



Water and sewer Department Organizational Structure



Domestic Water Network

Domestic water network in Jericho has been established in 1997.

- The main target of this project was to improve the water network and reduce the losses by replacing the old and inefficient asbestos Pipes with new isolated steel pipes and extending of Jericho water network to include new areas lies under the border of Jericho municipality.
- Total length of domestic water network is 86 Km in 1997 and according to the data in 2016 the length of water network is 194 km.
- The coverage area with water supply service about 33 km².
- The population served 25000 capita.

5

Domestic Water Network Components

Main source

Ein-ALsultan spring:

Average Discharge 650 M³/ Hr

Pumping Stations

1- Main Pumping Station

Q= 450M³ / Hr , H= 20m

2- Northern Tank Pump station

Q= 100M³ / Hr , H= 100m

3-Southern Tank Pump station

Q= 90M³ / Hr , H= 40m

Water Tanks

1- Main Tank/ 2000 M³

2- New Tank / 1000 M³

3-Northern Tank /500 M³

4-Southern Tank/ 500 M³

5-AL-Duke Tank /5000m³

Water Meters

(Residential , Commercial)

Meter Type

½",3/4" Volumetric Meter



6

Ein-sultan spring

The main source for water in Jericho is (Ein-sultan) spring located to the east of Wadi Al-Qilt in Jericho city , it is related to the Upper Cenomanian - Turonian Aquifer. It's annual flow)discharge about 5.5 MCM (average annual flow) equal to 650 M³/ Hr divided into:

- 42% for domestic consumption= 273 cum/ Hr

- 58% for irrigation use=377m³/hr

The percentage mentioned above was proposed for distribution of Ein-sultan water between sultan Water Association (J.M and (Agriculture).

Worth to be mentioned, in 2016 J.M was obliged to exceed the proposed Quota with average consumption of 390cum / Hr during the dry season.



Quality of Jericho Domestic Water Chemical Prosperities

T.D.S	320 ml/l	
Conductivity	640	
Salinity	0 – 2 %	
Potassium (K)	20.25 mg/l	
Sodium (Na)	50.8 mg/l	
So4	24.3 mg/l	
Turbidity	1-5 NTU	
PH	6- 8	
Temperature	21 – 25° C	
T.C	Nil	
F.C	Nil	



* Most of the consumers don't use any kind of filtration systems for domestic water in Jericho City . However some are using simple home filters.

WATER SUPPLY SERVICE LEVEL

INDICATORS	Before 2005 Estimated	2016 Actual	GOALS FOR 2025
Staff¥1000 connections	3.3	6.6	Max. =5
Production capacity (m3/day)	6552	8477	15000
Water quality	PWA ST./WHO	PWA ST./WHO	PWA ST./WHO
Coverage area	About 40%	62%	90%
Supply duration (hr./day)	24 hr.	9 hr.	24 hr.
Supply pressure	Less than 1	Less than 1	2-2.5
Number of connections	3626	6990	9500
NRW	More than 30%	17.45%	Less than 10%
Collection ratio	Less than 40%	73%	95%
Staff number	15 water section	65as total 39water section	75 as total 45water section

9

Success story

- one of the best achievement in the municipality is applying the billing system (one single visit (read- spread- collect)) , at the end of this year we will work on this system , this work integrated with the collection department.

The objective to improve the collection ration to become more than 95%.

- Reduction of non- revenue water: there is an improvement in decreasing the head loses in 2015-2016, which become less than 20%.

- The municipality succeed in preparing water master plan in 2011 and now we work on updating the plan depending on the hydraulic analysis for the water net work.

10

Success story

- The municipality owned an electronic system to follow the water quality for ein sultan spring (the main source of water) but for part of test not all.
- We used the performance indicator in cooperation with water sector regulatory council and we need to compare with other countries and what are the procedures used in japan to measure the indicator.
- In 2014 we finished and operated waste water treatment plant and cover more than 40% of the city with sewer network, we implemented projects related to house connections concentrated on the areas surrounding ein sultan spring the main source of water supply.

11

Recent challenges to improve water supply services

- There is limited water resources , which Ein sultan spring the only source of water in Jericho , there is a continuous increase of population in addition to tourism and agricultural projects which need a large quantities of water.
- In summer the municipality face big problem, water supplied to the costumer in two phases , During the day and night with 9 hr for each phase because of shortage of water sources , there is no control for the Palestinian in the water source.

12

Recent challenges to improve water supply services

- water dep. facing a problem related non-revenue issues (illegal connections and leakages).it needs long time to solve and find the problem because there is no equipment's and technology to determine exactly where is the point of illegal connection or leakage, the percentage of loses arrived 30% in sometimes. And the absent of regulations and laws which encourage the people to practice this wrong behavior.
- There is big problem in Jericho that is the sewage system not cover all the city which threat the quality of water and possible to cause a pollution in the future.

13

Recent challenges to improve water supply services

- We trained on non-revenue but we need more in this field specially in the technologies used to find and determine exactly where is the location of problem to secure and save more water and increase the supply for the customer.
- We worked on preparing water master plan, but we need to learn how to determine the challenges and threats, find the weaken and strong point to build actual improvement plan.

14

Argent support for Water Sector

Sewage System

Construction of Sewage Network to cover all Jericho city.

connecting the houses on the sewer network.

Construction of new facilities for reusing of Recycled Water.

Irrigation Water Network

Supplying of Spare Parts

Improvement of Irrigation water network & Pumping Stations

Replacement of the inefficient water meter facility

Domestic Water Network

Prospecting for extra water resources (additional resources)

Improvement of water network .

Supplying of new equipment & water facilities.

Water Supply Administration
For Better Management of Water Supply Services
Course (A)

RWANDA

Water Supply Administration for Better Management of Water Supply Services

Country: RWANDA

Position: Branch Manager

Organization: Water and Sanitation Corporation
Limited (WASAC Ltd)



Country Overview



Rwanda is located in the great lakes region of East Africa. Its Neighbouring countries are Uganda in the North, Tanzania in the East, Burundi in the South and Democratic Republic of the Congo in the West. The country covers an area of 26,338 Km² and an estimated population of 12 million people, with an annual population growth rate of 3 %.

Water Supply Services

National targets

The water Sector is committed to reaching ambitious targets in water supply and sanitation, with the vision to attain 100% service coverage by 2020. Water supply and sanitation services are critical drivers for social and economic development, poverty reduction and public health. To achieve these targets, the Sector needs to increase drinking water access of 4% every year.

Whole country

Area: 26,338 Km²

Population: 12,642,240 habitants

Coverage of water supply : 82 %

Water supply :

Service area: 22,123 Km²

Population served: 2,523,909 persons

3

Water supply services in WASAC Ltd

	2014-2015	2015- 2016	2016- 2017
Staff/1000	5/100	5/100	
Production capacity(m3/day)	41,061,229	43,558,705	
Water Quality	WHO	WHO	WHO
Coverage area	74%	82%	
Supply duration	14-16 h	14-16 h	14-16 h
Supply pressure	2-6 bars	2-6 bars	2-6 bars
Number of connection	156,618	172.747	
NRW	38	35.7	
Collection ration		59	
Staff number	834	793	820

4

Success story of Water Supply Services

- WASAC treats and distributes clean water Countrywide to supply water to all populations especially those in urban habitats.
- 3,512,250 residents of 13 urban areas including Kigali City are the population targeted for clean water services
- WASAC manages 23 treatment plants which provides clean water (74.4 m³ per day) through 7,781,477m of pipes to reach 191,684 Its water supply connections which supply various categories of users (Households, Industries, Publics services, ...)
- WASAC systems combines a new and an old network (some of pipes are old from colonial period) which are the main cause of leakages influencing the gap between the supplied and the billed quantity of water

5

Success story of Water Supply Services(cont'd)

- WASAC faces regularly water losses due to water leakage in the network, and fraudulent connections.
- Water registered for billing compared to quantity supplied to networks is an indicator of distribution efficiency
- New pipes have since been laid and old pipes rehabilitated.
- Provision of meter to every client has been made so that each meter could be read and fraud reduced.
- Many development partners supporting the water supply and sanitation sub sector. These include Vitens Evidens International, JICA, Water for People, UNICEF, WHO, World Vision, Humburg Wasser

6

Water Rates And Bill Collection System

- The WASAC bills are issued on the basis of actual readings recorded from the meter by our Meter Readers.
- All water services are billed monthly. Customers can settle their bills at the WASAC bank accounts indicated on their bills or by using a mobile phone.
- All WASAC bills for water supply, meter rent, repair works and any other services are payable before the deadline indicated on the bill




WASAC
Water & Sewerage Services
Simplifying life

Save your time Pay your water bill through prepayment service

BENEFITS OF THIS SERVICE TO THE CUSTOMER

- ✓ The customer will avoid long time and queuing while paying bills at cash Desk.
- ✓ Prevent unnecessary disconnection of water services.
- ✓ Prevent penalty of late payment.

Water Prepayment Service

In a bid to promote good service delivery and revenue collection, the Management of WASAC LTD is implementing Water Prepayment Services.

This service consists of the following:

Prepayment between WASAC Ltd and Customer who prefer to pay Bills in advance. Customers on this prepayment system will sign an agreement with WASAC Ltd to pay for their water bills according to the previous average consumption of six months or one year depending on the choice of the customer.

<i>Tariff</i>	<i>FRW/m³</i>	<i>TVA</i>	<i>TTC</i>	<i>TTC+VAT</i>
Water Tap	323	0.18	58.1	381
0-5	323	0.18	58.1	381
6-20	331	0.18	59.6	391
21-50	413	0.18	74.3	487
51-100	736	0.18	132	868
>101	847	0.18	152	999
Factories	736	0.18	132	868

9

Water Quality Management

- The water supplied by WASAC is treated according to the international standards and it benefits of a regular control at water treatment plants and distribution network
- In order to meet current water standards, specific water purification steps are taken that include: Physical and chemical treatment; and Laboratory analysis to assure the water quality.
- After these steps have been taken and it is ascertained that the water is safe, it is then distributed.



11

Water Treatment Plants Capacities

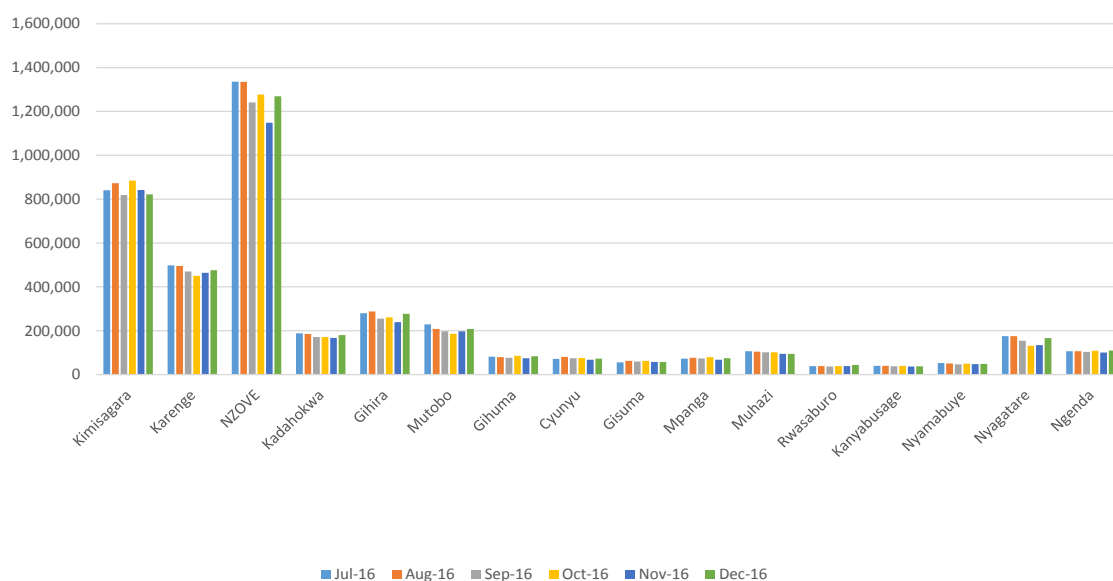
Supplied City, Town or Center		Name of water treatment plant	Date of installation/extension	Installed capacity (m3/day)	Average of water Production/May-2017
Kigali City	Nyarugenge, Kicukiro, Gasabo	Kimisagara WTP	1981/1988	24,000	24,367
		Nzove WTP	2003/2009/2016/2017	50,000	37,641
		Karenge WTP	2008	15,000	15,578
Southern	HUYE	Kadahokwa WTP	1982/2005 /2015	8,500	5,833
	MUHANGA	Gihuma WTP	1987/2015	4,320	3,990
	NYANZA & RUHANGO	Mpanga WTP/CU	1984/2006/2014	3,840	1,471
	NYANZA & RUHANGO	Mpanga WTP / LV WATSAN	2017	5,040	1,786
	NYAMAGABE	Gisuma WTP	1987/2005	1,200	1,331
Western	RUBAVU	Gihira WTP	1987	8,640	8,409
	RUSIZI	Cyunyu WTP	1987	1,300	494
	KARONGI	Kanyabusage WTP	1986	850	975
Northern	MUSANZE	Mutobo WTP	1987/1994	12,500	6,155
	GICUMBI	Nyamabuye WTP	1988	1500	1,012
	RWAMAGANA	Muhazi WTP	1986/2004/2014	3,960	1,299
Eastern	RWAMAGANA	Muhazi WTP / LV WATSAN	2017	2,800	791
	BUGESERA	Ngenda WTP/CU	1998/2014	4,840	3,140
	NGOMA	Rwasaburo WTP	1986	1000	847
	NYAGATARE	Cyondo	1982/2014/2015	5,000	2,843
	NYAGATARE	Gihengeri	1982/2016	3,500	1,572
	NYAGATARE	Tovu	1982/2012/2015	1,200	112
	NYAGATARE	LV WATSAN	2017	2,400	400
Total				161,390	120,045

Monthly Production

Nº	WTP	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Total
1	Kimisagara	840,913	872,943	818,914	884,156	842,073	821,678	5,080,677
2	Karenge	497,982	494,717	470,283	449,757	464,386	475,787	2,852,912
3	NZOVE	1,335,740	1,334,753	1,241,120	1,276,620	1,148,422	1,269,078	7,605,733
4	Kadahokwa	188,073	185,574	171,194	171,424	167,316	179,903	1,063,484
5	Gihira	280,176	287,934	254,574	261,395	239,202	277,061	1,600,341
6	Mutobo	229,508	207,953	196,910	185,913	196,740	208,000	1,225,024
7	Gihuma	81,877	80,153	76,361	85,413	74,351	84,071	482,226
8	Cyunyu	71,452	80,724	74,623	75,911	67,775	72,559	443,044
9	Gisuma	56,152	62,859	60,098	62,653	57,736	58,165	357,663
10	Mpanga	73,114	76,708	73,699	80,119	67,678	74,614	445,932
11	Muhazi	106,221	104,367	101,418	101,658	94,937	94,148	602,749
12	Rwasaburo	39,260	39,235	36,716	38,863	39,044	43,998	237,116
13	Kanyabusage	39,714	39,640	37,857	39,439	37,011	37,566	231,227
14	Nyamabuye	52,308	51,255	47,238	49,636	47,634	48,662	296,733
15	Nyagatare	175,795	175,372	154,462	131,817	134,264	166,366	938,076
16	Ngenda	106,648	106,407	103,429	108,993	101,062	109,901	636,440
Total		4,174,932	4,200,594	3,918,897	4,003,766	3,779,631	4,021,557	24,099,377

Production from July to December 2016

Monthly production from Jun 2016 to Dec 2016



1. Water losses of any nature which has many consequences from finances resources to environment wastage
2. Inappropriate technology in water supply services
3. Lack of funds for large scale projects implementation
4. Non revenue Water is still high

Water Supply Administration
For Better Management of Water Supply Services
Course (A)

SUDAN

Water Supply Administration for Better Management of Water Supply Services

Inception Report Presentation

1. Country: **Sudan**
3. Position: **manager of civil works department**
4. Organization: **DWSU**



Drinking Water & sanitation Unit



1. Outline of Water Supply Services of DWSU

- ❁ The Drinking water & Sanitation unit (DWSU) is a national institution, which is responsible for planning, designing and execution of water facilities, financed by national government or foreign funds across the country
- ❁ It is under the umbrella of the ministry of water resources and electricity of Sudan
- ❁ training is one of major responsibilities of the unit
- ❁ With contribution of JICA established training Centre which conducts annual program to train the staff from state and federal levels



Annual Courses , planned and actual number of trainees for last year

Training Course	Training	Actual	Plan	Remarks
Water Treatment Plant	4	58	84	Remaining 1 time
Water Supply Facility	5	82	110	Remaining 1 time
Data management/GIS	5	73	80	Completion
Well management	3	58	63	Completion
Water Quality Analysis	2	17	30	Remaining 1 time
Organizational Management	3	24	45	Remaining 1 time
Pipe Network Management	2	17	30	Remaining 1 time
Total	24	329	442	5 times

1	Northern	19
2	River Nile	18
3	Red Sea	15
4	Kassala	13
5	Gedaref	20
6	Khartoum	16
7	El Gezira	30
8	Sennar	15
9	White Nile	21
10	Blue Nile	19
11	Northern Kordofan	18
12	Southern Kordofan	27
13	Northern Darfur	23
14	Southern Darfur	24
15	Western Darfur	23
16	N.W.E. Company	11
17	PWC	14
18	Hawata Project	5
Total		329





Shandi water supply services

For the purpose of case study, I will take a town north of Khartoum (Shandi), where we constructed a proper water facility for first time



Whole Country:

Area : 1.8 million km²

Population : 37 million Habitants

Coverage Water Supply: 62%

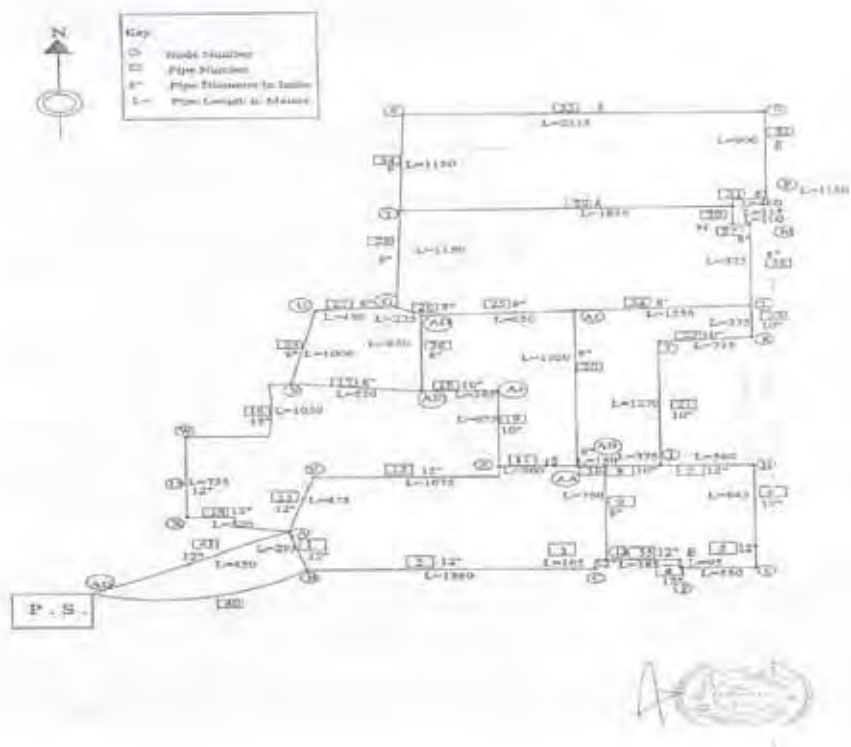
Your Water Supply System/City:

Service Area : 36 km²

Population Served: 100 thousand



The network layout



Main Performance Indicators

INDICATORS	2004 or 2005	2014 or 2015	Goals for 2025
Staff/1,000 connections	5	3	2
Production capacity (m3/day)	6,000	12,000	50,000
Water quality	Sudanese standards	Sudanese standards	WHO Guidelines
Coverage area	25%	70%	90%
Supply duration (hr/day)	10	20	24
Supply pressure	2 bar	6 bars	8 bars
Number of connections	8,000	14,300	20,000
NRW	45%	35%	15%
Collection ratio	25%	40%	90%
Staff number	40	45	40



2. Success Story of your Water Supply Services

- Due to the lack of any suitable water facilities in the town the planning administration decided to build water treatment plant to cover the water demand of the growing town
- They designed a treatment plant with capacity 12,000m³
- The plant will be executed in 2 phases with capacity 6,000m³ for each
- The network has various diameters 12 – 4 inches
- After finishing the construction works we start operating the project for 6 months,
- We required people from local and brought experience employees from out as to led the work specially financial one
- In our plan the local staff should replace the outsider within one year



The Goals achieved

- Establish water supply system
- Provide the habitants with sustainable potable water.
- Decrease waterborne diseases
- Customers are willing to pay for services
- Training the locals to operate, maintain and manage their system
- Teach the managers how to utilized their budget



3. Recent Challenges to Improvement of Water Supply Services

- ❁ Marketing the opportunities for investment in water sector inside and out side of Sudan by mapping our needs and creating stabile environment
- ❁ To establish fair water tariff system
- ❁ Establish central laboratory in every state and reference one at federal level
- ❁ Provide manuals for operation and maintenance
- ❁ Provide spare parts from good manufacturers
- ❁ Use more modern technologies in water treatment processes and network monitoring
- ❁ Conduct training courses at states and federal level
- ❁ Decentralization the senior staff and rotate them around the country
- ❁ Enhancement the work environment
- ❁ Enhancement salaries and benefits for workers to make the sector attractive



Water Supply Administration for Better Management of Water Supply Services

Inception Report Presentation

1



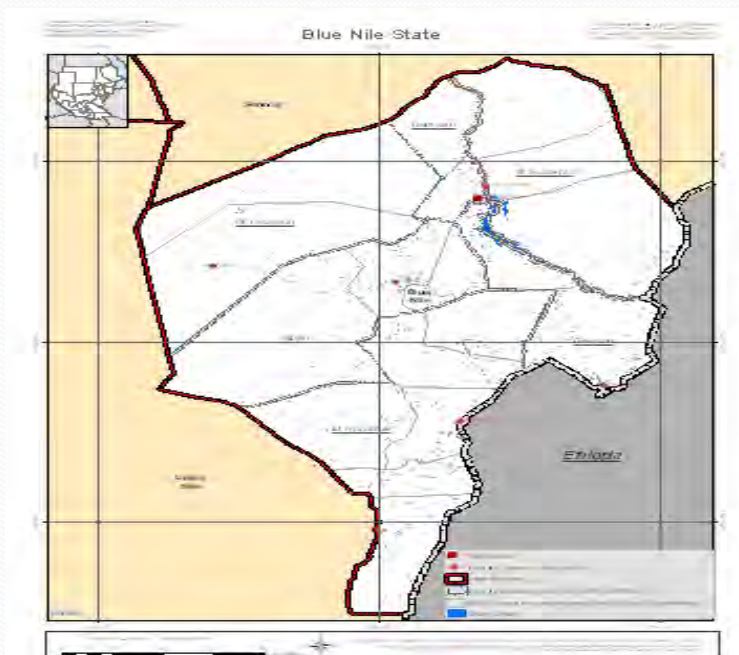
Blue Nile State



Republic of Sudan



Drinking Water Corporation





Country: Sudan

Name: Abdelrhman Mohammed Ahmed

Position: Director General

Organization: Blue Nile State, Water corporation.

Water Supply Services

Water Resources :

1- Ground Water :

2- Surface water :

Water Sources

Ground Water		Surface water		
Water Yards	Hand Pumps	W .T.P	Dams	<i>Hafirs</i>
150	1900	5	6	127

Water source Photos :



W.T.P Rosaries Town



Boot Dam



Geriwa Hafir

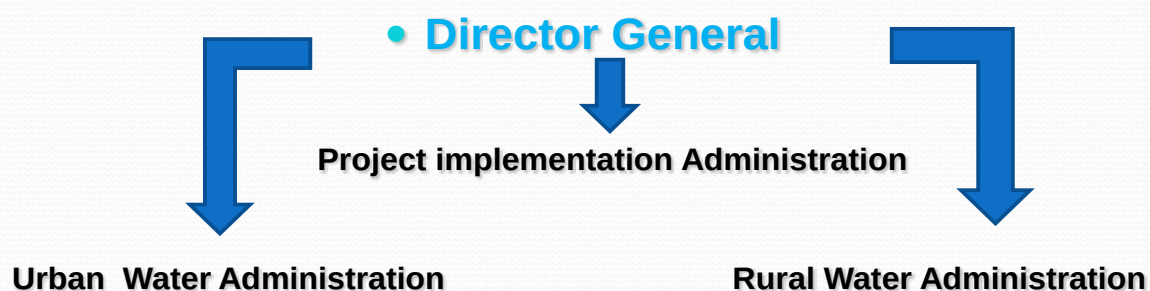


Guli – Hand Pump



Al - Gari Water Yard

Organization Chart :



Whole state:

Area : 46,000 km²

Population : 1,193,293 Habitant

Coverage Water Supply: 62 %

Water Supply System/City:

Service Area : 55 km²

Population Served: 450,000

7

Outline of Water Supply Services

INDICATORS	2004 or 2005	2014 or 2015	Goals for 2025
Staff/1,000 connections	10	15	19
Production capacity (m3/day)	10,000	32,678	50,000
Water quality	WHO & Sudanese Standards (SSMO) Guidelines	WHO & Sudanese Standards (SSMO) Guidelines	WHO & Sudanese Standards (SSMO) Guidelines
Coverage area	20 %	62 %	95 %
Supply duration (hr/day)	10	18	24
Supply pressure	6 bar	10 bars	15 bars
Number of connections	12,000	45,000	80,000
NRW	-	40%	20%
Collection ratio	29%	60%	90%
Staff number	120	700	1500

8

2. Success Story of your Water Supply Services

attached video show about 5 minutes and 30 sec showing the success story of water supply in period 2013-2017 •

9

Recent Challenges to Improvement of Water Supply Services

- Capital income less than operation and maintenance cost .
- Weakness of water tariff rate
- Lack of water policy
- Weakness of Capacity building
- High turbidity of surface water
- High cost of chemicals used in treatment
- limited ground water basin
- High rate of non – revenue water



Pipe net leakage



Fittings leakage



Blockage of water pipelines with trees roots

11



Blockage of water pipelines with trees roots

Water Supply Administration
For Better Management of Water Supply Services
Course (A)

TANZANIA

THE UNITED REPUBLIC OF TANZANIA

REVOLUTIONARY GOVERNMENT OF ZANZIBAR

A COUNTRY REPORT ON

WATER SUPPLY ADMINISTRATION FOR BETTER MANAGEMENT OF WATER SUPPLY SERVICES

PRESENTED BY

ACTING COMMERCIAL DIRECTOR

ZANZIBAR WATER AUTHORITY (ZAWA)

MINISTRY OF LAND, WATER, ENERGY AND ENVIRONMENT

ZANZIBAR - TANZANIA

1



2

ZANZIBAR



ZANZIBAR ⇒ UNGUJA & PEMBA +
ABOUT 50 SMALLER ISLETS

CAPITAL: ZANZIBAR TOWN

AREA : 2,580 km²
UNGUJA : 1,660 km²
PEMBA : 980 km²

POPULATION (2012): 1,303,569
UNGUJA : 896,721
PEMBA : 406,848,
URBAN POPULATION: 20 – 25%

LOCATION : 5 – 6°S OF EQUATOR
40 km EAST COAST OF AFRICA

3

ECONOMY AND CLIMATE

• ECONOMY

- Agriculture (clove as main cash crop) contributes about 75% of Foreign Exchange)
- Other minor economic activities:-
 - Tourism
 - Carpentry
 - Petty business,
 - Small-scale industries.

• CLIMATE

- Zanzibar experiences a tropical climate with:-
 - Heavy rains during March /June (called Masika)
 - Hot east monsoon winds during December/February (Kaskazi).
 - Cool weather during June/August (Kusi).
 - Short rains during September / October (Vuli).
- TEMPERATURE : max 39° c, average 25° c
- ANNUAL RAINFALL: UNGUJA: 1,857mm – 1,625mm Pemba : 1,912mm – 1,531mm

4

ABOUT ZANZIBAR WATER AUTHORITY

- It is a semi-autonomous water utility established in 2006
- Historically, it was a Central Government Department.
- It is responsible for clean and safe water supply services in both Urban and rural areas of Zanzibar.
- The main source of water supply is the ground water with about 311 boreholes out of which, 160 found in Unguja and 151 in Pemba. There are however, some springs and caves produce water for domestic purposes.
- The total production of the operation boreholes are estimated 163, 038, 281 liters/d with the existing transmission **mains** convey pumped water from the boreholes to either the storage tanks or direct to the distribution system. The GIS database provides 56km of transmission mains made of AC – DICI-PE-PVC pipes from 100 to 600mm

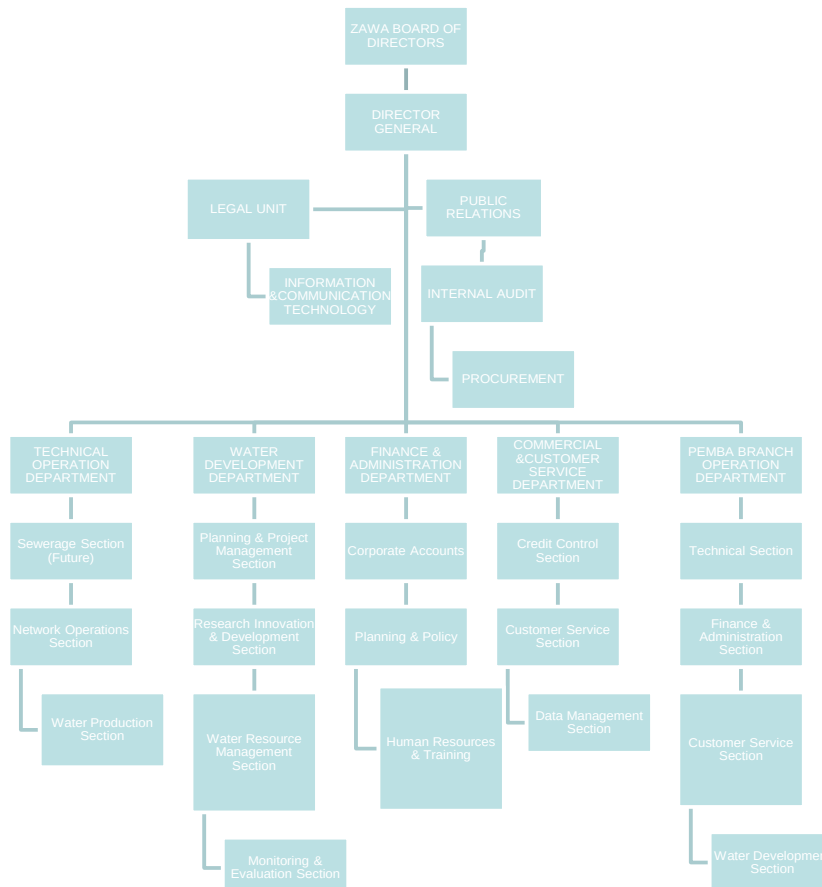
5

THE ORGANIZATION CHART OF ZAWA

- Zanzibar Water Authority falls under the Ministry of Land, Water, Energy and Environment.
- The Director General is the Chief Executive Officer who is appointed by the President of Zanzibar and is in charge of all Jurisdictional responsibilities in both Unguja and Pemba Islands. He is an ex-Officio member of the Board of Directors and responsible to the Chairman of Board of Directors who is also appointed by the President and the three members appointed by the Minister responsible.
- The DG is assisted by five directors who form top management of ZAWA, the Technical Operation Director, Commercial & Customer Service Director, Finance & Administration Director, Water Development Director and Pemba Branch Office Director (see the organizational structure below).

6

ZAWA ORGANIZATIONAL STRUCTURE



7

REDUCTION OF NON-REVENUE WATER

- The percentage of water lost due to leakage is around 30%
- **Leakages**
 - Leakage which is caused by frequent break down of pipes in distribution system is the leading part of unaccounted water in Zanzibar.
 - The major causes of leakages are old age systems, corrosion, vandalism and quality of pipe and fitting materials. They altogether contribute to about 20% of unaccounted water
- **Leakage repair**

It comprises many processes including:-

- Collecting and documenting of the complains from the customers through main customer complaints. (see the table below).

A table showing Collecting and documenting of complains from the customers

No	Name	Date	Place	Phone Number	comments
1	Muarabu A. Hamad	8/1/2016	Michenzani Block/10	0777 489097	They complain to have taken many days since they sent their application
2	Daudi M. Daudi	11/1/2016	Malindi Brunch	0777437219	They complain not to have received water for six months
3	Khamis M. Machano	11/1/2016	Magogoni	0777475648	They complain for a pipe breakdown near their habitations

- Survey work which comprises the network staff surveying the area to determine the nature of the problem like size, material and types of fittings required for that particular repair.
- Repairing the leakage where, the network people now repair the leakage so as to improve the service to the people

A Picture showing some ZAWA staffs doing leakage repair



- **Illegal Use of Water**

- it has become a scenario since the introduction of water fees especially in irrigation and other business activities.
- The Zanzibar Water Authority suffers from legal shortcomings caused by over politicization of water sector, weak managerial authority, resulting into inadequate, poor sustainability of the water distribution to other customers and in many cases poor water quality due to unauthorized connection. Illegal use of water contributes to about 8% of all unaccounted for water in Zanzibar.

- **Measures Against Illegal Use of Water:**

- Increasing daily patrol for the networks.
- Reducing conflicts during registration of new customers.
- Promoting house connection group.
- Reducing registration fees.
- Supplying more water to users.
- Improving the penalty for persons found guilty of illegal connection.
- **Metering System:** There are two systems of metering used;
- Bulk systems installed in large consumers (see the diagram below).

11



12

- Individual systems installed in small consumers



10

MANAGEMENT OF WATER QUALITY

It can be looked into two perspectives. The first is from sources of water while the second is to the ending for user.

Starting with from sources of water, it is important to know that the main sources of water in Zanzibar are Boreholes (see the diagram).

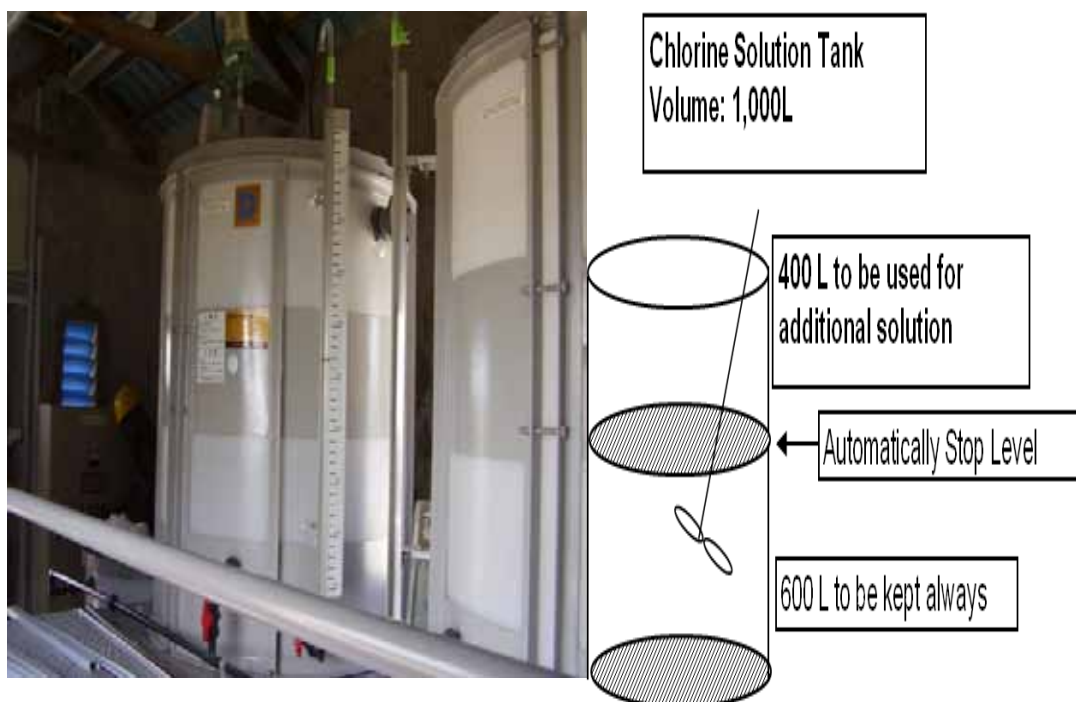


Several initiatives are taken to ensure the quality and safety of water, including:-

- Chlorination/disinfection of water from water sources, it is conducted at the main water station at Saateni or in some other small plants (see the diagram).



- The bacteriological tests are done monthly. Although in some part of the islands, water is directly pumped to the distribution system, but the practice is greatly discouraged as it is now insisted that any built up scheme shall include the construction of a distribution tank (see the diagram).



- Location of Well at a reasonable Distance from the Ocean and residential houses. Wells in Zanzibar are located at a reasonable distance from the ocean beaches. In this respect, the salt water in the aquifer can be held far enough from the seaward by the remaining fresh water flow so that the well can always yield fresh water.
 - Control of Pumping hours to Prevent Seawater Intrusion. The pumping time is controlled (i.e. less than average recharge) in order to maintain the interface between salt water and fresh water at a safe distance from the seaward to the well site in order to prevent seawater intrusion.
 - Well Field Management. Wells are being managed right from exploration before construction of water facilities, i.e. perform geophysical survey test drilling, test pumping, draw accurate map of test holes, and record fluctuation of groundwater levels.
- On the side of the end user, some surveys are conducted to see the amount of residual chlorine.

17

WATER QUALITY

a) Raw water (from Mtoni and Mwanyanya springs)

Turbidity: 0.02 – 0.03 NTU

Color: Colorless

pH: 7.1 average (Neutral)

b) Tap water (Treated water)

Turbidity: 0.02 NTU

Color: Colorless

pH: 7.1 average (Neutral)

Iron: 0.02 mg/l Fe (kaburi Kikombe 2-5mg/l)

Manganese: Negligible

v Hardness: 70mg/l CaCO_3 Moderate hard

Nitrogen Nitrate: 0.2 – 0.5 mg/l NO_3

18

WATER SUPPLY SERVICE STANDARDS

- **Water coverage**

According to the vision 2020, access to water should reach 100%. In 2005 it should be 95% for urban and 60 % for rural. For Pemba should be at least 50 %. It is good to mention that the water coverage reached to those stout goals by the ZPRP.

- **Urban water supply**

The present urban water supply comprises of four urban water supply schemes: The Zanzibar town in Unguja, Wete, ChakeChake and Mkoani towns in Pemba under the assistance of Finland through FINNIDA. These schemes serve about 300,000 inhabitants. Despite all improvements assisted by FINNIDA since 1991 as well as the efforts from the Government, the condition of the schemes and service standard are still unsatisfactory. There are distribution interruptions mainly due to old and worn infrastructure and poor maintenance. There is about 10% of urban population, which is yet to be served. The current supply for four towns from the operational sources is as shown in the table below .

19

Number	Description	Zanzibar town	Wete	Chake	Mkoani
1	Source				
	Borehole	77	13	8	7
	Springs	2	1	2	0
	Local wells	1	0	0	0
	Water production m ³ /day	66,298,584	12,929	11,200	11,948

20

- **Rural Water Supply**

The Government of Zanzibar has implemented the Zanzibar Rural Water Supply Project with the assistance funds from ADB and Abu Dhabi Fund for Development. The actual implementation covered a population of more than 250,000 people since they are operational during the year 2000. The old schemes established before the preparation of the Master Plan for the rural areas continue to serve more than 60,000 inhabitants in their respective areas.

- **Service Ratio**

If we compare the total population with the served population, the service ratio is about 62%. Though the service ratio is high in terms of Coverage, demand/supply ration is a major setback towards the total satisfaction of those favorable consumers.

This situation has instigated a number of households to install booster pumps and indoor water storage and provided a flourishing business for water boozers.

21

- **Service Hours**

Since the water distribution system are in both, gravity flow and pumping system, the service hours is 24 hours a day, 7 days a week.

- **Water Supply Capacity**

Practically, the current water sources have capacity of producing 99,080m³/day. But this production is not fully realized due to various interactions which include lower capacity pumps, pump breakdown, power failures etc. Water supply network expansion based on capacity has always led to the intermittent supply in some areas covered by piped water supply schemes.

- **Average Water Supply Volume**

The average water supply production is about 75,106m³/day for both Unguja and Pemba Islands. The average supply volume that is estimated to reach the consumers is 228, 716, 430 litres/day.

22

MANAGEMENT OF WATER SUPPLY SERVICE ON SELF SUPPORTING BASES

- Clean and safe water supply service delivery is entrusted to ZAWA alone in Zanzibar as per the Water Act of 2006. However there are a lot of other private providers of the service including the politicians, NGOs, SBOs, and other institutions. The role of ZAWA is also to set the Standards, regulate and ask such private providers to follow the standards.

- **Major recent achievements in improvement of water supply**

There is an improvement of water supply service delivery in Zanzibar.

The main reasons behind it being the various water projects supported by The UN and other partners including:-

UNDP, UNICEF, IRAN, USA WORLD BANK, Red Cross, JICA, and Alyouseif Charitable Society.

23

More specifically, the JICA funded projects including The Zanzibar Water Supply Improvement Projects which had two phases. In this project, a total of four (4) water tanks have been constructed which are Welezo Water Tanks (2), with the storage capacity of 8,000,000 liters, Kijichi Water Tank with the storage capacity of 2,000,000 liters, Kinuni Water Tank with the storage capacity of 2,000,000litres

- JICA Makadara Pilot Area project, this project aims at capacity building to ZAWA staff so as to apply the same knowledge and expertise to the remaining area of the Islands. Soon after the project completion, it expected to replace the old pumps with the new ones.

24

EXPECTATIONS FOR THE JAPANESE PRIVATE COMPANIES AND TOWARD THE PROGRAM

With ongoing cooperation between Japan and Tanzania specifically Zanzibar, coupled with various projects. The Japanese private companies have a good chance to apply for expertise in such projects. Again, they have a good chance of increasing production of the plumbing materials in their companies and sell to Zanzibar because most of our network is outdated/aged and need replacement.

Toward the program, the trainee will increase the capacity regarding issues of water through various lectures, visits and discussions with water practitioners from various countries. By transferring the expertise back to Zanzibar, the country will also benefit by having more effective and efficient management of water supply services.

25

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.

Japan International Corporation of Welfare Services (JICWELS)

Toranomon YHK Bldg. 4F, 2-3-20, Toranomon

Minato-ku, Tokyo 105-0001 JAPAN

Phone: +81-(0)3-6206-1137

Fax: +81-(0)3-6206-1164

<http://www.jicwels.or.jp>

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。



〒105-0001

東京都港区虎ノ門 2-3-20 虎ノ門YHKビル 4階
電話 03-6206-1137（事業部） Fax 03-6206-1164

<http://www.jicwels.or.jp>