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

Country Reports

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

Sudan

Country Report Training and Dialogue Program Water Supply Administration for Better Management of Water Supply Services

Country: Sudan

Organization: Public Water Corporation





Oranization chart: Attached

History of Public Water Corporation
There had been two organizations in Sudan deal with water issue, the National Urban water corporation and rural water corporation, they had been dealt with planning, design, construction, operation, maintenance, monitoring and evaluation and managing all water systems in Urban and Rural areas.

In1994 and due to Decentralization policy in the country

the situation was changed and each the state became responsible for operation, maintenance and managing the water systems at urban and rural areas and the National Water Corporation was created to be responsible for planning, design, construction

monitoring and evaluation of water projects at the whole country level beside its role in National

supplies monitoring of water quality and capacity building of water staff.

Water planning: In order to fulfill overall objectives of Water resources planning and management, and enhance the development and implementation of effective national water policies and strategies for integrated water resources management (IWRM), the Sudan National Water Policy was developed in 2003 This brings together aspects of water resources

management, utilization, and protection in the context of a single policy and covers sectors including agriculture

, industry, health, energy and transportation. To increase its effectiveness, the water policy should pay more attention to pricing and fuller participation by stakeholders. Relevant concepts that could have been better considered and incorporated include: water as an economic good, adoption of an analytical framework, institutional and regulatory systems, incentives, water conserving, poverty alleviation, participatory approaches, environmental protection and capacity building.

In 2005 and due to peace agreement National Water Corporation became responsible

only for the Northern states and its name was changed to Public Water Corporation (P W C) and part of National development budget transferred to the states to be responsible for their projects'undersupervision of Ministry of Irrigation and water Resources .

In 2011 and due to referendum the separation happen

, the Sudan became two Country, Sudan Government and South Sudan; the Public Water Corporation became responsible of states in Sudan government.



My official position is the contract and monitoring manager

I'm one of the numbers of engineers' supervision reporting to director of project execution department, we responsible for supervision and monitoring of water projects that financed by the National budget or foreign aids and loans.

Water Corporation Works ServicePublic s

Planning, design and construction supervision of all water projects that financed in National level.

Role of consultancy to all state in all water issues.

Capacity building of the staff working at water sector in the states, the agreement signed with JICA.

Do monitoring and evaluation of water quality for all water points in the country.

Supplying the states water corporation with all chemicals, materials and equipment.

Water supply services standard

Public Water Corporation had developed 14 technical guide line and manual for water supply and sanitation facilities which include all the technical activities. This manual has to be update from each two up to four years.

Recently there is a workshop to update this manual in Nyala (South Darfur) in 2012.

All companies or partners work on the sector have to comply with this guide lines and they get the final approval from their final design from public water corporation.

Water rate they prepared by state water corporation (S. W.C) to minster approved by states ministers council and the final approval state assembly council legislation.

personnel employment:

State government control the personnel employment.

Operation and maintenance (O*M) budgeting cover from revenue collection and some time cover from the state budget .

Capital investment comes from federal government



The current privatization

The private sector not involve in the operation and maintenance(O¥M) management of water system expect where they contract in boot system.

All of the system state owned company.

They get their water from private well and rain.

They store water from the public water supply in to ground reservoir and they pump it to the rest of the building.

Very limited sewerage system only exist on part of the two town Capital (Khartoum and Khartoum north) covering only 10% of the population of the capital .



The sewerage system operates and manages by public company in the state under The minister of the state water.

There is a plan for construction of sewerage system in all big town in the states and other part of the capital. There is private company for collecting and disposal of solid waste. There is no sorting of the disposal In future plan to sort the solid and recycle them for use

Finance depend on two ways Capital investment and operation &maintenance

Tariff, water purification, distribution, pipe material or type equipment, human resource and water quality control.

Capital investment is very high ,state cannot afford it ,so they depend on the federal government had the priorities in budget year.

Operation and maintenance (o¥m) cost covered by the revenue collection

the revenue collection is weak for most causes not reach 70% from the total bill .

The water tariff approved by state assembly council which Is very weak not to covering all the cost .

Water purification

High turbidity during the rainy season for surface water resource, so many input are use in purification example Pac, Pam, aluminum sulphate and all of them imported from outside the country.



High cost of power to run the purification process.

From time to time need to replace the fi

From time to time need to replace the filter media

Pipe material or type of equipment most of them imported from outside country with low cost but it is not good enough to work for along time so it need to be replace several times .

Transport cost from the sea port to capital and the states.

The Process Flow Diagram Blue NileRiver Intake Pump Station Rough Settler Rapid mixing and Distribution shaft Chemical House Clarifiers **Filters** Chlorine Treated Water Reservoir & Backwashing House Water Tanks High Lift Pump House & Backwashing Pump house **Booster Pump Station** AldaliDistribution Plant Gafarat <u>Town</u> Aldali Distribution Network



Aldali water supply system was

implemented in the year 2011 to supply water to

Aldali area which lies at 67km away from

the Blue river Nile

The population of that area is 21000

The system consist of

- ➤ Water treatment plant , the capacity is 20000 m3 per day
- > Transmissions pipe line, 67 km
- ► Boaster station at 47 km away from WTP
- ➤ Distribution plant
- ➤ Water distribution net work





The users can obtain the water in two ways

1 - The public taps

The number of this public taps is 45
The price of water in this taps is .5 US \$
per m3

2- In the future me be use the private taps

Technical problems in the water system

The high turbidity during the flood season and that requires

1- using bigger dosing of PAC

2- Increasing the daily maintenance time

Expectation for the Japanese private companies

Water quality management strategy, monitoring system and safety plane.

- -Strategies to reduce NRW
- Management of water supply system in Japan

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

Rwanda





RWANDA COUNTRY REPORT

Water Supply Administration for Better Management of Water Supply Services

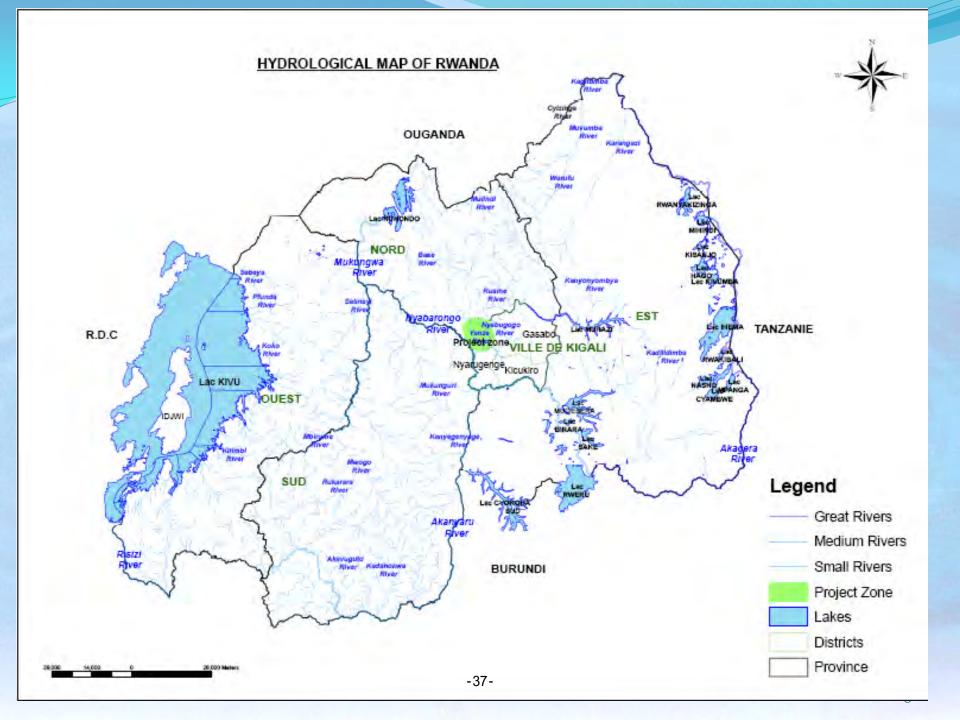
Quick Country Overview

Bordering Countries:

Uganda (North), DRC (West), Burundi (South) and Tanzania (East)

- Surface Area: 26,338 Sq km
- Location: Central and East Africa
- Land: 20,599Sq km
- Water: 1,390 Sq km
- **Forest:** 4,350 Sq Km
- The relief is mountainous
- **Population:** 11,000,000 (density ~ 380inh/sqkm)
- Urban Pop is about 14%
- Resources: Human (Services) and Tourism (3 parks)





My Job

Water Network Management (Felicien):

Electromechanical Engineer trained in water supply engineering

My main attributions are:

- · Planning and execution of water network extension;
- Planning and execution of water network reinforcement
- · Preparation of hydraulic materials to order;
- Water store situation monitoring.
- Making report.

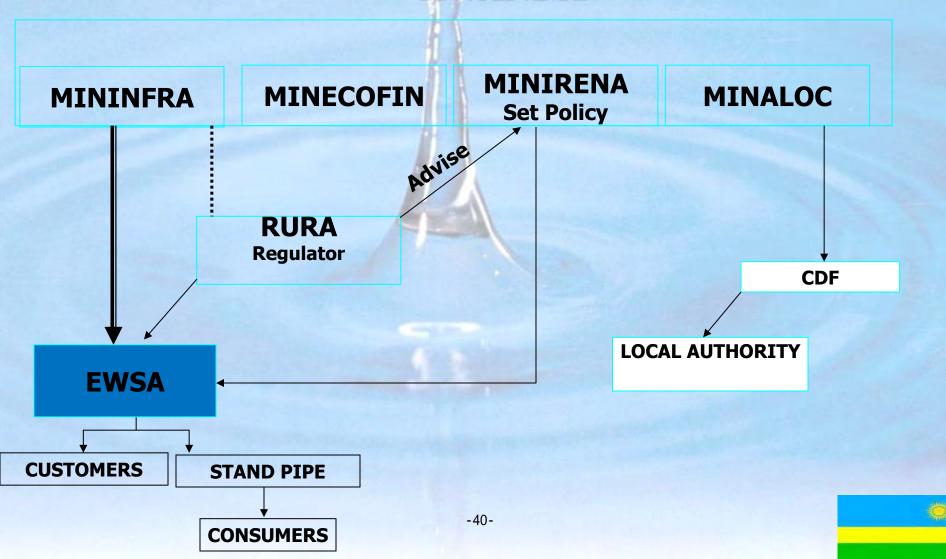


1. ORGANIZATIONAL PROFILE EWSA

Energy Water and Sanitation Authority

- EWSA is a national utility which is mandate to produce and distribute safe water.
- It has a mission of creating conditions for the provision of sufficient, safe, reliable, efficient, cost-effective and environmentally appropriate water and sanitation service to households and to all economic sectors on sustainable basis

WATER SUPPLY AND SANITATION CHART IN RWANDA



2. FLOW CHART FROM INTAKE TO TAP

The value chain for delivering the water services comprises four stages:

- water harvesting and storage (tapping water sources and storing water in reservoirs and other similar structures);
- water treatment (dealing with water quality and safety);
- Water distribution (providing a network to supply water to end customers); and
- Customer interface (connections, customer metering, billing, bill collection, and customer services).



3. GENERAL SITUATION OF WATER RESOURCES IN RWANDA

- In General, RWANDA has a rich hydrological network, where water is in abundance comparatively to its area country;
- This Water as exploitable resource come from rivers, lakes and water Springs; but actually only 12,22% of available quantity is exploited.
- The pluviometry varies between 800 and 2000 mm per year that is to say 1400mm of average.
- As regards the National safe water distribution achieve on average 75%, that is to say 74% in rural area and 76% in all urban centers of Rwanda.

My Job

Water Production, Distribution and Quality Monitoring Officer (Philbert):

The mains attributions were:

- To conduct audit and inspection to the water service provision;
- To monitor the quality of service rendered to customers;
- □ To draft regulatory tools in water supply sector.



4. WATER POLICY AND REGULATION

4.1. RWANDA UTILITIES REGULATORY AGENCY (RURA)

- RURA is a Regulatory Authority created by Law N° 39/2001 of 13/09/2001 for Regulating Certain Public Utilities (Telecommunication services, Transport, Energy and Water and Sanitation.
- Created as a result of privatization to provide security of services and to work in transparency in regards to service delivery;
- The law provides (art 5) a mandate to RURA to enforce compliance with the sector laws, advise the government on issues related to Water, complaints handling & disputes resolution, to approve utility rates (Tariffs), etc.
- RURA carries out independent audit and inspection to water utilities which result in suggestions, recommendations and enforcements.

4.1. LEGAL AND REGULATORY FRAMEWORK

The legal & regulatory framework currently in use:

- ☐ The National Water Supply and Sanitation Policy updated with strategies inclusive (1997, 2004 & 2010),
- □ Law N° 62/2008 of 10/09/2008 putting in place the use, conservation, protection and management of water resources regulations (Water law),
- ☐ Drinking water Standards (RBS & WHO),
- Different guidelines developed by RURA { Guidelines on Required minimum service level for water service provision (pressure, Reliability of supply, access to supply, qlty, water meter & billing & complaints handling)}

5. WATER RATES AND BILL COLLECTION SYSTEM

- •The EWSA 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 EWSA bank accounts indicated on their bills or at any nearest branch by indicating both the bill number and the amount.
- •All EWSA bills for water supply, meter rent, repair works and any other services are payable before the deadline indicated on the bill





The cost per m3 is set according to the consumption as indicated below:

Monthly Consumption

At Public Water Kiosk

Between 0 and 5 m³

Between 6 and 20m3

Between 21 and 50m3

Between 51 and 100m3

Above 101 m3

Industries

Tariff Excluding VAT (18%)

Rwf 240 (0.41\$) / Unit

Rwf 240 (0.41\$) /Unit

Rwf 300 (0.51\$) / Unit

Rwf 400 (0.68\$) / Unit

Rwf 650 (1.12\$) / Unit

Rwf 740 (0.41\$) / Unit

Rwf 593 (1.02\$) / Unit

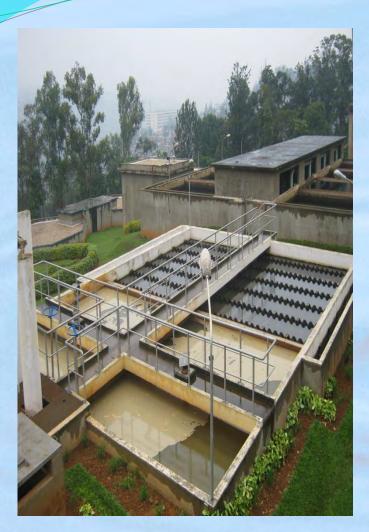


6. WATER QUALITY MANAGEMENT

- The water supplied by EWSA 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.
- •After these steps have been taken and it is ascertained that the water is safe, it is then distributed.
- •External inspectors (RURA & RBS) come to check the quality of water produced and distributed.
- •The quality of service are ensured.



KIMISAGARA WATER TREATMENT PLANT







7. WATER SUPPLY SERVICES

- EWSA treats and distributes clean water Countrywide to supply water to all populations especially those in urban habitats.
- •2 millions residents of 15 urban areas including Kigali City are the population targeted for clean water services
- •EWSA manages 16 treatment plants which provides clean water (m³ 48,808 per day) through 4,647,565 m of pipes to reach Its 95,442 water supply connections which supply various categories of users (Households, Industries, Publics services, ...)
- •RURA audit and inspect the quality of service rendered to customers

8. PRIVATE SECTOR PARTICIPATION IN RURAL WATER SERVICE IN RWANDA

- ✓ Currently 847 water systems (December 2010)
- ✓ With the current policy, rural water systems belong to districts and the policy is to delegate them to private operators.
- ✓ Only **215** under contracts with private managers (48: Cooperatives, Companies, individual & Regies) with **6%** increment recorded for 2010,
- ✓ 62 water supply systems managed without management contracts by institutions such as religious, schools, hospitals, etc.
- ✓ Management contracts duration ranges between 2 to 15 years,
- ✓ Two main companies: AQUAVIRUNGA & FH- PROCOM

9. CHALLENGES WITHIN THE WATER SECTOR

Lack of qualified human resources (technical and operational management), ☐ Shortage of enough funds to develop the sector ☐ Private sector involvement very limited at present ☐ Lack of a strong legal and regulatory framework, ☐ Water quality control remains an ultimate challenge in rural areas, ☐ Most private operators in rural areas are still not yet fully professional, ☐ Frequent leakages on small diameter pipes which has consequences from finances resources to environment wastage and people's life. ☐ The isolation of operators' locations and rural stakeholders working places constitutes a problem to regulation and monitoring operators' performance (Transport, fees, No connection, etc). ☐ Water tariffs in rural areas tend to be relatively high, in particular

where pumping is involved,



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Guyana



Water Supply Administration for Better Management of Water Supply Services

Country Report
GUYANA

Country profile



Guyana - Surrounded by Atlantic Ocean -North, Venezuela - South, Suriname - East. Brazil - West.

: 215,000 km² Area

Population: 750,000

Coverage Water Supply: 98%

Guyana is located in the North East shoulder of the South America

Background on Guyana Water Inc.

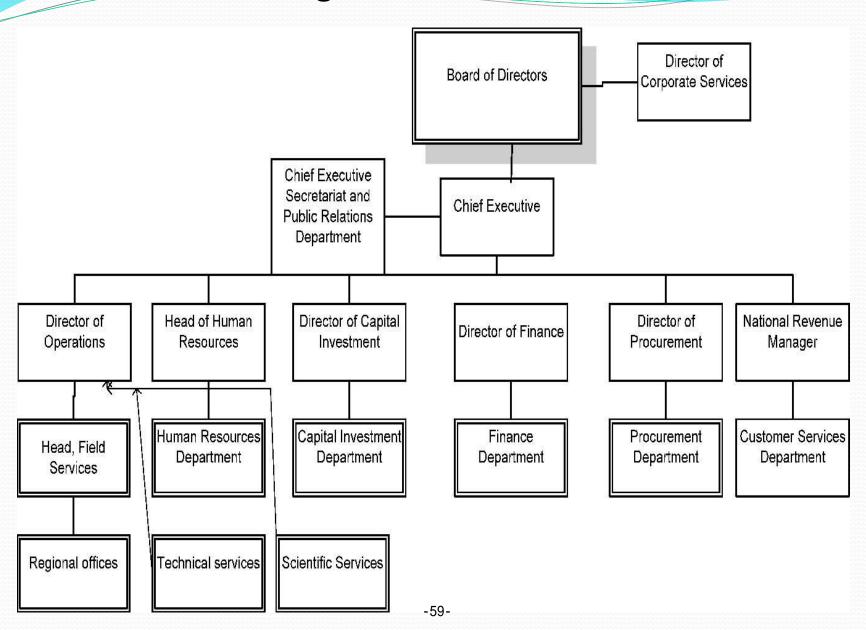
- GWI was formed in 2002 with the merger of 2 (two) entities:
 - Georgetown Sewerage and Water Commissioners -
 - statutory body with responsibility for water and sanitation services in Georgetown
 - Guyana Water Authority -
 - statutory body with responsibility for water services in the coastal regions and Hinterland areas
- Company is owned by the Government of Guyana
- Has an operating license to provide potable water to the residents of Guyana
- Reports to the Honourable Minister of Housing & Water Mr. Mohamed Irfaan Ali

Current Situation

Customer Count – 176,748

			Baseline -	2012		
	Metered		UnMetered		Total	
	Treated	Un- Treated	Treated	UnTreated	Treated	Un Treated
Domestic	42,875	12,807	34,996	74,367	77,871	87,174
Commercial	7,238	1,082	1,082	2,300	8,320	3,382
	50,113	13,889	36,078	76,667	86,191	90,556

Organizational Chart



GWI Mission Statement

 "To deliver safe, adequate and affordable water and to ensure safe sewerage systems for improved public health and sustainable economic development."

Management of water quality

Current situation significant amount of water supplied is high in iron content and distribution systems are old

Quality is monitored monthly from one central laboratory

Major Problems treatment facilities are not meeting WHO standards

Constant delays in shipment of chemicals

Understaffed laboratory

Current actions

Increased monitoring of quality

Additional suppliers for chemicals

2. Reduction of non-revenue water

Current Situation
Non Revenue Water as at December 2011 – 65%
Production 131m m3 - Billings 47.16m m3 (NRW= 83.84m m3)

36% metered customers

Major Problems

Poor collections efficiency

Leaks/Wastage

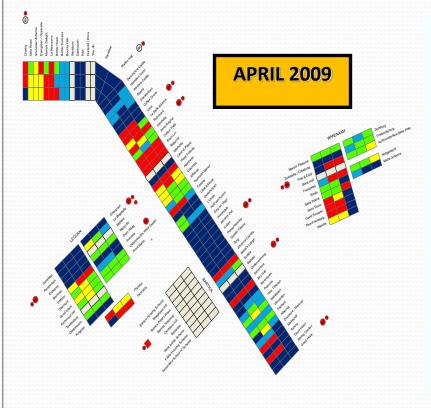
Old tariff structure

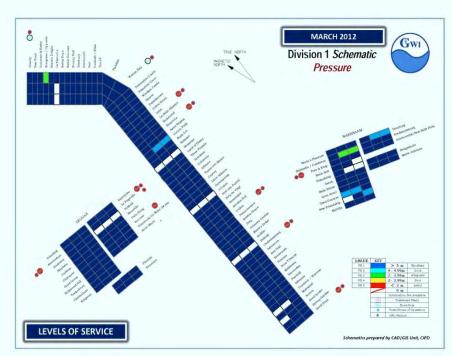
Current Actions

District Metered Areas / Increase metered coverage in treated areas

Review of Tariff Structure

Water supply service standards Level of service map – Division 1





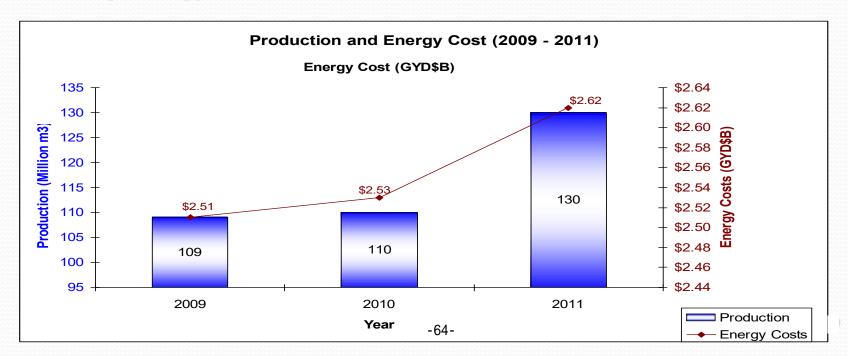
Management of water supply service on a selfsupporting basis

Current Situation

High operating cost Subsidized operations Company operating at a loss

Major problems

Increasing energy costs



Current situation cont'd

GWI Operating Performance						
	2009	2010	2011			
Operating Loss for the Year Before Subvention	(2,504,575,283)	(3,134,017,380)	(3,318,448,290)			
Government Subvention	1,900,116,101	1,943,168,994	1,081,623,591			
Operating Loss	(604,459,182)	(1,190,848,386)	(2,236,824,699)			
	(604,459,182)	(1,190,848,386)	(2,236,824,699)			

Current Actions

Upgrading of electrical panels

Power factor connections

upgrading electrical and pumping units for efficiency

Major recent achievement in improvement of water supply services/management

2009	INDICATORS	2011
2.9	Staff/1,000 connections	3.1
298,000	Production capacity m3/d	359,000
WHO Guidelines	Water quality	WHO Guidelines
93%	Coverage area	97%
10-12hrs/d	Supply duration	10-12hrs/d
25psi	Supply pressure	25 psi
168,781	Number of connections	176,748
53%	NRW	65%
46%	Collection ratio	78%
500	Staff number	589

Major recent achievement in improvement of water supply services/management

- Expansion of Coverage
- Additional Treatment Plants
- Distribution upgrades
- Additional wells
- Improved quality
- Increased collections

6. Expectation for the Japanese private companies & Water Supply Utilities

- Technical Assistance
- Assistance in constructing treatment facilities

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

Morocco





Kingdom of Morocco:

Country located: North Africa

Area : 710,850 km²

Population: 34 million Habitants

The climate:

Mediterranean in the North & in mountains (West of Atlas)

Coverage Water Supply:

- Urban Rate of connexion (93%)
- Rural Rate of connexion (91%)





Water ressources

Morocco is a Mediterranean country which has a rich and diverse natural environment. Its climate is semi arid and water resources are totally generated from endogenous precipitation

advantage: no sharing of water resources with other countries

140 Billions m3

121 Billion m3 lost by evapotranspiration

22 Billion m3Usable water ressources



13 Billion m3
Water resources mobilized

18 Billion m3

surface resources

4 Billion m3 groundwater resources

9 Billion m3 surface resources

4 Billion m3 groundwater resources

Unconventional water resources



Desalination, wastewater reuse for irrigation

11,5 Billion m3Agriculture

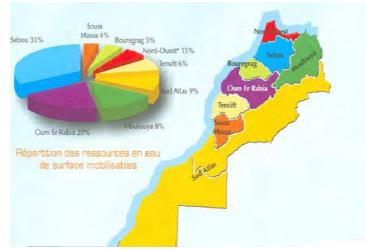
1,5 Billion m3Drinking water



Water ressources

Water resource potential is:

- ✓ Heavily used
- ✓ Badly distributed
- ✓ Variability in space and time
- ✓ Limited
- ✓ Threatened pollution, siltation of dams



Morocco has 130 large dams and 100 small dams located throughout the country. The biggest one is Al Wahda which was described by (LOICZ) as the second most important dam in Africa.





National Office of Drinking Water (ONEP)

- Public company
- Founded in 1972
- Civil status
- Financial autonomy
- No subvention since 1993

Mission of ONEP:

- 1. Planning for water supply throughout Morocco
- 2. Production of drinking water
- 3. Distribution of drinking water for the benefit of local collectivity
- 4. Sanitation management for the benefit of local collectivity



National Office of Drinking Water (ONEP)

- ❖ <u>ONEP</u> is a supplier of water that produces 91% of the country's drinking water and sells most of the Regis and private concessionaires.
- ❖ ONEP also distributes water directly to customers in about 595 medium to small towns (with 1.5 million customers).
- ❖ ONEP has also taken over sanitation services in more than 79 of the towns where it distributes drinking water by 2009, and it is expected to take over sanitation services in a total of 191 towns by 2017.
- ❖ ONEP also control same company of supply water in Africa in cooperation south-south (cameronaise deseaux) and take technical help like conception supply system and training for staff of same partner in Africa.



The production of ONEP is about 901 Million m3:











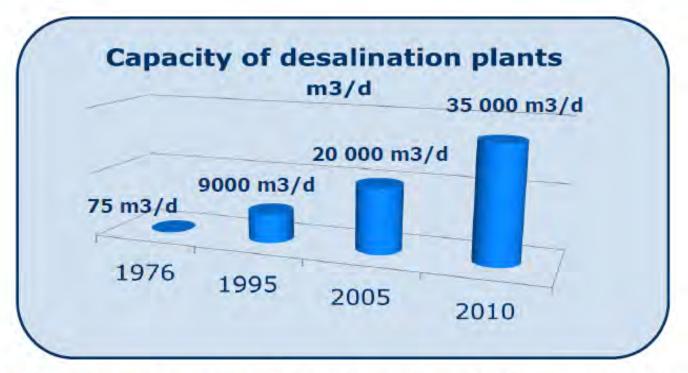








Capacity of desalination plants



ONEP is in the process of carrying out a desalination plant to serve water the city of Agadir and its region, it is dimensioned for a flow of 100,000 m³/d (first phase).

Other projects are in the stage of feasibility study such as the development of desalination or demineralization plant combined to renewable energy.

-77-



Financial indicators

→ Annual investment : MAD 4 017 M ≈ US\$ 502 M (2010)

→ Annual turnove: MAD 3 645 M ≈ US\$ 455 M (2010)

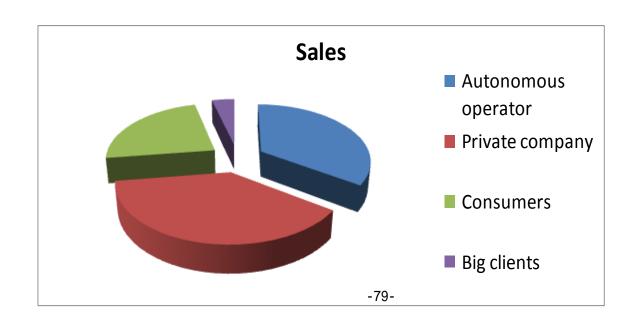
Number of staff : 7 650

→ Value-added : MAD 2 497 M ≈ US\$ 312 M (2010)



ONEP's Sales

Designation	Sales in million m3		
	2009	2010	
Private company	285,4	292,1	
Autonomous Operators	253,6	265,6	
Authers	192,5	208,7	
TOTAL	732	766	

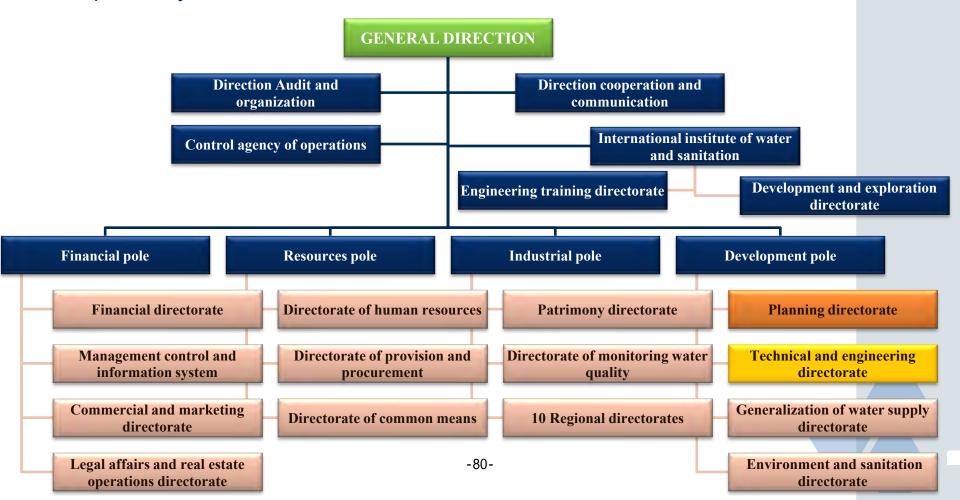






Organizational structure of ONEP

- Central Directorate based in Rabat.
- Regional directorate covering the whole country to ensure the proximity of the service.





Management of water quality in ONEP





Water supply service standards

The quality monitoring of produced water are distributed according to the laws and regulations relating to quality of water intended for human consumption:

- ☐ Moroccan law 10/95 on the water,
- □ Order No.1277-01 (2002) laying down quality standards for water used for drinking water production,
- ☐ The standard Moroccan No. 03.7.001 on water quality for human consumption nears 2006,
- ☐ Moroccan standard No. 03.7.002 on control and monitoring networks of public water supply.
- ☐ The regulations governing the quality of drinking water (used by ONEP), largely inspired by the Guidelines of the World Health Organization (WHO) and EU directives for the quality of drinking water.



Water supply service standards/Performance Indicateur

PERFORMANCE TARGETS:

- ➤ Day-to-day continuity of the water supply;
- ➤ An adequate and high-quality water supply system;
- ➤ Effective treatment and transportation of water
- ➤ Continuity of water supply in the long term.

Main indicator of drinking water quality: (Moroccan standards)

- microbiological 10 /100 ml
- pH 6.5 8.5
- Iron 0.3mg/L
- color 5 HU
- turbidity 1 NTU (0,3 NTU)
- Manganese 0.1 mg/L
- Aluminum 0.2 mg/L



Management of water quality in ONEP

ONEP provides routine surveillance of the quality of water resources, water produced and distributed through a network of laboratory:



1 central Lab 64 lab for drinking water 22 lab for STEP

The following table shows changes of the volume of analyzes performed by the laboratory network for the periods 2009-2010:

Analysis types (UAB)	2009	2010
Bacteriological	1 242 138	1 951 785
Physicochemical	399 057	575 655
Monitoring	41 463	39 649
Pollution check	59 824	57 019
Pesticides	15 808	18 397
Trihalomethanes	19 250	21 975



Management of water quality in ONEP

Among the carried out actions:

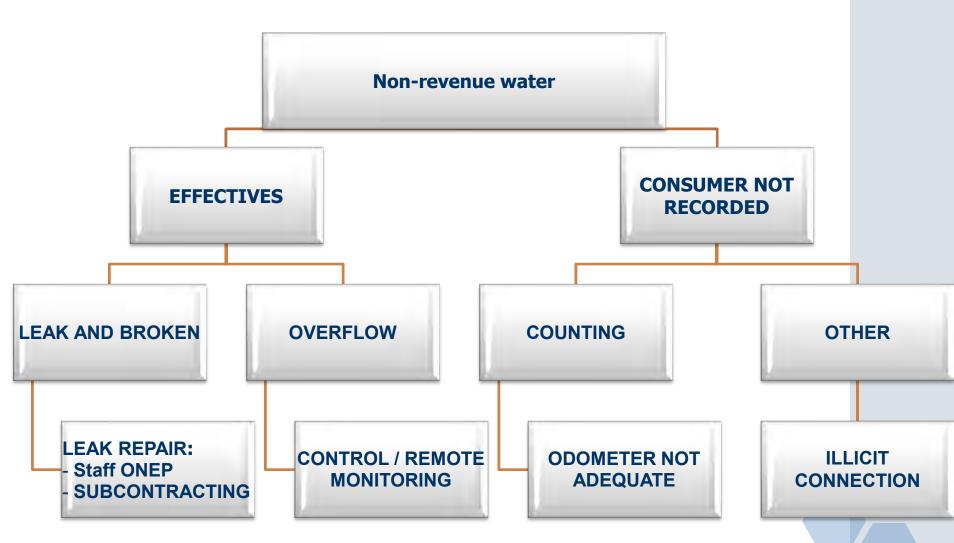
- Investigation of potential pollution at the water source
- Evaluation of pollution hazards in water supply system
- Intervention in case of o pollution hazard
- Eutrophisation control...
- Diagnostics and follow up wastewater purification plants performances

Among R&D activities:

- Monitoring and protecting water resources and drinking water supply against pollution
- Improving the water quality and developing new systems for drinking water treatment
- Experiences on simple techniques for the purification and water reuse that can be adapted to the Moroccan environment
- Development of specific treatment and evaluation of new technology



Reduction of non-revenue water





INDICATORS MEASURES

		YEARS					
	1999	2000	2001	2002	2003	2004	Average
Number of operations performed	121	131	133	99	97	113	116
Linear system inspected Km	3158	3434	3718	2998	2323	3044	2605
Leakage flow recovered m3 /h	1616	1312	1474	1376	1066	1228	1345
Volume recovered per year m3	14.156.160	11.493.120	12.912.240	12.053.760	9.338.160	10.757.280	11.782.200



Management of water supply service on a self-supporting basis

ONEP has developed during the last twenty years innovative solutions In the partnership with the communes:

- Sub delegation to private Moroccan local companies,
- Outsourcing to micro enterprises
- Stand-posts guards for the rural areas water supply

In water supply sustainability:

- National tariff's solidarity system
- Stamps system for the administration payments
- Social connections
- -Participation of the population for the projects realization, maintenance and financing.





Major recent achievement in improvement of water supply service / management:

Example of an action plan for one Division (DTI/S) of management technique and engineering

Division			Cost in	Planning of realization		
	City	Project	Million €	Progress	begin	Compl
Laayoune AKHFENIR DAKHLA Tan Tan Tamanar Division Marrakech	Laayoune	Strengthening of the drining water from the desalination of sea water at a flow 150 I / s and doubling of the driving	26	Work in progress	jan-07	Dec-11
	AKHFENIR	Desalination of sea water for a flow 10 l / s	40	Work in progress	jul-08	may-11
	DAKHLA	Processing station for the demineralization a flow of 200 l / s	25	Work in progress	sept-11	jun-13
	Tan Tan	Strengthening of drinking water for Tana Tan with desalination unit for a flow of 100 l / s	21	Work in progress	may-11	nov-12
	Tamanar	Supply water drinking of 35 I / s from the barrage Igouzoulen	5.2	work completed	jul-06	mar-11
	Marrakech	Extension of the treatment plant for a flow 1000l/s	23	Work in progress	dec-09	mar-12
	Marrakech	Supply water drinking of 1400 l/s from the barrage lalla Takerkoust	140	Work in progress	jul-11	dec-12
_	Kelaat Sraghna	Supply water drinking of 150 l/s Kelaat Sraghna	80	Work in progress	Feb-11	jun-11
	Benguerir-Skhour R'hamna	Supply water drinking of 200 I / s from the barrage El Massira	36	Work in progress	nov-08	may-11
		Cost Global Projects	2 82			

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

Bosnia-Herzegovina

Country Report



Name of the Organization: Public Enterprise "Vodovod i kanalizacija" Ltd, Zenica Bosnia and Herzegovin

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General Information of Bosnia and Herzegovina

- Bosnia and Herzegovina is a beautiful country located in Southeastern Europe
- Size: 51,129 km², population: 4 million
- Its capital and largest city is <u>Sarajevo</u>
- Beautiful country with beautiful breathtaking landscapes, a lot of water potential, many beautiful rivers, lakes, 20 kilometers of coastline on the Adriatic Sea, beautiful mountains, forests...







Moderate-continental climate with average temperature of 10°C and with dry hot summers and cold rainy and snowy winters

1. Management of water quality

1-1. Current situation and major challenges/problems

Public Enterprise "Vodovod i kanalizacija" Ltd, Zenica is the entity responsible for safe, reliable and effective water supply system for about 80,000 citizens, average consumption of drinking water of about 300 l/s

- The raw water for the City of Zenica is collected from three springs and one river intake:
 - "Kruscica" Spring about 290 l/s for Zenica
 - "Babina Rijeka" River Water Intake about 10 l/s
 - "Strmesnjak" Spring less then 10 l/s
 - "Klopce" Spring less then 1 l/s
- Major problems: human activity, negligence and lack of conscience as well as lack of National Authorities actions and adequate penalties
- Major risks: deforestation that causes high turbidity of "Kruscica" spring; uncontrolled and illegal discharge of the wastewater in the "Babina Rijeka" river from nearby villages and heavy silt load drawn by river water during wet seasons
- Major challenge: to provide enough quantities of safe drinking water

1-2. Current actions against the problems and any achievement

- Public Enterprise "Vodovod i kanalizacija" Ltd, Zenica is fighting with all legal means to prevent forest cutting and illegal disposal of waste waters around water source areas writing claims to the Ministry of Agriculture, Forestry and Water Management against individuals and companies that are responsible for such actions - no progress so far
- Municipality of Zenica, the "Vodovod i kanalizacija" and some other municipalities (Vitez, Novi Travnik, Busovaca) are now doing much effort to implement regional water project "Plava voda" - supposed to be realized within the next few years
- The "Vodovod i kanalizacija" is trying to rationalize water consumption and reduce pipe breakdown and water leakage - by repairing and replacing existing decrepit water supply network water losses reduced from more than 50% to 33% of the produced water in the last four years, average quantity of the water drawn from the sources reduced from 420 l/s to 300 l/s

1-3. Monitoring System / Plan of Safety of Supplied Drinking Water

- Every day 10 water samples from different points of water supply network are put to test in order to determine their physical, chemical and microbiological parameters should be inside limits defined by Regulations on Drinking Water Health Care (Official Gazette BiH 40/10)
- The "Vodovod i kanalizacija" has its own laboratory located on Crkvice water treatment plant
- Results of the analysis are sent to the Public Health Institution of the Zenica Doboj Canton and Sanitary Inspection
- Actions or plans of safety of supplied drinking water are determined and defined by law (Water Law Official Gazette FBiH 70/06), Regulations on Drinking Water Health Care (Official Gazette BiH 40/10) and decrees and regulations issued by Municipality, Zenica-Doboj Canton and Federation of BiH
- By laws and decrees mentioned above water protection zones are defined and also measures and actions that are and are not allowed within these zones and also penalites for those who are not acting according to regulations
- Other actions: constant monitoring of relevant object such as reservoires, water sources, river water intake, 24-hours-a-day crew located at objects: Kruscica water source, reservoir Zmajevac II, Kasapovici river water intake, Crkvice water treatment plant, for constant monitoring of the water production processes

1-4. Implementation of Water Safety Plans or similar efforts

Implementation of actions mentioned is mandatory

Thanks to efforts of the "Vodovod i kanalizacija" there has been no reports of diseases caused by contaminated drinking water supply and also no severe water

contamination situations so far

 Measures and actions for protection of water protection zones are not well applied despite laws, decrees and penalties

The City of Zenica, its citizens are unfortunately losing two main historical water sources because of human negligence and lack of conscience as well as lack of National Authorities actions and adequate penalties

Safe, effective and reliable drinking water supply is one of the most basic human needs and of crucial importance for every town, its development and existence

2. Reduction of non-revenue water

2-1. Current situation and major challenges/problems

- Non-revenue water is water that is "lost" in water supply system through leakages (real physical loss), unbilled authorized consumption and through illegal connection or metering inaccuracies (apparent loss)
- Problem is the existing water network is more than 30 years old and has many older elements and pipes - repairing and replacing these old pipes and elements requires great financial resources
- The "Vodovod i kanalizacija" files a lawsuit against illegal consumers legal system is slow and not efficent enough in solving these lawsuits



2-2. Current actions against the problems

For reduction of real losses water supply system of the City of Zenica is partitioned

into 16 zones with constant metering of water consumption

The "Vodovod i kanalizacija" is doing much effort and invests great financial resources to repair and replace old pipes and elements, fittings etc

 Unbilled authorized consumption is actually metered, although not billed

- Illegal connections:
 - Are being traced
 - Employees are financially
 stimulated to report any illegal connection and illegal consumer they discover
 - The "Vodovod i kanalizacija" files a lawsuit against such illegal consumers and does much effort in cutting-off such illegal connections from water supply system
- Rule: pipelines, manholes for water meter placement and other elements should be strictly located on the public ground because of the easier-access, maintenance and control

2-3. Any achievment

- By partition of the City of Zenica into zones bigger pipe breakdowns have been discovered and repaired
- Losses in the last four years have been reduced from more than 50% to 33% of the produced water (32,2% in year 2011), average quantity od water drawn from the sources has been reduced from 420 l/s to 300 l/s
- The "Vodovod i kanalizacija" needs to reduce more of these losses
- For further reduction of real losses, this enterprise needs greater fundings for dividing the City of Zenica into more zones in order to determine parts of water network with "insidious" leakages so that they could be repaired and replaced



3. Water supply service standards

3-1. Current situation and major challenges/problems

- Water supply services are regulated by Municipal Decree on Water Supply and Sewerage System (Official Gazette of Municipality of Zenica 5/11), Law on Utility Services, then internal Decrees, Regulations and Procedures of the Public Enterprise "Vodovod i kanalizacija" Ltd, Zenica
- Decrees, Regulations and Procedures are mostly based on the experience of the "Vodovod i kanalizacija" and they represent a compromise of what is in interest of the enterprise and of what is in the costumers interest
- In those regulations, procedures and decrees tariffs for various services are determined and defined
- Usually costumers are unsatisfied with prices of services although they are affordable, and they often complain and argue about them
- Also by these regulations, procedures and decrees location of the manhole for the water meter placement is determined (on the public ground because of the easier access to the water meter and control of the consumer itself)
- Costumers usually argue about water meter location, manholes dimensions, distance from their objects etc

3-2. Current actions against the problems

The "Vodovod i kanalizacija" is giving much effort to provide quality water supply service: safe and reliable 24 hours supply and water quality

Trying to:

- keep fair and transparent relations with costumer, to make agreements and compromises with costumers, to settle, to give a costumer possibility for payment arragements, to insure efficent and fast solving of the complaints, requests
- the "Vodovod i kanalizacija" has signed a contract with some banks so that the costumers pay no provision for the bill payment
- provide for its customers all kind of technical and other support in various issues in order to keep good image of enterprise etc
- be at service 24 hours a day and for this purpose it has special on-call service crew

3-3. Any monitoring by Performance Indicators (PI)

- The "Vodovod i kanalizacija" has no precisely defined and determined performance measurements of service quality
- Best indicator is the increased number of customers who are regularly paying their bills for water consumption and also reduced number of oral and writing complaints, and increased number of satsified costumers

4. Management of water supply service on self-supporting basis

4-1. Current situation and major challenge/problems

- Water tariff for metered consumption is still considered as a social measure in response to high rate of unemployement in the city (therefore very affordable and non commercial rate)
- The "Vodovod i kanalizacija" management can suggest water tariff but the founder of this enterprise, Municipality, has to aprove it
- Policy: "Water-social good" still prevails
- For years no legal actions against delinquent customers have been taken customers are used not to pay their bills for water consumption
- Legal system is slow and not efficent enough in solving the lawsuits against delinquent consumers
- Disconnecting delinquent customers from water supply system is often not so easy

 a lot of water meters, manholes, pipelines are located inside private properties
 where they can't be easily and constantly controlled (especially delinquent consumers who live in apartment blocks)

4-2. Current actions against the problems

- Filing a lawsuit is raising awareness of the consumers to pay their bills in order to avoid complications and paying penalty interest
- Marketing campaignes such as comparision of price of 1 m3 of bottled water and 1 m3 of water from the water supply network (ratio: 1000:1)
- The "Vodovod i kanalizacija" is trying through investements in water supply network improvement to show consumers that paying bills for water consumption will eventually result in a safer, more efficent and more reliable water supply service
- The "Vodovod i kanalizacija" is sponsoring many community activities: sport activities, donations etc, in order to create better and fair relations with the consumers
- Due to these actions taken by management of the enterprise, the "Vodovod i kanalizacija" is providing quality water supply service on self-supporting basis



5. Major achievement in improvement of water supply services/management

- The City of Zenica was few years ago known for its water supply reductions (22 hours a day during dry seasons)
- Due to effective management the "Vodovod i kanalizacija" now provides safe, effective and reliable 24 hours a day water supply thruoghout the entire service area
- Due to its constant repair, replacement and improvement, water supply network has been renewed, losses have been reduced to 33% of produced water
- Number of consumers with their own water meter has been increased and also their awareness of the importance of water consumption rationalization
- Due to the legal actions this enterprise has taken regularly number of consumers that are paying their bills for consumed water has been notably increased



6. Expectation for the Japanese private companies

- The "Vodovod i kanalizacija" would appreciate any effort from Japanese companies in solving problems mentioned in this report
- > This enterprise is especially interested in purposing solutions for:
 - reduction of high turbidity of the "Kruscica" spring (measures, actions, techniques, technologies);
 - reconstruction of the "Babina Rijeka" river water intake in order to capture the water even in cases of heavy silt load drawn by river during wet seasons (measures, actions, techniques, technologies);
 - actions and measures in case of incident that may cause water contamination;
 - reduction of non-revenue water, especially of smaller "insidious" leakages (measures, actions, techniques, technologies);
 - actions against delinquent consumers (actions, regulations);
 - water supply service practice (rules, regulations, administrative procedures).

Thank You very much for Your coorporation!

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

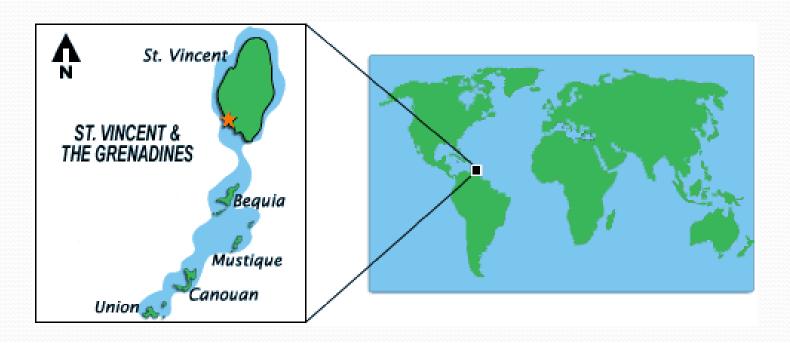
Saint Vincent and The Grenadines

Water Supply Administration for Better Management of Water Supply Services (A)

Saint Vincent and The Grenadines

General Country Profile: Background

• St. Vincent & The Grenadines is an archipelago of 32 islands and cays located in the Windward Islands at the lower end of the Caribbean chain at latitude 13° 15N, 61°12W.



General Country Profile: Background

- St Vincent, the main island, is entirely volcanic in origin and has a mountainous terrain that's extends from north to south. The average yearly temperature is 27° C (83°F) and the rainy season is from June to December. The annual rainfall varies from 1700mm in the south and south west to 5000 mm in the mountainous centre of the island.
- Most of the islands population on mainland St.
 Vincent receives treated piped water from streams and springs. The water, following treatment, is gravity fed to supply systems on a continuous basis.

General Country Profile: Background

St. Vincent and the Grenadines

Area: 388 sq. km.

Population: 103,869 (July 2011 est.)

Coverage Water Supply: 90%

Main land St. Vincent:

Area: 344 sq. km.

Population served: 95,560.

Number of metered customers: 38,878.

MISSION

- Mission of my organization is to consistently provide all customers with the highest quality water supply, sewerage and solid waste management services in an efficient and affordable manner.
- My mission in the organization is to manage and coordinate the maintenance repairs and expansion of the system to meet the goals of our organization.

1. Management of Water Quality

1.1 Current situation

Supply Systems

- Fancy
- Owia
- Perseverance
- Jennings
- Montreal
- Majorca

- Mamoon
- Dalaway
- Stream 24
- Layou
- Hermitage
- The monitoring of water quality is done at separate points of the treatment and distribution systems once per week or twice in major systems.
- The parameters that are tested include: Turbidity, PH, Residual Chlorine.
- Based on the results of these tests further parameters are analyzed.

1. Management of Water Quality

1.1 Major Challenges/problems

- Lack of full treatment, in some cases there is simply collection and disinfection
- Denudation in watershed from natural and anthropogenic factors resulting in high turbidity in surface stream intakes.
- Inefficiency of drip feed Chlorinator systems.
- Limitations of our Supervisory Control and Data Acquisition, SCADA, system.
- Reduction of water quality due to old pipelines with internal corrosion.

1. Management of Water Quality

- 1.2 Current actions against the problems and any achievement
 - Issues relating to both the lack of full treatment and high turbidity levels are counteracted by constant monitoring at the source.
 - The inefficiency of the drip feed chlorinator is addressed by giving the relevant capacity building courses to treatment plant operators to detect and to some extent tackle issues relating to same.
 - Thus far we have had favorable results as it pertains to our quality consistency levels.
- 1.3 Monitoring System/ Plan of safety
- Systematic monitoring of quality indicators at all sources and specific points in the distribution systems

2. Reduction of non-revenue water

2.1Current situation and major challenges/ problems

- There is approximately 40% of non-revenue water which is derived mainly from leakages and metering errors.
 - ✓ Causes of leakages include: Ground movement, pipe corrosion mainly due to ground conditions, High system pressure, pipe age and poor quality workmanship.
 - ✓ Metering errors are incurred by: wear overtime, chemical build up/ water quality impact, adverse effects of high system pressure and corrosion.
- One of our major challenge includes leakages of distribution mains within the capital city indicated by evidence that the level of consumption seldom vary even though almost all economic activity comes to a halt at nights.

2. Reduction of non-revenue water

2.2 Current actions against problems

 Leak detection and meter testing are at the forefront of our efforts, which also include pipeline upgrades and replacement.

2.3 Achievements

 There has been a reasonable decrease in nonrevenue water, however a lot more has to be done to carry this figure closer to what's deemed acceptable.

3. Water Supply Service Standards

3.1 Current situation and major Challenges/ Problems

- Water supply service standards have always been at the forefront of our operations as we have always strived to attain the highest quality.
- Our service is continuous 24 hr per day and there are Operations and Maintenance teams on standby to tackle issues whenever they arise.
- Our major issues arise during periods of continuous rainfall when the turbidity levels rise at our surface stream intakes or in periods of drought when the flow rates of our rivers reduce.

3. Water Supply Service Standards

3.2 Current actions against the problems

• In cases when turbidity levels rise, the intake and treatment plant is shut down and water the then supplied from the available storage tanks.

3.3 Monitoring by performance indicators

 This is done annually in the form of Performance Management Systems evaluations.

4. Management of water supply service on a self-supporting basis

4.1 Current situation and major challenges/ problems

- Over the last 42 years, CWSA has successfully managed and developed the water sector in St. Vincent and the Grenadines.
- The major problem is that there is only rudimentary water supply systems based mainly on rain water harvesting in the Grenadines where 8.6% of the population resides and there are no surface streams.

4.2 <u>Current actions against the problems</u>

 The implementation of a SPACC project on Bequia to provide Desalinated water.

5. Major recent achievement in improvement of water supply services/ management (part 1)

<u> </u>		
1995	INDICATORS	2011
8.7	Staff/ 1000 connections	5.8
20,000	Production capacity m³/d	26,000
WHO Guidelines	Water Quality	WHO Guidelines
65%	Coverage area	98%*
24hr/d	Supply duration	24hr/d
variable	Supply pressure	variable
17,259	Number of connections	38,878
60%	NRW	40%
75%	Collection ratio	95 %
150	staff number	225
* On mainland St. Vincent where we op		

⁻¹²⁰⁻

6. Expectations for the Japanese private companies & Water Supply Utilities

- Technical support as it relates to remote monitoring programs.
- Innovative materials of greater life span that can function in our high pressure systems.
- Technology as it regards to leak detection.
- GIS support so that we can effectively map and route pipelines.
- Filtration technology that will efficiently reduce turbidity.
- Storage solutions that will increase storage capacity on the mountainous terrains of SVG.
- Solutions to the water supply issues of the Grenadines, e.g. Desalination and water reuse technology...

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

Macedonia

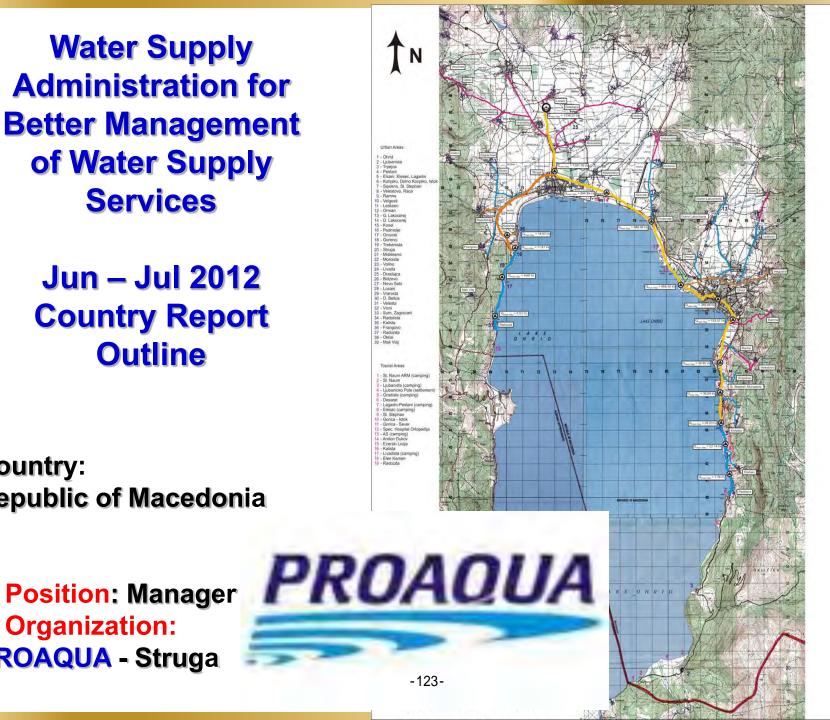
Water Supply Administration for Better Management of Water Supply **Services**

Jun – Jul 2012 Country Report Outline

Country: Republic of Macedonia

Organization:

PROAQUA - Struga



REPUBLIC OF MACEDONIA

with a land area of 25,333 km², the Republic of Macedonia is a country in Southewestern Europe with geographic coordinates 41° 50′N 22° 00′E

Macedonia is mountainous territory covered with deep basins and valleys; the country is bisected by the Vardar River. It is a landlocked country

but has three natural lakes: Ohrid Lake, Prespa Lake and Dojran Lake.

Whole Country:

Area: 25.713 km²

Population: 2.053.000 Habitants

Coverage Water Supply: 89%

Selected Water Supply System/City: Struga PROAQUA

Service Area: 500 km²

Population Served: 120 thousand





Mission of my organization is:

- Collection, purification and distribution of drinking water;
 Drainage and discharge of storm water;
 Removal of sewage collection system and their treatment
- To manage and coordinate activities related to the activity of the enterprise, to establish working strategies, procedures, activities and operational plans, lated to physical, financial and commercial purposes.
- My actual job to achieve the mission is the maintenance and development of the enterprise and its basic functions. Efficient and proper management of sanitary drinking water, managing water and sewerage its maintenance (functional and construction) and its expansion.

Management of water quality

The Law on Waters (Official Gazette) provides a legal basis for water protection and management in the Republic of Macedonia.

It regulates the manager of water resources use and exploitation, protection against harmful effects of water, protection of water against exhaustive water extraction and pollution, water resources management, sources for and manger of financing water management activities, concessions, transboundary water resources, and other issues of relevance with regard to the provision of a unique water use regime.

The Water Law provides three types of water management planning and development documents:



National Strategy
for Waters
Water Master
Plan and
River basin
management
plans

Reduction of non-revenue water

- In many urban areas the current condition of the water supply systems is not satisfying regarding the distribution network, main convey pipelines, water storage tanks, structures and other facilities. The network is mostly worn out, rather old, the capacity of the pipelines is not meeting the growing demands and is constructed of very different materials: cost iron, asbestos concrete, PVC, concrete etc.
- The final result is very high water losses, which are estimated 10-60% of the total consumed water. Additionally, domestic water supply systems are also in a bad condition, which also increase the water losses. This shortage of drinking water especially in the summer period leads to restriction of the water supply for few hours in a day.
- Regarding the rural water supply systems, there are no data on their condition, or efficient system for their operation, maintenance and financing. According the experience, once they are put in operation, there is no regular monitoring, so only necessary remedies are performed when they are needed.





Water supply service standards **Performance Indicators**

Total population that water supply is approximately 50 000.

Water is provided from

- sources at Gravity
- sources with pumping.

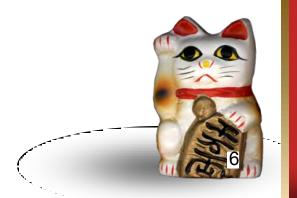


For leveling the unbalanced water supply system of Struga built tanks with a total volume of 6600m3.

Department of water each month continually ongoing maintenance of water supply and associated hydro network with timely and quality repairs of defects. Service water treatment continuous control of the health safety of drinking water. For samples sent in RIHP-Skopje analyzes according to the Rules for health safety and water safety of drinking water

Large chemical analysis to determine the presence of toxins and difficulties metal

- Analysis of the presence of pesticides
 Analysis of the presence of radioactive elements
 Basic bacteriological and chemical analyzes
 Analysis of the presence of residual chlorine



Management of water supply service on a self-supporting basis

In the Republic of Macedonia, the public enterprises (actually public water companies) are responsible and for water supply and collection and treatment of wastewater

In most households, water is not metered and the charges are set as flat annual or monthly rates. This does not encourage the user to save water and usually in this case the consumption is higher than originally calculated.



Average cost revenue collecting rate is about 55%. Such low cost revenue collecting rates provoke problems in the operation and maintenance of the water supply systems by the public utilities.

Major recent achievement in improvement of water supply services / management

1990	INDICATORS	2011
22	Staff/1,000 connections	4.3
65,000	Production capacity m3/d	500,000
None	Water quality	Good
20%	Coverage area	90%
10hr/d	Supply duration	24hr/d
0.2 bar	Supply pressure	4.5 bars
26,881	Number of connections	50 000
72%	N.R.W.	6.2%
48%	Collection ratio	99.9%
42	Staff number	230
	-130-	

Major recent achievement in improvement of water supply management

Water services are all services that provides capture, abstraction, storage, treatment and distribution of surface or groundwater, or collection and purification of waste waters into surface waters.



According to the Census 2002, the number of dwellings (houses) connected to public water supply system is 86 per cent of all dwellings. The percentage of connections to public water supply systems in the municipalitiesurban areas is much higher than the average and higher comparing to rural areas. It varies from 82 % Ohrid and Struga

Regarding the rural areas the percentage of the connected dwellings to the public water supply systems is very different and varies from 10 per cent up to 100 per cent.

In average about 70 per cent of the population is connected to public water supply, while the remaining 30 per cent has mainly local facilities in urban areas.

Expectation from the training program

Regarding the current condition of the drinking water supply, there are several problems:

- high water losses and very low water use efficiency;
- water quality problems;
- inefficient operation and maintenance of the systems in rural areas;
- low cost revenues collecting rates of the public utilities;
- regular monitoring of the water quality and quantity in water supply systems;
- database on national level for all issues related to drinking water supply

Those problems can be discussed with the JICA & Water Supply Utilities, about their experience is solving such problems.

Thank YOU!



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

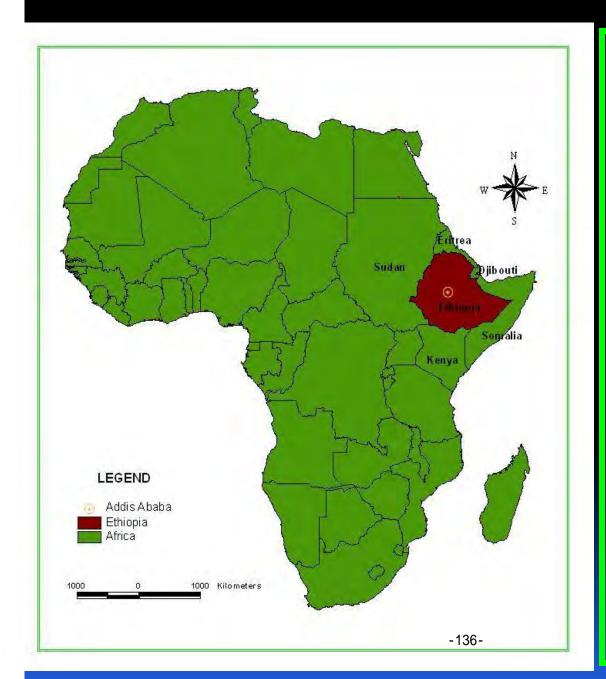
Ethiopia

WATER SUPPLY ADMINISTRATION FOR BETTER MANAGEMENT OF WATER SUPPLY SURVICES(A)

COUNTRY REPORT OUTLINE

From Addis Abeba Water Supply & Sewerage Authority

Addis Abeba (ETHIOPIA)



LOCATION: in the HORN of AFRICA.

CAPITAL: Addis Ababa.

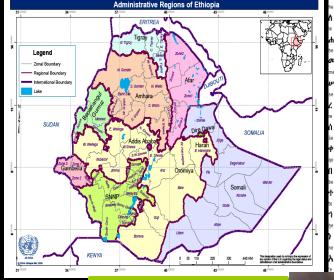
AREA: 1,132,328 Km².

POPULATION: more than 70 million.

CURRENCY: Birr.

ECONOMY: Agriculture (Coffee, Oil seeds, cotton, cattle, fish ...). Industry (Processed leather goods, textile ...).

Other facts

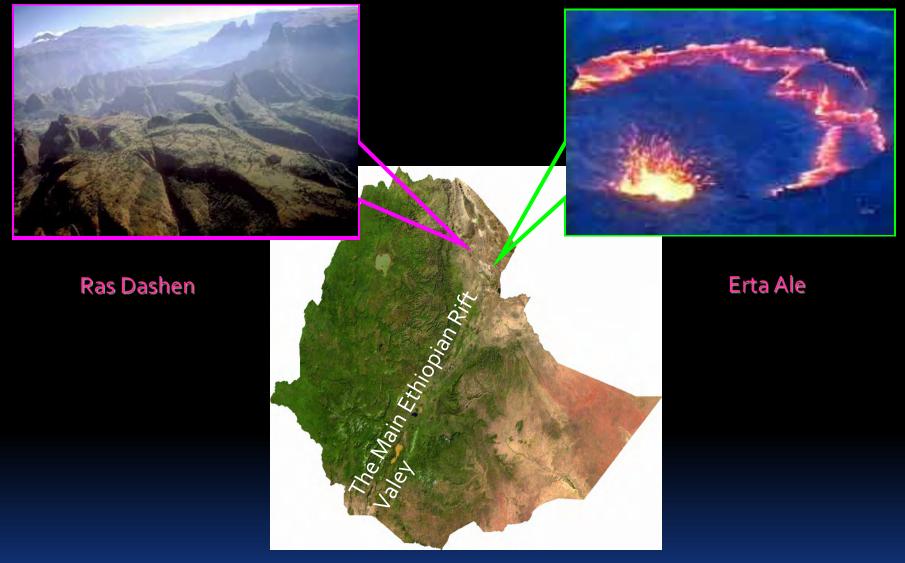


- Languages:
 - More than 70 languages.
 - Amharic is the official language
 - Has its own alphabets.
 - A place where coffee was discovered.
 - A mother of famous world athletes.





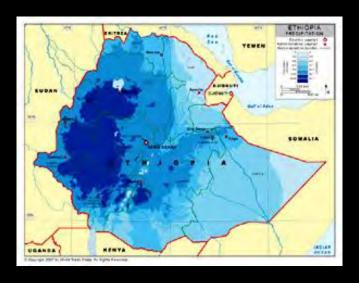
GEOMORPHOLOGY



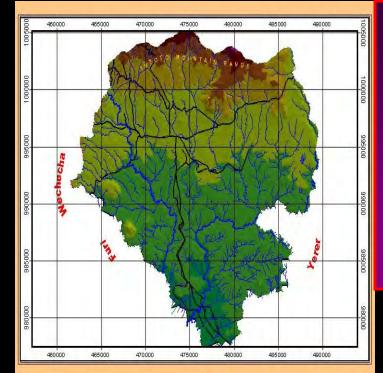
Altitude range: 110m below sea level to 4,620m above sea level.

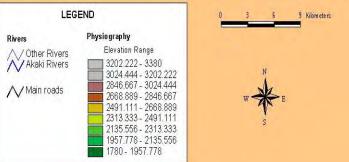
CLIMATE

- Ranges from hot low land to cool high land.
- Three major rain fall regimes:
 - SW & W Mono modal, March to October (Atlantic).
 - Central, E and NE Bi-modal, June to September + Feb – May Atlantic and Indian oceans respectively.
 - S and SE Bimodal, September to November + March to May, Indian ocean.
- SW Ethiopia gets the highest Mean annual rainfall, which is > 2,400mm.



THE CAPITAL



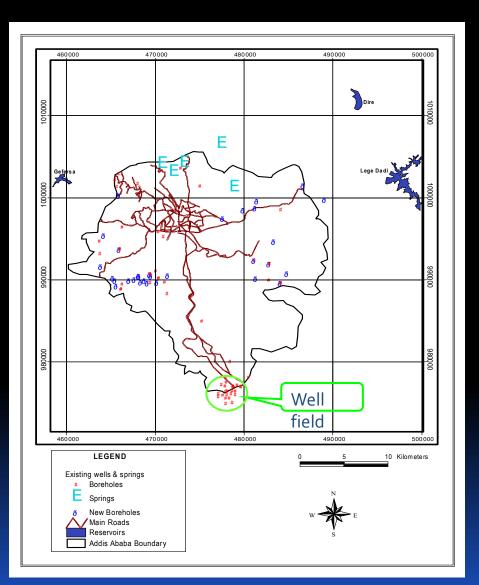


- Area : 518 Km².
- Divided in to 10 sub-cities.
- Population: >3 million.
- Two main rivers drain the area.



SPATIAL DISTRIBUTION OF WATER INFRASTRUCTURES

- Three reservoirs are located in the NE and NW directions.
- Groundwater sources:
 - A well field in the southern part.
 - Other wells in the Western and Eastern parts.
 - Few low yielding springs in the Northern part.

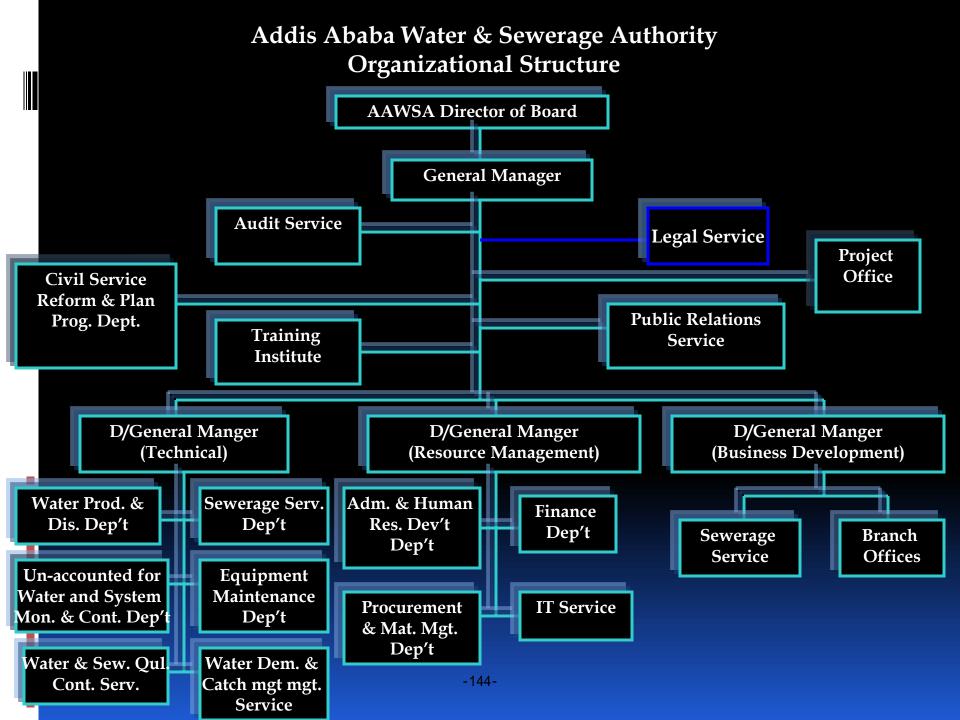


Addis Abeba Water S. & S.A

- Provide potable water supply & solid waste disposal service to the people of Addis Abeba
- My official position is surface water pr.c.m

Cont'd

- Generally
 - Northern portion is a recharge area, hence water is scarce.
 - Southern portion is a discharge area, good potential for ground water.
- Well field =(116 m³/day).
- Other wells and springs = (10,000 m³/day).
- Groundwater accounts for about <u>36%</u> of supply.
- Institution in charge: Addis Ababa Water & Sewerage Authority (AAWSA).
 - Water Production Dept. + Central Lab.
- Surface reservoirs =(105,000 m³/day).



Treatment Plant & Dam



The Well field



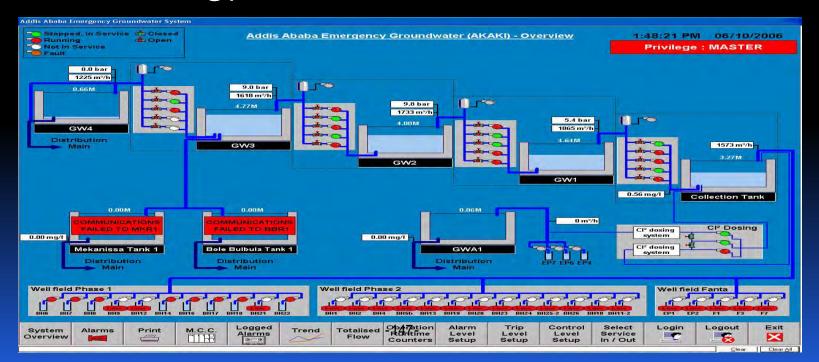
- The well field are in the southern part of the capital
- A total of <u>133wells</u>, serve Addis.
- Abstraction: <u>130</u>
 m³/d.

 Well Depth (m)
 SWL (m.b.g.l)
 Discharge (l/s)

 116 - 600
 20 - 72
 20 - 100

Cont'd

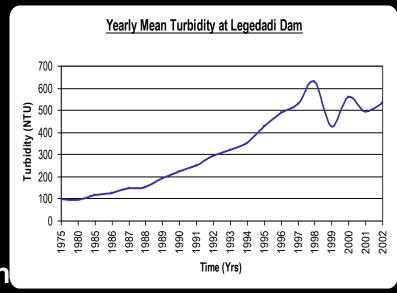
- Water from well field is boosted four times before it gets in to the distribution system.
- The whole System is monitored by System Control and Data Acquisition (SCADA) technology.



THE MANAGEMENT ASPECT

1. Surface water sources:

- Monitored for
 - Production.
 - Chemicals used.
 - Turbidity of raw water.
 - Water quality after treatm



- A general increasing trend is observed.
- Curve declines for the year 1998/1999 as a result of the commencement of Dire dam.

Cnt, d

- Measures taken:
 - Catchment management study conducted.
 - Recommendations demanded much money.
 - Afforestation around dams implemented.

The Water Rate system (Tarif) For Domestic use

	Monthly Consumption m ³	Cost in Birr	Cost in Dollar
Case 1	0 -7	14.35	
Case 2	0 -20	76.00	
Case 3	0 -40	152 .00	
Case 4	0 - 100	380.00	
Case 5	0 - 300	1140.00	
Case 6	0 - 500	1900.00	
Case 7	o - 6oo	2280.00	

Con,d Non Domestic

	Monthly Consumption in m ³	Cost in Birr	Cost in Dollar
Case 1	0 -7	12.25	
Case 2	0 -20	61.65	
Case 3	0 -40	156.65	
Case 4	0 -100	513.65	
Case 5	0- 300	2003.65	
Case 6	0 - 500	3863.65	

The bill collection

- The bill collection system The bill is collected at AAWSA bill collecting centre.
- There are 226 bill collecting center in Addis
- Abeba

Water quality Management

- Monitored by AAWSA
- The Regulatory body , Ministry of health also Counter checks every week

		Raw water	Finished water
	Turbidity -	200 – 1200 Ntu	0
	Color -	2050 – 790	7.5
	PH -	7.0 - 7.2	7.8
	PO ₄ mg/l -	0.4	0.1
	SO ₄ mg/l -	40 - 20	10
	Fe as F mg/l	0.65 – 0.4	0.01 - 0.2
	NO ₃ as N mg/l	0.8-0.1	0.4
	Alkalinity as CaCo ₃	75 – 55	40 – 60
•	Hardness	65 – 70	50 – 80
٠	Fluoride	0.4 – 0.3	0.2
-	Residual		1.2 – 0.6

Con, d

- The current monitoring system is by BSC team & Capacity Building Bureau
- The Laboratory situation –
- Personnel –
- Chemists 2
- Microbiologist 2
- Biologist -1
- Environmentalist—1
- Sociologist—1
- Technicians-3

Cont, d

 Some bore holes are found polluted & disinfected by chlorine

Current Situation of Water Supply service

- 98% of the population gets water from the water supply system
- 2 % is not getting from the system, rather from own source or

Spring.

73% of demand coverage.

Private sector Participation

 All the water works are controlled by the government. No intervention of private investors up to now

Reduction of Non Revenue Water

- 37 40 % of water produced daily is lost as non revenue water . 17% is commercial loss & the remaining 20 23 % is system loss.
- Action Replacement of old pipes & malfunctioning meters .
- Bill collection on time
- No significant achievement .

Water supply service Standards

- New water connection 4dys
- Maintenance 2dys
- Meter maintenance- 3 dys
- CURRENT SITUATION
- New connection 8hrs
- Maintenance 4 hrs
- Water meter maintenance- 8hrs

Cont, d

- Current action Implementation of BPR & BSC (Business process Restructure)
- Monitoring is done by BSC implementing team & capacity Building bureau.

Management of water supply service on a self supporting basis

- Recurrent budget (operation & maintenance) 100% covered by AAWSA
- Capital budget is subsidized
- Water Tariff is not on cost recovery basis.

Recent Achievement in improvement of water supply services

- Integrated Catchment Management plan is developed
- New ground sources are developed
- Expansion of existing water treatment plant
- NRW reduction studies are implemented

Expectation for the Japanese private companies

- -Water quality management strategy, monitoring system and safety plane.
- -Strategies to reduce NRW
- Management of water supply system in Japan

THANK YOU

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

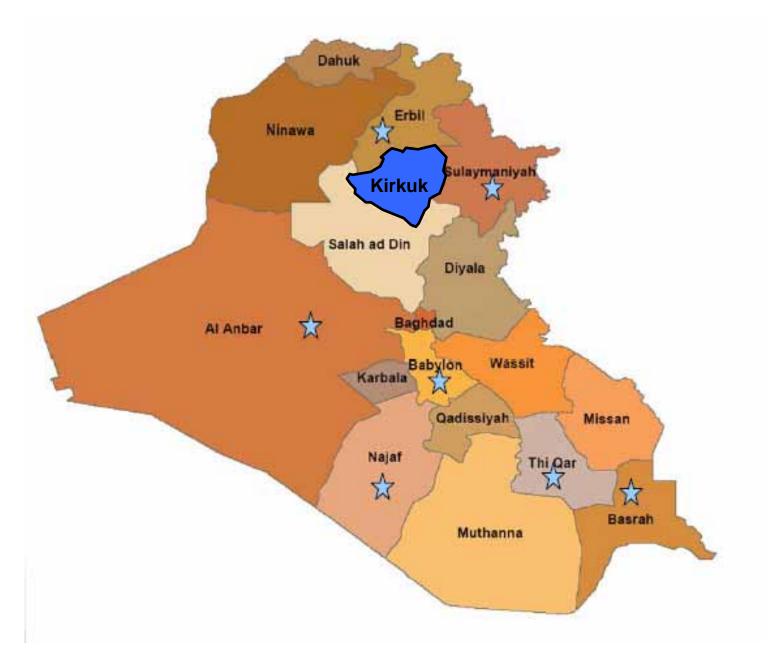
Iraq

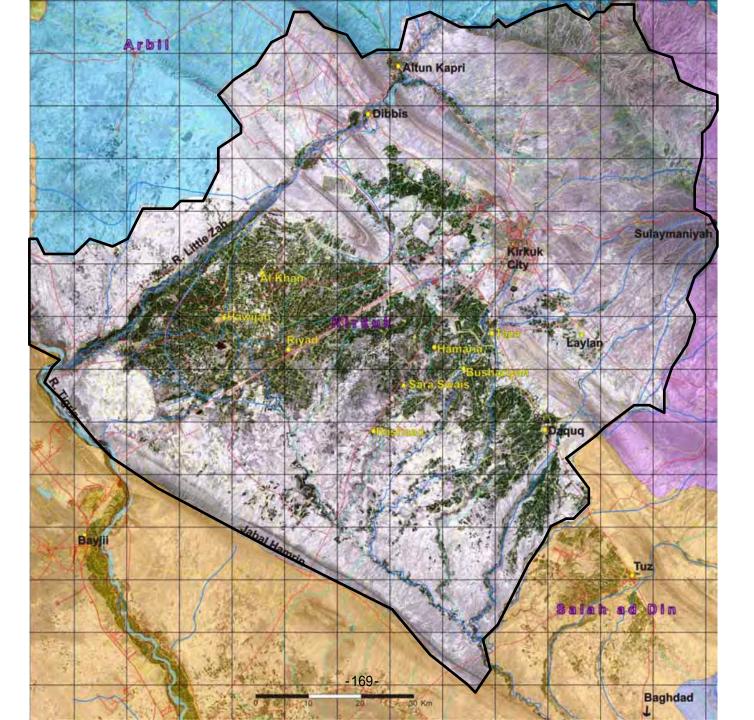


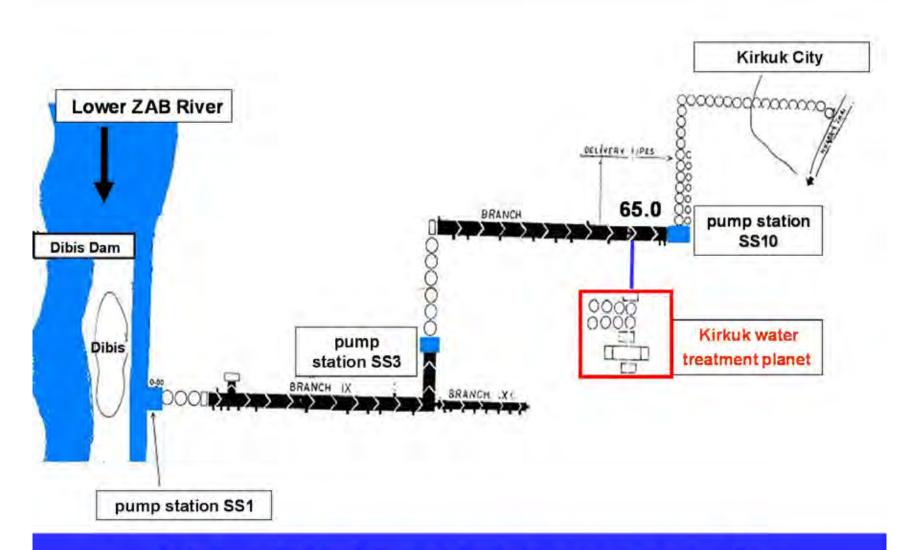
Water Is. The Life

My Organization

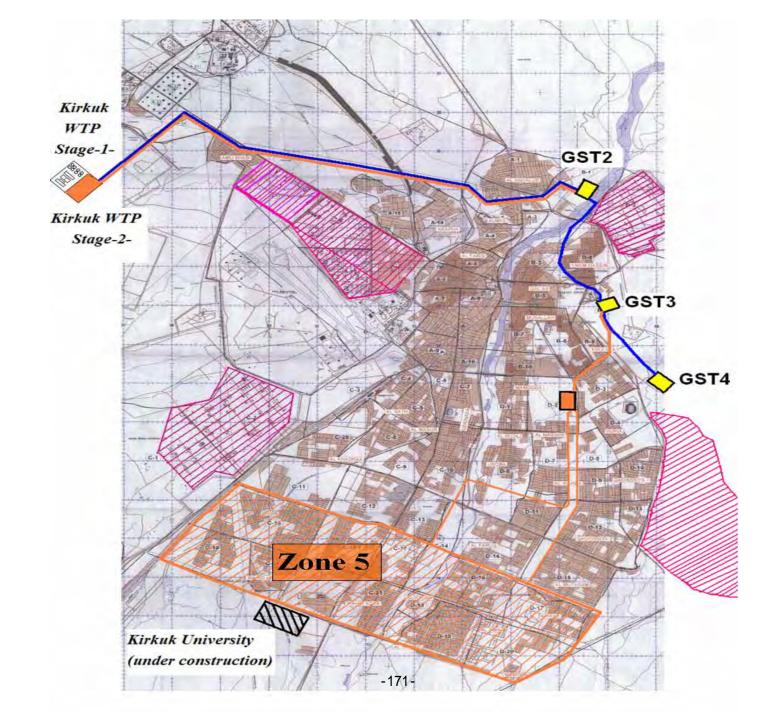
- General Directorate of Water.
- Kirkuk Water Directorate.
- Manages every thing about administration, production & distribution of drinking water for Kirkuk province. (from sources to tap).
- National Government Institution.
- Head of GIS unit.







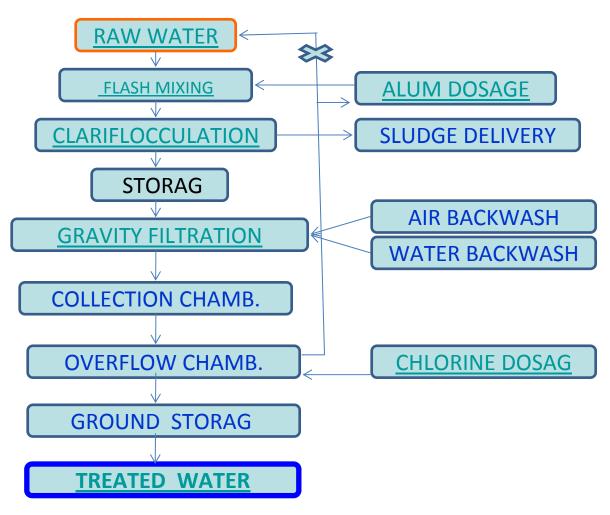
موقع مشروع ماء كركوك الموحد على قناة ري كركوك



Kirkuk Water Treatment Plant



Water Treatment Flow Chart

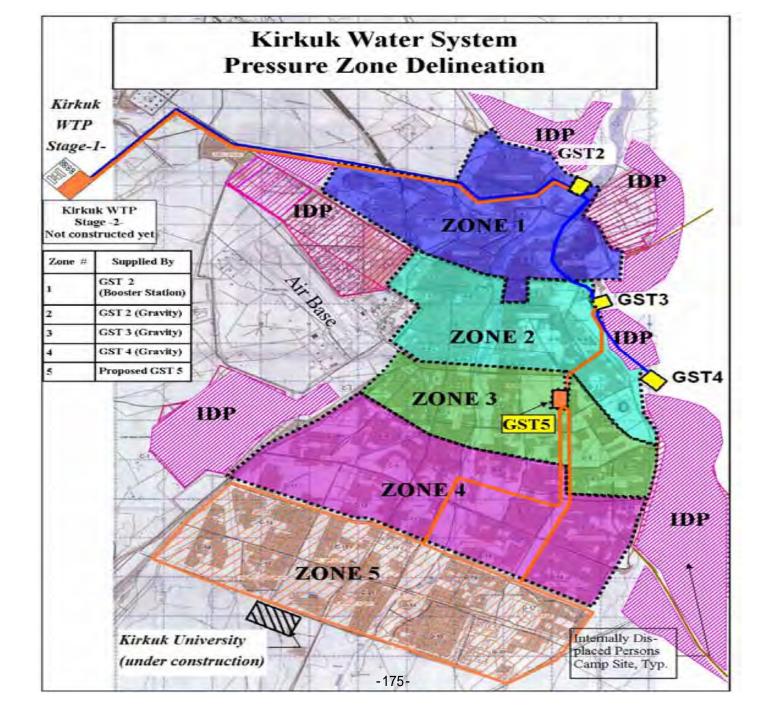


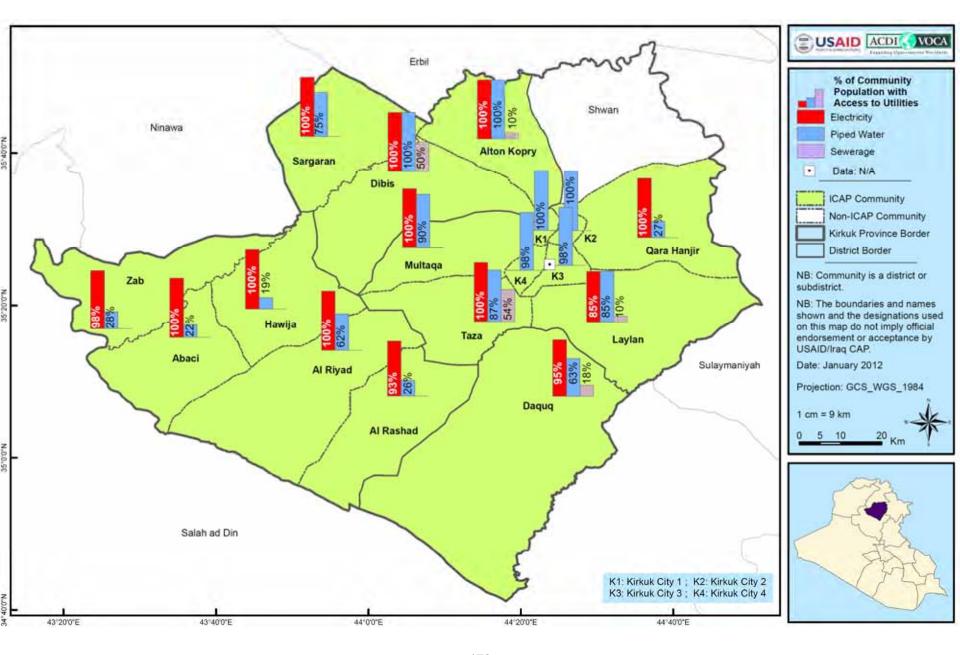
Kirkuk Water Supply – Stage 1

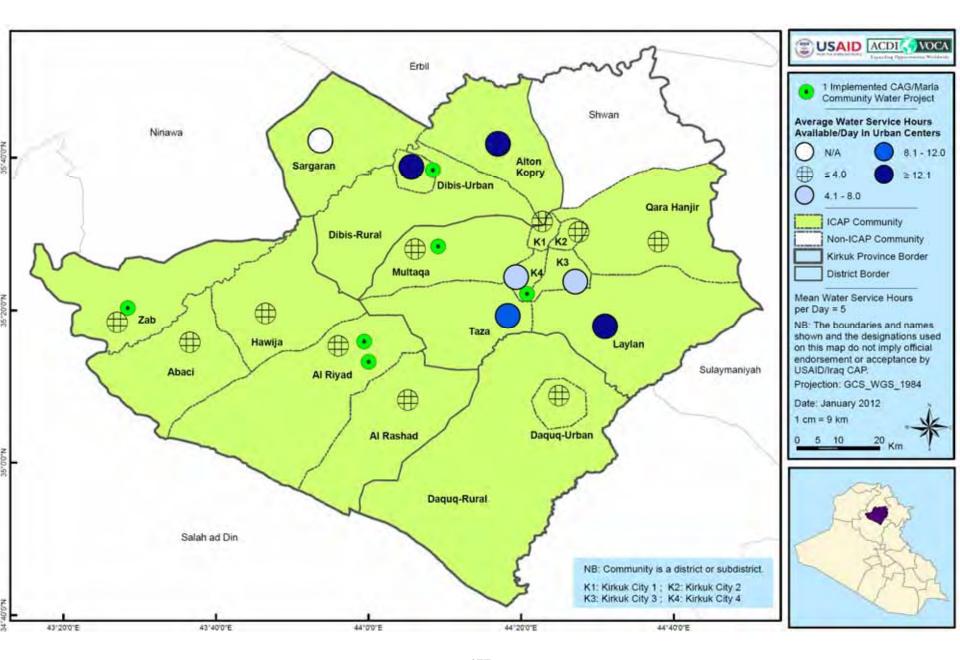
Capacity: 16200 m3/hr (consumed raw water)
 15420 m3/hr (produced drinking water)
 12600 m3/hr (Kirkuk city)
 2820 m3/hr (gravity to the industrial zone)

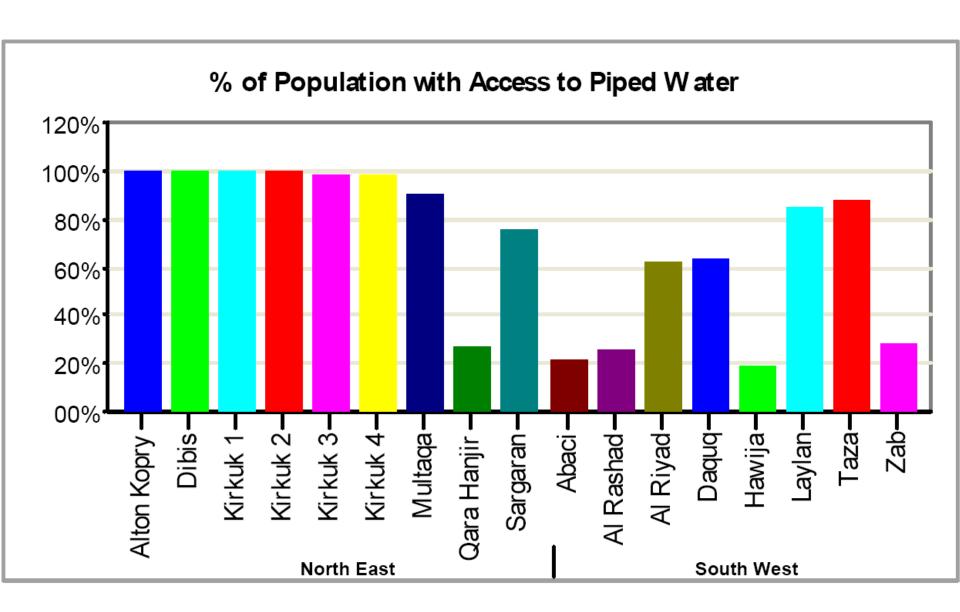
24/7 duty time ----- 12 hrs/day service time

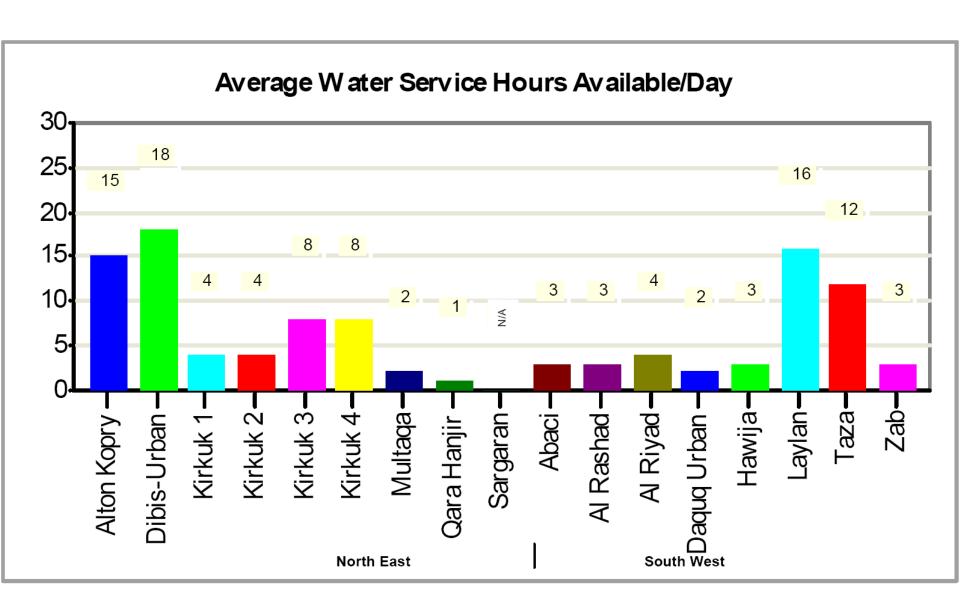
- Designed for 600,000 people. (about 1,250,000 now)
- Transportation to Kirkuk City: 2x1200 mm, 11.4 km
- •Storage Tanks: 4 ground storage tanks (GST 2,3,4,5) with total capacity 170,000 m3
- •Total length of distribution network: about 250,000 m (D< 1000mm) 57,000 m (D> 1000mm) Divided to 5 Zones











Problem Issues

- New residential areas has been constructed.
- Unstable Electric power source.
- Unstable raw water source.
- Little Budget funding.
- More than 40% pipe network is old. (40 45) years
- Many Illegal connections.
- Security problems.
- Temporary billing system.





Thanks

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

Jordan



المملكة الدنياله المية وراة المياهوالري

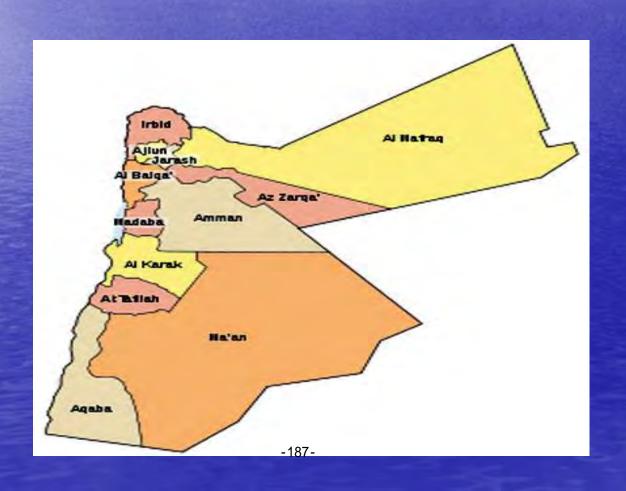


سلطقلمياه قطع الشوولانفنيه 2012 The Hashemite Kingdom of Jordan (HKJ)
Ministry of Water & Irrigation (MWI)
Water Authority of Jordan (WAJ)

Country Report For
Water Supply Administration for Better
Management of Water Supply Services(A)
Training course No.: (J12-00796)
By Japan International Cooperation Agency
(JICA)
From June 24, 2012 to July7, 2012

Prepared by WAJ's Participant:
Project Coordinator/Supervision Department-Technical Affairs.

KINGDOM OF JORDAN





(1) Management of water quality

From my point of view as a supervising and a coordinating project engineer I see that Jordan, has adopted many international water quality standards developed by the World Health Organization (WHO), the United States Environmental Protection Agency (EPA), and others. The guiding criteria shall always be the provision of safe drinking water and protection of the surface and groundwater. ALSO concerns for public health and the health of workers shall be always under focus and I have to mention that on governmental aspect laws for Jordanian water standards are applied and updated periodically. So The major challenges in the field of water quality are:-

- equipped laboratories and qualified personnel to be of major concern .
- quality of treated effluent and the performance of the wastewater treatment plants are greatly affected by the influent water quality which may be of domestic or industrial source. The use of treated effluent offers challenges as well as opportunities. Performance of some treatment plants is inadequate resulting in low quality effluent that could have an adverse effect on public health. So it must be carefully monitored and upgrade treatment.
- implementing an outreach program to ensure that awareness is created and people know how to properly maintain their rooftop storage tanks to reduce the possibility of contaminated water entering the household as an example and many other simple but important roles that need awareness about .



So some of water safety plans & efforts in this field are :

- ensuring that all water supply projects have Environmental Impact Assessments during the planning and design stage and Environmental Management Plans during the construction stage.
- making a national effort to improve existing systems, expand them to cover areas not being served, and to improve technical and managerial capabilities.
- WAJ have to continue with the enhancement of the operation and maintenance of the existing distribution systems and reservoirs, and the rehabilitation of old and damaged components.



(2) Reduction of non – revenue water:

Jordan is one of the fourth driest countries in the World. Demand for water exceeds Jordan's available water resources. Access to a safe water supply is an essential requirement. It is not the intention to restrict water on essential uses, but in some areas, there are excessive claims on the available water resources.

Groundwater is being exploited at about twice its recharge rate. There are hundreds of illegal wells. Annual per capita water availability has declined from 3600m3/year in 1946 to 145 m3/year today. Water for irrigation utilizes 71% of the water demand and 64% of water supply.

Non-revenue water remains high throughout the country, yet in places like Aqaba has declined significantly in recent years through improved management and capital investment.



(3) Water Supply Service Standards :-

You can judge the Current Situation for water supply service and standards if you know that in the year 2008 the renewable freshwater resources available per capita in Jordan were about 145 cubic meters per year. This is less than one third of the widely recognized "water poverty line" of 500 cubic meters per capita per year. Also Surface water supplies contribute approximately 37% to Jordan's total water supply, while Groundwater contributes approximately 54% to total water supply.

The unsustainable abstraction of groundwater largely due to population growth and agriculture expansion is a major problem today. This has been exacerbated by the lack of enforcement of regulations

As water tables drop, pumping costs and salinity levels increase. This sobering observation requires that water be well managed and used as efficiently as possible, that demand be proficiently managed, that all available sources of water be developed.

Also WAJ provides wastewater collection and treatment services to fourteen major populated areas. About 4 million people (62% of the population) are served by sewerage systems producing about 100 MCM of effluent per year that is being reused primarily in agriculture. So this brief can give description for the major challenges and actions against some problems facing water supply services.

Unfortunately there are no accurate monitoring for performance indicators, but any way now there is good awareness for the need to put high and updated standards & laws to protect it & to implement, so now you can find a Jordanian standard regarding drinking water quality & there are many experts committees that developing new standards for different aspects like services which can be applied easily in our local non highly educated societies.



(4) Management of Water Supply Service on a self - supporting basis :-

The major achievements on this field are :-

- 1. The concept of utilizing greywater and rainwater is fully embedded in the codes and requirements of buildings.
- 2. Water supply from desalination is a major source for human, agricultural & industrial use now in Jordan & this mainly done by private sector.
- 3. Drinking water resources are tried to be protected from pollution.
 - 4. Surface water is acceptably stored and utilized.
 - 5. Treated wastewater effluent is efficiently and cost-effectively used.
 - 6. Our shared water rights are protected.

And current actions & acts to Achieve the Goals on a self – supporting basis :-

- 1. Jordan will continue to study opportunities for further investment in surface water facilities and schedule a plan to enhance the storage of dams by removing sediments that accumulated over the years.
- 2. In order to enhance surface water resources, an implementation to a comprehensive monitoring and assessment program for surface water

quantity, quality, uses and protection.

3. Giving priority to modernizing and upgrading systems.



(5) Major recent achievements in improvement of water supply services/management:-

Now in my country Jordan a big project for getting wells water from the far south district to the capital Amman by pressurized piping system in order to solve the problem of increasing water demand for the population & which we call it AL DIECI Water Project and which is expected to be partially put in service by mid of the year 2013.

Also rehabilitation & improvement of water supply networks projects are carried out and giving good results (for example the ZARQA Governate & IRBID Governate areas) and still running new projects with the same aim.



(6) Expectation for the Japanese private companies :-

- The relationship between the Japanese and Jordanian governments is basic role for very big & strong relationship & friendly business relation for both private sectors, especially when Japanese buseniss men and company owners deal with the simple and beloved citizen of Jordan who have great appreciation and love for every Japanese equipment trademark because of its proficiency & good manufacturing.
- Now in water supply services many great opportunities and aspects are there for private companies and for example :





- 1. to market water treatment components like filters ,softners ,pumps,ozone generators, ultraviolet units & many other components needed for small watertreatment shops that belongs to ordinary citizens and for large governmental water treatment plants .
- 2. Also in periodically basis large scale projects for water systems like networks, monitoring & control systems, water treatment plants & pumping stations are pronounced by different governmental institutions which is by the flexible laws of investments in Jordan is allowed for the international Japanese contracting companies, consultants & manufacturers can participate.
- 3. There are many benefit wise studies & with great profits but need funding by private banks and large scale companies or group of companies to carry out the job in B.O.T (Build, Operate & Transfer) basis such as the two seas transfer pipe lines which is essential project for the whole Jordanian water situation and to take the Turkish experiment on this field as an example.
- 4. Also the Japanese private companies can benefit from the calm and strong political situation of our beloved Jordan & its very unique position in the middle of many consumers markets like gulf countries and north african countries for re-export trading especially that many encouraging investment laws are there such as taxes free & ownership, industrial areas and many more.

Thank You.....

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

Tanzania

TRAINING AND DIALOGUE PROGRAMS

Water Supply Administration for Better Management of Water Supply Services (A)

JFY 2012



THE UNITED REPUBLIC OF TANZANIA

REVOLUTIONARY GOVERNMENT OF ZANZIBAR







INTRODUCTION OF ZANZIBAR WATER AUTHORITY (ZAWA) AND TRAINING PURPOSE

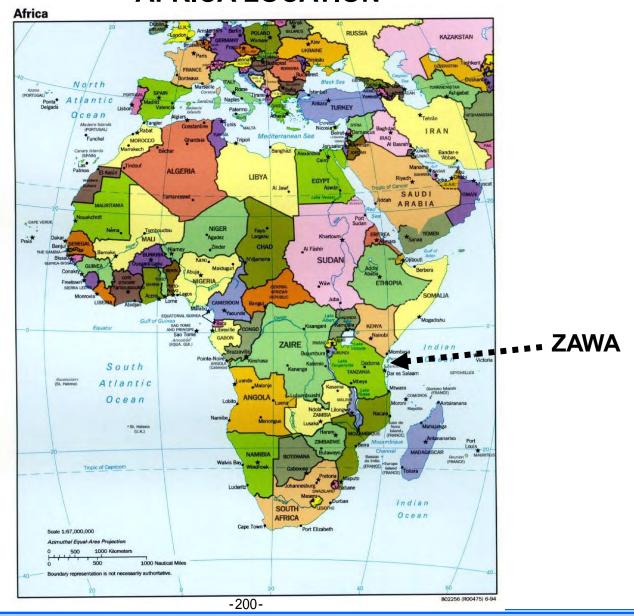


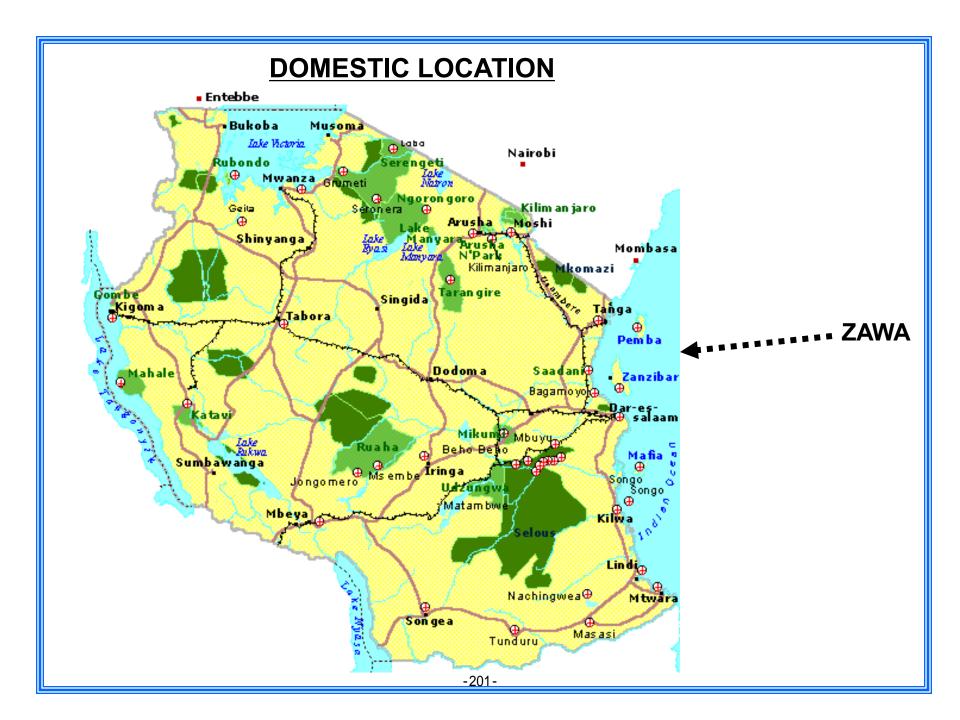
BY
ABDULAZIZ I. MASOUD





AFRICA LOCATION





TANZANIA GENERAL OVERVIEW

- Tanzania was formed by Tanganyika and Zanzibar which resulted The United Republic of Tanzania
- It is located between longitude 29 and 41East and latitude1 and12 degrees South of Equator.
- It has a total land area of 945,090 sq.km.
- The land boundaries cover 402 km.
- Its economy depends mainly on agriculture which accounts more than 50% of the GDP.
- According to the National census 2002 it has 34.4 million people.

-202-

ZANZIBAR

Zanzibar and Pemba



ZANZIBAR ⇒ UNGUJA & PEMBA + ABOUT 50 SMALLER ISLETS

CAPITAL: ZANZIBAR TOWN

AREA : 2,580 km² UNGUJA : 1,600 km² PEMBA : 980 km²

POPULATION (2002): 984,625 UNGUJA : 622.459 PEMBA : 362,166 URBAN POPULATION: 20 – 25%

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

ZANZIBAR HISTORY

1963: Zanzibar Independence from British Colonial Rule

1964: Zanzibar Revolution from Sultanate Rule

1964: United with Tanganyika to form The United Republic of Tanzania

Up to 1970s: The World's largest producer of cloves

1980s: Economic Recovery Programs (Tourism, Trade liberalization, Free port, Economic processing zones, etc.)

1995: First Multiparty Election Introduction of Multiparty Democracy

2000: Second Multiparty Election

2005: Third Multiparty Election

2008: First Power Outage Crisis

2010: Second Power Outage Crisis

2010: Zanzibar Referendum for Introduction of Government of National Unity

2010: Fourth Multiparty Election

2011: Ship's Sinking National Disaster. More than 2,000 people lost

ZAWA HISTORY

PERIOD	WATERWORKS SYSTEM
1880	Sultan Barghash constructed large masonry water conduit from Mtoni Spring to Maruhubi Palace (Now Maruhubi Ruins)
1920	Start of water supply using Cast Iron Pipes from Mtoni and Bububu Springs by Gravity to Saateni Water Pumping Station and then pumped to Stone Town and some Urban and Periurban areas First Modern Water supply System in Zanzibar
1950	Introduction of the use of boreholes for Urban and Rural water supply services to cope with the ever increasing demand
2004	Approval of National Water Policy
2006	Enactment of water legislation which led to establishment of ZAWA

ZAWA HISTORY (Cont...)

PERIOD	PROJECT				
1982 - 1986	Zanzibar Hydromaping Project which produced Hydrogeological Map of Zanzibar funded by UNTCD				
1988 - 1994	Zanzibar Rural Water Supply Project with the assistance of funds from African Development Bank (ADB)				
1990 - 1994	Zanzibar Urban Water Supply Development Project Assisted by FINNINDA				
1994	Zanzibar Water Supply Development Project funded by the Ruler of Sharjah				
1996 - 1998	Zanzibar Rural Water Supply Project with the assistance of funds from Abu Dhabi Fund for Development				
2002 - 2010	The Project for Urban Water Supply Development in the United Rebublic of Tanzania assisted by the Government of Japan through JICA				

ZAWA HISTORY (Cont...)

PERIOD	PROJECT
2008 - 2010	Project for Enhancement of Water Supply Management of Zanzibar Water Authority funded by JICA
2008 - 2011	ZANWAT Sustainable Running Water Management and Cost Recovery in Zanzibar funded by European Commission

ZAWA HISTORY (Cont...)

PERIOD	HOST INSTITUTION				
COLONIAL PERIOD (SECTION)	PUBLIC WORKS DEPARTMENT (PWD)				
1964 – 1975	WORKS ROADS AND TECHNICAL UNIT				
(SECTION)					
1975 – 1984	MINISTRY OF WATER AND ENERGY				
(FULL DEPT)					
1984 – 2004	MINISTRY OF WATER CONSTRUCTION ENERGY LANDS AND ENVIRONMENT				
2004 - 2010	MINISTRY OF WATER CONSTRUCTION ENERGY AND LANDS				
2010 – PRESENT	MINISTRY OF LANDS HOUSING WATER AND				
(AUTHORITY)	ENERGY				

ZANZIBAR ECONOMY

 Zanzibar economy was mainly dependent on cloves which were introduced by Arabs during the 19th century as the main stay of economy

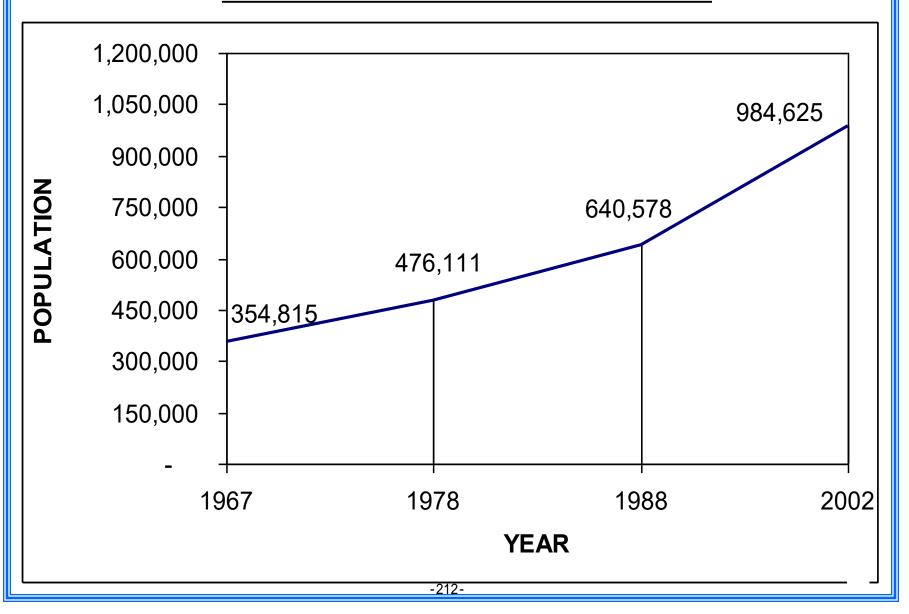
SUB TITTLE

- During 1980s, Zanzibar shift from cloves dependence to tourism.
- The number of tourists who visited Zanzibar has been increasing fro 128,445 in 2008 to134,954 (5.1) in 2009/2010 ,(refer Chief Govt. Statistical Office 2010).
- The Zanzibar GDP ranges between an average of 5.4 % to 6 %.

DATA OF ZAWA

- 1. Start to service: 2006 (6 Ys ago)
- 2. Population: 984,625 (2002)
- 3. Connections: 3,836 (2010)
- 4. Service rate: 65% (2010)
- 5. Pipelines length: 150km
- 6. Revenue rate : 40% (FY.2010)
- 7. Leakage rate: 35% (FY.2010)
- 8. Daily supply: 46,000m3 (FY.2010)
- 9. Distr. Manage.: 4 Service areas

POPULATION IN ZANZIBAR



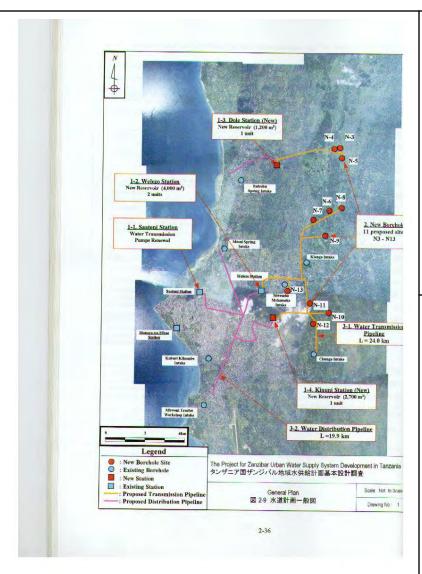
Service Rate

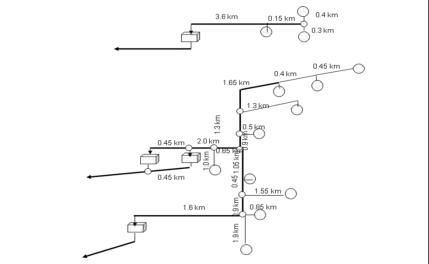
	Population Served							
Year	Urban			Rural			Total	
	People	Growth Rate %	Coverage %	People	Growth Rate %	Coverage %	People	Coverage %
1999	298 661	3.8	70	604 506	3.1	30	903 167	45
2000	310 011	3.8	70	620 251	3.1	35	930 262	48
2001	321 791	3.8	70	636 379	3.1	40	958 170	51
2002	336 110	3.8	75	648 515	3.1	46	984 625	56
2003	348 883	3.8	75	668 619	3.1	48	1 017 502	57
2004	362 140	3.8	75	689 347	3.1	49	1 051 487	58
2005	375 901	3.8	75	710 716	3.1	51	1 086 617	59
2008			75			60		65
2010	452 961	3.8	80	827 922	3.1	60	1 280 883	67

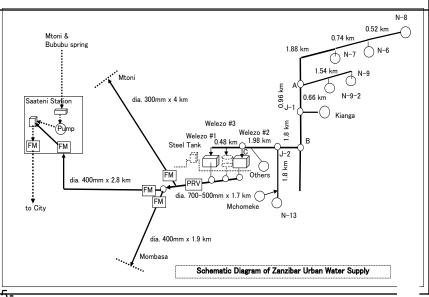
Pipelines Lengths

Total	150 km
ACP (Asbestos Cement Pipe)	45 km (30%)
PEP (Poly-Ethylene Pipe)	25 km (17%)
PVC (Poly-Vinyl Chloride)	15 km (10%)
SP (Steel Pipe)	10 km (6%)
DIP / CIP (Ductile / Cast Iron)	55 km (37%)

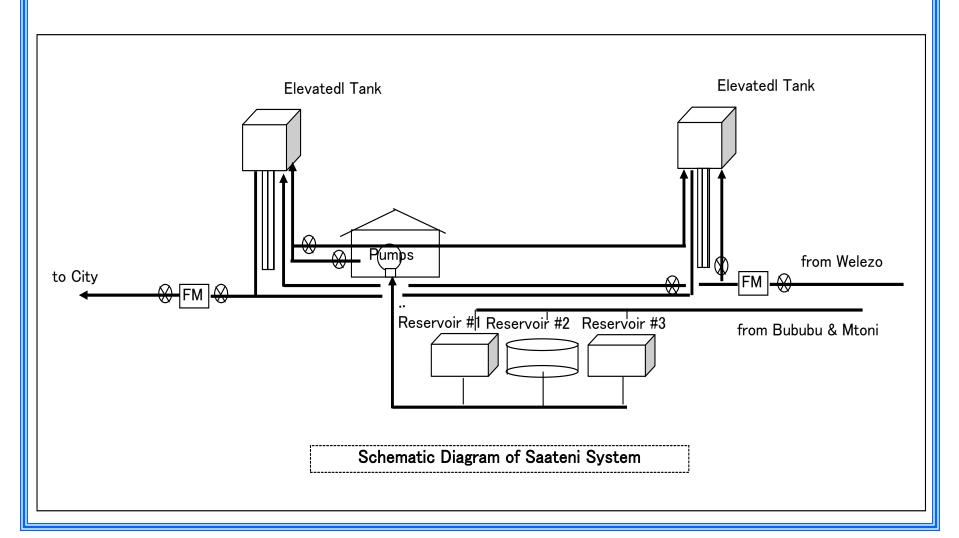
Intake & Treatment Facility







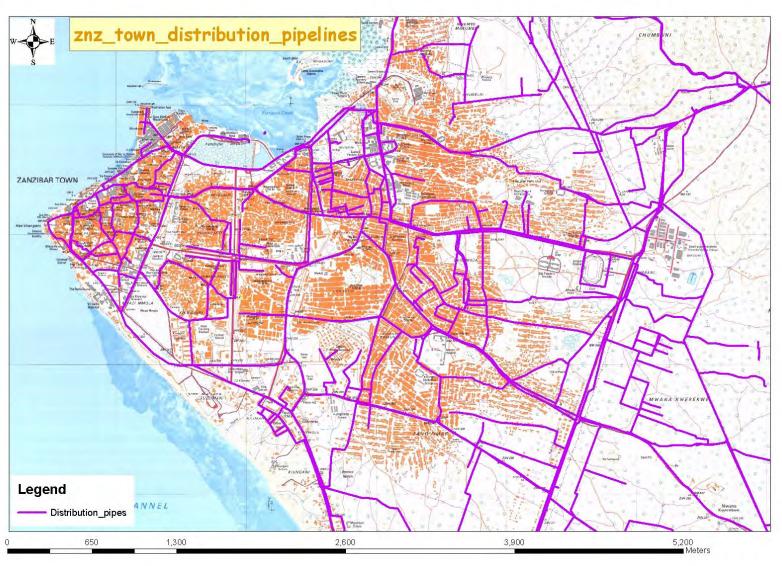
Distribution Facility



Distribution Facility (cont...)



Distribution Facility (cont...)



Strength of ZAWA

- Existence of necessary Legislation: Water Act, National Water Policy, Water Regualtions
- 2. Existence of Comprehensive Strategic Business Plan 2008 2013
- 3. Existence of a Clear Decision Support System (ZAWA Board)
- 4. Enough Water Resources
- 5. Using Ground Water, no need of large treatment only disinfection is required
- 6. ZAWA is the sole regulator of Water Resources
- 7. Good Documentation on Ground Water Status

ZAWA Strategic Business Plan 2008 - 2013

Vision:

"To be the best water and sewerage services provider in East Africa"

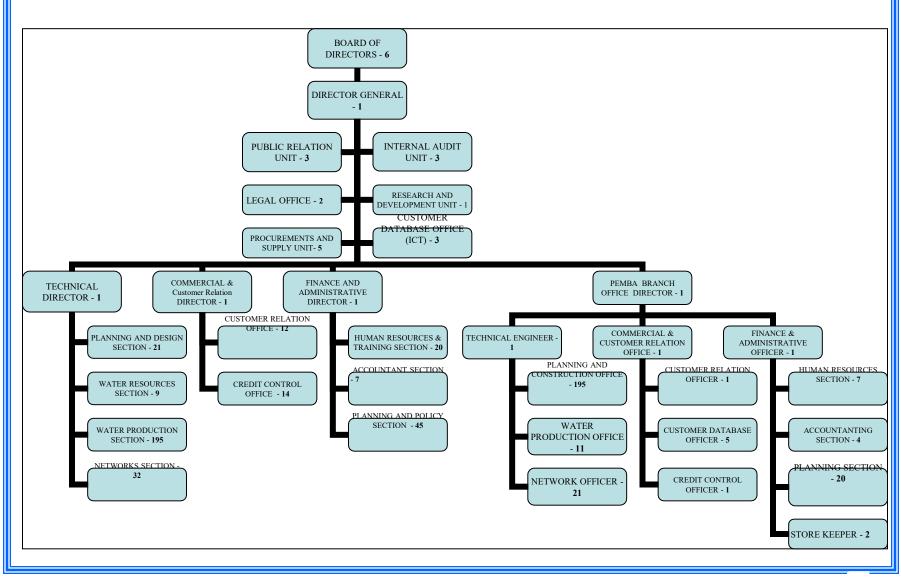
Mission:

"To develop and provide potable, adequate and affordable water supply and sewerage services in a sustainable and environmental friendly manner".

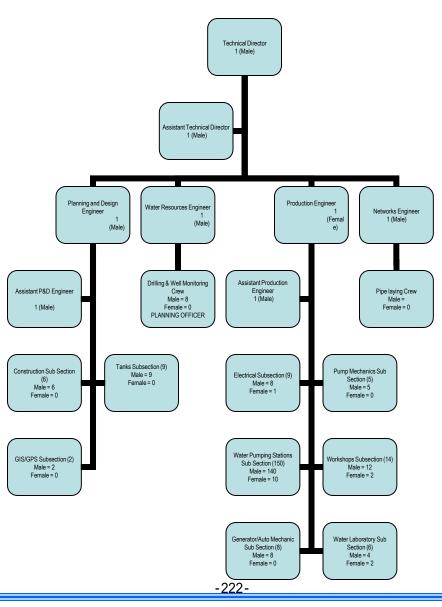
Motto:

"Every Drop Count, Use Water Wisely"

Organization Chart of Zanzibar Water Authority



Organization Chart of Technical Department



Tariff Classified Block

Customer category	Block (m³)	Tariff (US\$/m³)
1.Water kiosks/ standpipes	Non applicable	0.09
2. Domestic	0 to 8	0.15
	>8	0.18
3. Institutions	0 to 15	0.18
	>15	0.21
4. Industrial / commercial	0 to 15	0.18
	>15 <1,000	0.24
	>1,000 <5,000	0.29
	>5,000	0.59
5. Agricultural	0 to 50	0.21
	>50 <200	0.24
	>200	0.29

SERVICE CHARGES

Size of water meter	Service charge (US\$/month)		
$\frac{1}{2}$ " - $\frac{3}{4}$ "	0.35		
1" - 11/2"	0.71		
2" - 3"	1.47		
4" and above	2.35		

Flat rate Water fees

Customer category		Flat rate (US\$/month)	
Water kiosks/ standpipes		Non applicable	
Domestic			2.35
	Less than 50 staffs		11.77
	>50 ≤100 staffs		29.41
Institutions	>100 staffs		117.65
	Community and religious, NGOs		1.77
		0 to 10 rooms	11.77
	Guest houses	>10 ≤ 20 rooms	23.53
Industrial / commercial		>20 rooms	44.12
	Hotels	.Grade B	294.12
		Grade A	411.77
		1 Star	1,176.47
		2 – 3 Stars	1,764.70
		4 – 5 Stars	2,941.18
	Restaurants/ bakeries		11.77
	Building constru	ctors	70.59
	Small scale indu	ıstries	17.65
	Petrol stations Car washes		11.77
			23.53
	Small scale		11.77
Agricultural	ural Medium scale Large scale -225-		52.94
			88.24

OTHER CHARGES

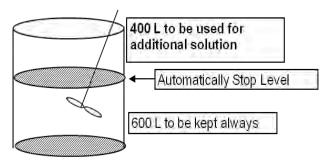
Other fees		US\$
	Pipe size of 1/2" - 3/4"	17.65
Water connection fee	Pipe size of 1"- 11/2"	20.59
	Pipe size of 2" or more	58.82
Water application form fee		1.18
Water registration fee		1.18
Water reconnection fee		5.88
Parabala drilling foo	Drillers	176.47
Borehole drilling fee	Well owners	29.41
Annual abstraction	Domestic	29.41
permit fee	Industrial/ commercial	117.65
Drilling license fee	-226-	294.12

Water Disinfection

Technique



Chlorine Solution Tank Volume: 1,000L





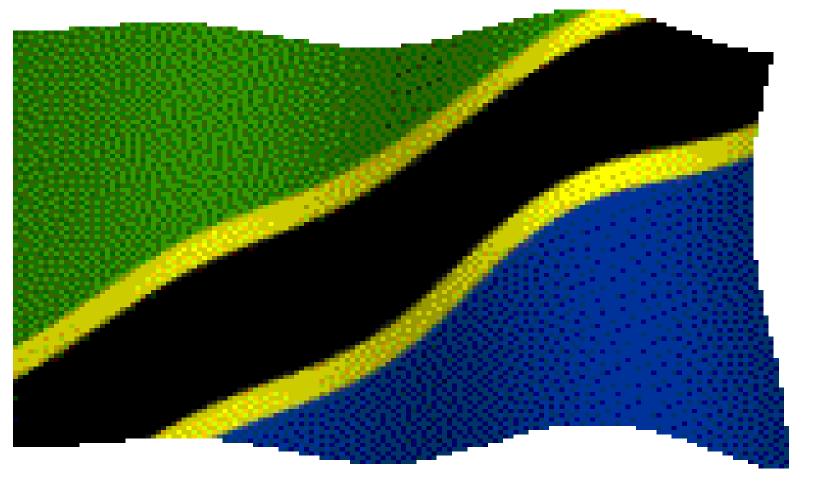


Training Purposes

To acquire basic knowledge and skills on:

- Network modelling for operational purposes, including non revenue water management, and planning and design requirements
- Production conceptual modeling
- Water Demand Management including Non Revenue Water

TakU4WE AEIN



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

Country Reports

Japan International Corporation of Welfare Services (JICWELS)

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

Bangladesh

Water Supply Administration for Better Management of Water Supply Services (B)















Khulna, the third-largest city in Bangladesh, is located on the banks of the Bhairab and Rupsha rivers in the southwest of the country. The present water supply to Khulna is mainly from groundwater sources drawn from both deep and shallow tube wells. In the long term as demand increases, conjunctive use of groundwater and surface water will be required, even though surface water may suffer from salinity intrusion in dry season. To cope with current insufficient supply and increasing demand, the Khulna Water Supply and Sewerage Authority (KWASA) had been established in February 2008. And KWASA plans to construct a new water supply system which utilizes surface water with assistance from the Japan International Cooperation Agency(JICA) and Asian Development Bank(ADB).

KHULNA WASA VISION, MISSION, OBJECTIVES & VALUES:

KHULNA WASA - Safe Water, Safe Life (Other slogan suggestions: KWASA's supplies, better for lives; KWASA - Water is pure, user is secure; KWASA supplies water and sewerage for life; Safe water, healthy life; Safe water to save lives; Safe water for secure life)

KHULNA WASA VISION:

To be the pioneer in the water and sewerage sector in Bangladesh ensuring a safe and sustainable water supply and environment friendly sewerage management for Khulna City to the satisfaction of the customer

KHULNA WASA MISSION:

To ensure digital service to all customers supplying sufficient amount of potable water and proper sewerage solutions by 2020; through use of e-technology, automation, research, effective planning and HR development, raising finance for investment in service expansion, efficient operation & maintenance and sharing of experience with similar Organizations;

CURRENT SITUATION AND MAJOR CHALLENGES

City Corporation Started	:	10/12/1984
KWASA Established from City corporation	:	02/03/2008
Total area	:	46.00 sq.km
Population	:	1.1 million
Wards	:	31
Holding no	:	50312
Drains	:	545.70km
Daily Water Supply Demand	:	170 MLD
Daily Water Supply	:	53 MLD
Production Well (14"x6")	:	32 No
Mini Production Well (6"x3")-	:	42 No
½" Deep Hand Tube Well	:	3736 No
½" Shallow Tube Well	:	5526
Street Hydrant	:	503
Distribution Pipe Line	:	270 km
Domestic House Connection(1/2"~2")		12500 No
Non Domestic(Industrial, commercial, Institutional, other)	:	385 No
Officer & Staff	:	287 No

WATER QUALITY: LIST OF DRINKING WATER QUALITY STANDARDS

Parameter	Unit	Standards
BOD ₅	mg/L	0.2
Arsenic	mg/L	0.05
Chloride	mg/L	150~600
COD	mg/L	4.0
DO	mg/L	6
Hardness	mg/L	200~500
Iron	mg/L	0.3-1.0
Lead	mg/L	0.05
р ^н	-	6.5-8.5
Nitrate	mg/L	10
TDS	mg/L	1000

WATER QUALITY MONITORING SYSTEM:

- Current monitoring system: In Khulna there is not pressurized system. Consumer's generally having their own storage tanks to provide system balancing and storage for the consumer. There were five elevated water storage tanks with a total capacity of 2815 m³. Two to them were completely demolished. And another one is defunct. As of now the handover of KCC asset is still on process and KWASA has no distribution system as built drawings. There are approximately 270km of pipelines with pipe sizes varying from 75 mm to 250mm in diameter are monitored by 12 No of manpower that is guided by an executive engineer.
- Laboratory Situation: There is a small scale laboratory which
 is operated by a sub assistant engineer to test the water quality.
- KWASA is a new organization and it is trying to implement the Guidelines for drinking water quality.

CURRENT SITUATION OF WATER QUALITY MANAGEMENT

➤ Water Source Management: The management of water sources has become a critical need in the city because of growing demand for water and increasing conflict over its alternative uses. In Bangladesh water had been considered as a free gift of nature and access to water is recognized as a basic right. But procedural and fiscal measures are enforced to regulate its mobilization and use. According to the Government policy of 1999, the ownership of water does not vest in an individual but in the state. The Government reserves the right to allocate water to ensure equitable distribution, efficient development and use and to address poverty. The Government can redirect its use during periods of droughts, floods, cyclones and other natural and manmade disasters. Allocation rules will be the formal mechanism for deciding who gets water for what purpose, how much, at what time for how long and under what circumstances water use may be curtailed.

Among 54 production tube well, 10 wells are out of pH standard, 26 wells are out of Fe standard, one well is out of Mn standard and three wells are out of cl⁻ standard. Wells that are within the standard are 22. Among 30 Hand pumps, three wells are out of pH standard and three wells are out of microbiological standard. Nine wells are within the standard. As far as Arsenic is concerned, all wells are within the standard.

REDUCTION OF NON-REVENUE WATER

CURRENT ACTION AGAINST THE PROBLEMS

• KWASA has implemented a consumer census by ADB study and fined out the illegal connection and initiated metering system for their new connection to the customer in new project. In this case NRW will be reduce after implementation of this project.

REDUCTION OF NON-REVENUE WATER

ACHIEVEMENT

The effect of consumer senses is visible now. Every month illegal consumers are willingly coming to KWASA office to legalize their connection and hence reducing the NRW.

REDUCTION OF NON-REVENUE WATER

CURRENT SITUATION AND PROBLEMS

■ In Bangladesh Water Utilities Data Book 2006-07 mentioned the average NRW is 22.5% based on 11 cities in Bangladesh. Regarding the current Khulna water supply system there is no reliable date to examine the amount of NRW due to a lack of reliable measurement data for water use. In the ADB report, it is estimated that the water loss to be 36% of production from the pumps to piped water. Taking into consideration the ADB figure, It is assumed the NRW of Khulna Water supply system is 40%.

CURRENT SITUATION OF WATER RATES AND BILL COLLECTION SYSTEM:

The non-metered users who contributed the 99% of KWASA revenue was an aggregate of broadly four types of users, namely residential, industrial, social and commercial. The water rates and connection fees effective in Khulna are summarized in the following table:

Connection Diameter (inch)	Flat rate tariff (USD/month)	Connection Fee (USD)
1/2"	0.5	10
3/4"	0.88	15
1"	2.5	22
1.5"	15	100
2"	25	125

PRIVATE SECTOR PARTICIPATION:

- The status of Private Sector Investment and its area: Water resource development, water treatment, water distribution, organization management
- The current situation of involvement of national government in water supply services: GOB is working to meet the MDG by 2021.
- >Current situation of Privatization:
- The current situation of privatization: GOB is enthusiastic for privatization of government institute step by step on loosing sector.
- ➤ Type of Privatization: Open tendered system, may be state owned company and foreign.
- Future direction of Privatization:
- ➤Other:
- ➤ If citizen cannot get sufficient water from public water supply system how d they get water actually: From private well
- The way of assuring secure water for the largest building: Deep well
- Sewage system concerned: City authority did not hand over the function to the KWASA yet.
- ➤ Maintenance situation of solid waste disposal:
- Existing situation: Open dumping
- Future Plan: Landfill

WATER SUPPLY SYSTEM PERFORMANCE



- Number of customers who received intermittent supply: 13000 Nos.
- ➤ Typical duration of supply:12 hours/day
- > Typical mains water pressure in pipe network:
- Number of water pipe breaks in the distribution network:730 Nos/year
- Required number of tests of teratd water for residual chlorince:
- Number of tests of treated water for residual chlorine carried out :
- Number of tests of treated water for residual chlorine passed:





NAME OF THE PROJECTS

DEVELOPMENT OF WATER
SUPPLY SYSTEM IN
KHULNA CITY

INSTALLATION OF PRODUCTION TUBE WELLS AND DEVELOPMENT OF WATER SUPPLY NETWORK

KHULNA WATER SUPPLY PROJECT

MAJOR COMPONENTS OF KHULNA WATER SUPPLY PROJECT:

- >Raw water transmission pipeline of 33 km length with 1350mm dia.
- Clear water transmission pipeline of 25km length with 300mm to 1000mm dia.
- **➤** Water Intake with capacity of 110000m3/day.
- >Impounding Reservoir with capacity of 775,200m3/day.
- Surface water treatment plant (SWTP) with capacity of 110000m3/day.
- >5 Distribution Reservoir with capacity of 10000m3-20000 m3
- ►11 Over Head Tank with capacity of 300m3-500 m3
- **➤ Distribution Pipe Network 700km of 50mm-400mm dia.**
- ➤ Service Pipe Connection 90,000 nos.

MAJOR COMPONENT OF DEVELOPMENT OF WATER SUPPLY SYSTEM IN KHULNA CITY:

- ➤ Construction of 13 Nos Production Deep Tube Well
- ➤ Construction of Distribution Pipe line: New 24Km and Replacement 21km
- ➤ Construction of Surface Water Treatment Plant: New 5.25MLD and Rehabilitation 1.25MLD
- ➤ Supply of 2 Nos mobile generator, 2NosTractor for generator,
- ≥3000 flow meter,
- ➤ Land acquisition of 1.45 acres

MAJOR COMPONENT OF INSTALLATION OF PRODUCTION TUBE WELLS AND DEVELOPMENT OF WATER SUPPLY NETWORK

- Construction of 8 Nos Production Deep
 Tube Well
- Construction of Main Water Supply Pipe line: New 77Km (100 to 300mm dia)
- ➤ Installation of 5000 flow meter
- Survey and GIS mapping

MONITORING SYSTEM

Monitored by one stop services. Customer can complain by written or call to the Number +88041 2831562. Based on the customer complain, necessary action is taken to their service problem.

THANKS TO ALL FOR YOUR KIND PARTICIPATION

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

Brazil

Water Supply Administration for Better Management of Water Supply Services (B)

18 Nov – 1 Dec 2012 Country Report Outline Format

1. Country: Brazil

3. Position: Water Losses & Energy Efficiency Manager.

4. Organization: CAGECE



General Country profile: Background

The CAGECE, Water and Sewage Company of the State of Ceará, has been undergoing upgrades and innovations to continue being a competitive and updated company, aiming the continuous pursuit of the execution of their mission. It has in its political the water supply on the best possible way, from the continuous improvement of techniques and methods used.

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Whole Country:

Area: 8.514.876 km²

Population: 193.946.886 Habitants

Coverage Water Supply: 97,9 %

Selected Water Supply System/City: - Ceara State

Service Area: 148.825,6 km²

Population Served: 7,2 million



My Mission (sharing among participating friends)

Mission of my organization is contribute to improve the health and quality of life providing solutions in sanitation with economic, social and environmental sustainability.

My mission in the organization is contribute to improve the water distribution systems through losses reduction and high energy efficiency.

My actual job to achieve the mission is improve the system with the implementation of several strategic management and operational tools, such as loss control.

1. Management of water quality

Current situation and major challenges / problems Given the demands of the new Ordinance (#2914) of the Ministry of Health, and the progressive deterioration of water quality from various sources of raw water, is becoming increasingly difficult to treat water using conventional technologies, requiring investments to operational improvements and the use of more sophisticated treatment.

Current actions against the problems and any achievement Research and development of treatment technologies aimed in solving problems found in watersheds used by the company as like as the presence of algae, iron, salinity, high turbidity,..

Monitoring System / Plan of Safety of Drinking Water by Organization / Regulatory The water monitoring is performed by the Cagece's Laboratories. It has 08 regional laboratories in midsize municipalities located in the interior, and the Central Laboratory responsible for monitoring the metropolitan area monitoring more complex analytical parameters, such as pesticides, organochlorines, heavy metals,...

Implementation of Water Safety Plans: The Cagece drafted in 2009 a system for collecting information from every part of the production chain of the water with a view to implementing the Water Safety Plan, covering information about the source, raw water, operation of treatment plants, conditions of reservation and finally, on the distribution networks. The information obtained is used for the preparation of annual action plans for improvements, adjustments of treatment technologies, recovery tanks, replacement nets,...

2. Reduction of non-revenue water 1 (Present Situation)

- Constitution of Non-revenue Water
- Note: Customized Buttom-up IWA Water Balance

System	Authorized consumption 225,467,924 64.39%	Revenue water	Billed authorized consumption	261,259,694 m³/year (74.61 %)
			Unbilled authorized consumption (ex. fire fighting, cleaning)	6,680,307 m³/year (1.91%)
input volume 350,180,558 100%	Water losses 124,712,633	Non Revenue Water (NRW) 131,392,941 25.39%	Apparent losses (Unauthorized	84,305,154 m³/year (24.07 %)
	35.61%		-257- Real losses (Leakage)	40,407,480 m³/year (11,54,%)

2. Reduction of non-revenue water 2

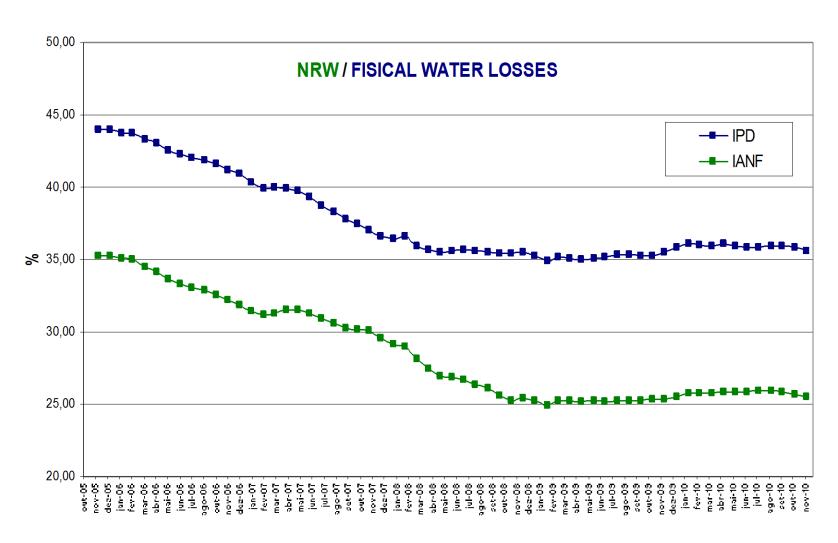
- INSTALLATION OF PRESSURE CONTROLLERS
- DETECTION BY NOISE LOGGERS AND CORRELATORS
- STANDARDIZED TEAMS AND OPTIMIZED VISIBLE LEAKS CORRECTION
- WIRELESS MAPPING OF PRESSURES SYSTEM
- DMI'S DEPLOYMENT (PILOT)
- ELECTROMAGNETIC'S METERS UP TO DN 100mm
- ULTRASONIC METERS FOR CALIBRATION
- REPLACEMENT OF ALL HYDROMETERS AGED > = 5 YEARS
- STANDARDIZATION OF FRAUD FIGHTING TEAMS
- BENCHMARKING AND JOINT PROJECTS WITH COMPANIES AND UNIVERSITIES
- ANALYSIS AND APPLICATION OF NEW METHODOLOGIES AND SOLUTIONS
- HIRING CONSULTANTS AND TRAINING OF EMPLOYEES
- DEVELOPMENT OF CONTROL, GREAT CUSTOMER, WATER BALANCE, ANALYSIS OF CONSUMPTION SOFTWARE

Main tactic: Pareto's Theory (principle 80-20):

States that for the vast majority of phenomena, 80% comes from the effects of 20% of causes.

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3. Water supply service standards /Performance Indicators



4. Management of water supply service on a selfsupporting basis 1

The Cagece today is knowed as reference in the Brazilian scenario.

Aiming at improving their management as a whole, the Cagece implemented a strategic management system that covers all areas of the company, so that all work cohesively in achieving the company's strategic objectives. Thus, the operational areas, environment, quality and commercial achieved status of main articulators of all internal processes.

The rate of water, even with the improvements, remains one of the lowest in Brazil.

4. Management of water supply service on a selfsupporting basis 2 - <u>Approaches to Renewal and Aging</u> <u>of Facilities</u> -

- How CAGECE is a relatively young company (40 years), only this time is thinking about renewing their main supply lines.
- Cagece just now began the use of asset management and pursuit of total quality services as both materials.



5. Major recent achievement in improvement of water supply services/management

2000	INDICATORS	2011
22	Staff/1,000 connections	3.2
905,000	Production capacity m3/d	1,728,000
None	Water quality	2914 Guidelines
93%	Coverage area	99%
22hr/d	Supply duration	23hr/d (mean)
2.0 bar	Supply pressure	2.5 bars
26,881	Number of connections	191,092
40%	NRW	25%
35%	Collection ratio	66%
2,800	Staff number	3,550
	-262-	

5. Major recent achievement in improvement of water supply services/management (PART2)

After inclusion of the strategic management, began a series of improvements, such as implementation of ISO 9001 in various operational areas, strength of the environment management, use of multiple operational optimization features, such as pressure control, active leaks research and certification of materials, services and laboratories.



6. Expectation for the Japanese private companies & Water Supply Utilities

CAGECE greatly improved its management system in recent years with the implementation of several strategic management and operational tools, such as loss control. But for it to achieve excellence and more refinement it is necessary to search for new knowledge, especially through international successful experiences.





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

Brazil

Water Supply
Administration for
Better Management
of Water Supply
Services







Water Supply Administration for Better Management of Water Supply Services

Applicant: SUZUKI, Fernando Mitio

Country: BRAZIL

Organization: Companhia De Saneamento Basico De São

Paulo - SABESP

Sabesp

Mission

"To provide water and sewage services, helping improving the quality of life and environment."

Vision

By 2018: To be acknowledged as a company that ensured universal water and sewage services in its concession area, in a sustainable and competitive way, bringing excellent environmental solutions, and focused on the client."



1. Management of water quality

One of the largest water and sewage service providers in the world...

Company Overview

- Sabesp is one of the largest water and sewage service providers in the world based on the number of Customers
- Provides water to 24.0 million people and sewage services to 20.6 million people
- Also sells wholesale treated water to 7 municipalities (3.7 million people)
- Natural monopoly, low operating risk
- Serves the City of São Paulo and 362 out of 645 municipalities in the State
- Covers 60% of State's urban population
- Operations in the São Paulo Metropolitan Region* represent 75.1% of our total revenues

*The Metropolitan Region we consider for this estimate, includes 8 municipalities outside the legal boundaries of the São Paulo Metropolitan Region and represent the total cities served by the Company's Metropolitan Division

Main Operational Indicators

	Water	Sewage
Connections (million)	7.5	6.0
Coverage (%)	100	82
Treatment (%)	100	76(*)
Billed Volume (ma million)	1,035.1	757.1

- F11 As of June 30, 2012
- (2) Treated sawage as percentage of collected sawage



1. Management of water quality

...with strong corporate governance

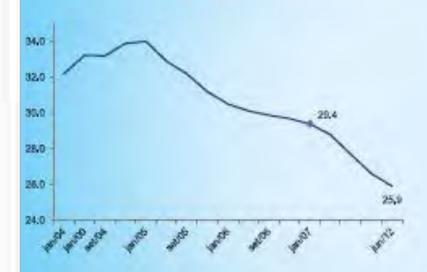
- We are a mixed capital company, majority-owned by the State of São Paulo, with significant private ownership
 - State law requires the State of São Paulo to own at least 50% + 1 voting shares at all times
 - Currently the Government of São Paulo has 50.3% share
- Listed on the "Novo Mercado" and NYSE, to the highest corporate governance standards. We are also part of BM&FBovespa's Sustainability Index – ISE
- 100% common shares
- Market Cap: R\$ 15,871.1 mn (as of March, 2012)
- •Federal Law # 11,445/07 → Federal Decree 7,217/10
 - Obligatory creation of a Regulatory Agency → Municipal or State level
 - Clarifies the payment conditions of non-amortized investments → up to 4 years
 - Disbursement of federal funds conditioned to the existence of a sanitation plan → Deadline 2014
- Regulatory agency → ARSESP activities and responsibilities include:
 - Services quality
 - Tariff structure and reviews
 - Planning is a concession holder attribution



2. Reduction of non-revenue water

Water Loss Program

Water Loss (%)



R\$ 4,3 billions investments in the Water Loss Program forecast for 2009-2019

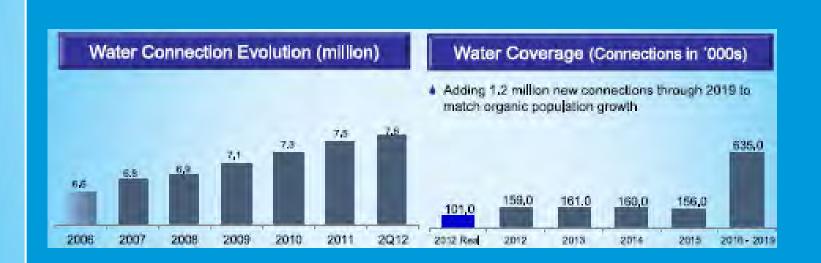
Strategy to Reduce Water Loss

Physical losses

- Replacement and repair of water pipes and mains
- Installation of probing and pressure regulating valves
- Preventive maintenance of existing and newly installed water meters
- Improvement in the quality of the materials
- Non-visible leak research
- Selective change of network and ramifications.
 Non physical losses
- Replacement of inaccuracy water meters
- Expand personnel who work on anti-fraud Actions
- Fraud prevention
- Control of inactive connections



3. Water supply service standards





3. Water supply service standards

3-3. Any Monitoring by Performance Indicators (PI)

Water and Sewage Volume
Water 2011 - By Region

Region*	Total
Metropolitan Region	1,150.6
Regional**	596.8
Wholesale	297.3
Reused Water	0.3
Total	2,045.0

^{*} volume of water billed by region (m³ million)

Operating Revenues 2011	Total
Water supply - retail	4,294.0
Water supply - wholesale	203.5
Sewage collection and treatment	3,615.7
Sewage - Wholesale	21.1
Other services rendered	1,066.0
Sewage collection and treatment - wholesale	1,158.6
Construction revenue	170.7
Total	10,529.6

^{**} composed by Interior and Coastal region



3. Water s

3-3. Any Monitoring by Pe

Teste 1: Panel of Indicators

Indicators	Units	2010	2009	2008	2007	2006	2005
Customer Service							
Water Service Rates			Ī	end to univer	sal service (f)		
Savage collection service rate	94	81	90	79	70	78	7a
Collected sawage treatment ratio	%	75	74	72	66	63	61
Resident population served by water supply	thed. inh.	23,025	23,363	23,162	22,960	22,700	22,5/0
Resident population served by sewage collection	thed inh	20,024	19,600	10,108	18,881	18,519	18,326
Number of cities with universal service (2)	un	141	125	110	108	104	
Positive customer satisfaction perception.	%	89	76	80	78		
Operational					- 10		
Water connections	thousands	7,295	7,118	6,945	6,767	6,600	6,489
Sawage corrections	thousands	5,718	5,520	5,336	5,167	5,002	4,878
Weter system extension (4)	km	05,379	63,732	62,582	62,318	61,469	57,900
Sawaga system adonaton (4)	km	44,279	42,806	41,312	40,608	39,126	37,181
WTP - Water Treatment Plant	un	213	206	206	108	107	201
STP - Sawaga Treatment Plants	un	480	475	464	461	446	440
Water loss	%	20	26	27.9	20.5	31.0	32.4
Water loss per connection	litors / (conn. vs. day)	403	402	436	467	511	620
Water matering ratio (5)	%	99.97	99.97	00.08	00,08	99.97	99.97
Produced water volume	million mil	2,853	2,845	2,853	2874	2,887	2,830
Ratel water micro matered volume	millered	1,514	1,444	1,404	1,302	1,363	1,313
Bulkweter volume billed	millerenis	293	288	285	274	263	250
Ratsil water volume billed	miles mil	1,099	1,630	1,506	1,573	1,544	1,500
Sawaga voluma billad	milion mil	1,434	1,373	1,330	1,300	1,246	1,198
Number of employees (6)		15,330	15,103	16,640	16,850	16,978	17,448
Operating productivity	connu/ employee	849	837	738	708	684	651

4. Management of water supply service on a self-supporting basis

4-1. Current situation and major challenges/problems

- Implement: a companywide Model of Management Excellence; ISO 31000 on Risk Management, and ISO 26000 on Social Responsibility/Sustainability;
- Develop channels that permit using our activities as a benchmark, which is already being done. In 2010, we conducted a total of 17 visits to several entities that use Sabesp as a benchmark for their actions;
- Promote the continuous improvement of operating and administrative processes (implement the system in all our Business Units and set corporate goals based on the GVA metric.) and/or activities;
- Continuously promote a quality, safety, and environmental preservation culture by offering consulting opportunities.

Table 2: Goals and Achievements

Indicators	Unit	Goal	Achieved
Water supply service rate		Tends to un	iversal service
Number of new water connections	thou un	148.5	189.4
Sewage Collection Service Rate	96	81,2	91,1
Number of new sewage connections	thou un	180,0	233.5
Collected sewage treatment rate	96	75.3	75.5
Revenue loss rate	96	25.0	26.0
Metering loss rate	liters / conn. x day	378.0	403.0
Customer satisfaction rate	96	80,0	89.0
Complaint with PROCON	Complaint/millions of customers	2.3	2,1
Maximum number of occupational accidents (1)	un	120.0	149.0 (2)
EESTDA Margin	96	42.0(5)	42.9(5)
Increase in billed sales volume	million m²	3,3169	3,426.6
ISO 14001 certified units	un	65.0	50.0 (3)
Investments (4)	billion P\$	1.8	1.6

⁽¹⁾ Does not include commuting accidents and accidents without leave of absence.

⁽²⁾ Refers to occupational accidents in the Business Units of the Metropolitan and Regional Systems Departments. If was set because of the 2010 Profit Sharing Plan.

⁽³⁾ The SGA (environmental management system) was implemented in the 65 units.

⁽⁴⁾ Amounts from the base financial budget. Does not include the PPP, the arrangement with the City of São Paulo and lease of assets.

⁽⁵⁾ Disrogarding CPGs and IFR8s



Water Supply Administration for Better Management of Water Supply Services

6. Expectation for the Japanese private companies

Looking for new possibilities to improve my knowledge and apply in my routine, to get solutions to the challenges of our process.



THANK YOU

SUZUKI, FERNANDO MITIO



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

Egypt

presentation

COUNTRY REPORT

COUNTRY

ORGANIZATION

MINISTRY

: EGYPT

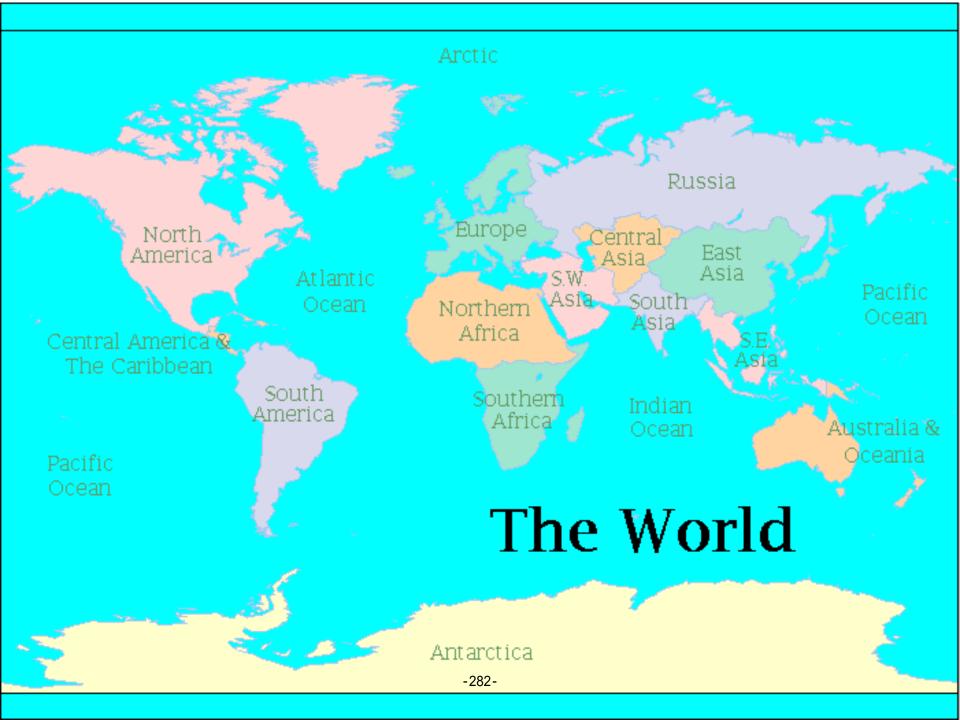
: *N.O.P.W.A.S.D.*

: MINISTRY OF HOUSING,

UTILITIES AND NEW COMMUNITIES

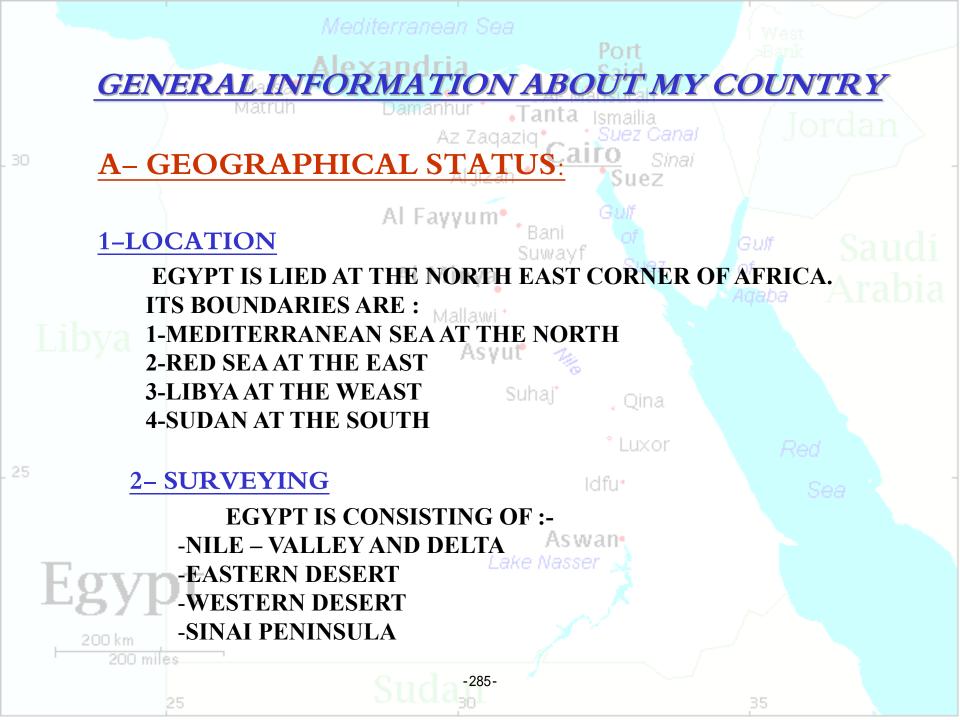
• PROFESSION : ARCHITECT

• PRESENT POSITION: Assistant head of central of north execution department











B-HISTORY INFORMATION:

- PHARAONIC ERA
- COPTIC ERA
- ISLAMIC ERA
- MODERN ERA







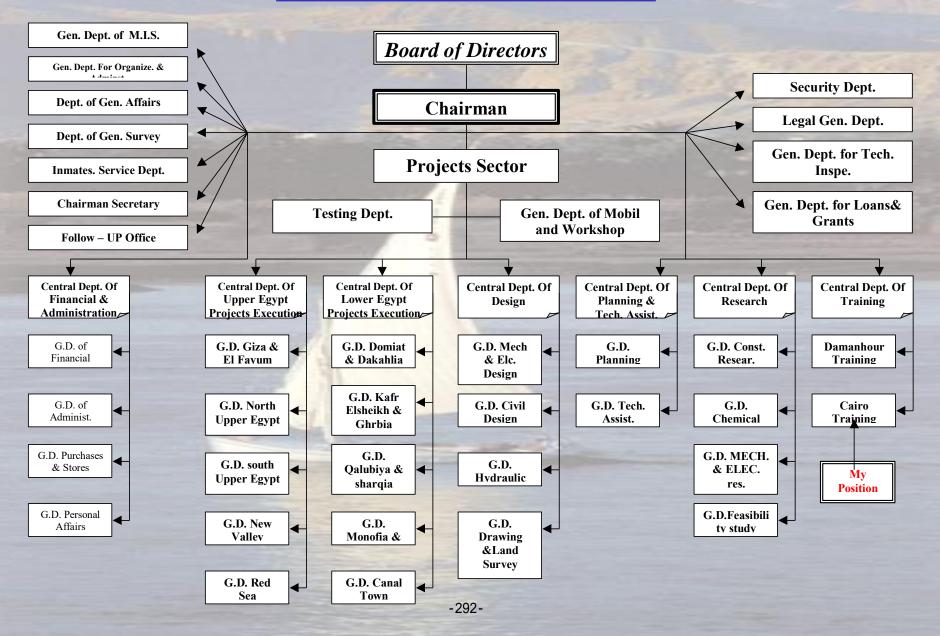
MY ORGANIZATION

N.O.P.W.A.S.D

NATIONAL ORGANIZATION FOR PORTABLE WATER AND SANITARY DRAINAGE

MINISTRY OF HOUSING, UTILITIES AND NEW COMMUNITIES

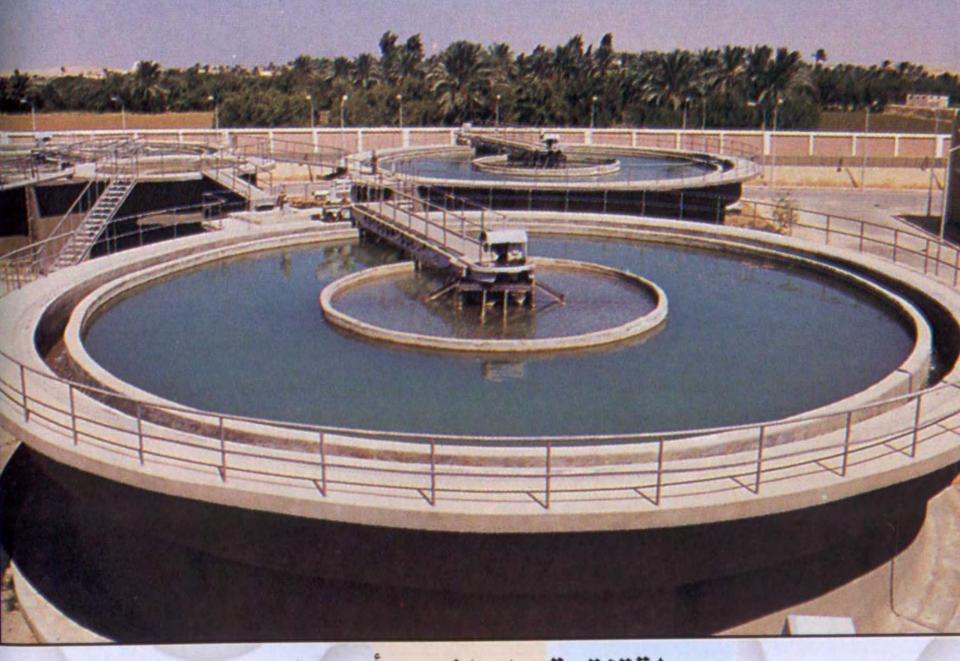
ORGANAIZATION CHART



THE DESCRIPTION OF N.O.P.W.A.S.D. WORKS

- •SET POLICES AND PLANS FOR WATER AND WASTE WATER ACTIVATES ON THE NATIONAL LEVEL.
- •DESIGNING AND SUPERVISING BIG PROJECT OF WATER & WASTE WATER.
- •TRAINING TECHNICAL STAFF TO PERFORM OPERATION AND MAINTENANCE OF WATER & WASTE WATER FACILITY.
- •PERFORMING RESEARCH AND APPLIED STUDIES RELEVANT TO WATER & WASTE WATER.
- •PROVISION OF CONSULTATION SERVICES IN DESIGN, MANAGEMENT, TRAINING AND TESTING IN FILD OF WATER AND WASTE WATER.





محطة تنقية مياه الشرب بأسيوط

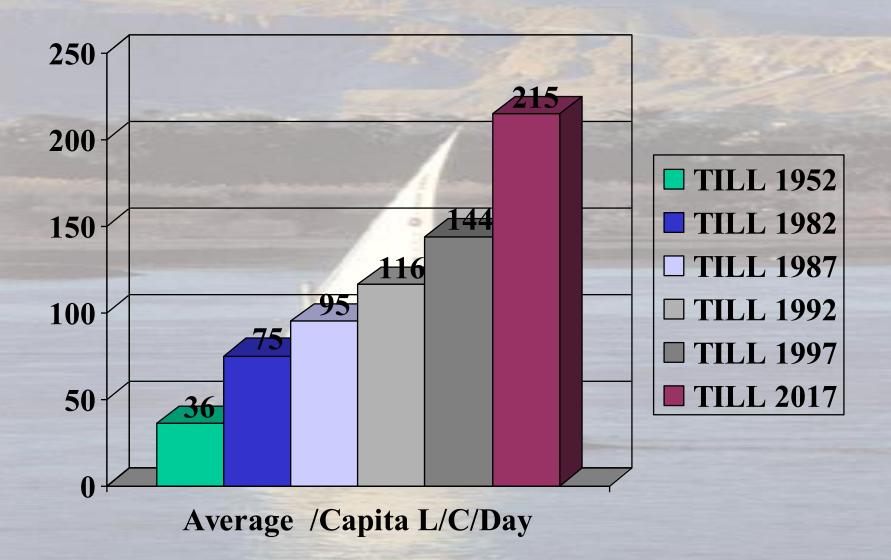
WATER IN EGYPT

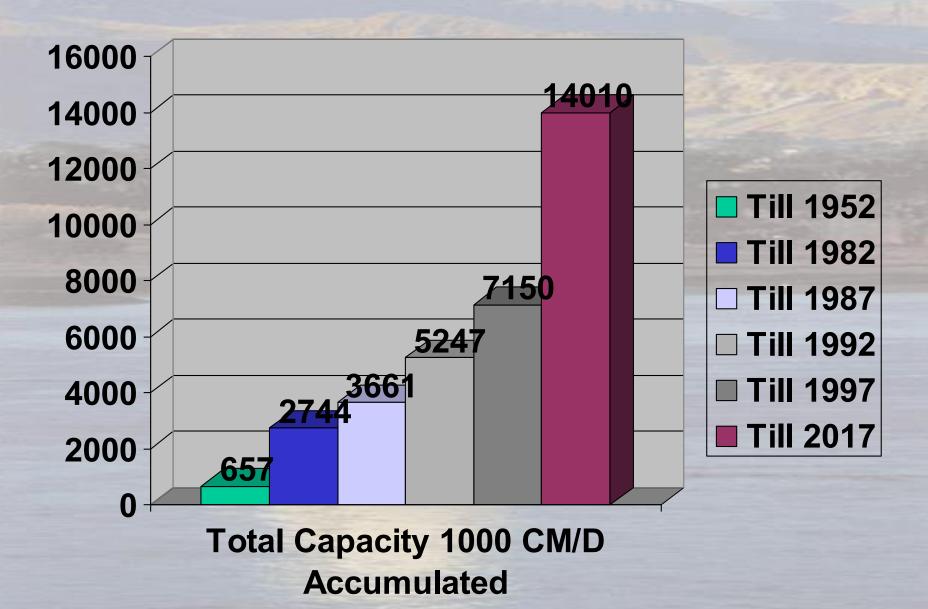
WATER RESOURCES IN EGYPT:

- THE MAIN SOURCE FOR WATER
 SUPPLY IN EGYPT IS NILE RIVER ARE
 ABOUT 85% FROM THE SOURCES
- THE WELLS IN THE DELTA & NEW VALLEY AND SINAI ARE ABOUT 15 % FROM THE SOURCES
- THE AVERAGE RAIN FALL OVER WHOLE EGYPT IS ONLY 10 MM/YEAR

N.O.P.W.S.D. PROGRESS IN WATER SECTOR

Item Period	No. of Executed Projects Accumulated	Total Capacity 1000M³/DAY Accumulated	Average /Capita L/C/Day	Total Investment Million EL.
Till 1952	39	657	36	22
Till 1982	126	2744	75	263
Till 1987	262	3661	95	561
Till 1992	575	5247	116	1851
Till 1997	947	7150	144	5944
Till 2017	1223	14010	215	13764





A SAMPLE -301-

FACOUS CITY

•TOTAL POPULATION : 1.5 MILLION

•POPULATION SERVED: 1.125 MILLION

•SERVICE RATIO : 75%

•SERVICE HOURS : 24 H/DAY

•WATER CAPACITY : 200000 M³/DAY

• UNACCOUNTED WATER: 25%

WATER DISTRIBUTION SYSTEM:

• TYPE OF PIPE : UPVC, CAST IRON, STEEL.

• TYPE OFJOINT : SOCKET-SPIGAT, FLANGED, WELDING.

•DISTRIBUTION SYSTEM : PUMPING-UP SYSTEM

• TYPE OF HOUSE CONNECTION PIPE : UPVC.

• TYPE OF HOUSE JOINT : SOCKET-SPIGAT.

WATER SUPPLY SYSTEM FOR HOUSE CONNECTION:

- DIRECT PRESSURE SYSTEM

- WATER TANK SYSTEM

• TYPE FLOWMETER: VENTURI, MAGNATIC, TURBINE METER.

LEAKAGE CONTROL:

- •THE SECTION IN CHARGE OF LEAKAGE CONTROL:

 NETWORK OPERATION& MAINTENANCE DEPT.
- •LEAKAGE REPAIR WORK SYSTEM:
 - -DETECTION THE PLACE OF LEAKAGE.
 - -REPAIR THE DEFECT PART IF IT POSSIBLE OR REPLACE IT WITH NEW PART.
- •LEAKAGE DETECTION WORK SYSTEM:
 - -NIGHT FLOW TEST.
 - -ULTRA SOUND DETECTION.
 - -MANUAL.

PROBLEMS CURRENTLY FACED:

- OLD NETWORK
- CRAKS IN THE PIPES AND FITTINGS
- CORROSION IN MITAL PIPES AND FITTINGS
- UNACCOUND WATER

(PUBLIC BUILDINGS, RANDOUM HOUSING AREAS, UN WORKED WATER METERS,.....Etc.)

THANK YOU FOR YOUR ATTENTION

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

Egypt

Water Supply Administration for Better Management of Water Supply Services (B)

18 Nov – 1 Dec 2012 Country Report Outline Format

1. Country: Egypt, kafr Elshikh gov.

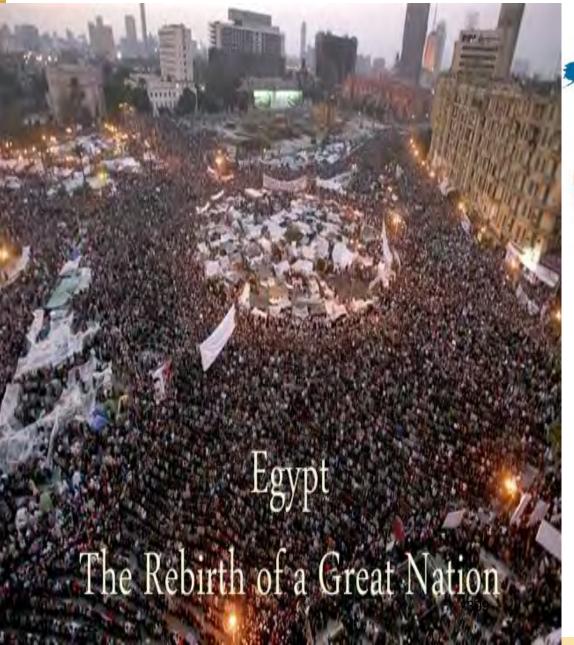
3. Position: Engineer in Master plan unit

4. Organization: kafr Elshikh water and wastewater

-308-

company (kwwc).

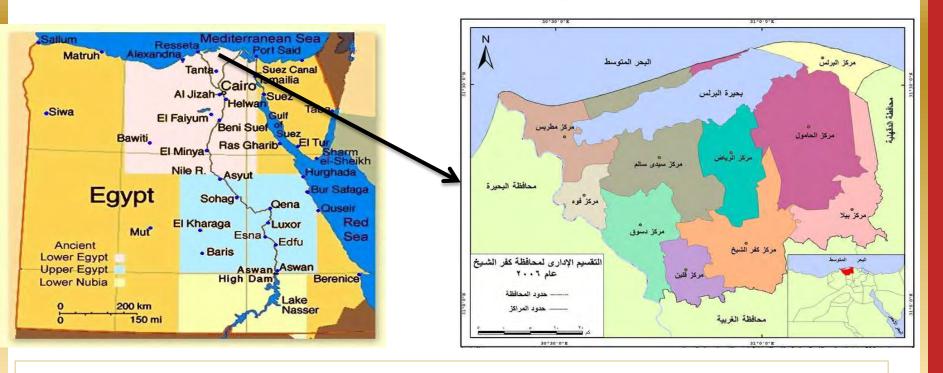
General Country profile : Background







General Country profile: Background



Whole Country:

Area : 1,002,450 km²

Population: 91 million Habitants

Coverage Water Supply: 83 %

Selected Water Supply System / City:

Service Area: 3467 km²

Population Served: 2955885 Habitants (except some small communities which served irregular

My Mission (sharing among participating friends)

- Mission of my organization is Manage all about water and waste water systems in Kafr Elshikh governorate, efforts to supply every citizens with water and waste water services.
- My mission in the organization is
 Water and waste water Projects planning locate future plans
 surround knowledge of the current WTPs and WWTPs in the governorate
- My actual job to achieve the mission is
 Review master plan submitted by the engineering consultant Review replacement and renovation plans Identify priority projects
 Database for WTPs and WWTPs in the governorate Studies of villages deprived of sanitation service Communicate with the local units and citizens' complaints
 Water balance studies

1. Management of water quality

current situation:

- total Capacity of production systems: 1041120 m3 / day
- Volume of water produced by the Utility: 251 million m3 / year
- 19 surface water plant with capacity (19000 129000 m3 / day)
- 40 small water plant with capacity less than 17000 m3 / day





2. Reduction of non-revenue water 1 (Present Situation)

 Constitution of Non-revenue Water (If you have the data, please fill in the table)

System input volume = 251 million m3 / year	Authorized consumption = approx 150 million m3 / year	Revenue water	Billed authorized consumption	(60 %)
			Unbilled authorized consumption (ex. fire fighting, cleaning)	(40 %)
	Water losses = approx 100 million m3 / year	Non Revenue Water (NRW)	Apparent losses (Unauthorized consumption (i.e. Illegal use), Customer metering inaccuracies) Real losses -313- (Leakage)	We have weak leakage measure department

2. Reduction of non-revenue water 2

- Old pipes .
- Leakage measure equipments .
- No Qualified workers .
- Maintenance .
- Illegal connections (non technical)

3 - May or recent achievement in improvement of water supply services / management

- The foundations of Achievement
- Measuring Achievement.
- Aiming high, trying hard
- Government's Failures
- Differences of opinion.



3 - May or recent achievement in improvement of water supply services / management

- The foundations of Achievement
- Measuring Achievement.
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Water Supply Administration For Better Management of Water Supply Services Course (B)

India





Country Report on Management of Urban Water Supply Services in Odisha, India



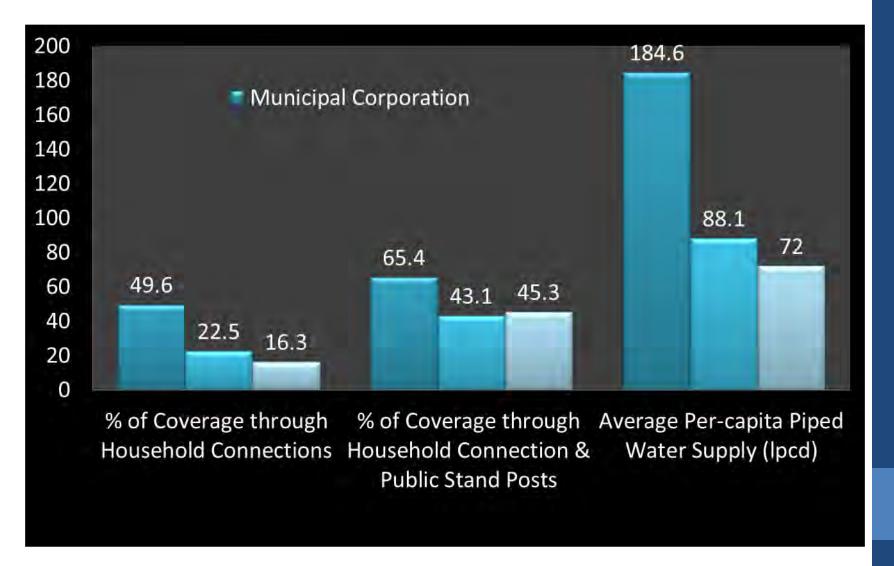
_{By} Bikash Chandra Mohapatra

Project Director-cum-Joint Secretary Housing & Urban Development Department Government of Odisha, India

Outline

- Status of Urban Water Supply in Odisha
- Management of water quality
- Reduction of non-revenue water
- Water supply service standards
- Management of water supply service on a selfsupporting basis
- Major recent achievements in improvement of water supply services/ management
- Expectation for the Japanese private companies

Status of Urban Water Supply in Odisha



Management of Water Quality

Water Resources and its Quality

- Although, India is endowed with reach sweet water sources, over the years, water quantity is reduced & quality deteriorated.
- A major challenge is collection and treatment of waste water in urban centres to check pollution of ground & surface water.

Actions Taken for Prevention of Pollution of Water Sources

- Sewerage projects in Bhubaneswar, Cuttack & Puri are executed with funding from JnNURM, JICA (Japan) and NRCD; & for some other cities in pipeline.
- Groundwater supply in the urban areas is treated to maintain residual chlorine concentration at the consumer end.

Framework for Monitoring of Water Quality

- As part of the monitoring protocol, water quality is monitored at various level.
- The drinking water quality is verified with Bureau of Indian Standard, IS: 10500/1991.

Reduction of Non-Revenue Water (NRW)

Contributing Factors for NRW and its Status

- High NRW is evident in most cities and towns of the State.
- Average NRW in Odisha is 45% against the national benchmark of reducing it to 20%.
- Accurate estimation of physical & commercial loss of water is not there.
- Household metering to measure water consumption by a particular consumer is not there.
- Revenue for water consumption through Public Stand Posts are not fully recovered.

Actions to Reduce NRW

- Prevention of physical loss such as leakages due to breaks in pipelines & lack of proper maintenance of WS systems.
- The Public Health Engineering Organization is developing a metering strategy for domestic household consumers.
- Installation of bulk flow meter are planned in all urban WS systems by 2015, as part of "Information System Improvement Programme".
- Household survey is conducted in Bhubaneswar to asses water demand, locate source & detect illegal connections.

Water Supply Service Standards

Current Situation and Challenges

- Govt. of India has adopted Service Level Benchmarking (SLB) for improving water supply service.
- ◆For the first time, measurement of performance is done through quantification on 9 pperformance indicators.
- The main challenge found during implementation of SLB for last 2 years is low reliability of the quality of data generated.
- Despite limitations, SLB has been implemented & the annual performance of municipal water supply systems have been reported & notified in the State Gazette.
- Improving the data quality is being taken up by implementation of "Information System Improvement Programme."

Water Supply Service Standard in Odisha as per National Service Level Benchmark

Dorformanco Indicators (DIs)	Category of ULBs			National
Performance Indicators (PIs)		M	NAC	National Benchmark
Household Coverage with piped w/s (%)	49.6	22.5	16.3	100
Per Capita Supply of Water (%)	184.6	88.1	72.0	135
Metering (%)	0.4	0.1	0.0	100
Non-Revenue Water (%)	43.9	36.9	49.9	20
Continuity of Water Supply (Hrs)	2.3	3.1	2.8	24
Quality of Water (%)	99.2	93.9	84.2	100
Redressal of customer complaints (%)	88.0	82.3	87.1	80
O&M Cost Recovery (%)	45.5	28.1	29.5	100
Efficiency in Collection of revenue (%)	65.5	48.6	48.9	90

Management of Water Supply Service on a Self-Supporting Basis

Current Situation and Challenges

- Average O&M cost recovery across ULBs is only 30%, which is heavily subsidized by the State Govt.
- Financial sustainability is high because of NRW, low consumer base and low water tariff.
- Lack of household metering & Public Stand Posts cause significant loss of revenue.

Current Actions against the Problem

- Proposal to revise current water tariff for domestic, commercial, institutional and industrial consumers is under consideration.
- Metering of domestic water supply has been proposed.

Current Action against Renewal and Aging of Facilities

- Replacement of old water pumps and distribution lines in a phase manner is undertaken.
- Old rising mains are replaced as part of capacity expansion.

Major Recent Achievement in Improvement of Water Supply Services/ Management

- The state Govt. is implementing a scheme for universal access to water supply by the urban poor known as "Piyush".
- The connection charge has been reduced by 80% i.e. Rs. 500/- payable in 5 instalments of Rs. 100 only and the monthly tariff has been reduced to Rs. 30/- only.
- There is a proposal for waiver of record of rights (RoR) of land for water supply connection to the urban poor.



Improvement Plan

- Overall Goal: Universal Access to drinking water service at most affordable price
- Purpose of the plan: Safe Drinking Water to All

No.	Activity	Resourc e	Respon sibility	Time line	Estim ated cost in Million \$	Expected Outcome	OVIs
1	Piped water supply to uncovered areas of BMC for 100% coverage involving enhancement of source and treatment plant capacity.	Training & Funding from Japanese side	Chief Engineer, PHEO, Odisha	2018	5.00	100% coverage of pipe network Improved Revenue Base	Coverage Cost recovery
2	Provision for 24X7 W/S involving Network Modelling, Zoning of Service Areas with provision of Zone Bulk Flow Meters, Source Flow Meters and User End Meters	Training & Funding from Japanese side	Chief Engineer, PHEO, Odisha	-327-	6.00	Reduction of NRW to less than 20% Better monitoring of pressure & flow in distribution system Reduced O&M cost Improved Cost Recovery	NRW Cost recovery Coverage Extent of Metering Continuity in Water Supply

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

Mongolia

Water Supply & Sewerage Authority Central Waste Water Treatment Plant

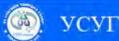
WATER SUPPLY WORKS IN ULAANBAATAR CITY





Brief introduction of UB city





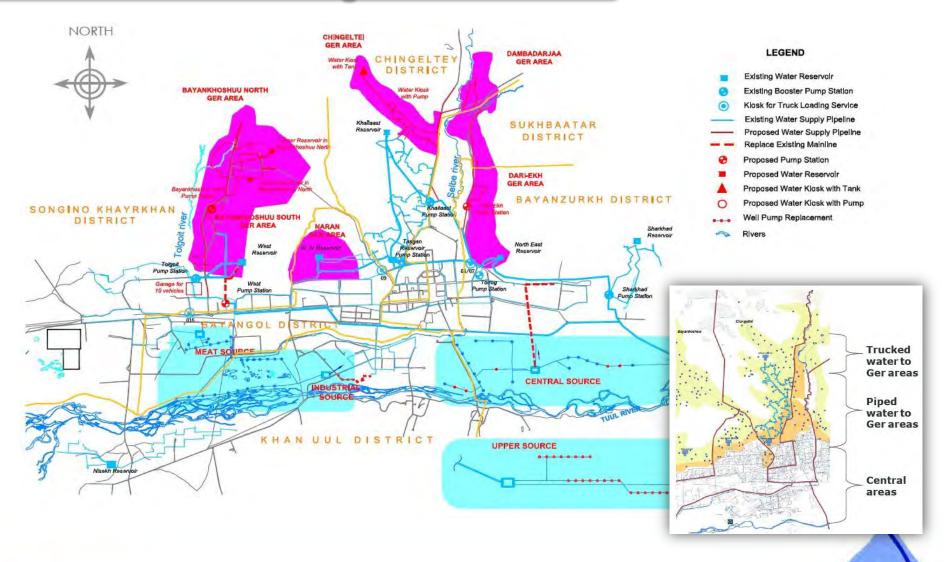
Water Supply Administration for Better Management of Water supply Services (JFY 2012) Country Report Outline

1. Organization and main tasks

Water Supply and Sewerage Authority of Ulaanbaatar "WSSA" city is state enterprise established in 1959 under the Municipality of Ulaanbaatar. It is responsible for water supply and sewerage for city residents and all other consumers.

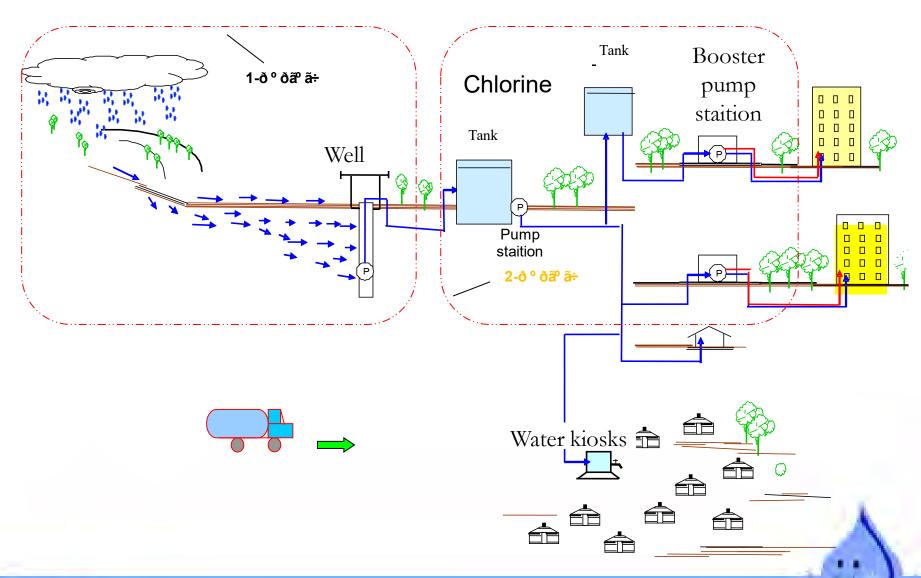
"WSSA" had been expanded in 1963,1964,1973,1974, 1978,1985, 1989 according to population growth and master plan of Ulaanbaatar city hence "WSSA" has 175 wells in the 4 water sources, 4 boosting stations, 446.6 km water distribution pipes, 154 km sewage discharging pipes, with daily capacity of the production 158,000 m³ water, in total 1940 m³ of water a day partly supplied to the "ger"area dwellers by tanker truck through the 442 kiosks, and collecting about 170,000 m³ waste water after the biological treatment is discharged to the river "Tuul". WSSA has 6 Departments, 6 Divisions and Project implementation unit. The number of employee is 1400.

1.2 Network of water supply and sewerage





System of water supply



Management of water guality

Current situation and major

Potable water quality

- Take samples from borehole, pipeline, customers, kiosks in ger area and carry out 71 chemical, bacteriological tests in accordance with MNS 900-2005 standard which is revised basing on 3rd guideline for potable water by the WHO
- Distribute potable water in Ulaanbaatar city that meet standard requirements completely.
- ❖Increasing numbers 7 research features and making a development for the industrial interior control quality. (shown 61 from 81 features)







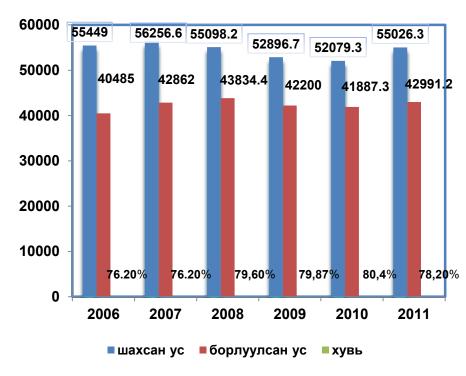
Water Safety Plan

- lodule 1. Assemble the WSP team
 - lîdule2. Describe the water supply sytem
 - lidule 3. Idenfity hazards and hazardous events and assess the risks
 - lîdule 4. Determine and validate control measures, reassess and prioritize the risks
 - lîdule 5. Develop, implement and maintain an improvement/upgrade plan
 - idule 6. Define monitoring of the control measures
 - lîdule 7. Verify the effectiveness of the WSP
 - lîdule 8. Prepare management procedures
 - idule 9. Develop supporting programmes
 - lîdule 10. Plan and carry out periodic review of the WSP
 - lîdule 11. Revise the WSP following an incident

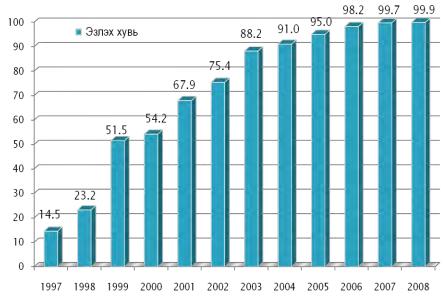


Reduction of non-revenue water

Ratio of pumped and sold water



Situation on metered customers



25000 water meters are necessary for metering customers in apartment buildings and 7 billons MNT are needed for investment.





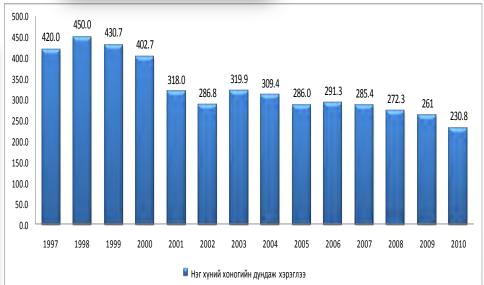




Water consumption by ger area dweller per person/day (I/day)











Water supply service standards

Location (figures), capacity of water intake facilities

| Water Source | Capacity м³/day | Produced,
м³/day |
|-----------------------------|------------------------|---------------------|
| "Central" Source | 114000 | 66000-77000 |
| "Industrial district"Source | 36000 | 24000-27000 |
| Meat factory Source | 15000 | 13000-14000 |
| Upper source | 90000 | 47000-49000 |
| Total | 255000 | 150000-160000 |



Produced m³/day



since 1999, we have been evaluated with 53 indicators of the performance & make analysis every year



Grand Fund and Technical Assistance from Japan

1993-1995:

"Master plan for Ulaanbaatar city water supply". A study team worked

1996-1999:

"The Emergency Rehabilitation of Water Supply Facilities in Ulaanbaatar City"

1999 îí:

JICA granted pipeline leakage detection tool and it became possible to identify location of underground cable and pipeline.

2005-2007:

"Improvement of water supply facilities for Ulaanbaatar city"

2009-08-04:

"New water resource in Gachuurt"

RESULT:

- Developed a Master Plan to improve water supply for Ulaanbaatar city in 3 stages
- Chlorinating facility at the Central source was renovated /1996/ and use of chlorine reduced by 50%, meters were installed at 56 Water and Heat Distribution Centers and in the result started to bill basing on metering. 60% of equipment were renovated and capacity increased by 20%, became possible to have remote control for borehole operation and energy consumption was reduced by 15-20%.
- US\$ 21 million
- A team started to work for detecting water leakage
- Pipeline water loss is 10%, and 50% of unaccounted water /1997/ was reduced to 21% and water consumption per person/day was reduced from 450-500l/day to 279 l/day
- 80 percent of Upper Source equipment was renovated, its capacity was increased by 20% and it became possible to control operation of new16 boreholes. /US\$ 14 million/
- A study team is working.









Central Source

•New borehole: -20;

•Yield improvement:-11;

•Bore pumps- 55;

•Assembled, installed:- 35;

•Transformer -12;

•Telemetry:-93;

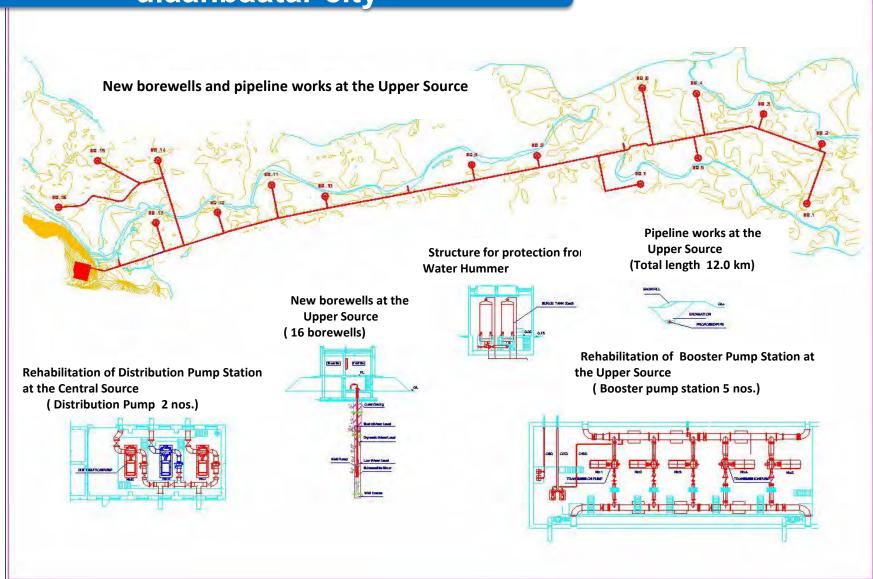
•2nd booster:- 5;

•Pipeline - 5 km;

•Flow meter: 10;



Water supply improvement project for ulaanbaatar city





Upper Source

•New boreholes: -16;

•Diaphragm:-2;

•Telemetry: -16;

•2nd booster pump: - 5;

•In the central source: -2 íàñîñ;

•Pipeline:- 12 km;

Training and technical assistance





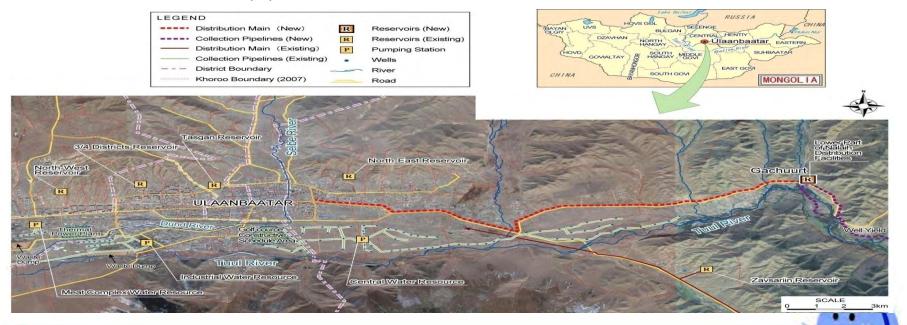




Gachuurt source project to improve water supply of Ulaanbaatar city

- With the grant fund of Japanese Government, CTI International company made preliminary study on Gachuurt wellfield and got approval on source.
- Detailed study will start in July, 2011.
- Will be implemented between 2011-2014
- Estimation cost 40,777,700 USD
- Components of project:
 - 21 borehole
 - 19 km water supply pipe6000m3 reservoir

 - Disinfection equipment





Thank you for your attention







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

Pakistan



IN THE NAME OF ALLAH THE MOST BENEFICENT & MOST MERCIFUL



KARACHI WATER & SEWERAGE BOARD

FACTS & FIGURES OF KW&SB



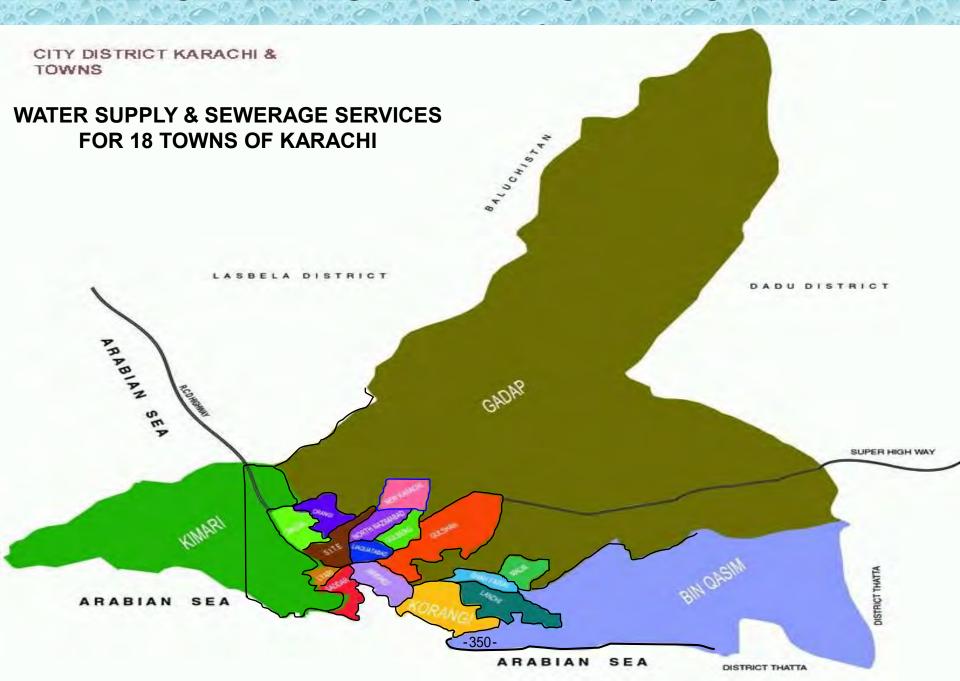




MAJOR FUNCTIONS OF KW&SB

- KW&SB was created under KW&SB Act-1996 repealing SLGO-1983 (amend)
- KW&SB is now part of CDGK as 15th Department under devolution
- Section-07 of Chapter-V of KW&SB, Act 1996 describes following Major Functions of KW&SB:-
 - Undertake Bulk Production, Filtration / Treatment Transmission and Retail Distribution purifying of Water
 - Under take Collection, Pumping, Treatment & Disposal of Sewage & Industrial Waste
 - Billing and Collection of Water & Sewerage Charges

MAP OF KARACHI DISTRICT INDICATING 18



MANPOWER STATUS

Total Strength

8274

Upto BS-16

$$BS-17 - BS-20 = 331$$

Officer : Staff

1 : 24

Technical

223 8274

8051

Supporting Staff

Technical

: Support Staff

1 -351-

360

TOTAL QUANTUM OF SERVICE TO MANAGE AND LOOK AFTER

- OVER 150 PUMPING STATIONS
- 25 BULK RESERVOIRS ON INSTALLATIONS
- OVER 10,000 KM OF PIPE LINES
- OVER 1072 MILLION GALLONS OF FLUID
- BILLING AND RECOVERY OF 1.4 MILLION ESTABLISHMENT / CONSUMERS
- OVER 400,000 VALVES
- OVER 250,000 MANHOLES
- OVER 3,600 SQ. KMS OF AREA & 21 MILLION population in KARACHI.

WATER SUPPLY

POPULATION (2012)
 21 MILLION

MAXIMUM WATER DEMAND
 864 MGD

AVAILABLE SUPPLY
 650 MGD

> INDUS SOURCE

| | Greater Karachi | 300 MGD |
|------|--|---------|
| 00/4 | Haleiji System | 30 MGD |
| - | K-II A A A A A A A A A A A A A A A A A A | 120 MGD |
| - | K-III | 100 MGD |
| 170 | HUB DAM | 80 MGD |
| | DUMLOTTEE WELLS | 20 MGD |

TOTAL : 650 MGD

• WATER LOSSES (30%) (-) 195 MGD Net supply (after accounting for Leakages) 455 MGD

Existing Water Filtration Facilities

 At present a total of 640 MGD of water is being supplied to the city of Karachi (except Steel Mills & PQA) out of which 435 MGD is being filtered at:-

| • COD Filter Plants (70 + 40) | 110 MGD |
|--|----------|
| Pipri (New) Filter Plant | 50 MGD |
| Pipri (Old) Filter Plants (25 + 25) | 50 MGD |
| NEK (Old) Filter plant | 25 MGD |
| NEK (New) Filter Plant | 100 MGD |
| Hub Filter Plant | 80 MGD |
| Gharo Filter Plants (10 + 10) | 20 MGD |
| TOTAL: | 435 MGD |
| | 60 N. N. |
| GAP water supply & filtration capacity | 205 MGD |
| Proposed 02 Filter Plants at COD & NEK | 185 MGD |
| GAP | 20 MGD |

Sewage Generation & Treatment

Bulk water generation

650 mgd

Sewage generated (at 60% of 650 mgd)

390 mgd

| Description | TP-I | TP-II | TP-III | TOTAL |
|--------------------------------|--------|--------|--------|---------|
| Treatment Capacity | 51 mgd | 46 mgd | 54 mgd | 151 mgd |
| Present Treatment | 25 mgd | 30 mgd | 35 mgd | 90 mgd |
| Deficiency in Optimal Capacity | 26 mgd | 16 mgd | 19 mgd | 61 mgd |

Shortfall in Treatment Capacity 390 – 151

= 239 mgd

Proposed Sew. TP-4(under S-III Project) under GOP = 100 mgd

-355-

Number of Water Supply Connections

| Total Number of Water Supply Connections | 1,035,910 |
|---|-----------|
| Residential | 928,483 |
| Bulk / Industrial / Commercial / Government | 21,000 |
| Others | 86,427 |
| -356- | |

Projects by Technical Assistance of WSP-SA, World Bank

Institutional Reforms

Restructuring

- Reorganization of KW&SB in 4 zones (other than Bulk Water Wing & Bulk (E&M) Wing.
- A unified organization setup at town level compatible to the devolution upto TMA.

Civil Society Liaison Cell

 Civil Society Liaison Cell established in KW&SB to interact with NGOs

Revenue Management

- Bills production system out sourced
- Reconciliation Revenue collection data management under City Bank
- Revenue shift devaluated with service providing engineer
- Revenue department shifted the Head Office for close liaison at 9th Mile Karsaz
- Establish Customer Services Centre at 9th Mile Karsaz fully computerized with staff form 9.00 AM to 9.00 PM in additional to Complaint Centre in office of 04 Zonal Chief Engineers and SEs in 18 Towns.

KW&SB's Strategy

- Improved delivery of water & sewerage services to 21 million citizens of Karachi
- Environment friendly initiatives
- Emphasis on public-private partnership
- Transforming KW&SB into sustainable institution
- Access to technology and automation

DEVELOPMENT PROJECTS

- KW&SB CARRYING FOLLOWING DEVELOPMENTS:-
 - Own Resources Funds
 - Town / UCs Development Funds
 - Tameer-e-Karachi
 - Annual Development Program Funds
 - Federally Funded Schemes

SCHEME UNDER PROGRESS

- DEVELOPMENT OF WATER & SEWERAGE INFRASTRUCTURE IN 18 TOWNS OF KARACHI US \$ 9 Million
- DEVELOPMENT OF WATER & SEWERAGE INFRASTRUCTURE IN INDUSTRIAL ZONES

US \$ 23.87 Million

- Korangi Industrial Area
- Landhi Industrial Area
- Federal B Industrial Area
- North Karachi Industrial Area
- > DEVELOPMENT OF INFRASTRUCTURE OF BULK WATER TRANSMISSION NETWORK

US \$ 21.19 Million

- Clifton area Improvement
- Lyari area Improvement
- Orangi area Improvement
- Baldia / Hawksbay area Improvement

Contd.

- MPROVEMENT OF WATER SUPPLY TO OFF SHORE ISLANDS OF KARACHI
- US \$ 2.68 Million

- Bhutta Village Island
- Salehabad





>IMPROVEMENT OF DRAINAGE SYSTEM

US \$ 2.50 Million

- Nahar-e-Khyyam
- Gulshan-e-Iqbal
- Nallah / Drains Cleaning / Disiting

TOTAL

US \$ 59.24 Million

Contd. ENHANCEMENT OF FILTERATION CAPACITY OF DRINKING WATER

➤ PROJECT PREPARED COSTING RS. 3 BILLION FOR ENHANCEMENT OF FILTRATION CAPACITY AT COD FILTRATION PLANT BY 85 MGD, CONSTRUCTION OF NEW FILTER PLANT AT NEK 100 MGD AND ENHANCEMENT OF 15 MGD AT PIPRI FILTER PLANT.

AT PRESENT

- TREATED 450 MGD

UN-TREATED 200 MGD







OLD NEK FILTER PLANT



COD Hills



The Vicious Cycle

Financial Constraints

Greater Reluctance to pay

Downward spiral

Poor Service Quality

Greater Dissatisfaction

Major Problems of Water Supply System

- ➤ Poor conditions of the existing water distribution system.
- Leakages in pipes that increases the water loss by 30%.
- Lack of KW & SB autonomy in the day-to-day operation and management of the services.
- >KW & SB's weak financial capacity.
- Absence of measured supplies and volumetric charging system (imposition of "water tax").
- ➤ Karachi is facing water shortage because of over-grown population & less dams &other storage facilities.

How to over-come the problem?

- > KW & SB should be given more autonomy.
- Water pipelines should be repaired and replace those which are old enough and not suitable.
- ➤ KW & SB should be given more funds so that it could do more work to benefit the people.
- ➤ People should co-operate with KW & SB by giving water tax.
- ➤ Diameter of the pipes should be increased to overcome the demand of the huge population.

ADDITIONAL PROJECTS UNDER PROCESS

Metering Stage-I

 Concept paper of Installation of Meters upon Bulk / Industrial / Commercial water connections.

(submitted to GOS for approval)

PRIVATE SECTOR PARTICIPATION PROJECTS

PROJECTS OF INTEREST IN WATER SUPPLY SECTOR

POWER PLANTS ON BOT BASIS

DHABEJI PUMPING STATION 35 MW

NEK PUMPING STATION 10 MW

HUB PUMPING STATION 10 MW

PIPRI PUMPING STATION 10 MW

























Thank you very much for your attention





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

Paraguay

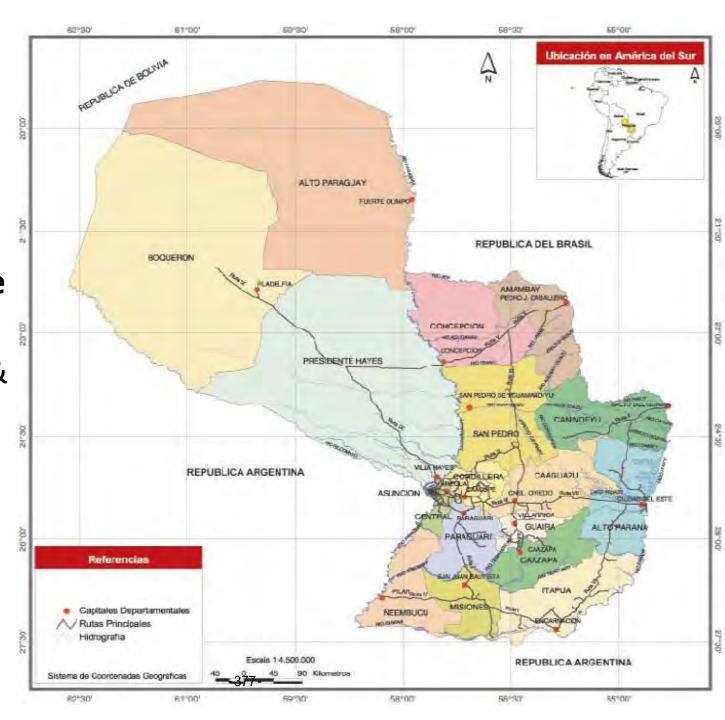
National Leadership in Water and Sanitation Situación del Agua Potable y Saneamiento en Paraguay

World Water Week

Setiembre, 2010

Paraguay, administrative division:

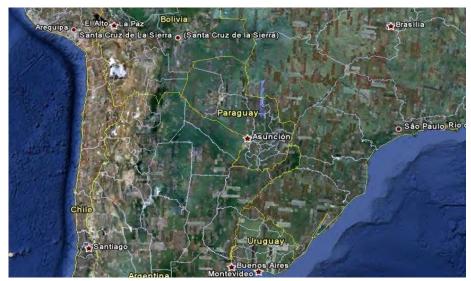
17th Regions & 238
Municipalities



"WATER SECTOR & SANITATION IN PARAGUAY"

THE WATER SUPPLY AND SANITATION SECTOR IN PARAGUAY

-378-



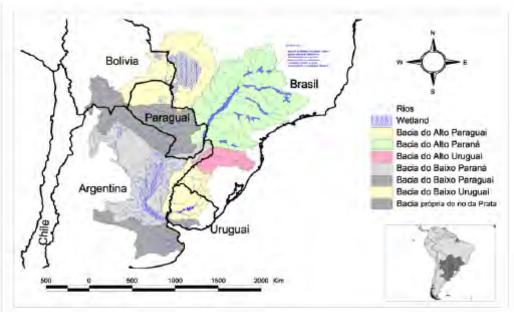


Figura 1 Bacia do rio da Prata e as sub-divisões

CURRENT POPULATION:

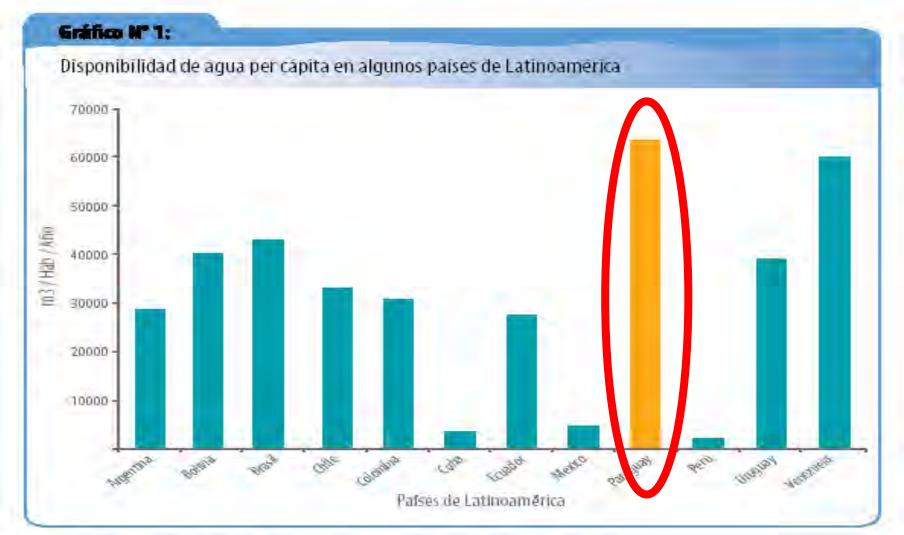
6.300.000 people

COVERAGE LEVELS:

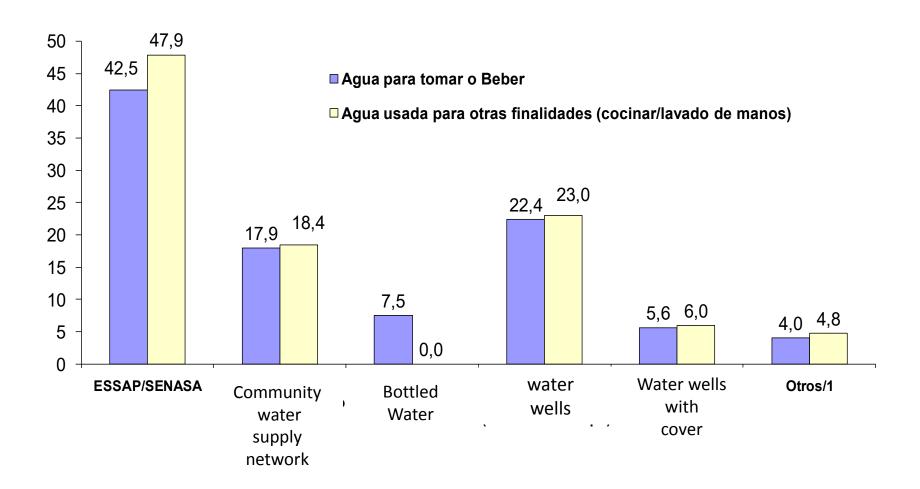
69.3% drinking water network (4.296.000 people)

24% basic sanitation (1.514.000 people)

DISPONIBILIDAD PER CÁPITA DE AGUA EN LATINOAMÉRICA

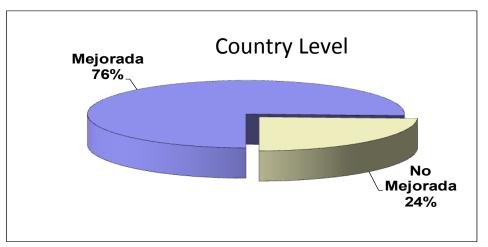


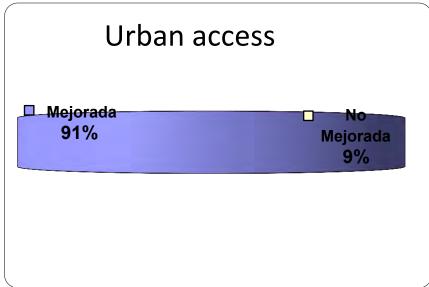
Water Services Coverage

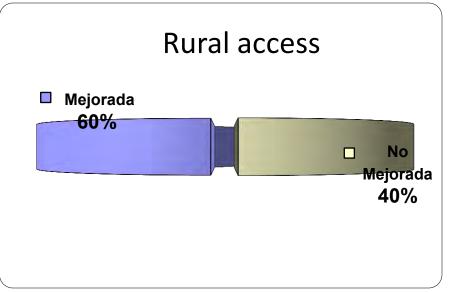


Fuente: National Survery of Water and Sanitation (Encuesta nacional sobre agua potable y saneamiento), DGEEC 2009 -380-

Access to Drinking Water

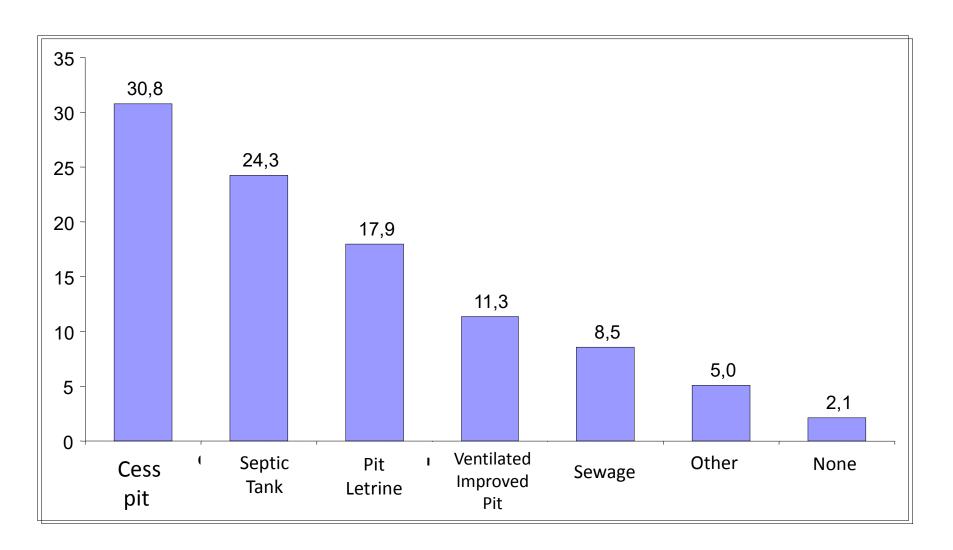






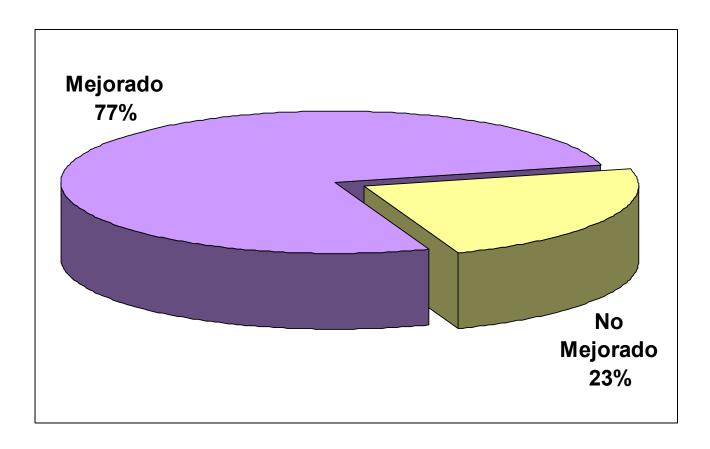
Fuente: National Survery of Water and Sanitation (Encuesta nacional sobre agua potable y saneamiento), DGEEC 2009

Paraguay: type of sanitation disposal



Fuente: Encuesta nacional sobre agua potable, y saneamiento, DGEEC 2009

Paraguay: Sanitation Access



Fuente: Encuesta nacional sobre agua potable y saneamiento, DGEEC 2009

COVERAGE AND MILLENIUM DEVELOPMENT GOALS

| Service Type | Cov | erage | (b) | Present | Additional Population |
|-------------------|-------|-------|-------|------------|-----------------------|
| | 1992 | (a) | Goal | Difference | Adicional |
| | 1332 | 2007 | 2015 | (b) – (a) | to Serve |
| <u>Urban Area</u> | | | | | |
| Improved Water | 57.0% | 83.8% | 83.8% | 0.0% | 546,365 |
| Source | | | | | |
| Basic Sanitation | 14.4% | 14.6% | 57.2% | 42.6% | 1,877,804 |
| Rural Area | | | | | |
| Improved Water | 2.9% | 49.2% | 51.5% | 2.3% | 209,273 |
| Source | | | | | |
| Basic Sanitation | 7.0% | 37.1% | 53.5% | 16.4% | 572,273 |

Fuente: Elaborado en base a información del Censo Nacional de Población 1992, Encuesta Permanente de Hogares 2007 y Proyección de la Población por Sexo y Grupos de Edad, según Áreas Urbana y Rural (2000-2030); DGEEC.

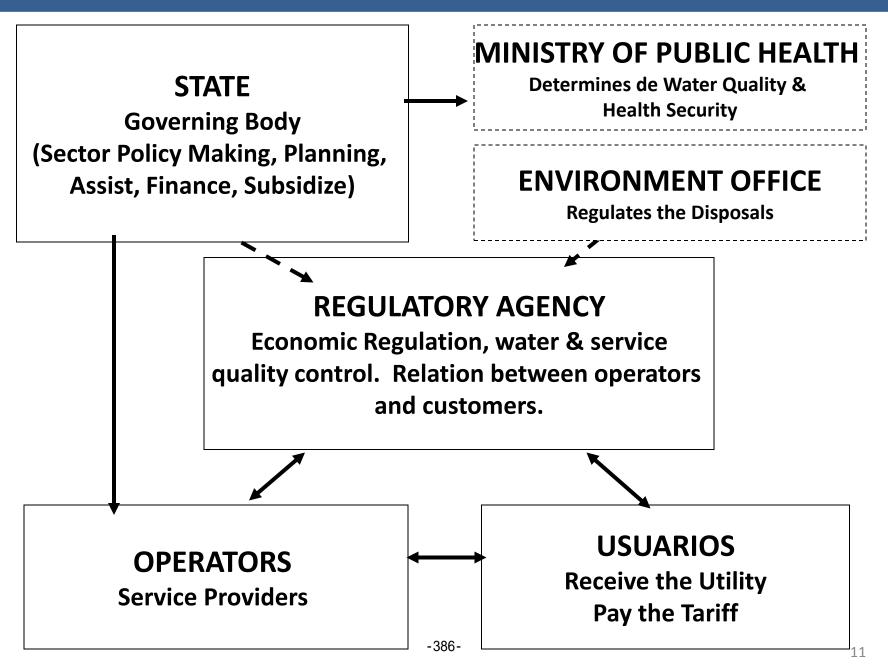
PES-BID. Marzo/Nov. 2009. NOTA TÉCNICA Nº 1354-AÑO 2010

ESTIMATED INVESTMENT TO REACH THE MILLENIUM GOALS

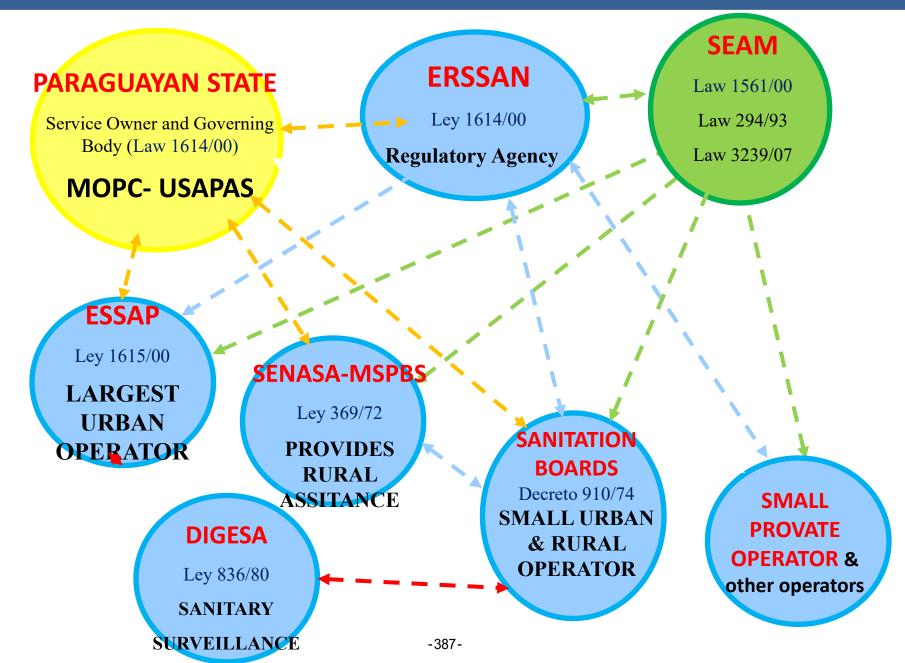
| Tipo de Servicio | Coverage
2007 | | Coverage 2015
(Millenium Goals) | | | Unit Cost
US\$/ | Total
Investme
n |
|--------------------------|------------------|------|------------------------------------|------|-----------|--------------------|------------------------|
| | Población | % | Población | % | to serve | person | US\$
Millones |
| <u>Área Urbana</u> | | | | | | | |
| Improved Water
Source | 2,960,279 | 83.8 | 3,506,645 | 83.8 | 546,365 | 160 | 87.4 |
| Basic Sanitation | 515,753 | 14.6 | 2,393,557 | 57.2 | 1,877,804 | 300 | 563.3 |
| Sub total | | | | | | | 650.8 |
| <u>Área Rural</u> | | | | | | | |
| Improved Water
Source | 1,241,032 | 49.2 | 1,450,306 | 51.5 | 209,273 | 120 | 25.1 |
| Basic Sanitation | 935,819 | 37.1 | 1,508,092 | 53.5 | 572,273 | 100 | 57.2 |
| Sub total | | | | | | | 82.3 |
| TOTAL | | | | | | 733.1 | |

Fuente: PES-BID. Marzo/Nov. 2009. NOTA TÉCNICA Nº 115. AÑO 2010

INSTITUTIONAL FRAMEWORK W&S SECTORS



INSTITUTIONAL FRAMEWORK W&S SECTORS



PRIORITY ASPECTS OF THE SECTORAL POLICY THAT NEED A GOVERNIGN BODY DEFINITION AND CHARACTERIZATION

- SECTOR FINANCIAL SYSTEM
- SUBSIDY SYSTEM
- SERVICE PRICE
- WINDOW FOR FINANCIAL MANAGEMENT
- CONCESSION CONTRACT AND LICENCE CONTRACT FOR PERMISIONARY (SMALL PROVIDERS)

- •STRENGTHENING OF SENASA, A RURAL AGENT OF WATER AND SANITATION OF THE COUNTRY
- •INFORMATION SYSTEM OF THE SECTOR (GIS)
- •SECTOR'S DIRECTOR PLAN SUBDIVIDED BY REGIONS

- Project IDENTIFICATION AND DEFINITION included Financing Frameworks, and the Private Sector (Aqueduct).
- Creation of a service PROVIDER ENTITY in the Alto Paraná region.
- Creation of a Small Urban Providers of water service and Sanitation in a INTEGRATED PROVIDERS SYSTEM (for Middle Size Cities –ciudades intermedias-)

Sector's Opportunity

- Multilateral Banks, Technical Cooperation Agencies, and Donor Countries <u>are interested</u> in supporting Sector Development.
- High Concentration of Urban Population (specially lats years):
 - 58 % population in 0.6% of country's territory
 - 70% population in 4.7% of country's territory
 - All of this mainly in Greater Asunción and y el Greater
 Ciudad del Este areas.

Threats to the Sector

 The Gobernment does not have the resources to meet the basic needs of the sector (specially in urban areas).

 Municipalities does not fully perform its responsibility of the land use and planning.

SECTOR'S RESEARCHS

1. Strategic Planning of Water and Sanitation Sector - Paraguay. PES – BID.

March – October 2009. Nota Técnica № 115. Año 2010.



2. Sector's Analysis Update

October 2009 to March 2010.

Programa Conjunto. Publicación OPS/OMS Representación en Paraguay. Año 2010



PROJECTS IN PROGRESS PROYECTO DE MODERNIZACIÓN DEL SECTOR DE AGUA POTABLE Y SANEAMIENTO. PRÉSTAMO BIRF Nº 7710-PY.



1. Institutional Strengthening of the USAPAS-MOPC, and the Regulatory Agency – ERSSAN, and the Environment Agency – SEAM).

Amount: US\$ 4,0 MILL.

2. Water and Sanitation for ASUNCIÓN and its Metropolitan Area. ESSAP S.A.

Amount: US\$ 50,5 MILL.

Population Reached: 1.020.000.

3. Water and Sanitation for Rural Areas. SENASA.

Amount: US\$ 9,5 MILL.

Population Reached: : 37.750.

PROJECTS IN PROGESS - PROGRAMA CONJUNTO

Fortaleciendo Capacidades para la Definición y Aplicación de Políticas Públicas de Agua Potable y Saneamiento



| PRODUCTOS | National
Counterparts | UNS | |
|--|--------------------------|----------|--|
| 1. Gender sensitive capacity strengthened to provide water & sanitation services | STP | UNDP | |
| 2. Strengthened Community, for their rights Promotion & Protection, involvement in decision making and control of public sector actions. | MOPC | PAHO/WHO | |
| 3. Water and Sanitation services Long and middle term Infrastructure Financing strategy designed and implemented. | MSPBS | UNICEF | |
| 4. Improved Access and Quality of service in rural areas and indigenous communities. -394- | ERSSAN | ILO | |

ADVANCES IN SECTOR POLICY DESIGN

PROJECTS IN PROGESS USAPAS STRENGTHENING PROJECT WATSAN PROJECT







KEY COMPONENTS OF THE PROJECT

- Capacities Strengthening of the Sector Leading Institution and the other institutions who support the managerial structure.
- Design of a NATIONAL STRATEGY to increase the sanitation coverage and its implementation.
- Support to the Sector Leading Institution to implement a comprehensive Database for the sector, with managerial indicators.
- Support to the service prices impact on the households income.

ADVANCES IN SECTOR POLICY DESIGN

PROJECTS IN FINAL PLANNING STAGES THE ALTO PARANÁ PROJECT – JICA/MOPC



GREATER CIUDAD DEL ESTE PROJECT: Water & Sanitation Services Modernization in CIUDAD DEL ESTE, HERNANDARIAS, MINGA GUAZÚ Y PRESIDENTE FRANCO.

It is a JICA – MOPC project.

Population Reached (Year 2020):

a) Drinking Water: 498.914 people.

b) Sanitation: 463.373 people.

TOTAL COSTO: US\$ 235,6 Millions

ADVANCES IN SECTOR POLICY DESIGN

PROJECTS IN FINAL PLANNING STAGES MIDDLE SIZE CITIES PROJECT AECID/BID/MOPC





Middle Size Cities Project. Urban and metropolitan areas. Modernization of Water and Sanitation Service Systems.

PROJECT implemented by AECID - MOPC.

POPULATION REACHED: 250.000 people.

COSTO TOTAL DEL PROYECTO: US\$ 50,0 Millones

(The following cities are being analyzed: Horqueta, Yby Yaú, Santaní, Villa del Rosario, Caaguazú, San Juan Nepomuceno, María Auxiliadora, San Juan Bautista, San Ignacio, Pirayú, Villa Elisa, J.A. Saldívar, Areguá, Ypacaraí, P.J. Caballerro, Curuguaty y Villa Hayes)

ADVANCES 2009 - 2010

a) EL PLAN ESTRATÉGICO SECTORIAL (PES), CON EL BID



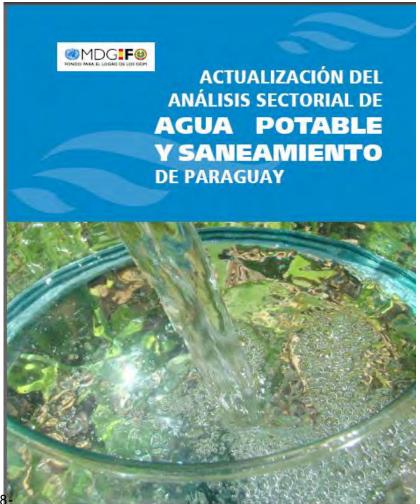
Plan estratégico sectorial de agua potable y saneamiento de Paraguay

Informe final

Diego Fernández Carlos Arturo Aguilera Juan Bóbeda Julio Giménez Banco Interamericano de Desarrollo

Sector de Infraestructura y Medio Ambiente

NOTA TÉCNICA No. 115 **b)** EL ANÁLISIS SECTORIAL DE AGUA POTABLE Y S ANEAMIENTO DEL PARAGUAY (OPS/OMS)





WATER AND SANITATION SITUATION SECTOR ANALYSIS (UPDATED)

JUSTIFICATION

the "Análisis
Sectorial realizado
en 1998", to the
present situation of
the country.

TO FOCUS AND CHARACTERIZE:

- SECTOR'S REENGINEERING
- USAPAS INSTITUTIONAL STRENGTHENING
 - FINANCIAL SYSTEM ORGANIZATION
 - PUBLIC POLICIES
 - PROVIDERS EFFICIENCY MODEL
- SERVICE PROVISION EFFICIENCY AND QUALITY STANDARDS
 - SECTOR'S LEGAL ORGANIZATION

SECTOR'S ANALYSIS UPDATED



PROPOSALS

USAPAS Action Priorities

- USAPAS's institutional strengthening and human resources qualification
- Establishing of regulations & signing Contracts & Permissions.
- Coordinate the Programming & implementation of WB, IADB, JICA and Spanish Fund loans
- Design and Implementations of sector's policies
- Coordinate the sector's information system.

-400-



PROPOSALS

Service Providers

ESSAP

USAPAS should sign the concession contract

Juntas de Saneamiento (Community Providers)

USAPAS should assigned the permission for the service.

Many of the communal providers should get their legal registration.

SENASA through small providers association could encourage.

The large increase in small providers should be organized by SENASA.

The increasing in coverage of established small community providers should be allowed instead the creation of new ones.

Small Private Operators

USAPAS should assigned the permission for the service.

There is a need of technical assistance SENASA and loans for longer terms.

Concession period should be longer, in order to provide legal security to investments in this areas.

Los Comités vecinales (Neighbour Providers)

They should become Community Providers with the support of SENASA.



PROPOSALS

Sanitation

- All infrastructure should be designed in based of Water basin.
 USAPAS will provide directions.
- Comprehensive and institutional solutions should be reached between providers (ESSAP, Aguateros, Juntas de Saneamiento, etc.).
- USAPAS should encourage the merge of small providers or the cooperation between them to reach economies of scale.



PROPOSALS

Town Characterization

- It is proposed the town in 3 types:
 - Towns type 1, population bigger than 15,000 people with a urban % larger than 85%.
 - Towns type 2, population bigger than 15,000 people with a urban % smaller or equal to 85% and larger than 45%.
 - Towns type 3, includes all other tows



PROPUESTAS

RECOMENDACIONES

Although there is no need for structural changes in the sector, there
is a need to re-define and make clear some activities and functions
of the main institution of the sector.

•

- In order USAPAS perform appropriately its responsibilities, it should be strengthened. The Executive should delegate to the MOPC the roels of Service Owner and Policy Maker, and this should delegate it to USAPAS. USAPAS could become a Vice ministry.
- Priority actions for **USAPAS** strengthening should be to improve its human resources qualification; design regulations and sign concessions and permissions contracts; Coordinate the implementation of WB and IADB loans; Establish sector policies; and Coordinate a sector comprehensive information system.



PROPUFSTAS

RECOMENDACIONES

- SENASA: should restructure to adapt to present times; coordinate its actions with other ministries and public institutions; discourage the creation of new small providers in urban areas; and assist to all service providers.
- ERSSAN & USAPAS should coordinate its action in base to the sector public policies in subjects such as: service tariffs, subsidies, contract & permission, information, etc.).
- SEAM should coordinate with USAPAS its role in the sector in key topics such as water souces protectin, identifications of water sources, permission for water resources use, and disposal conditions.



PROPUESTAS

RECOMMENDATIONS

- Long term Strategic Planning should be done in base to the physical planning with the coordination of USAPAS in the framework of the Master Plans.
- Sector Investment should be organized by one institution in order to avoid the present disorder in this area.

INSTITUTIONAL STRENGTHENING PROJECT OF USAPAS – MOPC – WATSAN PROJECT



PROJECT AIM

Support the capacities development of the Ministerio de Obras Públicas y Comunicaciones through the strengthening of the Unidad de los Servicios de Agua Potable y Alcantarillado Sanitario (USAPAS), in its rol of sector Leading Institution and sector Coordinator.

EXPECTED RESULTS

Support to the Reform and Modernization of State institutions in order to improve the democratic system.





FORTALECIMIENTO DE USAPAS – MOPC PROYECTO WATSAN

JUSTIFICATION

Reform & modernization of Public Institutions in Policy Design and Implementation of the Water and Sanitation Sector.

PARA LOGRAR:

- STRENGTHENING OF USAPAS IN ITS ROLE OF POLICY MAKER AND COORDINATOR OF THE SECTOR
- DEVELOP A NATIONAL STRATEGY TO INCREASE THE SERVICE COVERAGE TOWARDS THE MDG
- •SUPPORT THE DEVELOPMENT OF A SECTOR COMPREHENSIVE DATABASE
- ASSES THE SERVICE PRICE ON HOULSEHOLDS CONSUMPTION BASKET



SIWI

FORTALECIMIENTO DE USAPAS – MOPC PROYECTO WATSAN

Inicio de Actividades:

- 1 de julio de 2010 Equipo de trabajo:
- 1 Gerente
- 1 Especialista enBase de Datos GIS
- 1 Especialista en Tarifas de Servicios Públicos

Activities in Progress:

- Sector Information Organization and processing of information received by the Regulator Agency.
- Geo referencing of the Aqueduct Project Components, which includes Works of Fast Impact to developed by the Boquerón Authority.
- Tariff Studies of the Aqueduct Project .
- •Analysis and Recommendations of TORs of PC Technical Inventary before de development of the conceptual model og SIS.
- •Follow Up of the PC activities.
- •Preparation Coordination of the Workshop of Alto Paraná with JICA and ITAIPÚ.

出典:平成24年度JICA集団研修カントリーレポート

- ▶ 平成 24 年度 JICA 集団研修「水道管理行政(A)」
- ➤ 平成 24 年度 JICA 集団研修「水道管理行政(B)」

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