WATER UTILITIES REFORM

CASE STUDIES FROM THE ARAB REGION





First Edition

ACWUA
Arab Countries Water Utilities Association

SWEDEN

"Support of ACWUA's Utilities Management and Utilities Reform Technical Working Groups Project is being carried out with support from Swedish development cooperation. The project is the sole owner of the production, and the publisher is responsible for the content."

FOREWORD

The water sector in the Arab region suffers from chronic problems and faces many challenges in terms of water supply and sanitation services. These challenges are common in most of the Arab countries and are summarized in water scarcity; increasing demand due to growing populations and conflicts; rapid urbanization; water pollution/water quality; limited access to drinking water & sanitation services in rural areas; lack of funding resources; ineffective water pricing and lack of cost recovery and asset management applications. Consequently, there is a substantial room for improvements in terms of administrative procedures, water policies, laws and legislations, as well as technical capacity.

Here arises the role of the Arab Countries Water Utilities Association (ACWUA) and other community-based organizations, in raising awareness at all levels within utilities, especially at the top and middle management levels that have the direct influence over decision makers, in emphasizing the need for development of new policies, and the amendment of existing legislations that would encourage the reform processes in water utilities.

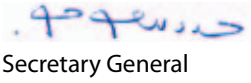
According to its mandate, ACWUA is playing a fundamental role in promoting and supporting water utility reform initiatives in the Arab world. Through the initiation of the (Utilities Reform) Technical Working Group (TWG), ACWUA introduced different Utilities' Reform topics (that were set according to utility members' needs) for research and discussion: Commercialization, Public Private Partnership and Decentralization, Tariff Reform among others. Throughout the last two years, the Utilities Reform TWG members met twice annually to share their countries' experiences, exchange knowledge in the form of case studies, and discuss potential aspects of reform accordingly. This publication includes the results of these meetings, where all case studies are produced in a very informative and professional manner, to present a valuable reference about the water utilities reform in the Arab Countries. These group meetings and all their associated activities were financially supported by the Swedish International Development Cooperation Agency (SIDA) within a two-year support project.

I would like to express my sincere thanks to the authors of this publication, our committed TWG members who showed real dedication to this project and contributed with their expertise to bring out this honorable work.

I would like also to thank the Swedish International Development Cooperation Agency (SIDA) for supporting the production of this publication.

Last but not least, I would like to thank ACWUA Secretariat team and the TWG advisory team from (ECO Consult) for their efforts throughout the two-year working period of the TWG up till the point this publication became available to serve the water and sanitation sector in the region.

Sincerely Yours,
Eng. Khaldon Khashman



Secretary General

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INTRODUCTION

Background and Overview

Since inception, the Arab Countries Water Utilities Association's (ACWUA's) role and mandate has been set to serve its constituency in upgrading their competences by improving their performance in the delivery of water supply and sanitation (WSS) services. In accordance with this role and mandate, ACWUA adopted a leading role in the region in presenting and examining approaches to improve the efficiency of the Operation and Maintenance (O&M) systems and standards, to implement reform and restructuring initiatives to improve operational performance, to extend services, to advance management systems, and finally to exchange expertise in developing operation and maintenance procedures and applications. Bearing this in mind, ACWUA recognized the need for setting the required technical, administrative, legal, scientific and economic frameworks that are necessary to enhance the performance of utilities and service delivery.

Accordingly, ACWUA initiated interdisciplinary Technical Working Groups (TWGs) comprising qualified experts from ACWUA member utilities to address specific utility issues in different high priority areas in the water and sanitation sector. Those areas were identified by the association through carrying out a needs assessment or its member utilities. To this end, ACWUA obtained the necessary funding to launch and activate the Utilities Reform (UR) TWG from the Swedish International Development Cooperation Agency (SIDA).

The UR TWG comprised seven members representing seven different ACWUA utilities and their respective countries working together for a two-year period of engagement in the TWG. The TWG members met twice to three times annually to design a work plan and schedule; design the outlines for the final deliverables of their work; present their respective experiences in reforming WSS services; exchange knowledge in that respect regionally; and present a future outlook that would serve ACWUA in further identifying improvement opportunities in the WSS sector regionally. The UR TWG relied primarily on its members' expertise in utilities reform in their respective organizations and countries, and complemented those competencies through information gathering and stakeholder consultation. The TWG members also participated in international and regional conferences presenting their experiences and reaching out to other WSS professionals and experts.

WSS Services in the MENA Region and the Need for Reform

A bird's eye view of WSS services in the MENA countries reveals several regionally common characteristics. Most of the Arab region is faced with acute water shortages that put tremendous pressure on utilities to develop and sustain adequate water supplies to meet the existing demand. Population growth, economic development activities and urbanization are directly impacting the demand for such services, and resulting in a rapidly growing demand. Further exacerbating the problem is the sectoral allocation of services based on a social viewpoint that is not completely backed by the economic viability perspective. This is manifested in mostly subsidized tariffs that in some cases cover O&M costs, and in other cases do not. Furthermore, developing additional WSS services adds financial burdens on the utilities which need more government support and subsidies. And at the heart of all this lies the issue of weak state-owned utility performance and the inability to provide the level of service required by the customers.

All the above manifestations support the need for reforming the utilities to improve service provision. The premise of utilities reform revolves around governance issues and financial sustainability. Specific reform elements target the achievement of financial viability through improved financial management and tariff restructuring; improving the institutional setup by separating functions to increase autonomy and accountability; improving stakeholder engagement and customer oriented approaches in the decision making loop; and achieving efficiency gains through improving utility performance.

A basic strategy to reform the utilities then is to improve the governance structure, through introducing institutional and regulatory changes within the sector, that are conducive and supportive of creating partnerships with the private sector to improve the level and efficiency of services.

On the institutional level, there are several setups that are operating within the region with the underlying principles of decentralization and commercialization: in Egypt there is the holding company and subsidiary model; in Morocco water production as well as distribution is through the National Office of Water and Electricity (ONEE), private sector and municipalities; in Lebanon, four autonomous regional water

establishments are responsible for providing services and operate under the umbrella of the Ministry of Energy and Water; in Jordan, the Water Authority of Jordan (WAJ) oversees service provision through its administrations or through state-owned water companies.

As for partnerships with the private sector, they come in different forms across the region; management contracts in Lebanon and Jordan, Build-Operate-Transfer (BOT) contracts in Jordan and Egypt, and concession agreements in Morocco.

This Publication

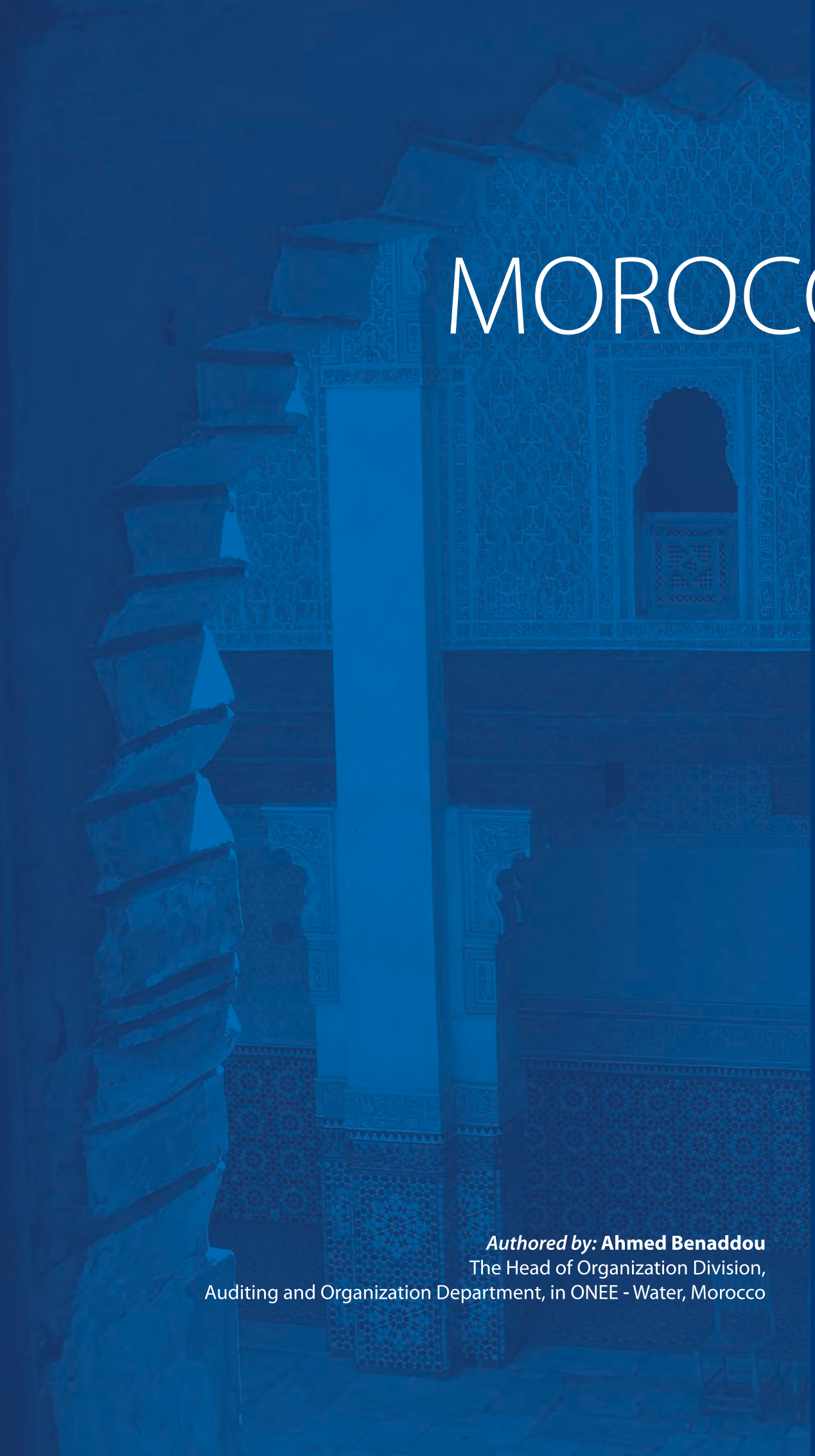
The main deliverables of the work of the TWG during the period of its engagement are two reports:

1. A compilation of the UR TWG regional case studies report, which covers the main theme of the TWG for the participating ACWUA member countries; and
2. A best practices guide in the area of utilities reform that is applicable in the region.

The publication in hand is the first of those two deliverables, and includes compilations of the experiences of the participating ACWUA countries in terms of utilities reform. It includes separate chapters for the seven participating countries with the author identified. In each chapter a country background is provided with focus on water resources, uses and service providers; the institutional and legislative framework governing the sector; strands of reform applied including decentralization and commercialization; and opportunities for and models for partnering with the private sector to accomplish the same.

This "Case Studies" publication is the first step that precedes the publication of the "Best Practices Guide in Utilities Reform in the MENA Region", which provides an in-depth analysis of the regional experience in this area, success factors, opportunity for replication and improvement and lessons learned.

Accordingly, this publication includes the experience of each participating country presented in the aforementioned context depending on the available information to the TWG members. The information included within is the results of the research and consultation efforts that were undertaken by the TWG members in their respective organizations and countries, and constitute the primary source of information.



MOROCCO

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ACRONYMS

BCM	Billion Cubic Meters
BOT	Build-operate-transfer
GPI	Gender Parity Index
GPOBA	Global Partnership for Output-based Aid
HCP	Commission for Planning
ISO/CEI	International Standards Organization / International Electro-technical Commission
IWRM	Integrated Water Resources Management
Km^2	Square kilometers
Kwh	kilo Watt Hours
l/s	Liters per second
LIMS	Laboratory Information Management System
m^3	Cubic meters
MCM	Million Cubic Meters
MDG	Millennium Development Goals
mm	Millimeters
O&M	Operation and Maintenance
ONE	National Office for Electricity
ONEE	National Office for Electricity and Water Supply
ONEP	National Office for Water Supply
ORMVA	Regional Offices for Agricultural Development
SDNAL	National Sanitation Master Plan
SMEs	Small and Medium Enterprises
UN	United Nations

INTRODUCTION

Water and sanitation utilities around the Arab countries are confronted with many difficulties and challenges as they strive to make organizational improvements. Water sector utility managers must consider a wide range of issues in their management improvement initiatives. General economic conditions, staff turnover, communication between internal management and relevant external stakeholders, involvement of staff across the organization, aging and occasionally decaying infrastructure, applied rate issues, and limited staff resources are some of the issues managers address.

This case study will focus on utility reform examples that have been applied in Morocco, such as partnerships with the private sector, private sector involvement and the involvement of local and municipal establishments in utilities reform as well as other numerous examples.

Country Background

Geographical Location, Area and Population

The Kingdom of Morocco is located in northwest Africa. It is bordered from the north by the Mediterranean Sea, from the south by Mauritania, from the east by Algeria, and west by the Atlantic Ocean. It has an area of 710,850 square kilometers (km^2). The length of the Moroccan coastline is 3,500 km.

The population of Morocco has witnessed a significant increase, as it rose during the period between 1960 and 1982 to 11,626,000 inhabitants, registering a growth rate of 2.8% per year. According to the census of September 2nd, 1994, Morocco's population was 26,073,717 inhabitants. This number increased to 29,840,273 million during the census of 2004. And in the light of the major changes that Morocco has witnessed, the phenomenon of urbanization has increased from 29% in 1960 to 55% in 2004.

As for territorial decentralization, Morocco initiated this approach very early: The communal public elections were organized in 1960,the first of their kind in history. The communal charter, which was adopted in 1976, expanded the responsibilities of municipal councils. Further two modified community charters were adopted in 2002 and 2009and elections were conducted regularly.

The Kingdom is divided into 16 regions: Oued Ed-Dahab-Lagouira, Laâyoune-Boujdour-Sakia El Hamra, Guelmim-Es Semara, Souss-Massa-Drâa, Gharb-Chrarda-Béni Hssen, Chaouia-Ouardigha, Marrakech-Tensift-Al Haouz, Oriental, Grand Casablanca, Rabat-Salé-Zemmour –Zaer, Doukkala-Abda, Tadla–Azilal, Meknes-Tafilalet, Fes-Boulemane,Taza-Al Hoceima-Taounate, andTangier-Tétouan.

Topography and Geology

Morocco has often been called the country of contradictions. This observation is confirmed more than ever in the natural environment: the snowy peaks of the high Atlas mountain chain (which mostly exceed 3,500 m), the vast stretching plains and plateaus or basins that prevail on the surface, the dry desert ecosystems where biological productivity is limited, and those areas that are abound with various forests. All of the above show considerable diversities.

The stretching 500 km mountain ranges from east to west cover a distance of more than one fifth of the total area, which is a major factor in shaping the landscape of the country. This includes: The Rif Mountains in the north that stretch from the Atlantic Ocean in the west to the lower Moulouya in the east, the total upper central plateau as well as Middle and High Atlas in the middle represent the two large ranges (with the highest peak of Jebel Toubkal at 4,165 m), and the Anti-Atlas in the south, not to mention the isolated highlands.

Outside these mountain ranges, the plains, plateaus and basins comprise most of the land. Atlantic Morocco consists of Atlantic coastal plains and plateaus (West, Chaouia, Doukkala, Abda) or internal plains and plateaus (Tadla, Haouz, Central Plateau, Rahamna, contour, Phosphate Plateau).

In Eastern Middle Atlas the eastern Mediterranean comprises middle plains (such as plain Tarifa) or internal plains. Away from the Mediterranean coast there are the arid high plateaus and their extensions that are typical for the harsh climate which makes them perfect for pastoral activities.

Finally, in the south and southeast, extend the pre-desert and desert areas which consist of plains and plateaus sometimes overlooked by prolonged sand dunes or mountains. The area is characterizedas being dry and harsh with excessive high temperatures, water scarcity, and thus scarcity of vegetation.

From a geological point of view there are some ancient rock formations (belonging to the pre-Cambrian and the first geological period) in Morocco and some areas with volcanic rocks, plains, plateaus and ponds with sedimentary rocks, as well as wide plains covered with modern river sediments

Land, Rivers, Lakes and Dams

The hydrological system is distributed starting from the central water reservoir represented essentially in the High Atlas and the Middle Atlas. The Rif range contributes to feeding the rivers that head towards Sebou. Depending on the climatic conditions, factors such as the concentrated rainfall, high evaporation as well as the overall low rainfall amounts usually explain the irregular flow even in areas of heavy rains. The level of evaporation explains the high deficit and the disparity between the coastal and inland areas.

There is an essential river network in Morocco, which consists of mountain tributaries that descend from the Atlantic Ocean and the Mediterranean Sea and flow from the Middle Atlas mountains in general. All rivers descend towards the Atlantic Ocean except for MoulouyaRiver which empties into the Mediterranean Sea, and the River Drâawhich empties into the desert. The rivers in Morocco overflow in the winter and in early spring. Some of the most important rivers include:

Table 1: Main Rivers in Morocco
(Source: Own, 2012)

Main Rivers		
Rivers	**Source**	**Length (km)**
Drâa	High Atlas	1,200 km
Oum Er Rbia	Middle / High Atlas	600 km
Sebou	Middle Atlas \ Rif	500 km
Moulouya	Middle Atlas \ High Atlas \ Rif	450 km
Tensift	High Atlas	270 km
Ziz	High Atlas	270 km
Bouregreg	Central Plateau	250 km

Morocco has 130 larger water dams, and dams in a variety of sizes that are distributed all over the country. They have multiple functions, such as to provide water for drinking, industry and irrigation purposes, as well as feeding water basins, containing floods, protection against soil erosion and against pollution, recreation and energy supply. The construction of dams in Morocco began in the 1920's. Since 1929 until independence in 1956, about a dozen water dams were built, mostly concentrated in northern and central Morocco. The pace of construction accelerated in the early fifties to build a bridge between valleys with a capacity amounting to 1,384 million cubic meters (MCM). The construction continued with the same pace in the years after the independence. At the end of the seventies Al MassiraDam was built, which is the second biggest dam in Morocco, with a capacity of 2,760 MCM. The eighties and early nineties however, witnessed the construction of a large number of small dams that were scattered over the national territory as well as building the largest Moroccan dam, Al Wahda dam. The first decade of the new millennium witnessed building many small dams alternating with some major projects. Nowadays the water dams in Morocco provide the country with a capacity of up to 17.2 billion cubic meters (BCM).

Climate and Climate Change

Given its geographical location on the latitudes, as well as due to its location on the western side of the continent, Morocco belongs to a subtropical climate with a clear Mediterranean effect, where it rains from the end of autumn till early spring, while from May to September high temperatures and drought prevail.

Given also the diversity of topography and also the presence or absence of sea effects, the Moroccan climate is very diverse. However the seasons' specific rhythm is characterized with a precipitation that is concentrated in cold or humid months of the year (from late autumn to mid-spring), while the rest of the year is characterized with heat and drought. The annual rainfall average ranges between 25 millimeters (mm) in the desert and 1,200 mm in the rural areas, which means that there are wide variations from one region to another.

On another level rainfalls are not regular, resulting in critical consequences for the previous or current traditional lifestyles. The seasonal drought and sudden floods are rather frequent phenomena. Subsequently, the climate is correlated with the element of risk and uncertainty which should be taken into account both in traditional adaptation strategies and in the process of development. The difference in annual rainfall averages is between 15 and 25% in the Northeast, and in extreme cases between 1 and 2%. Besides the general rainfall, irregularities can also be seen in delays of the first rainfall, therefore the concentration and rigor of rainfalls are typical characteristics of the climate in this area.

Economy and Socio-economic Development

On the economic level, the integration with the global economy represents the transitional horizon for the Moroccan economy; the dynamics of an accelerated openness during the eighties was permeated by successive periods of internal reforms and trade liberalization within the framework of several agreements signed by Morocco. Thus, the projects for economic transition are many and various: infrastructure projects (ports of Tangier-Mediterranean, road networks… etc); touristic projects (the "blue plan"); the new industrial policy and rehabilitation of Moroccan entrepreneurship (Charter of Small and Medium Enterprises (SMEs), rehabilitation strategies, monitoring of macro-economic balances (reducing foreign debt); legal and administrative reforms for various economic sectors (Labor Code, the financial and fiscal sector… etc); developing a more effective framework for investment (King Hassan the II Fund for Economic and Social Development, Regional Centers for Investment).

At the social level, Morocco has launched a number of promising projects. Thus the recent years have recorded a number of qualitative junctures in terms of social issues; furthermore decisive portfolios have received special attention in response to the Millennium Development Goals (MDGs) which Morocco got seriously involved with, such as: educational reform project that adopted the National Charter for Education and Training; entry of compulsory health insurance into force; accelerated pace of social housing programs, mobilization of additional resources (the «Cities Without Slums» program); measures that target to break the isolation of the rural areas (providing roads, electricity and drinking water).Through the confluence of sectoral efforts, undertaking the social field today has been rather coalescent, through a horizontal vision that allows for the contribution of all the involved actors within a coordinated framework.In this regard, the National Initiative for Human Development came to change the concept of social work, by broadening its horizon and providing it with an unprecedented harmonized vision.

Achieving the Millennium Development Goals Indicators

Morocco has committed in 1990 to achieve the MDGs as defined by the international community and a few years away from 2015. It is safe to say that the achievements made by Morocco, both in the economic field as well as in the field of human development, would qualify it to be among the countries that will be able to achieve the MDGs in this scope. It is a fact confirmed by all of the studies conducted by the "Haut Commissariat au Plan- High / Commission for Planning" (HCP) as well as the evaluations of many individuals and institutions of the United Nations (UN). Furthermore the evidence lies in the credibility of the available statistical data. The comparison between the last two decades really indicates that the average economic growth went from 2.2% to 4.4%, while this growth rose (without counting the primary sector) from 3.0% to 4.8%, domestic demand rose with an average annual rate of 5.1% instead of 2.4%; the gross investment rate rose from 24.8% in 1999 to% 32.6 in 2009, the unemployment rate witnessed a decline from 13.8% in 1999 to 9.1% in 2009, although it is still high among the holders of certificates of higher education. The final household expenses recorded a consumption rise of 4.3% for the annual average and 5.6% as of the year 2003; the purchasing power of households has improved by 2.4% per year as a result of the improvement of individual income with an annual rate of 4.3% and prices at consumption with 1.9%.

In addition to the above, the dependency of the population on the basic services has developed with an accelerated rate. While access to electricity and water was made public in urban areas, the rate in rural areas has risen from 9.7% in 1994 to% 83.9 in 2009 for electricity and from 14% to 90% for drinking water. In the field of education, the net rate of children's enrollment in schools (aged 6 - 11 years) has gone up from 52.4% to 90.5% at the national level, while it almost tripled in the rural areas and was four times higher for females. This has changed the ratio of females to males in primary education from 66% to 89%, and doubled the Gender Parity Index (GPI) in rural areas. On the other hand, life expectancy at birth has gone from 65.5 years in 1988 to 72.9 in 2009. This development constitutes an indication on the progress made in the areas of nutrition and public health.

SECTOR OVERVIEW

Since gaining its independence, Morocco has adopted a strong and dynamic policy in the field of water in order to overcome the fragility caused by the climate fluctuations, through water control and storage during the rainy years, in order to cope with the need during the drought years. Thus the main objectives were: responding to the growing demand for drinking water from the part of the population, and providing agriculture with its essential needs in order to provide the nutritional needs and encourage export agriculture.

The challenge at the time, which was put to practice in 1998, was the attempt to irrigate one million hectares by the end of the last century.The policy of dams enabled Morocco to ensure water and food security and improve the incomes of farmers in irrigated areas, as well as the intensification and diversification of agricultural production and the development of agricultural exports.Since its initial vision, the water policy in Morocco focused for a rather long time on the mobilization of water resources:

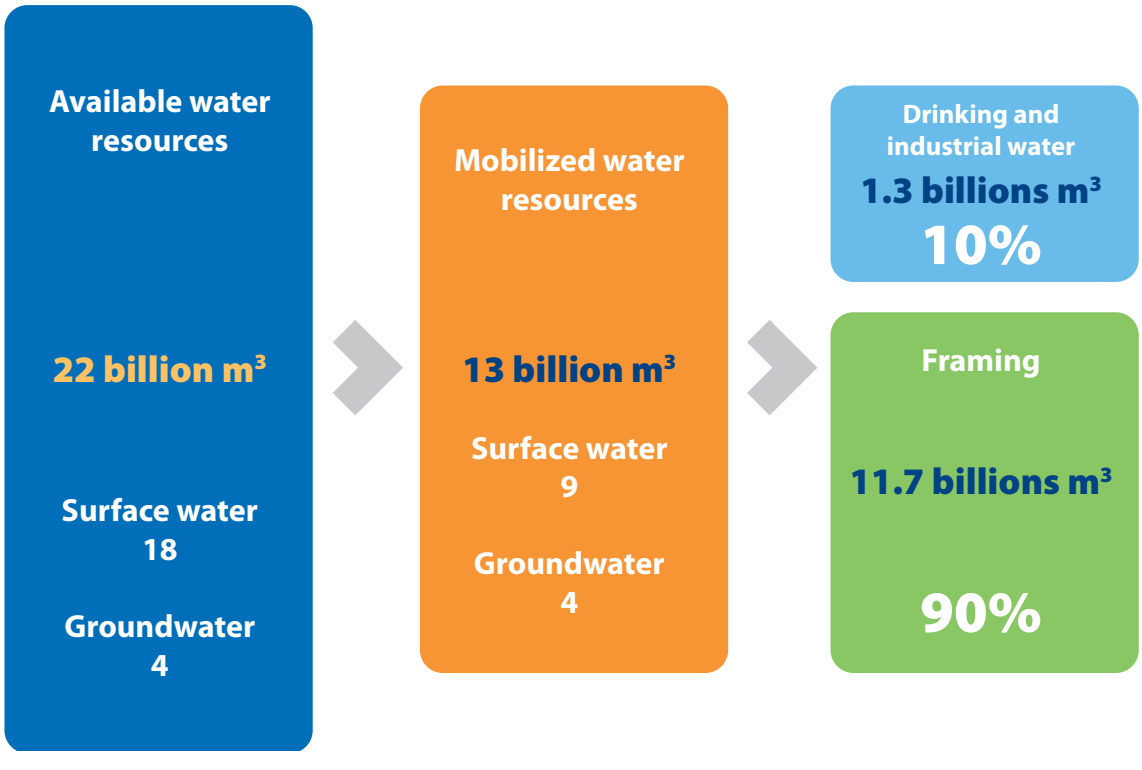

Figure 1: Available Water Resources

(Source: Planning Directorate/Needs and Resources Planning Section)

The completed preparatory actions have enabled:

1. Mobilization of 75% of the viable surface water by completion of 130 large dams and more than 100 small dams with a capacity of 17.5 BCM as well as construction of dozens of installations to divert water;
2. Completion of several wells for groundwater exploitation enabling the mobilization of all groundwater;
3. Irrigating more than 1.5 million hectares of agricultural land;
4. Providing, supporting and enabling public supply of drinking water (during the last 30 years two decades were marked by drought however the water supply was availed);
5. Protection from floods in cities and plains;
6. Producing about 10% of the national production of energy as hydropower.

Besides the aspect of the mobilization of water resources, which is considered to be one of the real successes of the Kingdom, the issues of wastewater and water pollution has received great interest from the beginning of the nineties to cover the deficit in this field.

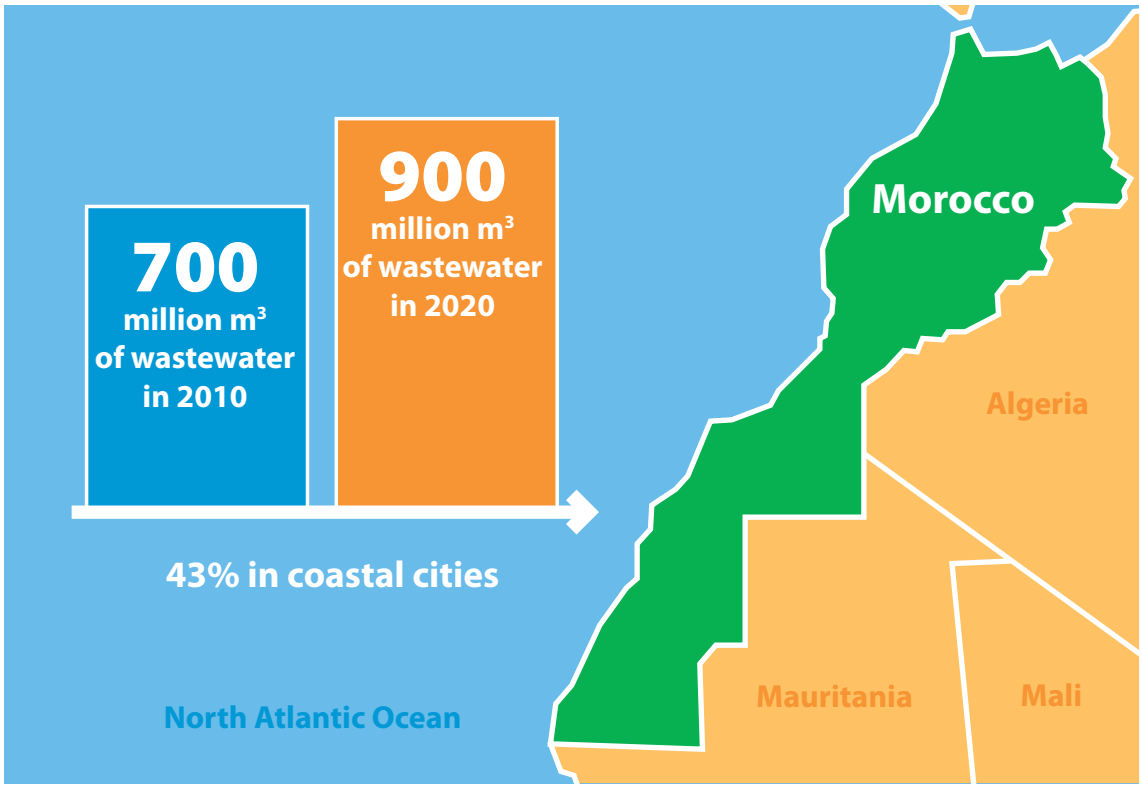

Figure 2: Wastewater Amounts in Morocco

(Source: Planning Directorate/Needs and Resources Planning Section)

Morocco is faced with a set of challenges in the management of its water resources, such as:

1. Limited water resources: 730 cubic meters (m^3) per capita per year currently, and 520 m^3 per capita per year by 2020;
2. An increase in the water demand: 13.7 BCM and 16.2 BCM by 2030;
3. Climate change and extreme events like floods and droughts;
4. Soil erosion and dams filled by mud: the loss of approximately 75 MCM;
5. Over-abstraction of groundwater;
6. Water pollution;
7. Low prices for mobilized resources especially for irrigation.

The Institutional Framework of the Sector

Overall, the involved parties in the water sector in Morocco can be divided into three main bodies as illustrated in Figure 3 below:

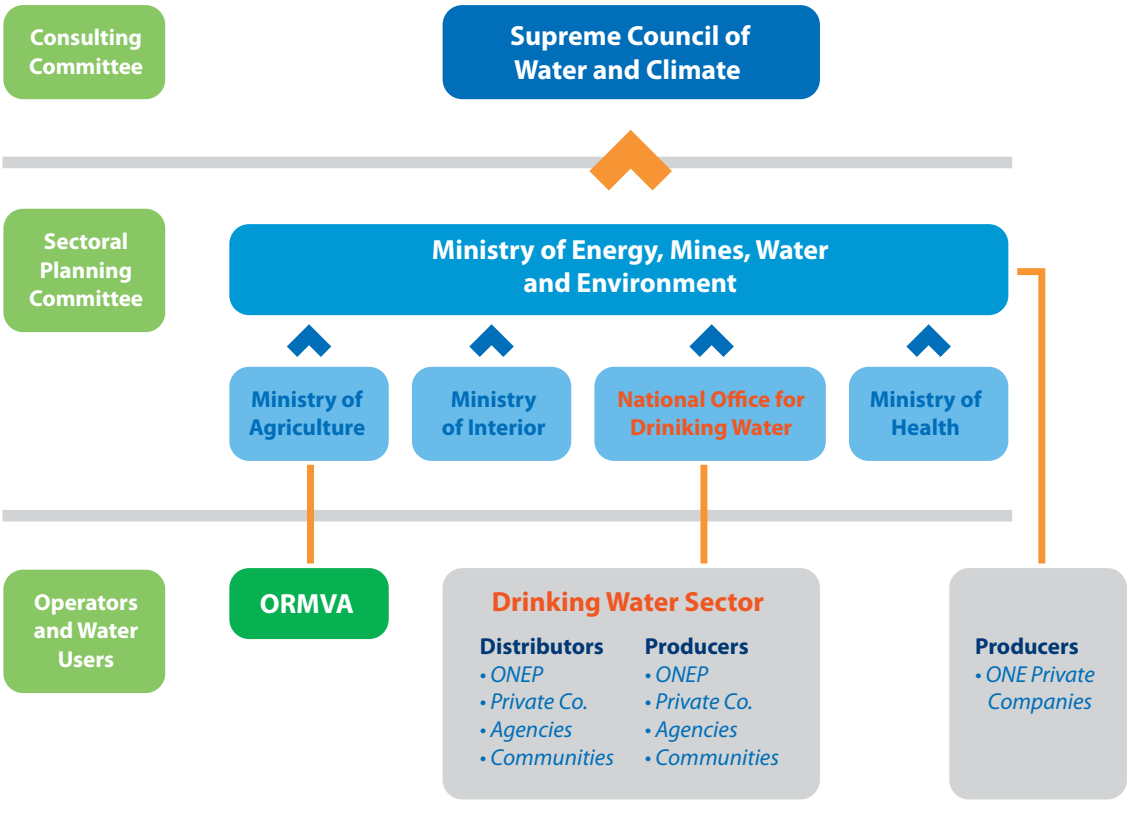

Figure 3: Institutional Framework for the Sector

(Source: Planning Directorate/Needs and Resources Planning Section)

- An advisory or consulting body);
- Sectorial Planning body);
- Other stakeholder.

1. The Supreme Council for Water and Climate

The Supreme Council for Water and Climate is the deciding body for water policies. In addition to the tasks that it can be authorized with by government, the Supreme Council for Water and Climate investigates and advises on the following:

- The National Strategy to improve the knowledge about climate and controlling its impacts on water resources;
- National Water Master Plan;
- Integrated water resources management (IWRM) plans in water basins, particularly water allocation between the different sectors and the different regions in the country or for the same basin, as well as the requirements of investment and protection and conservation of water resources.

The Supreme Council for Water and Climate consists of:

- For the first half of its members it consists of representatives of the state; water basin agencies; National Office of Drinking Water Supply (ONEP); and the regional offices for agricultural investment.
- For the other half of the representatives, they cover water users elected by their counterparts; housing or regional councils elected by their counterparts; representatives of higher education and scientific research

institutions in the fields of water engineering and conservation; and
- Representatives of national expertise within professional and scientific associations in the fields of water engineering and conservation.

The council can also call upon any qualified specialist in the field of water field to participate in its sessions.

2. Ministry of Energy, Minerals, Water and Environment

It is the government body that is responsible for the management of natural resources in Morocco, including water. It is charged with several tasks, including:
- Identifying and evaluation of water resources;
- Monitoring the weather and informing of any weather changes;
- Planning for the development of water resources;
- Transport of water;
- Management of water resources;
- Contributing to the protection of people and property through forecasting and monitoring weather related risks;
- Preservation of the water related infrastructure and resources; and
- Research and development in the fields of water and weather.

3. Water Basins Agencies

Water basins agencies were created as public institutions by virtue of the Water Law No. 10/95. These agencies are subject to the supervision of the government institutions in charge of water. Each water basin agency is assigned with the following:
- Preparing the master plan for IWRM for resources under its jurisdiction;
- Ensuring the implementation of the Master Plan for IWRM under its jurisdiction;
- Granting licenses and concessions for the use of the public water domain provided by the Master Plan for IWRMunder its jurisdiction;
- Providing any needed financial assistance or other (such as technical) support to public or private persons, whether for the protection of water resources from pollution or for management or use of the public water domain;
- Completion of all water-level measurements, as well as hydrological and hydro-geological studies used for planning and management both at the quantitative and qualitative levels;
- Completion of all quality criteria and the application of this law's provisions as well as the laws in force for the protection and rehabilitation of water resources in cooperation with the government authorities in charge;
- Proposal and implementation of appropriate procedures, especially the regulatory ones to ensure providing the population with water in case of a water shortage as stipulated in article 10 of this law or for the prevention of flood risks;
- Management and monitoring the use of water resources;
- Completion of the necessary infrastructure for prevention and mitigation of flood risks;
- Keeping a recognized record of water rights, concessions and granted water licenses.

The water basin agency is managed by a Management Council that consists of:
- Representatives of the State;
- Representatives of the public institutions of the State that are specialized in the production of drinking water, hydroelectric power generation and irrigation;
- Concerned agricultural chambers: chambers of industry, commerce and relevant services, concerned regional councils, concerned ethnic groups, water users associations, etc.

Morocco has nine water basins: Souss-Massa-Drâa, Tensift, Bouregreg, Oum Er Rbia, Loukkos, Sebou, Guir-Ziz-Rheris, Sakia El Hamra, Oued Eddahab, and Moulouya.

4. Regional Offices for Agricultural development (ORMVA)

The "Regional Agricultural development Office" is a public institution with both civil and financial independence and reports to the Minister of Agriculture. The office performs tasks related to storing, collection, distributing and transfer of water from or to agricultural exploitation institutions. The water resources intended for use by farmers are generally allocated according to their region based on certain

decrees that include the areas designated for this issue. As for the management of the regions allocated to the office from the public water domain, it could be arranged by authorization from the relevant Minister by virtue of the decree issued on 11 Muharram 1344 (August 1, 1925) concerning the water law. The office exploits the public facilities for irrigation and reform purposes.

5. National Office Of drinking water (ONEP)

ONEP is a public institution that was founded in 1972. It has an industrial and commercial character as well as financial independence. The main functions of ONEPinclude the following:

- Planning the supply of drinking water within the Kingdom and programming of projects;
- Carrying out studies concerning the drinking water supply as well as ensuring the completion of tasks for the production and distribution units;
- Monitoring the quality of produced and distributed water as well as control of pollution or drinking water;
- Providing distribution services commissioned by local municipalities; and
- Participation and technical assistance: conducting studies in partnership with the relevant ministries; preparing legislative and regulatory texts that are necessary for accomplishing tasks.

As of October 2000, ONEP was assigned to manage the sanitation sector for the centers that fall under its jurisdiction. And as of 2004, ONEP was assigned with supplying drinking water in the rural areas. The strategic foundations of ONEP include:

- Improving and securing the supply of drinking water in urban areas;
- Turning the supply of drinking water to public for the general rural population, according to the principle of the right to water; and
- Effective intervention in the sanitation field to protect the environment and water resources.

The table below shows the development of the most important indicators for drinking water.

Table 2: Most Important Indicators related to Drinking Water

(Source: Planning Department / Resources Planning Section)

Indicators	1975	1985	1995	2011
Production (MCM / year)	350	600	740	920
Supplied population (million)	7.6	11.4	15.5	30.7
Urban areas	5.3	9.4	13.7	18.4
Rural areas	2.3	2.0	1.8	12.3
Access to water networks in urban areas (%)	83	97	100	100
Access to water in rural areas (%)	22	17	14	92

The following are achievements of ONEP in the area of wastewater up till the end of 2011:

- ONEP started operation on the management of wastewater in 83 municipalities;
- Completion of 46 treatment plants with an overall capacity of 174,000 m^3/day, thus contributing to raising this capacity from 6% in 2005 to 24% in 2011, taking into consideration the achievements of the municipalities;
- Operation of about 6,000 km of sewer and rainwater drainage pipes; and
- Concerning investments: ONEP completed several projects between 2000 and 2011 with a total value estimated at 5.76 billion dirham[1], which benefited 3.2 million people spread over 83 cities and centers.

6. Municipal AutonomousAgencies for the Distribution of Water and Electricity

Any autonomous agency for the distribution of water and electricity is a public institution with a commercial and industrial character. It has significance character, financial independence and is in accordance with Decree No.2.64.394 dated September 29th, 1964 concerning municipal agencies with a legal character and financial independence. The agency is subject to the supervision of the Ministries of Interior and Finance, as well as being monitored by the State's financial control regarding public companies and other bodies. According to this decree, the municipal councils and municipal union committees that decide-to ensure public interest of an industrial or commercial character– on the creation of an office that has a civil character and financial autonomy, decide on the amount and type of appropriation to the office. A draft of the internal system should also be added to the constituent decision. This decree shall determine the scope of the special

1. 1 Dirham =0.0903€

regulations for each particular office especially the specifications ledger for operation purposes. The agency is managed by an administrative board and a management committee, and a Director to manage the work.

Table 3: Municipal Autonomous Agencies

(Source: Own, 2013)

Agency	Symbol	Date of Establishment	Tasks
Autonomous agency for distribution of water and electricity in Fez	RADEEF	1969	Water - sewage - electricity
Autonomous agency for distribution of water and electricity in Safi	RADEES	1972	Water - sewage - electricity
Autonomous agency for distributing the new water and electricity – El Jadida	RADEEJ	1971	Water - sewage - electricity
Autonomous agency for distribution of water and electricity- Meknes	RADEM	1969	Water – sewage- electricity
Autonomous agency for distribution of water and electricity -Oujda	RADEEO	1976	Water - sewage
Autonomous agency for distribution of water and electricity- Taza	RAEETA	1978	Water - sewage - electricity
Autonomousagency for distribution of water and electricity Kenitra	RAK	1970	Water - sewage - electricity
Autonomous agency for distribution of water and electricity Tadla	RADEET	1981	Water - sewage - electricity
Autonomousagency for distribution of water and electricity Larache	RADEEL	1996	Water - sewage - electricity
Autonomous agency for distribution of water and electricity Chaouia	RADEEC	1976	Water - sewage
Autonomousagency for distribution of water and electricity Marrakech	RADEMA	1971	Water - sewage - electricity
Multi-service autonomous agency Agadir	RAMSA	1982	Water -sewage

Legal and Regulatory Framework of the Sector

The legal and regulatory framework distinguishes between:

1. Stakeholders - drinking water production: production of drinking water is distributed as follows:
   - ONEP is the most important producer on the national level: 80% (920 MCM in 2011);
   - Distribution agencies, private sector companies and municipalities: 20%

2. Stakeholders - distribution as well as management of sanitation sector in urban areas: these services are the jurisdiction of local municipalities established under the sponsorship of the Ministry of Interior in accordance with the requirements of the community charter. There are currently four patterns applied to run these services in urban areas:
   i. Delegation of management to private companies for sanitation services and electricity and drinking water distribution (Lydec: SUEZ Group in Casablanca since August 1997; Redal: Veolia group in Rabat since January 1999; Amendis: Veolia group in Tangier and Tetouan since January 2002;
   ii. Management through the municipalities' independent agencies for major cities, and there are currently 12 agencies in each of Agadir, Marrakech, El jadida,Safi, Settat, Beni Mellal, Kenitra, Meknes, Fez, Taza, Oujdaand Larache.
   iii. Delegation of management to ONEP: The office manages the distribution of drinking water in small and medium-sized towns, if local municipalities are interested (595 centers in 2011). ONEP subscribers/customers reached around 1.5 million subscribers.After amending the law for establishing ONEP in the year 2000, the latter started engaging in sanitation services in the centers where it is responsible for drinking water distribution at the request of the concerned municipalities (83 centers in 2011).
   iv. Management through local municipalities for the rest of the other municipalities.

Key Documents that guide Sector Management

Successive Moroccan governments have strived to give water utilities great importance by developing and updating the national strategy in this field whenever necessary. This strategy focuses on the effective management of water demand:

1. Reducing demand by 2.5 BCM per year;
2. Management and development of available supply (mobilizing water resources: 5 BCM per year);
3. Protection of water resources and preserving the ecosystem (preservation of water basins and replenishing its supply through artificial recharge; protection of water resources quality and pollution prevention by national programs for sanitation and pollution prevention; and preservation of basins, oases and wetlands);
4. Minimizing the impact of water associated risks and adaptation to climate change (improving the protection of people and property against flooding by a national program for protection against floods; fighting the impacts of drought by drought management program on the level of water basins agencies);
5. Proceeding with legislative and regulatory framework reform (completing the applied provisions of the Water Law; and reviewing the Water Law in order to make it more compatible with the present and future requirements); and
6. Modernization of the management, the development and qualification of human resources (developing and qualifying human resources; updating working tools and methodologies; capacity development of professional and technical competencies; and supporting scientific research).

Water Law

In 1995 the public authorities issued Law 95/10, or what is referred to by the Water Law.This law seeks to adopt a national water policy based on the futuristic outlook that takes into account the evolution of water resources on one hand, and the national needs on the other, including legal measures designed to rationalize the use of water, making its access public, the solidarity of authorities, and addressing disparities between urban and rural areas within the framework of programs that aim at achieving water security within the entire Kingdom. The following are some of its most important foundations:

- Decentralized management on the regional level within the water basins;
- Consultation and participation of all water users;
- Developing economic mechanisms to encourage an economic use of water and preserving it under the principle of "polluter pays and user pays";
- Developing IWRM plans to plan for the sustainable management of water resources at the regional level and in a participatory agreed upon framework in order to improve the living conditions of the population; and
- Creating water basins agencies that ensure the integrated and decentralized management of water resources.

The provisions of the Water Law focus on the following:

- Water as a public domain;
- Acquired rights for the public water domain;
- Preservation and protection of the public water domain;
- Planning for the development of water basins and the use of water resources;
- General terms and conditions for the use of water;
- Fighting water pollution;
- Water allocated for food production purposes;
- Prerequisites for the exploitation and sale of natural water with a medical purpose as well as the so called "spring water or bottled water";
- Provisions relating to preparation and use of water intended for irrigation;
- Provisions relating to the use of water in case of a drought;
- Transitional and miscellaneous provisions;
- Local municipalities and water; and
- Water police: offenses and penalties.

Communal Charter

Concerning the territorial decentralization, it can be said that Morocco initiated its approach rather early. The Communal Charter, which was adopted on the 30/09/1976, appeared to expand the competences of the municipal councils. Two more communal charters were adopted in 03/10/2002 and 18/02/2009 in order todevelop local governance; modernize local administration; strengthen civil unity; and improve public utilities management. The communal Charter has stipulated the following in article 39:

"The local Council decides on the creation and management of public utilities, particularly in the following sectors: supply and distribution of drinking water – electrical distribution - sanitation - collection of solid waste and similar waste, its transfer to the public waste landfills and treatment - public lighting - public urban transport - transport, travel and public roads' signs - transport of the sick and wounded - slaughterhouses and transport of meat and fish - graveyards and facilities for the transportation of deceased".

The Council decides on the manner in which the public utilities are to be managed: directly by the agency, an independent agency, a concession and any other methods for the delegated management of public facilities in accordance with applicable laws and regulations.

Law of Delegated Management

Delegated management or delegation of authority is a contract whereby a legal person called "the delegator" who is governed by public law, authorizes for a limited duration the management of a public utility assuming its full responsibility to a legal person governed by public or private law –called "the delegate" which entitles him to collect fees from those who use the services of the utility, or to make profits of the said management or both. This is known as Law No. 05-54 or delegated management of public utilities.From these definitions we conclude that a delegation of management contract has the following characteristics:

- It is a management contract that includes three key elements: an agreement, a scope statement and annexes;
- It concerns the management of a local public industrial or commercial utility;
- It is a contract that combines two parties: an authority giving the delegation, which is a legal entity governed by public law and having financial independence, and the delegate representing a private legal entity, either national or foreign; and
- The companies with authorization are subject to the labor law.

The aforementioned law expects the delegate to be established in form of a company subject to Moroccan law whose purpose is restricted to the management of the public utility, and can be used in complementary activities of the utility, as well as the stipulation of law concerning the principle of retaining users and their acquired rights by the delegate, and publication of financial information in order to ensure transparency of the delegated management before the delegating authority.

The law 05-54, which consists of 34 articles, specifies the legal and accounting system of assets that are components of the delegated management, especially due return and repossessed goods, with the possibility of mortgaging the return assets by the delegate according to precise conditions, intended to preserve the continuity of the public utility in the event that the latter cedes to perform his trust in favor of the delegator, as well as the requirements of rights and duties of the delegator and the delegate, in which the law grants the latter the right to use the public domain with the help of the delegator. The general stipulated principles include:

- Respecting the principle of competition and transparency: call for competition; direct negotiations; and economic and financial balance for the delegated management contract;
- The delegate holds the responsibility for the risks of managing the utility he was commissioned with;
- Follow-up of the delegated management and monitoring of the implementation of the contract;
- The public domain is under disposal of the delegate, and assets that shall be compulsorily returned to the delegator at the end of the delegated management can also be subject to mortgage; and
- Possible resorting to arbitration and possibility for the delegate to subcontract on part of the contractual obligations.

APPLICABLE REFORM COURSES

Applying Commercial Principles

The institutions working in the water sector are characterized by their commercial nature and thus:

1. The autonomousagencies for the distribution of water and electricity are considered as public institutions of a commercial and industrial nature and incorporate legal characteristic and financial independence (autonomous owned utility) in accordance with Decree No. 2.64.394 dated September 29, 1964 concerning collective agencies with legal characteristic and financial independence.
2. ONEP is a public institution of a commercial and industrial nature, and incorporates a legal characteristic and financial independence (autonomous owned utility) according to the charter 1.72.103 founded on April 01, 1972.
3. The delegate companies (concessionnaires) that operate water and sanitation utilitiesare franchised companies.
4. Water Basin Agency is a public institution with a legal characteristic and financial independence (autonomous owned utility). The agency's budget consists of: exploitation proceeds and profits, as well as those resulting from operations and assets; fees paid by beneficiaries; fees for using the public water domain; advances and loans granted by the state, public or private donations, as well as permitted loans, all according to the applicable laws and regulations; updated tax resembling fees; and all other activity related proceeds.

Decentralized Management

1. Water basins and local water committees applying decentralized management of water resources

The Moroccan legislator applies a methodology based on decentralization and participatory management of water resources. This strategy adopted by the Water Law and is manifested in modernization and sponsorship of the following institutions:

- At the national level the **Supreme Council for Water and Climate** represents the supreme body charged with setting the public policy of Morocco. At the regional level water resources are managed within the frame of a geographical unit i.e. **the basin**, which is seen as an important innovation that would create and apply the principles of decentralized water management. Indeed a water basin represents the perfect natural geographic domain to monitor and solve problems related to managing water resources, as well as to achieve an actual regional solidarity among the users of a common water resource. Chapter 20 of Water Law No. 10/95 has specified the main responsibilities of the agencies within their territorial scope, including: the preparation of the master plan for applying IWRM, ensuring its implementation, granting of licenses and concessions for the use of the public water domain as provided by the master plan, completion of all water level measurements and calibrations, as well as hydrological and hydro-geological studies, as well as those related to planning and management both at the quantitative and qualitative levels; taking the necessary measures to protect and restore water quality, measuring and monitoring the use of transmitted water as well as the completion of the necessary infrastructure for the prevention of floods.

- At the regional level the **Regional WaterCommittees** play a key role in the development of cooperation between the state on the one hand and local communities on the other hand, through contributing to the development of master plans for the integrated management of water basins; encouraging municipalities' work in the field of water demand management and protection of water resources from pollution; and applying every action that would help sensitize the public to the protection and conservation of water resources.

2. Management of water and sanitation utilities is the responsibility of local municipalities[2]

According to the communal Charter the water distribution and wastewater collection services fall under the jurisdiction of the local municipalities that choose the form of management. Article 39 of the Community Charter stipulates the following:

"The local Council decides on the creation and management of public utilities, particularly in the following sectors: supply and distribution of drinking water – electrical distribution - sanitation - collection of solid waste and similar waste, its transfer to the public waste landfills and treatment - public lighting - public urban

2 . Urban Municipality, Rural community

transport - transport, travel and public roads' signs - transport of the sick and wounded - slaughterhouses and transport of meat and fish – graveyards and facilities for the transportation of deceased".

3. ONEP is a decentralized organization

With regard to ONEP, its organizational structure provides the required elements of a decentralized structure:

- The existence of various administrative units within the organization: ONEP has ten regional offices covering all 16 regions of the kingdom. The office also has agencies covering all prefectures in the kingdom in addition to the organizational sub-divisions of the units (595 centers in 2011);
- Clarity of specialization and responsibilities: The office has an organizational manual that can identify clearly and precisely the responsibilities and duties and the authorities of those who supervise; and
- The scope of supervision and line of authority and responsibility: The officehas a manual on delegation of authority and signatures that clearly define areas of intervention for officials of different hierarchy levels. The head of each group is commissioned with the necessary authority to perform these activities.

Integration of Services

As part of the integration of services a series of initiatives wereundertaken:

1. Expanding on the role and responsibilities of ONEP in the sanitation sector

The sanitation sector remained marginalized until the beginning of the nineties of the last century due to a lack of technical and financial resources. This situation prompted the public authorities to intervene as follows:

- To carry out a study for the National Sanitation Master Plan (SDNAL) starting in the nineties;
- Assigning the sanitation service to professional agencies in the major cities (independent agencies and companies for delegated management);
- Amendment of the decree concerning the creation of ONEP by expanding on its responsibilities to intervening in the field of sanitation (September 2000); and
- The Ministry of the Interior and the Secretary of State for Water and the Environment in 2005 developed the National Program for sanitation.

2. Expanding the role and responsibilities of ONEP in the area of drinking water sector in rural areas

As of 2004 the office was assigned with the task of making public the service of water supply in rural areas. In order to succeed in the task entrusted to it, the office developed a strategy to intervene in rural areas. The strategy adopted the following principles:

- Proper planning of projects by covering all regions with master plans for providing drinking water;
- Adopting an integrated vision for intervention in urban and rural areas when designing projects; and
- Adoption of appropriate technical solutions and new approaches to the management of drinking water supply utilities in order to ensure continuity of service (sustainable -often surface- water resources, structured projects, appropriate and innovative management patterns,....).

Some of the most important historical turning points in providing rural areas with drinking water were:

- The starting point: the percentage of access to drinking water in rural areas does not exceed 14% by the end of 1994.
- In 1995: launch of the program that provides rural communities with drinking water and aims to reach an access ratio of 80% in 2010.
- In 2001: royal directives on the occasion of the ninth session of the Supreme Council for Water and Climate aim to accelerate the pace of intervention in rural areas.
- In 2002: the government statement which set the goal for a new rate of 90% by 2007 instead of 80% in 2010.
- In 2004: Set ONEP as an official representative for coordinationand supervision of the various programs and initiatives aimed at providing rural areas with drinking water. A national study was completed to diagnose the status of drinking water supply in rural areas with the participation of various stakeholders. It was able to determine the access at 61%.

Modernization of Services

1. Significant investments towards modernizing the water and sanitation utilities

The following figure shows the achievements for the development of such utilities between 2007 and 2011

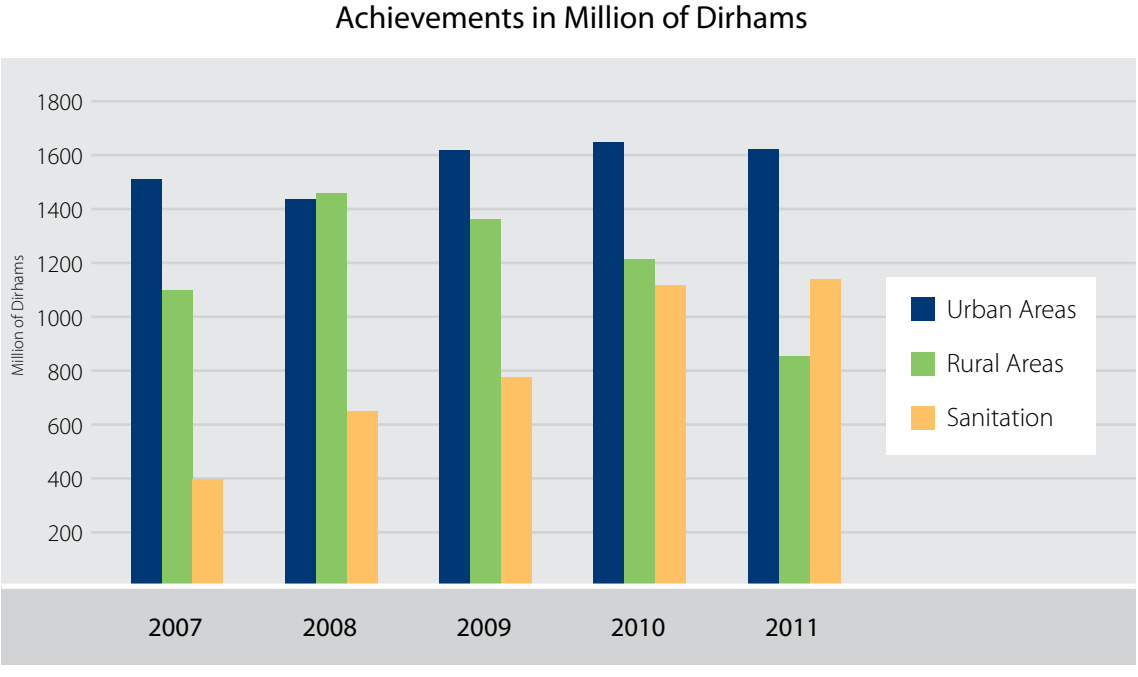

Figure 4: Achievements in Water and Sanitation Utilities 2007 – 2011

(Source: ONEP, 2012)

In order to follow up and keep up with the initiatives aiming at improving the services, ONEP introduced an investment program of up to 5.19 billion Dirhams. The main objectives of this program are:

- To increase the profitability of production utilities from 94.4% recorded in 2011 to 96%.
- To improve the performance of distribution networks from 72% as recorded in 2011 to 77% for cities and centers where the office is managing the distribution of drinking water.
- To increase production of more than 15,000 Liter per second (L/s) of which 12,900 L/s is from surface water and 1.600 L/s through the desalination of sea water and brackish water.
- To increase house connections in urban areas from 94% in 2011 to 96%.
- Working in 90 cities, urban centers and villages to manage the water distribution utilities for the benefit of approximately 500,000 inhabitants.
- To increase the rate of supply of drinking water in rural areas from 92% in 2011 to 96% for the benefit of approximately 540,000 inhabitants.
- Completion of individual house connection projects in rural areas for the interested population which fulfill the criteria in force.

As for the sanitation program, 6.5 billion Dirhams shall be invested, with priority given to sector projects that have the greatest positive impact on the environment, in particular, protection of water resources, as well as those that benefit the greatest number of citizens.Some of the most significant goals are:

- To complete the construction of wastewater treatment plants in cities and centers where the office is managing the water and sanitation utilities. This shall increase the capacity of the treatment plants from 190,000 m^3/day to about 400,000 m^3/day;
- To construct more than 2,000 km of wastewater pipes; and
- To work in 70 cities or new centers in which the office is managing water utilities, in order to manage the sanitation sector for the benefit of a population estimated at 2 million.

2. Water quality monitoring and pollution control

Water quality monitoring and pollution control is considered to be one of the highest priorities in institutions working within the water sector, in particular the sector of drinking water. In order to develop and modernize the services in the field of water quality monitoring and pollution control, the office developed a Laboratory Information Management system (LIMS), and earned an accreditation certification according to the international standards on laboratories competencies International Standards Organization / International Electro-technical commission (ISO/ CEI) 17025 (from the part of the Ministry of Development and Environment/Canada, starting from September 2002; and from the part of the Ministry of Industry and Trade (Morocco), starting from September 2003).

3. Projects in Progress

- A project for following up the accreditation of regional laboratories according to the international standard ISO 17025 (2009 – 2012);
- A Project for developing a health risks assessment system in production and distribution facilities according to the international standard ISO 22000; and
- A project for developing a quality management system according to the international standard ISO 9001 including activities of the water quality monitoring management.

4. Customer Service

Citizens had an important role, even if indirectly, through civil society associations, consumer protection associations and professional unions, to develop a general framework for improving and reforming the water utilities. It enabled the interaction between the citizens and the institutions to improved the services through:

- Expanding the representation of the office across the Kingdom;
- Expanding the network centers for collecting water fees and other services;
- Continuing to open other collection centers in countries containing a Moroccan community similar to the centers located in France, Italy and Belgium; and
- Modernizing the Directorate for customers services through the adoption of a new information system.

The office also strives to improve the level of services through:

- Establishing a call center for customers via a telephone number and an electronic portal;
- Simplification of administrative procedures for applying for house connections and supply services;
- Adopting a social approach by suggesting innovative payment mechanisms for connecting to water and wastewater networks; and
- Individual handling of all applications as well as customers requests.

Energy Efficiency

With regard to energy, it suffices to include the case of the ONEP, where it gives priority to the control and rationalization of the energy cost. The following figure illustrates the progress of energy indicators in the period 2006-2010.

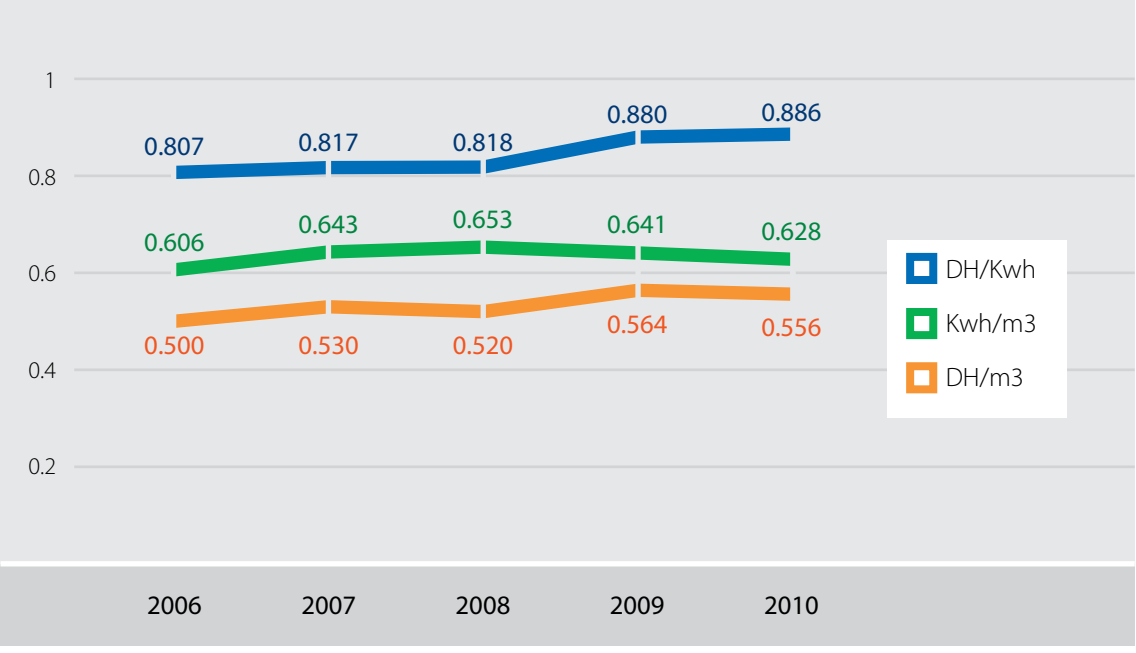

Figure 5: Progress of Energy Indicators
(Source: Facilities Directorate/Results Improvement Division, ONEP, 2011)

In order to reduce energy consumption a series of measures have been taken:
1. The formation of a committee for the reduction of electric power consumption;
2. Initiation of energy audits (diagnosis of the status quo of the electric power consumption; measuring the energy performance indicators; and developing an action plan);
3. Improving the cost-effectiveness of the distribution network and transfer pipes by continuing maintenance operations as well as relying on the development of technologies based on modern information systems in the field of the exploitation of projects of transfer and distribution via remote control (7 operations are in the process of completion);
4. Increasing the capacity of storage reservoirs;
5. Taking into consideration in projects design, the electrical energy consumption as a criterion in the evaluation and selection of contractors to construct pumping stations and treatment plants; and
6. Encouraging the application of the latest techniques designed for saving electrical energy.

During operation, the following measures were taken:
1. Close monitoring of the power factor to avoid taxes imposed by electricity distributors;
2. Following a pumping program to reduce the duration of operation during peak hours;
3. Requiring energy audits;
4. Giving priority to exploitation of resources with the least Kilo Watt Hour per cubic meters (kwh/m^3) index;
5. Carrying out annual campaigns to measure the efficiency of pumps in order to identify and replace low performing equipment, which are high power consumers; and
6. In terms of administrative and public media procedures,carrying out an outreach program to raise awareness among employees about the need to reduce energy consumption.

Participation of the Public Sector in its Various Forms

In accordance with the communalCharter the water distribution and wastewater collection services fall under the jurisdiction of the local municipalities that choose their form of administration. The management of such services by ONEP is considered to be the representation of partnership within the public sector. ONEPis authorized to work within a framework of a management contract with the concerned local community for 10 years, where the partnership is automatically renewed thereafter for periods of five years unless one of the parties explicitly expresses to the other party of wanting a termination of the partnership. When the agreement ends:
1. ONEP returns the following to the municipality:
   - Distribution facilities, as well as the subscribers' water meters, all means of exploitation owned by the

municipality and all fixed or mobile equipment that is associated with distribution and bought from management funds;
- Subscription contracts as well as all technical, administrative and financial documents relating to the recovered facility;
- Assets and liabilities as concluded from balancing the management accounts, where the municipality shall be assigned to pay back all debts to all the creditors. The municipality shall replace ONEP in all of the commitments that have been made by the latter with respect to the recovered facilities.

2. The municipality shall be responsible for all the employees in accordance with the specified conditions. It shall maintain all their rights and privileges acquired at ONEP.

According to the agreement and in the area of Operation and Maintenance (O&M):
1. ONEP shall ensure operation of distribution utilities in accordance with the methods applied as its own, as is the case for expansions, annexes or changes in the distribution utilities which will be completed during the term of this agreement;
2. The acquisition of means of operation (shops, buses, furniture, office supplies, measuring devices and equipment, etc. ...) for distribution shall be carried out by ONEP for the accountand at the expense of the municipality in the case of making some of the means available to the office directly by the municipality. Their specifications shall perfectly match the defined specifications of ONEP;
3. In the context of bringing in ONEP, the municipality is committed to facilitate all the administrative and similar procedures that are necessary for the acquisition and maintenance of right-of-way and those agreements associated with distribution utilities. These shall be put at the disposal of ONEP land plots necessary for O&M; and
4. ONEP will take over the responsibility of maintaining the utilities necessary to keep them in good functioning condition.

As for new projects/facilities/expansions, ONEP is responsible for development, rehabilitation, expansion and changing the distribution network within the municipality as needed, and at the expense of the municipality.

In terms of budget, each year ONEP presents an estimated budget written in terms of expected earnings, expected O&M and new projects costs, as well as the necessary financial means needed for the next fiscal year.

Partnership with the Private Sector

Delegated Management

The philosophy is based on delegating a public utility for a specified period of time from a legal entity governed by public law, to a legal entity governed by private law, and is therefore a kind of partnership between the public sector and the private sector, in order to achieve a number of objectives:
- Benefiting from private investment to put into action development strategies;
- Transfer of know how in modern technology;
- Benefiting from competencies in marketing and management;
- Reducing the State's financial contribution in capital investment; and
- Expand public services and mobilizing the job market.

In this context, the first known contract of delegated management in Morocco occurred in 1997 to manage the electricity, water and sanitation utilities for the duration of 30 years. It was signed between the municipality of Casablanca and the company «Lyonnaise des Eaux» which replaced the independent agency for the distribution of water and electricity in Casablanca. The contract, which defines the rights and obligations of the contracting parties, consists of fourteen annexes and scope statements. It has been revised by an annex contract that entered into force on 20th of May, 2009.

After that, Veolia (a subsidiary of the multinational global Veolia Environment)started to work in Morocco in 1999, based on a delegated management contract for the sectors of water, electricity and sanitation in both Rabat and Sale through one of its subsidiaries «Redal» for a period of 30 years. The contract entered into force on the beginning of January 1999.

In 2002, the same global company was able to get a delegated management contract for the sectors of water, electricity and sanitation in the cities of Tangier and Tetouan through its subsidiary «Amendis», which is a shareholding company under private Moroccan law. It is responsible for delegated management of water

distribution and wastewater collection and electricity distribution services in Tangier and Tetouan for a period of 25 years starting from beginning of January 2002.

The delegated companies have committed towards the delegating authority to achieve the following key objectives:

- To achieve the lowest possible prices for drinking water and electric power and sanitation services;
- Self-financing and the economic and financial balance of the delegated utilities;
- Gradual increase in rate of connections to networks for drinking water, electric power and sanitation networks within the coverage area;
- Highquality of services;
- High technical quality and proper maintenance of equipment allocated to the delegated utilities;
- Good management of human resources.

It is to be noted that these contracts entered into force prior to the issuance of Law No. 05-54 (2005) concerning the delegated management of public utilities.

The Experience of ONEP a Public Institution with the Private Sector

There are numerous forms of applied partnerships with the private sector, and they relate to all projects phases, whether in the drinking water or sanitation utility (construction contracts; Build-Operate-Transfer (BOT) especially in the field of wastewater treatment; and service contracts (studies, maintenance, management of pumping stations, security services… etc). Partnership with the private sector in the field of management is a model worth elaborating on:

1. The new approach to manage facilities: rationalization / outsourcing.
   In line with its strategy, ONEP applies the following key principles in the management of the completed supply utilities:

a. Rationalization of human resources in cases of direct management, especially for major or strategic centers and utilities: expanding of authorities / adoption of a supervision system / automating operations.

b. Supporting the policy of «outsourcingto other parties» through new types of management in utilities, including the adoption of a soft approach that takes the local specificities into account; respecting the legal and institutional framework; encouraging the involvement of local beneficiaries: associations, private contractors, etc.; and maintaining the monitoring and supervision role with ONEP.

This approach has taken into account the institutional and the legal frameworks in force in Morocco. The outsourcing approach has taken several forms:

- Since 1987: adoption of management for public fountains by using delegated guards;
- Since 1996: very small (Micro) local contracting companies program (they were created with the help of ONEP);
- Since 2004: extended subcontracting (larger scale) for the operation of supply facilities in medium and small centers and departments of medium and large companies (seven operations, starting from the year 2009); and
- Since the year 2011: a new model for larger scale subcontracting for the operation of supply facilities while shifting the commercial responsibility for the company (the first typical operation in the Jorf Al-Melha area with support from the World Bank).

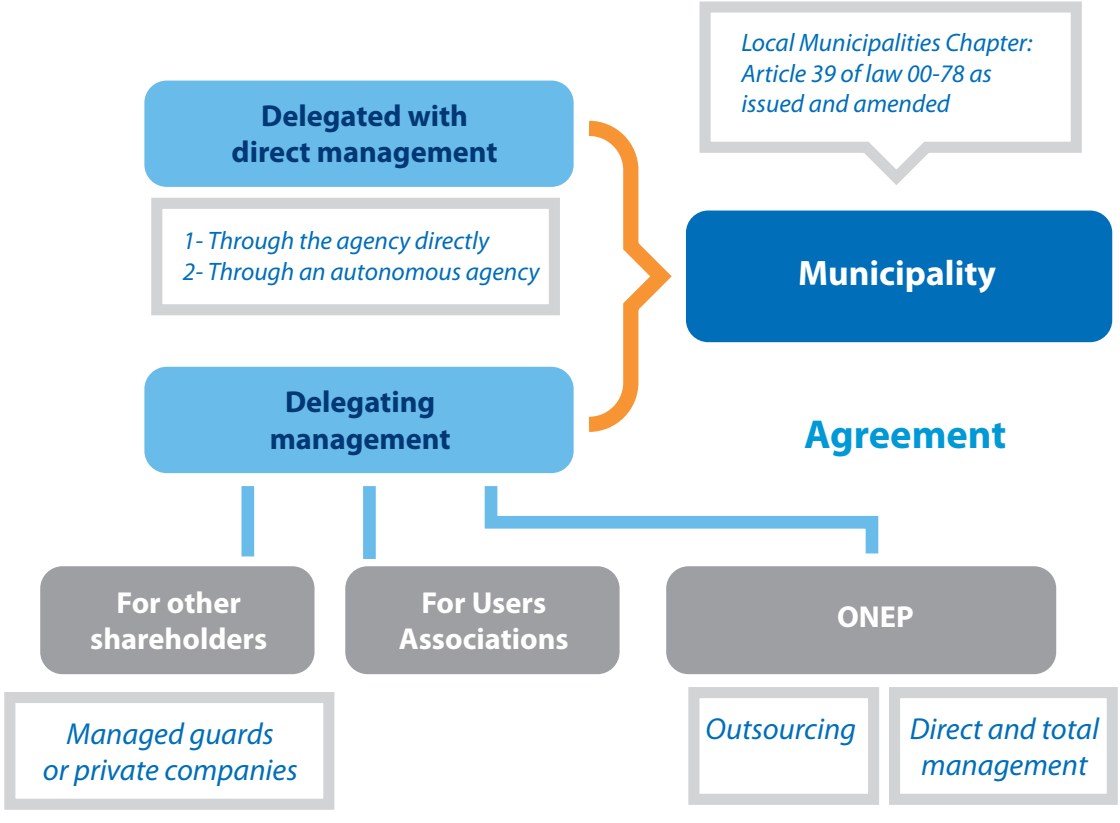

Figure 6: Subcontracting Model

(Source: Drinking Water Supply Directorate / Types of Management Section)

2. Management by appointed guards/operators.
   An appointed guard (or guardian or operator) can be one of the citizens in the village/community, whose responsibility becomes to manage and maintain public fountains, as well as buying water from ONEP and re-selling it to the consuming population for a specific price after consultation with the municipality. The acting legal framework is an agreement between ONEP and the delegating municipality and a collective decision to appoint the guard, and a contract in his name from ONEP to supply the water.

The results of applying this model were:
- 97% of the operated fountains are managed by appointed guards (about 7,000 fountains supplying more than 2.077 million inhabitants);
- Reducing the selling price by 64%;
- Providing support through training and capacity building; and
- Automated follow-up to monitor problems and develop appropriate solutions (the automatic fountain model).

3. Management by users associations.
   As illustrated below, this model entails a trilateral agreement between the municipality, ONEP and the users association. The municipality delegates production to ONEP and distribution to the association. The results of applying this model were signing 361 agreements, and the formation of 315 associations with 655 beneficiaries.

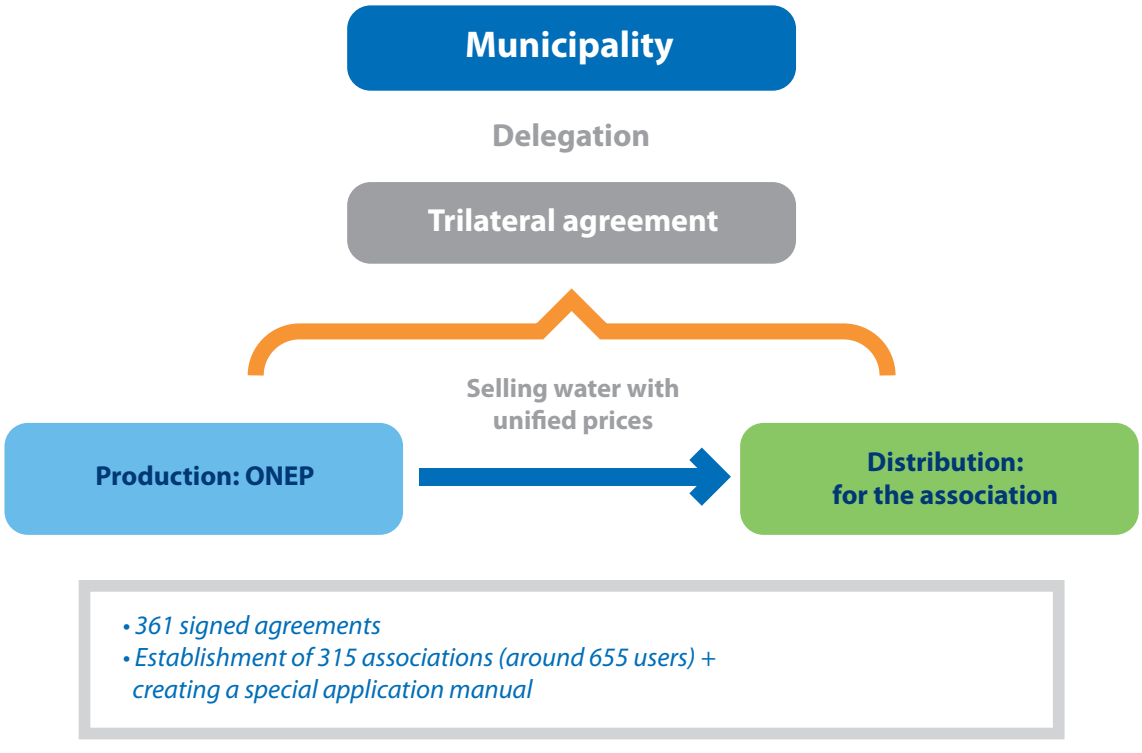

Figure 7: Management by Users Associations

(Source: Drinking Water Supply Directorate / Types of Management Section)

4. Management by private companies.

There are four forms for this type of delegation:

Form 1: Very Small (Micro) Businesses Program

The objectives of the program are to make available local setups thatenable delegation of responsibilities within the rural supply program through participation in management and maintenance of completed facilities, and to create job opportunities for graduates of training centers.

The concerned businesses are companies formed by graduates from vocational training centers (3-5 individuals). Their assignment would be the technical operation of pumping stations and water treatment and networks. The contract is a direct framework agreement for a maximum period of five years.

The applied methodology entails:

a. Planning through the identification and approval of needs (framing regulation) and announcing applications for nomination.
b. Preliminary selection by examining the file for qualifications appropriate for the type of work, for a resident of the area covered by services, and with an age less than 40 year.
c. Selection of candidates, done by performing oral and written tests.
d. Creating the business by creating the administrative and legal file, and providing the necessary equipments/ machinery.
e. Launching activities by visiting the facilities, signing the contract, and signing the contract annex (technical scope).
f. Monitoring and evaluation of the quality of work done, and evaluation of performance to decide on the possibility of contract renewal for another year.
g. The outcomes were more than 750 contracts signed since 1996.

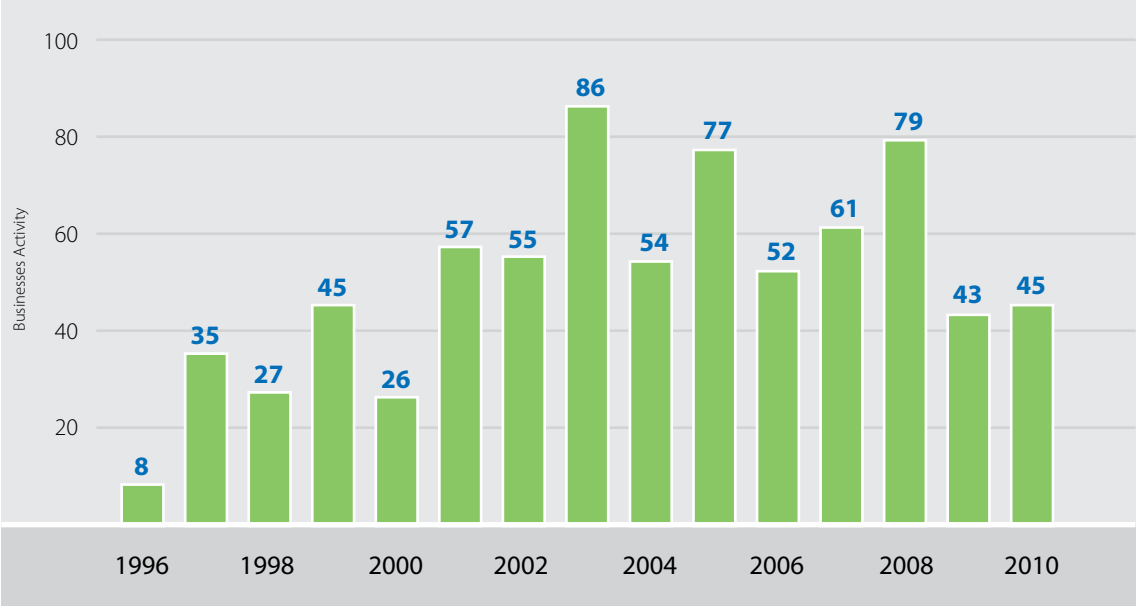

Figure 8: Established Businesses over the Years
(Source: Facilities Directorate/ Maintenance and Support Section)

Types of activities of micro businesses are distributed as follows in terms of type:

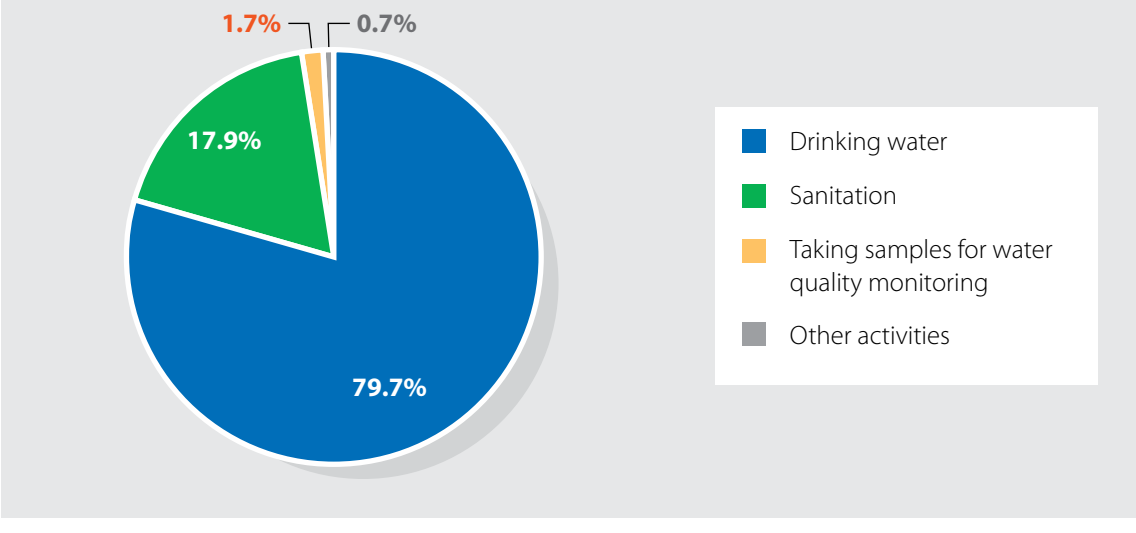

Figure 9: Types of Activities undertaken by Micro Businesses
(Source: Facilities Directorate/ Maintenance and Support Section)

Form 2: Subcontracting to Manage Isolated Water Systems

This form is best illustrated in Figure 10 below. It entails delegation of authority for the management and operation of an isolated part of the water system. For example, it would cover operating and maintaining a water source along with the transmission pipe that delivers it at a point of distribution before the network. So start and end points are well identified.

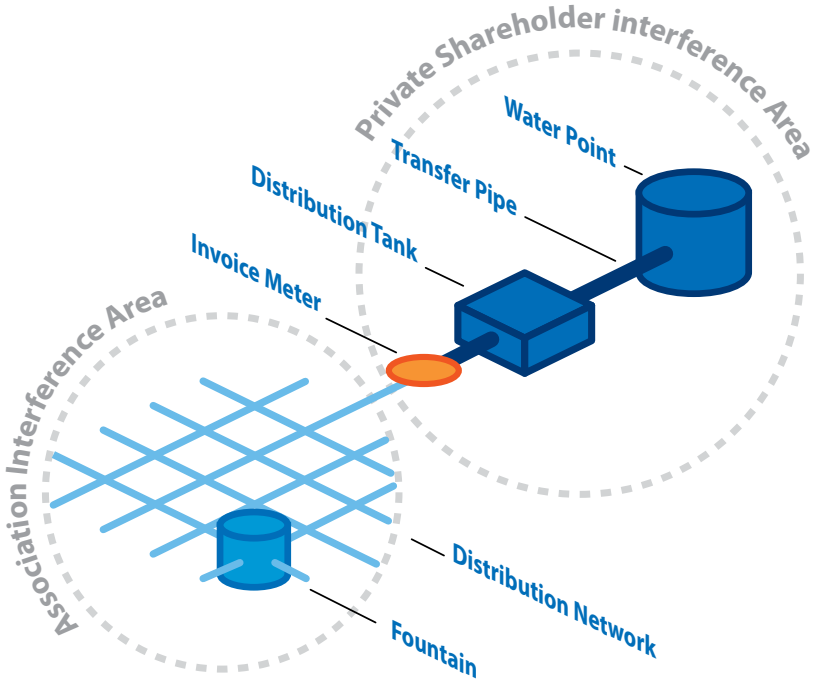

Figure 10: Areas of Intervention of Private Sector
(Source: Drinking water supply Directorate/ Types of Management Section)

Form 3: Subcontracting without transferring commercial risk

This type of contracting usually takes place for a five year period. Technical specialties to be covered include operation of utilities and monitoring indicators for profitability and efficiency; expansion and rehabilitation of distribution networks and establishing house connections; and monitoring water quality. Outsourced commercial functions include meters reading, as well as the billing process.

Performance related characteristics entail a fixed price according to type of facility (related operations and maintenance activities, new house connections, installation or rehabilitation of network pipes…) and measured against specific technical indicators such as profitability and energy efficiency indicators.

Within this setup the responsibilities of ONEP are overall responsibility for the services provided in front of the delegating municipalities and the subscribers, and ensuring water quality and quantity delivered. More specifically, and on the technical level, ONEP is responsible for following up and monitoring of the completed tasks and provided services, and monitoring of water quality indicators (biological, physical and chemical). As for the commercial level, ONEP is responsible for issuing water bills, and following up on amounts payable and orders to suspend services as well as examining applications for house connections and complaints.

Form 4: Subcontracting – with transferring commercial risk and subsidies under OBA (ouput Based Aid)

The objectives for this type of contracting are:

- Continuing to provide the rural areas with drinking water by connecting the remaining remote areas;
- Responding to the requests of the population through increasing individual house connections in rural areas by 2% to more than 50% over the next five years through leveraging private sector dynamics and flexibility of operation;
- Reducing operating costs through offering incentives to the private company; and
- Maintaining the level of quality of service provided, even within the rural areas.

There are certain institutional and legal determinants that need to be considered:

- As Delegated by the municipalities for the management of the drinking water services, ONEP remains responsible for the utility before the concerned municipalities;
- All current and future customers remain those of ONEP and the same tariffs apply to them as applicable in other centers it is responsible for running;

- ONEP is the only entity that addressed the private company, which is liable before it only;
- ONEP cannot, being delegated by the municipalities, give any authorization to a third party, but it can handle accomplishing some tasks within the framework of the legal requirements governing the conclusion of public procurements; and
- The agreement that ONEP concludes is not a contract of delegation of authority, but an agreement for up to ten years after it is authorized to do so by the governing board.

An example of this type of setup or subcontract is the typical case of Jorf El Melha. It involved 10 municipalities that include 216 villages, 194 of which are supplied with water by ONEP. Population within all municipalities is more than 139,000 with an overall service area of around 1,200 square kilometers (km^2). The related facilities are:

- Production facilities:
  - Wells and water boreholes (11)
  - Pumping stations (17, with 37 pumps)
  - Disinfection equipments (23)
  - Transformers (11)
  - Transmission pipes (around 69 km)
- Distribution facilities:
  - Distribution network pipes (more than 487 km)
  - Reservoirs (17) with storage capacity of around 4,215 cubic meters
  - Individual house connections (more than 7,800)
  - Public fountains (more than 255)

The responsibilities of ONEP are:

- Putting the facilities at the disposal of the company in return for an annual payment/fee;
- Ensuring the availability of necessary water resources;
- Tracking and monitoring the company's performance and ensuring the quality of the provided service;
- Completion and rehabilitation of major facilities (wells, reservoirs, transmission pipes, main distribution pipes); and
- Providing incentives based on the achieved results.

The main characteristics of the contract are:

- Agreement duration: 10 years.
- Customers remain within the framework of their agreement with ONEP and prices are the same as previously applied.
- The private company applies the same standards adopted by ONEP.
- The private company operates the facilities placed under its authority without transferring the ownership.
- The company has the right to provide their own management resources.
- The company assumes commercial responsibility and related risks.

Other Forms of Reform

Consolidation of Drinking Water Utilities and Sanitation Utilities and Electricity Distribution Utilities under One Institution (Law 40.09)

Morocco's needs for energy and water have been growing steadily due to its characteristic mobility at the economic and social levels, and especially due to the programs of public access to energy, drinking water and sanitation services. In order to meet the challenges that Morocco faces in the field of electrical power, and drinking water and sanitation services, it has become necessary to cope with the changes that are typical of these vital sectors across the world. For this purpose and for the standardization of the new strategy for water & electricity, as well as to ensure the continuity of public utilities for water and electricity they are being managed rationally through the adoption of suitable action plans. These action plans guarantee their availability, plan their needs, and improve their consumption without affecting the productivity. ONEP and the National Office of Electricity (ONE) have been consolidated into a single institution, «National Office of Electricity and Drinking Water Supply (ONEE)". The joint activities of both institutions are intended for the coordination of national strategies in these two major intertwined areas. This leads to the mobilization of energy and water resources, their pricing, securing their supplies, availability at affordable prices, production control and effective management.

THE REGULATORY FUNCTION

Principles Adopted in the Regulatory Process

Delegated Management

Morocco has based its new managerial policy for public sectors upon the European experience and followed its path accordingly, specifically the French experience, which was launched early by granting concessions in a number of sectors, starting by the railway transport sector, road traffic sector, as well as solid waste and electricity distribution, water and gas. Morocco has staked the above mentioned step on improving and providing services, increasing quality and speed, decreasing the costs, as well as attracting investors and capitals. However, the experience exceeds 10 years if we start counting from 1997, which was the actual beginning of the concept of delegated management, with the contract that joined the urban municipality of Casablanca and the Lydec company for water and electricity distribution. This contract indicated that there are significant issues in operationalizing this type of setup as requiredand within the proposed stakes, mainly due to the absence of a clear law that clearly defines roles and responsibilities and mandates and clear mechanisms for monitoring and accountability (report of Supreme Council of 2009).

Micro Entreprises

This particular methodology adopted by Morocco is considered to be a model experience that deserves analyzing and studying due to its relevance to other (in particular Arabic) countries.

Subcontracting - with transferring commercial risk and subsidies under OBA (ouput Based Aid)

This approach began in Morocco in 2007 with Lydec company in Casablanca and Amendis company in Tangier and Tetouan, as well as the autonomousagency for the distribution of water and electricity in Meknes. The aim was to link 11,300 poor and marginal dwellers with water and sanitation services, using a 7 million US$ grant from the Global Partnership for Output-Based Aid (GPOBA) of the World Bank. The results based approach of support or financing was applied in several countries especially in the field of energy and social services. The Moroccan experience is also considered to be an exemplary experience due to the nature of the contract concerning drinking water services in the relevant region. Currently the experiment is being evaluated by an independent research office.

Adopted Performance Indicators

In order to define the performance indicators used to measure performance and quality of services provided, annual reports presented for boards of directors, agreements or concluded contracts between the delegator and the delegate or program contracts with the state were used.

Performance Indicators for ONEP

- Subscribers'/customers' accounts receivable
- Number of subscribers
- Net profit/loss
- Amounts of drinking water produced
- Distribution centers
- Connection rate in the rural areas
- Benefiting population
- Number of wastewater treatment plants
- Operation centers (centers where ONEP services the wastewater facility)
- Benefiting population
- Human resources indicators
- Distribution profitability
- Production profitability

Performance Indicators for Delegated Companies

- Investments carried out
- Connection rate to the distribution network
- Distribution profitability
- Storage capacity

- Expansion of distribution network
- Completion of the social network
- Power consumption costs
- Quality of services
- Continuity of services
- Average subscription period
- Average period for completing a household connection
- Ratio of complaints/disputes with subscribers
- Complaints processing time

Performance Indicators for Municipal Autonomous Agencies

- Number of subscribers
- Net profit/loss
- Investments carried out
- Connection rate to the distribution network
- Quantities of purchased water
- Length of distribution network
- Access to water rate
- Power consumption costs
- Service quality
- Continuity of services
- Average subscription period
- Average period for completing a connection
- Ratio of complaints/disputes with subscribers
- Complaints processing time

Applied Audit Methods

The State has the right to exercise control over the general contractors. By this the State aims to ensure a balance between the independence and the effectiveness of the contractor, the respect for the governance principles and to achieve coherence and harmony in the whole public sector for the benefit of the public interest. These controls are related to the administrative and financial aspects, as well as the judicial monitoring which is entrusted to the financial courts, and last but not least the political control performed by the parliament.

The Parliament

The Constitution states that it is permissible by initiative of the king or upon request of a majority of the members of any of the two Councils to form parliamentary committees for fact-finding purposes. These committees are entrusted with collecting information related to particular facts and to inform the Council(s) by which they were formed with the results of their findings. No fact-finding committee shall be formed for facts subjected to follow-ups of judicial proceedings as long as these are ongoing; furthermore each fact-finding committee shall be suspended as soon as a judicial inquiry begins in the facts that the committee was formed for.

Fact finding committees are usually temporary in nature and end their mission by the submission of their reports. A regulatory law defines the performance of such fact finding committees. The constitutional legislator states that each of the two parliamentary Councils is entitled to a weekly session for parliament members' questions answered by the government. These questions shall be answered within 20 days following the referral of the question.

Financial Inspectorate General

As the supreme organ of control, the Financial Inspectorate General monitors state finances and local municipalities in accordance with the laws and regulations, especially Decree No. 1.59.269 dated 17 Shawal 1379 (April 14th, 1960) concerning the Financial Inspectorate General. Thus it is responsible for:

- Controlling the matters of cash funds and accounting for public accountants, state employees and local municipalities in general;
- Supervision of accountants and ensuring that all recorded processes of the public revenues and expenditures accounts by the authorized officers and public supervisors are correct from a legal point of view; and
- Examination of public projects funded by foreign parties. The Inspectorate is adopting new approaches in this context that are consistent with those in force on the international level.

The Interventions of the General Inspector of Finance are subject to an annual program certified by the Minister of Finance. This program may experience some adjustments in case of emergency and urgent tasks that may occur. The mentioned annual program also takes into account the intervention requests that are expressed by the various ministries.

Board of Directors

An administrative council includes among its members various custodian and intervening ministries in the sector as well as representatives from the urban water distribution agencies, representatives of water basins agencies and representatives of the elected parties. The Council works according to what is defined in the law, including taking various decisions of a guiding and strategic character to monitor and improve the performance of institutions. The Board of Directors convenes on a regular basis to approve the financial accounts and reports of the office's overall performance during the previous year, as well as to discuss the budget and work program for the coming year, and taking the necessary decisions in order to develop the work procedures.

Audit Committee

It is an external body that was derived from the administrative council and updated under the law of 69.00 on the subject of follow up and monitoring of public institutions. This body, whose members mainly consists of the Ministry of Financeand Economy, Ministry of Interior and the Department of State assigned to Water issues under the supervision of the Administrative Council to which it offers a comprehensive report of its work regarding the Offices' Audit and an assessment of the management methods and procedures as well as proposals for development and improvement. Since its establishment, the Committee holds meetings regularly and presents its reports to the Board of Directors for approval.

The Court of Auditors

Similar to developed countries, Morocco made sure to upgrade the court of Auditors to the level of a constitutional institution that plays an effective role to rationalize the management of public funds. It fully exercises its function as a supreme auditing institution while being independent from the legislative and executive authority. In that regard, chapter ten of the Constitution explains that the court of Auditors of Accounts shall exercise the supreme control in the implementation of financial laws, shall assist the Parliament and the government in the areas that fall within its jurisdiction under the law, and shall submit to His Majesty the King the data of all the work that has been carried out in its annual report framework. Moreover, and in the framework of the decentralization policy, the constitution stipulates the creation of regional courtsfor the assigned accounts in order to monitor local municipalities, their agencies and the method in which they run their business. The culmination of the constitutional requirements has been the issuing of Law No. 99-62 concerning the code for financial courts on the 13 of June 2002.

Thus the functions assigned to the financial courts have been clarified more explicitly in order to ensure the exercise of integrated control, the establishment of a better balance in the responsibilities that are being monitored, and subsequently achieving a more fair and impartial system of sanctions and follow-up thereof. It should be noted that the most important kind of control practiced by the financial courts is that concerning the judicial control of the legality of financial operations and the extent of their conformity to the law stipulations (making decisions concerning accounts, de facto management, discipline in matters of budgetary and financial affairs), and a control management that is oriented towards the assessment of the performance results of monitored units in terms of efficiency, economy and sufficiency. The court of Auditorsfulfills the following functions:

1. Auditing and settlement of public utilities accounts, as well as accounts of contracting and public institutions.
2. Declaration and decision concerning the de facto management.
3. The Budgetary and Financial Disciplinary.
4. Monitoring the conduct of the institutions under its control and the use of funds.
5. Re-appealing final decisions in the regional councils.

Regarding the management control the courtmonitors the conduct of utilities and public institutions that fall under its responsibility, to assess the quality and provide, if necessary, proposals concerning various means of improvement of methods and raising effectiveness and performance. Monitoring concerns all aspects of management. The courtcan perform tasks of assessing public projects in order to determine, based on the achievements, the extent to which the desired goals for each project were reached through monitoring the designated indicators.

Delegated Management Monitoring Committee

In addition to the control exercised by the state or other authorities under the legal provisions in force, the Delegator has general authority over the Delegate in matters of economic, financial, technical, social and managerial monitoring in connection to the obligations stipulated in the contract. The Delegator has, on a permanent basis, all monitoring authority to ensure through inspecting various documents in the field, the smooth and successful management of the utility and the proper execution of the contract. The Delegator can demand viewing or have access to every document in the possession of the Delegate related to the implementation of the operations associated with the delegated management. The contract of the delegated management must indicate the periods and forms of control exercised by the Delegator in order to execute the delegated issue, the follow up and various technical, accounting and financial documents communicated to the Delegator regularly by the Delegate. The Delegator may perform external audits and controls from time to time, or to get assistance from experts chosen by him, provided he informs the delegate with their appointment.The Delegator can also be present in an advisory capacity during Board of Directors meetings or those of the institution in charge of handling and negotiating, as well as in the General Assemblies of the delegated company. He may also appoint a representative, unless the contract of the delegated management stated otherwise. He shall receive a copy of the documents provided for the participants in these institutions. The delegated management contract stipulates the penalties against compromising monitoring operations exercised by the Delegator, as well as to rebuke non-fulfillment of contractual obligations relating to information and communication which the delegate is obliged to provide.

Applied Tariff

In Morocco the water and sanitation fall within the list of services with fixed prices. This regulation is defined by a decree of the Delegated Minister to the Prime Minister in charge of public and governance affairs. The tariff system is based on axioms for which the competent public authorities have taken into account several considerations: it embodies a social character through allocating a social block/segment for the benefit of the low-income individuals so that this particular social group benefits from this vital substance against a rate that suits its purchasing capabilities. It also takes into account other equally important aspects that are associated with the economic sector by demand management and reducing consumption. Further it adopts the budget criteria and rational management of the available financial resources. Therefore the block system used, as well as the pricing system, are two systems defined by the Delegated Minister to the Prime Minister in charge of public and governance affairs. The tariff system in Morocco is characterized by the following:

- At the national level, the water tariff at the production stage is specified by a decree, so is the case for the tariff price of water and sanitation at the distribution stage by agencies and ONEP. The tariff is often unified at production for urban areas that are supplied from the same water basin. It includes two solidarity contributions, one of which benefits small and medium centers managed by the office, and the other to contribute to providing rural areas with water, and as well as a part that goes to the water basin agencies for supplying water.
- Regarding private companies that are delegated to conduct these services, the tariff for distribution as well as the revision and amendment costs, are specified in accordance with the requirements and conditions set forth in the delegation management contract between the delegating authority, the Ministry of the Interior and the Delegate. The approved prices are either ascending depending on the amount of consumption for residential use (ascending block system), or unified as is the case for other uses (industrial and preferential). As for sanitation, payment is calculated on the basis of the amount consumed of drinking water along the lines of the water billing. The customer is also required to pay a certain contribution to connect his home to water distribution network or wastewater collection network, which is a one-time-only payment (either one lump sum amount or in installments), as well as connection expenses. And in spite of the fact that the tariff system, which is currently in place, has effectively contributed in bridging the investment and management needs, it has nevertheless suffered from several discrepancies, including among other examples:
  a. All consumers benefit from the social contribution, regardless of their standard of living;
  b. Liberal professions benefit from the contribution that is intended for domestic consumption; and
  c. Lack of efficiency and effectiveness of the current tariff system in the rationalization of consumption and demand management.

For the ecological and environmental considerations applying a certain tariff should be based on the type and amount of pollution resulting from industrial and manufacturing enterprises as a base for calculating the sanitation fee.

CONCLUSIONS

The Moroccan experience in the field of water utilities management has enabled Morocco to achieve the following:

- Manage public institutions that have high experience in the administration and management of the water sector;
- Create engineering consulting offices that gained international professional competences;
- A network of private companies capable to accomplish major projects;
- Sophisticated laboratories to follow up and monitor events; and
- Institutes, schools and universities specializing in the field of water.

The practices and national experience also showed the prospects for development and prospects for ONEP manifested through projects such as supervising the management of the drinking water service in Cameroon through the Cameroonian branch company for water from 2nd of May 2008 within the framework of a partnership with the private sector; and supervising the management of drinking water, sanitation and solid waste management services in the Mediterranean port of Tangier via the Mediterranean Tangier services company starting from September 1, 2008 within the framework of a partnership with the private and the public sectors.

The Experience of Delegated Management

After years of practical application of the delegated management in the water sector, it proved not to live up to the required standards. There are several disadvantages and breaches on a practical level carried out by the delegated companies as demonstrated by the report of the court of Auditors for accounts for the year 2009:

- Illegal distribution of profits during the first five years of the delegated management;
- Unjustified costs related to the transfer of expertise and technical support;
- Not paying the delegating authority their contractual duesas per payment terms;
- Failure of the delegate to perform the financial investment balances (Works Fund);
- Not paying the investment differences and interests upon investment differences to the delegating authority;
- Illegal change of sources and methods of financing investment projects;
- Noticeable delay in the completion of the investment programs;
- Failure to achieve some of the contractual goals regarding sanitation and drinking water;
- Failure to communicate with and supply the delegating authority with information;
- Reducing the real value of the investment differences;
- Calculating non-due amounts within the framework of the revision of tariffs;
- Lack of commitment to obligations;
- Applying unsatisfactory methods to carry out the contractual projects; and
- Lack of transparency in projects management.

Subsequently and to these disadvantages:

- There is a need to define or put into place follow-up mechanisms and strict monitoring of fulfillment of all assigned commitments by the delegated companies stipulated in the scope statement;
- Putting into effect legal control mechanisms as stipulated by the law 05-54 (internal and external control);
- Establishing an entity for monitoring and follow up as a unique and mandatory element for delegated companies and as the single channel to receive requests and complaints;
- Providing the monitoring and follow up entity with necessary means and equipments to enable it to perform its task at its best;
- Passing a legislation related to arbitration. This is an exceptional method to resolve a dispute away from the jurisdiction of ordinary courts. The arbitration is considered to be an agreement concluded between two or more parties to settle a dispute, through a body that consists of one or more arbitrators in order to issue a verdict with a binding adjudication; and
- Considering the difficult equation between the interests of the private sector in achieving a quick profit, and the objectives of the public sector which aim to achieve the public interest.

Outsourcing through Sub-contracting

In general the outsourcing approach in ONEP has enabled the following:

- Rationalize human resources in direct management cases, where the rate of the appointed employees in each new center decreased from 4 during the nineties to about 1.5 during the next decade. In the

2002-2008 period, the total number of employments avoided by the office through the creation of micro contracting businesses amounted to 3,582 (3,138 drinking water and 444 wastewater). The micro contracting businesses supervise 40% of the water pumping stations; 87% of the wastewater pumping stations; 47% of the water distribution pipes; and 77% of the wastewater collection pipes.

- Strengthen the direct dialogue between the office (the state) and its local partners, i.e. local municipalities.
- Establish the principles of engaging and involving the concerned population in rural development projects (to encourage creating development associations).

After internal evaluation processes for the micro contracting businesses experience, it is possible to discuss the following obstacles:

- The lack of some expertise within the graduates of the vocational training centers which are needed in certain fields (automation, regulation and remote management);
- Difficulty in working at the onset of the period of agreement due to weak financial means of the contractors and having to wait for reimbursement by ONEP before initiation of activities; and
- 10% of these contractors withdrew from executing their work.

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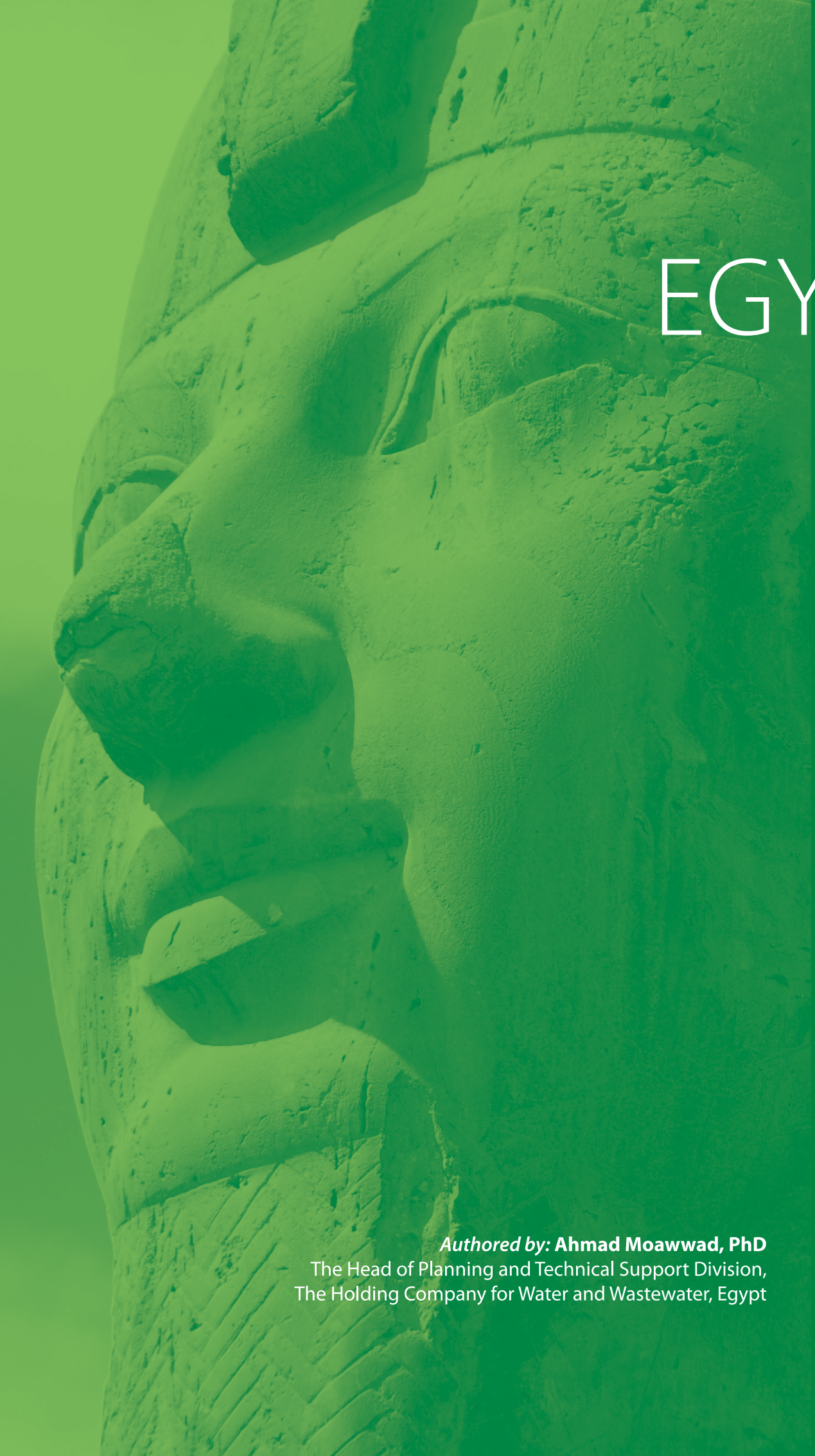

EGYPT

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ACRONYMS

BCM	Billion Cubic Meters
BOT	Build-operate-transfer
CAPWO	Cairo Alexandria Potable Water Organization
CAOA	Central Agency for Organizational Administration
DWI	Drinking Water Inspectorate
EWRA	Egyptian Water Regulatory Authority
EGP	Egyptian Pound
FY	Fiscal Year
GCOSD	Greater Cairo Organization for Sanitary Drainage
GCWC	Greater Cairo Water Company
GDP	Gross Domestic Product
HCWW	Holding Company for Water and Wastewater
kW.h	Kilo Watt Hours
MCM	Million Cubic Meters
MHUUD	Ministry of Housing, Utilities and Urban Development
MWRI	Ministry of Water Resources and Irrigation
NOPWASD	National Organization for Potable Water and Sanitary Drainage
O&M	Operation and Maintenance
OFWAT	United Kingdom Office of Water Services
PPP	Public-private Partnership
SCADA	Supervisory Control and Data Acquisition

INTRODUCTION

Water and wastewater utilities around the Arab countries are confronted with many challenges as they strive to make organizational improvements. Water sector utility managers must consider a wide range of issues in their management improvement initiatives. General economic conditions, staff turnover, communication between internal management and external stakeholders, involvement of staff across the organization, aging infrastructure, tariff issues, and limited staff resources are some of the issues managers address. In this case study we will focus on the strands of utilities reform and applied models of Public-private partnership (PPP) such as management contracts, Build-operate-transfer (BOT) and others. For the sake of better understanding for the case study, this chapter will illustrate the country back ground.

Country Background

Location, Area, and Population

The Arab Republic of Egypt lies in the farthest east– northern point of Africa. It has an overall area of 1,002,450 square meters, and a population of 83 millions.

People of Egypt are mainly localized in Nile Valley and urban areas. Cairo is the most populous region, which accounts for nearly one fourth of the country's population. Alexandria comes as the second populous region. The majority of Egypt's remaining population inhabits the Delta, and coastal Mediterranean and Red Sea, as well as cities alongside the Suez Canal. Populated areas comprise 40,000 square kilometers, whereas the unpopulated desert constitutes the rest of the country's area. Average population density in Egypt is 63 capita/ km^2 with a maximum of 900 capita/ km^2 in the Delta accounting for 98% population on 4% area. Egypt is recorded as one of the most populous areas in the world.

Land, Rivers, Lakes, and Dams

The Nile River crosses Egypt from the south to the Mediterranean in the north. Egypt's water share from the Nile River is 55.5 Billion Cubic Meters (BCM)/year according to the Nile Water Treaty signed between Egypt and Sudan in 1959.

As for lakes, Lake Naser (also known as Al-Nouba or Al-Sadd Al-Ali Lake) is located in the farthest south of Egypt. The lake is an artificial water body, formed as a result of constructing the High Dam (Al-Sadd Al-Ali Dam) in Aswan. This dam is the only existing dam in Egypt, and was constructed across the Nile River to provide protection against seasonal flooding, and to provide water for irrigation during off-seasonal periods.

Additionally, towards the north west of Egypt in Fayoum is Lake Qaroon, which is one of the biggest naturally occurring water bodies in the country. There is also a number of shallow lakes along the Mediterranean coast, like Lake Al-Manzela, Lake Al-Borles, and Lake Maryout, in addition to a few marshes that are shrinking and continuing to shrink with the increasing human activities nowadays.

Climatology and Climate Change

Rain falls along both the north eastern and western coastal region, with a density ranging from 100 to 200 mm per year. However, rainfall is fluctuating from year to year, and also within the same year. Rainfall is heavier in the south-eastern parts of the country (Halayeb, Abu-Rmad, and Shlaten), and can reach 500 mm per year. Total precipitation in the country is estimated at 0.5 BCM/ year, as an internal renewable water source that finally flows into permanent or temporary water channels and replenishes ground reservoirs.

Economy

Egypt's economy is mainly dependent on agriculture, industry, tourism, and remittances from abroad, and on a smaller scale oil, petrochemical Industries, media, and revenues from the Suez Canal. Egypt's industries include petrochemicals, iron and steel, cement, wooden furniture, and textiles. Cotton, fruits and tomatoes are the most prominent of the country's export products. Contrary to what is seen in Iraq and the Gulf countries, Egypt's economy is one of the diverse economies in the Middle East that is not dependent on the availability of oil.

Towards Achieving Millennium Development Goals

In terms of the status of the Millennium Development Goals (MDGs) in what is related to water and sanitation, in 2008, services of potable water reached 100% coverage, but this recently dropped to 98%, due to lack of required financial resource to sustain the coverage.

In 2011, the public sanitation system served 86% across cities of Egypt, and is planned to reach 100% through the five-year plan (2012– 2017). On the other hand, sanitation services (treatment and collection) only covered 14% in the rural areas of Egypt in 2011. It is planned that 100% coverage will be reached by 2022.

Water Sector Overview

Other than precipitation and the Nile river waters, Egypt's groundwater resources accounted for 6.4 BCM/year up to the year 2000. They are expected to account for 10.4 BCM/year by 2017. Egypt has six main aquifers: the Nile aquifer; the Nubian sandstone aquifer; the Moghra aquifer; the Karstified Carbonate aquifer; the Fractured Rocks aquifer; and the coastal aquifers. Non-conventional water resources in Egypt also account for 7.8 BCM from treated wastewater and desalination of sea water.

Clean water production rate is 25 Million Cubic Meters (MCM)/ day, whilst treated wastewater amounts to 9.6 MCM/ day. There are 200 large water treatment plants and 801 small ones. There are 1,580 groundwater well and 31 desalination units. As for wastewater treatment, there are 357 treatment plants.

Total length of the water networks is estimated at 146,000 Km, whereas that for the wastewater collection network, it is estimated at 39,000 Km.

Institutional Framework of the Sector

The responsibility of running the water sector mainly lies with two ministries: the Ministry of Water Resources and Irrigation (MWRI)-responsible for water resources management and related research and policy setting, water quality and the protection of the coastal zones and lakes, and for the construction, operation and maintenance (O&M) of irrigation and drainage networks; and the Ministry of Housing, Utilities and Urban Development (MHUUD)-responsible for the provision of water supply and sanitation services to the municipal and industrial subsectors.

A number of other ministries in Egypt are linked with the water sector as well:

- Ministry of Agriculture: for validating use in agriculture;
- Ministry of Industry: for disposal of industrial wastewater;
- Ministry of Health: for control of impact on human health;
- Ministry of Interior: for enforcing applicable laws and addressing violations;
- Ministry of Environment: for environmental protection, follow-up and monitoring and evaluation in general; and
- Local governance: for coordinating efforts amongst different ministries.

The entities working within the sector for the delivery of water and sanitation services under MHUUD in specific are:

- Holding Company for Water and Wastewater (HCWW), responsible for the treatment, desalination, transmission, distribution and sale of drinking water and for the cleaning and safe disposal of wastewater through companies working on the local level and responsible for provision of water and sanitation services. These companies include the functions of planning, O&M, financial and commercial affairs, laboratories, projects, and human resources;
- National Organization for Potable Water and Sanitary Drainage (NOPWASD), responsible for water and sanitation sector investments in Egypt except Cairo and Alexandria;
- Cairo Alexandria Potable Water Organization (CAPWO), responsible for water and sanitation sector investments in Cairo and Alexandria; and
- Egyptian Water Regulatory Agency (EWRA), responsible for follow up, and monitoring all water and wastewater-related activities throughout Egypt, whether such activities are for governmental or non-governmental projects, according to the relevant applicable laws. EWRA works in several areas such as monitoring water quality, monitoring technical performance through performance indicators for all service providers in the sector, and research related to tariff setting.

The central government provides support to the sector by financing and executing projects of potable water and sewage water including rehabilitation and replacement, and providing a subsidy to cover the O&M costs related to water and sanitation services.

Legal and Regulatory Framework of the Sector

A number of laws and decrees govern the sector in general, and these are:

- Law no. 96 of 1950 related to residential wastewater disposal into the public sewer network;
- Law no. 196 of 1953 related to industrial and commercial wastewater disposal into the public sewer network,
- Law no. 93 of 1962 related to wastewater disposal in sewage systems;
- Law no. 48 of 1982 related to protecting Nile River and watercourses from pollution;
- Minster of Irrigation's decree no. 8 of 1983 related to the executive list of law no. 48/ year 1982 (controls, standards, and specifications);
- Minister of Irrigation's decree no. 43 of year 1985 related to controls and standards of wastewater disposal into sewage system;
- Prime Minister's decree no. 1476 of year 1985 on the formation of executive committee to protect Nile River from wastewater disposing;
- Law no. 213 of year 1994 related to organizing management, benefiting from development of irrigation systems, and the foundation of Water Users Association Union;
- Law no. 4 of year 1994 related to protecting the Environment (air– soil– water); and
- Deputy Prime Minister/ Minister of Agriculture's decree no. 603 of year 2002 related to using treated and untreated wastewater in agriculture, specifically for landscaping and trees;
- HCWW was formed under Egyptian Law 203 of 1991 regarding public sector companies, and each of the subsidiaries was transformed into a subsidiary of the Holding Company under Law 203;
- Presidential Decree No 249/2006 transferred control over water and wastewater facilities' assets from local administration units to the HCWW;
- Presidential Decree No 117/2010 transferred control over water and wastewater facilities' assets from the New Urban Communities Authority to the HCWW;
- EWRA was established by Presidential Decree No. 136/2004 to regulate, follow up, and monitor all water and wastewater-related activities throughout Egypt.

Main Initiatives and Activities related to Sector Reform

Many initiatives were taken to reform both water and sanitation services delivered. These included:

- Water resources strategy for the year 2050;
- The development and application of efficiency standards for water use;
- Launching projects for detecting leakage;
- The preparation and implementation of water conservation plans (public awareness) by national authorities and local governments;
- The design and implementation of economic tools;
- Coordination with MWRI concerning investment plans of sewage waters, to enhance reuse and minimize pollution; and
- Coordinating with the relevant ministry for securing the funds necessary for rehabilitating and substituting old and damaged networks, in order to reduce losses and improve performance.
- An urgent plan for the improvement of water and sanitation services in Egypt was developed with the specific objectives of covering all regions that suffer from poor water services, and which accommodate nearly 5% of the total population; and providing continuous water supply to all parts of the country and with good pressure. 2 MCM/ day of additional capacity were planned. To achieve the objectives of the plan, work entailed the rehabilitation of 114 treatment plants; commissioning of 121 new treatment plants; drilling 660 new wells; and implementation of new networks with total length of 4,500 km of various diameters.
- Development of a master plan for Egypt for water and sanitation services up till year 2037, in addition to highlighting high priority projects and investigating all possible funding scenarios. The master plan is implemented over two phases: (1) assessing current baseline, and identifying projects of high-priority within all governorates by local consultants; and (2) reviewing work carried out in the first phase by international consultants, and developing a national strategic master plan.
- The development of a national strategy for urban sanitation services with the objectives of using the Master Plan to develop clusters of sanitation projects on the national level; identifying priorities in terms of rural areas to be targeted (villages of close proximity to water bodies, villages of high population density, villages of shallow ground water levels, and villages fully covered by potable water services); and introducing decentralized wastewater systems for some of the remote villages.

STRANDS OF APPLICABLE REFORM

Decentralized Management

Prior to the formation of HCWW in 2004, the authorities were not able to operate on an economic basis, and the Ministry of Finance became responsible for providing subsidies needed to meet O&M costs within the water sector. By the end of Fiscal Year (FY) 2003, the total accumulated deficit of the eleven economic authorities and three companies working within the sector had reached Egyptian Pounds (EGP) 7.6 billion. This financial crisis triggered the April 2004 reform of the sector, which resulted in the formation of a water sector holding company and the transformation of the fourteen largest utilities in the country into subsidiaries of that company.

HCWW was established by Presidential Decree no. 135 in April of 2004, and began operations in September of that year. The same Presidential Decree transformed the fourteen largest utilities in the country into subsidiaries of the Holding Company. In April of 2006 a ministerial decree directed that all water and wastewater departments in the governorates not served by HCWW be transformed into subsidiaries of the Holding Company. It is expected the incorporation of these new companies will take place over the next several years. In April 2007 an additional ministerial decree directed that the water and wastewater operations of the new communities, developed by the New Urban Communities Authority, are also to be taken over by HCWW.

The scope for establishing HCWW was to manage the portfolio of water and wastewater companies' assets in the governorates, including shares, instruments, bonds, and any other tools or financial instruments. In April 2006, additional responsibilities were given to HCWW; namely to take over the water and wastewater operations in the New Communities; and, corporatize the water and wastewater service facilities in governorates not already served by subsidiary companies.

The Holding Company is responsible for managing its subsidiaries. Each subsidiary produces potable water, provides wastewater treatment services and bills customers within its jurisdiction. The purpose of establishing the subsidiary companies was to make them responsible for undertaking purification, desalination, supply, transportation, and sale of potable water, as well as the collection, treatment, and safe disposal of wastewater.

Upon the formation of HCWW and subsidiary companies, the sector witnessed a number of improvements:

- Increased autonomy: utility managers no longer had to secure authorization for organizational and staffing changes from the Central Agency for Organizational Administration (CAOA), nor were they required to abide by the Egyptian Procurement Law 89 of 1998.
- Better supervision: previously, governors managed the utilities by exception; becoming involved only when problems surfaced. The management of the utilities lacked performance improvement programs, clearly defined objectives, and evaluation of performance against benchmarks/standards.
- Improved financial management: under the old system, the governor was not accountable in case the utility did not cover operating costs. The burden usually fell on the Ministry of Finance, which had no active participation in the utilities management or in setting the tariffs. Currently, HCWW is held accountable and its management tracks the financial situation of each of the utilities. Tariff increases have been considered again, as illustrated by the September 2004 tariff increase in Cairo.

For all governorates one subsidiary is responsible for water and wastewater except in Cairo and Alexandria, where there are separate subsidiaries for water and wastewater. In Cairo water is managed by the Greater Cairo Water Company (GCWC), while wastewater is managed by Greater Cairo Organization for Sanitary Drainage (GCOSD). HCWW does not undertake infrastructure development.

Working on Commercial Bases

As described earlier, forming HCWW and the water companies highlighted the need to work as utilities on commercial basis. From a deficit of EGP 7.8 Billion before 2004, currently, a general description of operational costs and revenues (operational cost– capital cost) is as follows:

- Percentage of total revenues to total costs: 77%;
- Percentage of total revenues to total costs (without depreciation): 98%;
- Percentage of total revenue coverage to total O&M costs: 90%.
- Percentage of total revenue coverage to O&M costs (without depreciation): 120%.

So, although cost recovery has improved, however, it is still lower than the required percentage needed for commercial activities and for encouraging the private sector of working with the utilities; still there is a load on the central government to subsidize the sector. EWRA is responsible for setting recommendations related to the tariff, its structure and the willingness and ability to pay. However, the decision to change the tariffs is based upon cabinet approval.

Other Forms of Reform

As another form of reform of the sector, HCWW and affiliated companies are starting on several initiatives that aim at improving the services provided. Such initiatives include the commencement of developing an Asset Management plan; improving networks performance and monitoring through introducing monitoring and control systems in the sector (Supervisory Control and Data Acquisition (SCADA) System); the establishment of secondary vocational schools to improve skills of technicians in the sector; and obtaining appropriate accreditations for operators of plants and utilities.

Partnering with the Private Sector

Since 2004, key structural reforms have been implemented by the central government, and are delivering results. To sustain Egypt's real Gross Domestic Product (GDP) growth prospects of around 7-8% in the future, Egypt needs more infrastructure investments. The Government estimates it can realistically mobilize a good portion of infrastructure spending through PPPs. In line with its economic reform agenda and strategy to increase private sector involvement and spending in public social infrastructure services, the central government has launched a PPP program with the principal objective to:

- Significantly expand and improve on public infrastructure (water, sanitation, transport, schools, hospitals, etc.) to meet growing demand for public services;
- Introduce private sector efficiency and cost effectiveness in all phases of public infrastructure and services, including financing, design, construction and operation;
- Change the focus of public procurement from inputs to outputs/services;
- Facilitate innovation in design, construction and delivery;
- Promote greater business opportunities for Egyptian contractors, service providers, and funding institutions; and
- Progressively transform the Government from a direct financier and provider to a policymaker, purchaser and regulator.

Forms of PPP Available

The affiliated companies under the HCWW operate wastewater treatment plants in a total capacity of 6,493,000 m^3/day. Whilst other private companies operate wastewater treatment plants in a total capacity of 3,107,000 m^3/day.

Similarly, while the affiliated companies operate desalination plants in a total capacity of 115,900 m^3/day, other private companies operate desalination plants in a total capacity of 50,100 m^3/day.

The affiliated companies also operate surface water treatment plants in a total capacity of 24.39 MCM/day. Whilst other private companies operate surface water treatment plants in a total capacity of 610,880 m^3/day.

For the first time, and through a PPP setup, a private wastewater treatment company in New Cairo is utilized to perform tertiary treatments in a total capacity of 250,000 m^3/day.

REGULATORY FUNCTIONS

Approved Performance Indicators

Within the framework of the role of EWRA in assessing technical, financial, and economic performance of service providers, EWRA cooperated with experts from the UK Drinking Water Inspectorate (DWI) and the UK Office of Water Services (OFWAT) to prepare annual spreadsheets to be submitted by the companies to EWRA for measuring performance indicators and levels of service.

Technical performance indicators included service coverage, constant delivery of service, high-quality service in terms of compliance with water standards, proper pressure, and minimal water losses. Financial and economic indicators included assets, employment, operating and maintenance expenses, collections, and tariffs. More specifically, indicators are listed under several categories:

1. Defining general data related to water services (e.g. service coverage/water (%); quantity of water produced; Quantity of water sold; Liter/capita/day sold and produced…)
2. Defining cost indicators of water services (e.g. personnel cost per cubic meter of water produced; energy cost per cubic meter of water produced; chemicals cost per cubic meter of water produced; Other O&M cost per cubic meter of water produced, and Total cost of cubic meter of water produced).
3. Defining financial indicators of water services (e.g. Percentage of operating and maintenance costs to revenue of activity; Percentage of operation, maintenance, and depreciation costs to total revenue (%); Percentage of total power cost to total operational and maintenance costs; Cost of cubic meter of water sold…).
4. Defining basic commercial and administrative indicators of water services (e.g. Collection rate; Percentage of bills issued to service subscribers; Number of water-related personnel for every 1,000 water connections; Percentage of metered connections (%)…).
5. Defining technical basic indicators of water service (e.g. Percentage of measured water production (%); Percentage of metered treatment plants (%); Percentage amount of chlorine used for every cubic meter of water produced (%); Percentage of unpaid water (%); Percentage of satisfactory water samples (%)…).
6. Defining general data of sanitation services (e.g. Percentage of service coverage – sanitation (%); Quantities of treated wastewater; Quantities of collected wastewater; Number of personnel; Total quantities of daily treated wastewater to overall population…).
7. Defining cost indicators of wastewater services (e.g. Personnel cost per cubic meter of wastewater treated; Energy cost per cubic meter of wastewater treated; Chemicals cost per cubic meter of wastewater treated; Other cost of O&M per cubic meter of wastewater treated; and Total cost of cubic meter of wastewater treated).
8. Defining financial indicators of wastewater services (e.g. Percentage of O&M and depreciation costs to total revenues (%); Percentage of total cost to total revenues (%); Percentage of personnel cost to total O&M costs; Cost of cubic meter of wastewater collected…).
9. Defining basic commercial and administrative indicators of wastewater services (e.g. Number of wastewater-related personnel for every 1,000 wastewater connections; Number of wastewater-related complaints for every 1,000 wastewater connections; Percentage of revenue collected from a water utility to the total revenues of sanitation services (for Cairo and Alexandria)…).
10. Defining basic technical indicators of sanitation services (e.g. Percentage of treated wastewater to total generated wastewater (%); Percentage of satisfactory samples – wastewater (%); Power consumption for each 1,000 cubic meter of wastewater treated (kilo Watt hour (kW.h)/ 1,000 m^3); …).

HCWW is responsible for compiling and calculating the aforementioned performance indicators from affiliated companies in order to measure services on the country level, which will be used afterward to evaluate and update plans for better performance.

CONCLUSIONS

1. The reorganization of the sector has resulted in assigning O&M responsibilities to one player, which is the aggregate of water and wastewater affiliated companies.
2. Water quality has improved through monitoring performance dually by the laboratories of HCWW and EWRA.
3. The coverage of potable water and sewage services has increased on the country level.
4. O&M costs have not been covered fully yet due to applying a limited tariff not sufficient to cover all entailed costs.
5. Although several improvements resulted from the sector reform in terms of decentralized management; setting a clear vision and objectives and associated master plans and investment plans; improving on services through using new technology; improving on the quality of water produced and the use of non-conventional water resources; and achieving better governance overall, however, there still are challenges that need to be addressed in order to further improve the performance of the sector. Such challenges include improving cost recovery even more; the need to further improve sanitation services coverage; expanding PPP and encouraging the private sector to partner with the companies for better service provision; and reinforce the role of EWRA and improve its autonomy and effectiveness.

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YEMEN

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ACRONYMS

BCM	Billion Cubic Meters
BOT	Build-operate-transfer
CIA	Central Intelligence Agency
COCA	Central Organization for Control and Auditing
CPI	Consumer Price Index
CSO	Civil Society Organizations
GARWP	General Agency for the Rural Water Projects
GDP	Gross Domestic Product
GNP	Gross National Product
IWRM	Integrated Water Resources Management
KPIs	Key Performance Indicators
MAI	Ministry of Agriculture and Irrigation
MCM	Million Cubic Meters
MDGs	Millennium Development Goals
MWE	Ministry of Water and Environment
NGO	Non-governmental Organization
NWRA	National Water Resources Authority
NWSA	National Water and Sanitation Authority
NWSSIP	National Water Sector Strategy and Investment Program
O&M	Operation and Maintenance
PPP	Public-private partnership
YER	Yemeni Rial
USD	United States Dollar

INTRODUCTION

Water and wastewater utilities around the Arab countries are confronted with many challenges as they strive to make organizational improvements. Water sector utility managers must consider a wide range of issues in their management improvement initiatives. General economic conditions, staff turnover, communication between internal management and external stakeholders, involvement of staff across the organization, aging infrastructure, applied tariffs issues, and limited staff resources are some of the issues managers address. In this case study we will focus on the strands of utilities reform and applied models of Public-private partnerships (PPP) such as management contracts, Build-operate-transfer (BOT) and others. For the sake of better understanding for the case study, this chapter will illustrate the country back ground.

Country Background

Yemen occupies a strategic and important location in the southeastern Arabian Peninsula. It is bordered by the Arabian Sea to the east and the Red Sea to the west. Yemen also has 2,500 kilometers of coastline (see Figure 1). Nevertheless, Yemen is facing big challenges in many areas: in terms of water resources, it is considered one of the most water-stressed countries in the world. The per capita share of renewable water is not more than 125 m^3 a year. With a growth rate of 3%, and much scattered communities, the provision of water services is becoming more complicated, leading to more fragile national economy, and political instability.

Geographical Location, Area, and Population

Yemen is situated in southern Arabian Peninsula. It is bordered by Kingdom of Saudi Arabia to the north, Arabian Sea and Gulf of Aden to the south, Oman to the east, and Red Sea to the west. Yemen has a total area of 555,000 square kilometers, and populated with 24,312,000 people as of 2004 census, and results accounted in 2011. Growth rate in average is 3.04%, and inhabitants are distributed on 21 governorates including the capital of Sana'a.

Figure 1: The Map of Yemen
(source: http://www.nationsonline.org/maps/yemen-map.jpg)

Topography and Geology

The country can be divided geographically into five main regions: the mountainous regions, the highlands, the coastal plains, the Empty Quarter (or the Ruba Al-Khali), and the Red Sea islands:

1. Mountainous regions: The inner mountains of Yemen are the lava formation of the Great African rift. The volcanic rift valley has resulted in the formation of the Red Sea and the Gulf of Aden. Mountains of Yemen extend along the north-south axis parallel to the Red Sea, and the west-east axis parallel to the Gulf of Aden in an L– shape– rolling terrain. Mountains are geologically composed of sedimentary volcanic rocks. Yemen's mountains have a continuous elevation that range from 1,000 meters to 3,666 meters above sea level. The highest point in Yemen is found in Jabal An-Nabi Shu'ayb (3,666 m), which is the highest peak in the Arabian Plate. It is within this part of the country that water flows down east, west, and south within wadis, which are classified according to drainage basins:
   - The Red Sea Wadis, mainly: Wadi Harad, Wadi Mawr, and Wadi Zabid;
   - The Gulf of Aden and Arabian Sea wadis, mainly: Wadi Tuban, Wadi Bana, and Wadi Hadramawt; and
   - The northern and northeastern wadis, such as: Wadi Khabb, Wadi As-Sudd, Wadi Adhenah, Wadi Ramaa', and Wadi Sh'aith.

   There are many wadi beds and open basins pervading Yemen's mountain chain that allow for erecting flood barriers and constructing dams, to irrigate agricultural lands downstream by the means of irrigation channels. Most important beds are: Wadi bed of Sa'ad (Sa'dah), Wadi bed of Al-Bon (Omran), Wadi bed of Behan (Shabwah), Wadi bed of A'iwah (Hadramawt), and Wadi bed of Sh'aith (Al-Mohrah).

2. Highlands: Lie in parallel to the east and north of the mountain chain, yet expanding more to the Empty Quarter where they start bottoming gradually. The highest highlands are 1,000 meters above sea level, and include: Sa'dah, Al-Jouf, Shabwah, Hadramawt, and Al-Mohrah. Yemen's highlands have blending borders with the Empty Quarter in the northern part.

3. Coastal plains: These essentially include coastal plains opposite to each of the Red Sea, the Gulf of Aden, and the Arabian Sea. Yemen's coastal plains are a continuous coastline that starts from Oman and extends southwest to strait of Bab-el-Mandeb, where it begins turning north up to the Saudi borders. Total length of the coastline is approximately 2,500 kilometers, and ranging in width from 30 to 60 kilometers.

4. The Empty Quarter (Rub Al-Khali): Is part of the Yemeni desert regions. Common vegetation found there may include: needle plants like Aruq Al-Kuthaib, Zeiza, Mawared, etc. There are also some flat lands scattered through the Empty Quarter. These include: Shoigat Al-Kharita, Maateef, and others. The seasonal Wadis provide a suitable habitat for animal grazing and rearing for nomadic settlements. Historically, the Empty Quarter was given a variety of names, such as Al-Rajraj Sea, Al-Safi Sea, the Great Yemeni Desert, and Al-Ahqaf Desert etc.

5. Yemeni Islands: They are spread within the regional water of Yemen in Red and Arabian Sea, and have their own distinctive climate, environment, weather, and natural characteristics; Most of the islands are scattered in the Red Sea along the coastline. The most important and biggest island is Kamaran. It is the only one inhabited, and contains some rare and wild animals, in addition to Huneish's archipelagos. The Mayoon Island (Breem) has a specific and strategic importance due to its location through which strait of Bab Al-Mandab is being controlled. In the Arabian Sea, the Yemeni islands are located more closely together. The most famous island is Socotras's archipelagos, which was named for being the home of the dragon tree and span wood, and some unique trees with significant medical and economic values. Adjacent to the Socotras's archipelagos there exists a cluster of small islands (most importantly, Abdul-Kuri, Samhah, & Darsah Island).

Land, Water Resources and Dams

Yemen is a water-scarce country that lies in an arid region and no running rivers. Local people have historically used rainwater, spring water, and wells, as well as rainwater harvesting, which is collected in pools, water barriers, and dams of various capacities. However, depths of wells never exceeded few tens of meters, and water was lifted up using animal power and sometimes man power, in limited amounts. Not until the sixties of the 20th century that mechanical drillers and water pumps have been used.

Yemen has adopted, since early periods, the design and implementation of and investment in many dam construction projects. Today it is estimated that more than 1,000 water utilities of 80 thousand cubic meter

storage capacity cost around 16 billion Yemeni Rial (YER), which means average storage capacity of 80 thousand cubic meter per one utility and average 16 billion YER that corresponds to 200 YER per one cubic meter of storage. Although the country receives around 50 – 60 Billion Cubic Meters (BCM) of rainwater yearly, rainfall received in summer are mostly not converted to storm water as it comes in summer where water is either retained by surface soil and promptly absorbed by the vegetation cover, or immediately lost through evaporation, accordingly storm water does not flow into wadis in more than 10% in average of what is being received, which accounts for 3– 6 BCM.

There are two main water sources for the purpose of supplying urban and rural populations of Yemen:

1. Surface water: This is water collected on the ground or flowing from watersheds, like spring water and water streams, as well as constructed water barriers. Replenished water in Yemen is 1,478 Million Cubic Meters (MCM) per year. There are four water basins: Red Sea, the Empty Quarter, Arabian Sea, and Gulf of Aden.

2. Groundwater: This is underground water stored in basins millions of years ago, and considered the main source of supply for cities, urban areas, and other populated regions. However, groundwater is recklessly over-exploited and aggressively used for irrigation without proper organization. Renewable water of the overall 14 basins of the country is estimated at 1,030 MCM per year. Replenishing rates are not equivalent to withdrawal rates in most basins.

Unconventional Water Resources

Water resources other than surface and groundwater include those supplied through unconventional resources such as:

- Treated wastewater, used in irrigation in a limited and uncontrolled way.
- Seawater desalination, which is still not exploited. However, one desalination project is under construction to supply cities of Ta'ez and Ebb, due to the over-exploitation of groundwater there.

Climate and Climatic Change

Coastal regions have wet and hot conditions, whilst conditions are moderate in hilly areas, and arid in desert regions. Rain falls throughout the year (4 seasons a year). However, precipitation rate fluctuates from one season to another; rain falls less in winter and more in summer and spring, and reaches its highest levels in the three months June, July, and August.

Yemen has been impacted -as the case in many countries of the world– by climatic change and rise in temperatures, a situation that caused tangible changes in weather, delay of seasonal precipitation, and flash rains, as well as natural disasters in general.

Economy, Demography, and Socioeconomic Development

Yemeni population grows at a rate of up to 3% (**Figure 2**), which could jeopardize available resources and increase poverty. People inhabit both rural and urban regions ranging at a percentage of 30% to 70%, whilst poor people mostly concentrate in the rural areas.

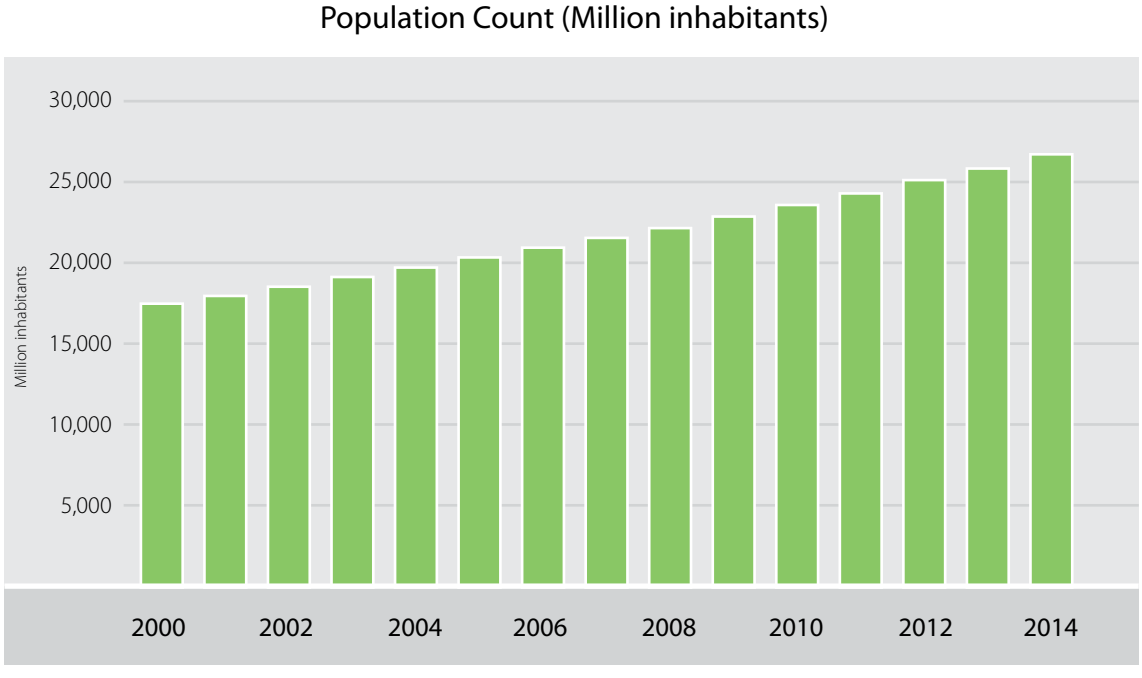

Figure 2: Census for the Period (2000 – 2014)
(Source: Statistical Yearbook of 2008)

Yemen has one of the most deteriorating economies amongst developing countries. Central Intelligence Agency (CIA) has reported that Yemen has the least per-capita income compared to other Arabic countries, which amounts to around 1 US dollar a day, whilst Qatar comes on the top of the hierarchy amounting to around 93 USD a day. National Studies have already concluded that the per-capita per-annum rate in Yemen is less than 600 USD. The national economy is significantly dependant on the following sectors:

- Industry – primary (extractive) and secondary (processing);
- Agriculture, livestock, and fishery;
- Transportation and communication;
- Retail and wholesale, and tourism services;
- Real estate, building, and construction; and
- Public services.

According to economic forecasts of Gross Domestic Product (GDP) in Yemen, year 2010 showed a real GDP growth of 8.7%, but had declined by 15% to 20% in 2011. The per-capita of the real Gross National Product (GNP) in 2011 has declined by no less than 21% compared to 2.0% decline in 2010.

Towards Achieving the Millennium Development Goals

Millennium Development Goals (MDGs) were declared in 2000. In the context of water and sanitation, the first goal is to reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation by year 2015. The second goal is to develop strategies for increasing efficiency of irrigation by 2005.

The National Water Sector Strategy and Investment Program (NWSSIP) of Yemen has considered the above goals in its main objectives, which shows agreement to support such MDGs through putting an investment program for a 5-year period of (2005–2009), excluding the rural water sector. The objective was based on achieving half of targeted percentage set forth in the MDGs. The reason behind excluding the rural water sector is explained by the relatively huge funds needed in order to fully achieve relevant MDGs in that sector. Additionally, management-related obstacles encountered during the preparation of investment programs were perceived difficult to overcome even though funds were made available. Administrative issues are inevitable considering the implementation of projects within thousands and even tens of thousands of communities. And both technical and social-linked constraints will further complicate the situation.

It is hoped that experience gained in the upcoming five years would help develop institutional capacity and enrich managerial experience. That would also help create robust methodologies for fund mobilization and management enhancement in order to catch and implement MDGs by 2015.

Water Sector Overview

With stressed water resources and over exploited groundwater reserves, Yemen is facing one of the most complicated and challenging developmental issues. Water shortage is growing due to imbalanced supply and demand (dwindling supply and growing demand). Consequently, groundwater is over exploited in many areas and basins. To manage such challenges, the water sector was regrouped into four sub-sectors:

- Water and Sanitation Sector for Urban Regions– Ministry of Water and Environment (MWE).
- Water and Sanitation Sector for Rural Regions– MWE.
- Water Resources Management Sector– MWE.
- Irrigation Sector– Ministry of Agriculture and Irrigation (MAI).

The four sectors work jointly to meet objectives of NWSSIP and achieve MDGs by broadening water and sanitation services sustainably and with a tariff that takes into consideration marginalized groups, and same for wastewater collection and treatment services.

Noticeable progress was achieved in improving the management of the water sector since Yemeni unification in 1990. Functions of management were combined and brought together under umbrella of the National Water Resources Authority (NWRA) established in 1995, and lately under authority of the MWE established in 2003. MWE is administering most agencies and corporations that function within the water sector. Such administration includes:

1. Water supply and sanitation in urban sector. This sector represents 29% of the population and is being managed by the National Water and Sanitation Authority (NWSA) that oversees branches in governorates which do not have local corporations. There are around 15 local corporations in the governorates, and around 36 water utilities in sub-urban cities, centers, and governorates that do not have local corporations. Most corporations and utilities enjoy administrative and financial autonomy. Each local corporation has a board of directors headed by the Governor, and in Sana'a headed by the Mayor of the capital. As for branches, there is an advisory committee for each branch, which is headed by the general director. Committees and boards are in charge of discussing and approving plans prepared by executive managements, as well as approving tariffs. The management of local corporations is directly responsible for daily operation of financial, managerial, and technical issues and the undertaking of new projects. For each local corporation or public utility, there is a distinctive organizational structure and different water and sanitation services tariff based on usage category. However, tariffs should cover operation and maintenance (O&M) costs, depreciation costs of the electromechanical pumping equipment, as well as treatment costs. The government supports new projects through an annual investment program that is in line with the National Strategy's objectives. Despite what has been achieved to support both the Good Water Governance, there is still more to be done regarding building institutional capacity, restructuring corporations and utilities, and setting regulations rightly for achieving transparency and efficiency (see **Figure 3**).

Institutional Setup

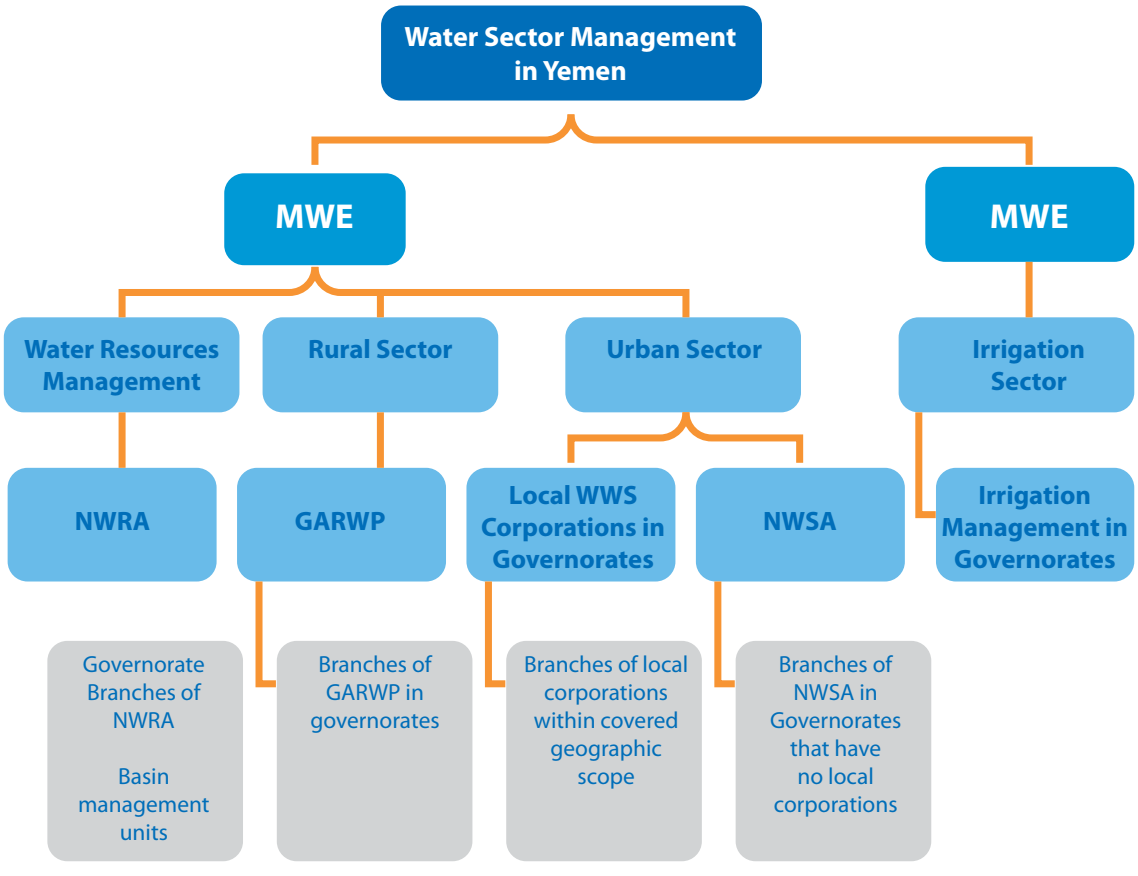

Figure 3: Institutional Setup of Water Sector Management in Yemen

(source: Statistical Yearbook of 2008)

2. Water supply and sanitation services for rural sector. This sector covers 71% of the population, where 80% of the poor inhabit urban areas. The sector is being managed by the General Agency for Rural Water Projects (GARWP). GARWP is responsible for financing and implementing water supply and sanitation projects in rural regions, while operation of those projects is entrusted to a committee formed from the local community. And due to lacking follow-up and attention to manage those projects, many of them failed to provide services to some of the poorest communities. Decisions related to providing water supply and sanitation services in certain villages and choosing the best alternative or technology used for each project should be based on type of demand in a transparent way, in addition to giving due attention to the technical side, to ensure successful project implementations and sustainable service delivery.

3. Water resources management sector. This sector is run by NWRA, which is in charge of monitoring wells drilling and following up on violations related to random wells drilling, in addition to conducting awareness programs and monitoring of water basins management. However, NWRA has not been able to cover the role mandated to it, and random drilling is still growing significantly without any means of limiting violations. Furthermore, local corporations for water supply and sanitation services in urban and rural areas are still required to strengthen their relationships with NWRA in order to be able to coordinate the reallocation of water resources whenever necessary; and proper discharge of wastewater that if left without treatment would impact health and environment, not to mention, providing additional source for reuse. In conclusion, relationship between MWE and NWRA on the one hand, and local committees of local authorities on another hand, should be strengthened, in order to allow for a decentralized implementation of policies and plans of water management and to enforce the Water Law.

4. Irrigation sector. This important sector consumes up to 95% of water resources under the authority of MAI. The establishment of the MWE has contributed to the representation of water sector in general, and water

management in particular at the cabinet level. However, MAI is still bearing the responsibility for irrigation, and had, and still has, a substantial role in upgrading water-related infrastructure such as dams. However, there is still a need to improve coordination between MWE and MAI regarding responsibilities in what is related to infrastructure development for surface water, as it is essential that all decisions related to locations and design of water infrastructure projects are taken within the perspective of integrated water resources management (IWRM). On another note, reforming the urban water sector requires the institutionalization of all regulatory responsibilities assigned to the autonomous water corporations established in the past.

5. Local corporations, to monitor and evaluate their performance, and report on progress achieved in terms of reaching the MDGs.

Legal and Regulatory Framework of the Sector

After holding long discussions, to reach common views, Yemen passed the Water Law in 2002, which provides legal grounds for controlling groundwater abstraction. The Law includes measures for wells licensing, wells and drilling equipments documentation, and stringent regulations to control over-abstraction. The Law also supports decentralization through encouraging the formation of water basin committees that would closely coordinate their water management implementation with the local corporations. Below is a list of laws and decrees active in the sector:

- Cabinet Decree No. 237 for the year 1997. Issued in February 1997 to approve the reform policies program for water and sanitation sector that emanated from Kelbermarten's study of 1996, funded by the World Bank within the program for reforming the urban water sector.
- Local Administration Law no. 4: Passed in 2000 and states that the system of local administration is based on decentralized management and financial activities, as well as expanding local participation in decision making process and management of local affairs, such as, socioeconomic and cultural developments. However, the poor interpretation of the law by local communities in the governorates negatively impacted the work of water utilities.
- Water Law No. 33 issued in 2002.
- Presidential Decree No. 105: Issued in 2003 for the creation of MWE within the framework of institutional reform. The purpose of establishing MWE was to bring most of the entities working within the sector under one umbrella, although irrigation and water basin management remained under MAI.
- Presidential Decree No. 218: Issued in 2004 regarding the regulatory framework of the MWE.
- The Water Law no. 41: Issued in 2006 to amend a number of the articles of Law 33 of 2002.

Primary Documents the Direct the Management of the Sector

A group of national policies direct the management and performance of the sector, and they are:

- The National Water Sector Strategy and Investment Program (NWSSIP) for the years 2005–2009 and its amendments of 2010– 2015;
- Cabinet Decree no.237: Issued in 1997 concerning the reform policies program for water and sanitation sector;
- The National Poverty Reduction Strategy; and
- Water Supply and Sanitation Sector Reform– in urban areas and introducing decentralization.

In this context, more light is shed on NWSSIP:

The reasons behind the formulation of NWSSIP can be summarized as follows:

1. Unified and agreed upon vision for the sector by all stakeholders. The vision was based on an assessment of the sector as a whole, taking into account previous experiences in preparing and implementing strategies and policies for the sector, as well as identifying clear quantitative and qualitative targets that need to be achieved within the coming years at the institutional and legislative and investment levels, by the Ministry and other related entities. These would necessarily include identifying roles and responsibilities for different related parties to achieve those targets.
2. The need to provide the appropriate circumstances to achieve the MDGs by 2015, as reflected on the Poverty Reduction Strategy, through clear identification of nationally agreed upon interventions, and mobilizing the support needed from all stakeholders including the state and foreign donors to come about with a clear set of objectives and measures, and consequently preparing a 5-year investment program based on that.

Five basic principles formed the foundation for developing the National Strategy:

1. Ascertaining the importance of the implementation part. Past experience witnessed the development of many strategies. Therefore, it was essential to highlight in the strategy the need to move from visioning to implementation through the development of an associating investment program for its implementation.
2. The importance of lessons learned from recent successful reform activities. For instance, lessons learned from urban water sector reform should be replicated in other sectors, where the success factors were the clarity of objectives and plans, and attaining consensus on them from all levels, in addition to mobilizing support from donors and obtaining technical assistance, and support in follow-up and monitoring. Similar programs can be adopted for other sectors, particularly for water and sanitation for the rural sector strategy, with clear objectives and approved plans, associated with interim check points to measure and evaluate progress.
3. Focus should be made on the importance of the connection between water supply and sanitation services provision on one side, and the goal of reducing poverty and creating jobs on another side, and achieving MDGs on a third side. This kind of interconnection should be utilized for mobilizing investments and achieving needed reforms in the sector. MDGs are intensively stressing on poverty reduction, and so is the strategy. Therefore, the NWSSIP can be considered as an executive plan for reducing poverty in Yemen through the implementation of water-related activities.
4. The strategy is based on a long term and integrated approach. It is a 5-year investment program (2005-2009), and updated periodically to provide a unified and cohesive framework for all partners.
5. Finally, identifying priorities (what is important and what is more important) is essential. The strategy emphasizes the implementation of necessary measures beforehand to ensure achieving main objectives. The strategy was also developed to be realistic enough to be implementable.

STRANDS OF APPLIED REFORM

Most Important Policies

One of the most important measures to be implemented is creating the institutional setup for NWSA branches in two phases. The first phase entails applying financial and administrative decentralization for the branches in the urban areas in Yemen, and preparing it for the transition with the possibility of working on creating local corporations when the proper conditions exist, and encouraging the participation of local communities and non-governmental organizations (NGOs) and civil society organizations (CSOs) and the private sector and the women's sector in all efforts directed at improving water and environment related conditions.

Of the most important measures to be taken comes the institutional development for branches of the water and sanitation local corporation on two phases; The first phase includes decentralizing financial and managerial activities of the branches in the whole state (urban areas), preparing them for the transition process, possibly establishing new local corporations whenever applicable, and encouraging participation of local communities and non-governmental organizations, civil agencies, the private sector, and women sector in the efforts of improving water and environment conditions. The second phase includes supporting the process of decentralization, increasing efficiency and enhancing performance, and developing a framework for developing a fair tariff reflective of actual costs, along with supporting the achievement of economic and social objectives, coordinating the sector's policy, and setting the ground for involving the private sector in water and sanitation services in urban areas.

Adopting Commercialization Principles

In principle, all water utilities work to recover operational and maintenance costs, as well as part of depreciation cost (only 10%) of electromechanical equipments on annual basis. Water utilities annually receive investment-linked support to construct both new and rehabilitated water and sanitation projects.

Cost Recovery

In the past, setting tariffs was controlled by the central government through NWSA, and there was one unified tariff at the national level. However, after applying financial and administrative autonomy within the local corporations, the policy of recovering costs was adopted. Consequently, corporations had their own tariffs, which comprised of 2-6 block. The first block was aimed to support the poor (subsidized block) while other blocks were aimed to recover costs.

Upon examining revised tariff to recover the cost of production and distribution, a tariff that is close to those costs was set. Several studies have considered cost recovery fundamental in setting strategies for water demand management. Still, the prevailing approach in Yemen is pricing water in less than its economical value and recovering the difference by a subsidy that also includes investment costs (sometimes there is a subsidy for operation and maintenance). Ten out of seventeen utilities provide services with revenues that do not cover no more than 90% of costs. It became well perceived that water tariff must be able to meet the following requirements:

- Providing financial resources for operating and maintaining water production and distribution facilities;
- Providing proper incentives conducive of water conservation and the adoption of tools and technologies that reduce consumption.

Basically, any tariff should ensure recovering operational and maintenance costs taking into consideration the economic and social circumstances of subscribers. Chronologically the tariff was increase since 1997 up to now around 200%. An example is the city of Mahwet, where the tariff was set at 10 YER and recently reached 143 YER.

Energy Efficiency

Energy is one of the most challenging issues facing water utilities. The average power cost of running water and sanitation services can range from 30% to 55% of operational and maintenance costs and total costs. It can also be said that till today, there are no systems for increasing efficiency of power consumption put in place, and there are no initiatives undertaken at the sector level.

Decentralized Management

Decentralization (administrative and financial) within utilities has resulted in the following:

- Organizational structures more capable of running water utilities and a stronger administration to deal with its roles.
- More developed human resources that helped achieve objectives and policies, and encouraged the staff to gain the required knowledge and skills, which has eventually led to more efficient and acceptable performance.
- Local community participation in planning, monitoring, and policy-making processes, through the management board and advisory committees.
- Flexibility in recovering costs through tariffs that are set by the corporations and approved by the Management Board, and finally approved by the Ministry.
- Enhancing decentralization for the water sector, and the provision of further examination into transitioning some water agencies into local corporations.

Local citizens are considered as participants in the decision making process through outlining policies and monitoring functions. This is reflected in the membership of the board of local corporations, which is comprised of the following:

- The chair– the Governor– (currently both the Governor and the Management Board are being elected);
- A member representing the private sector, nominated by the Chamber of Commerce in the relevant governorate;
- A member representing the local community;
- A member representing the women's sector;
- A member from office of the Ministry of Planning and Development in the governorate;
- A member from the office of the Ministry of Finance in the governorate;
- A member representing the customers, nominated by the Governor; and
- A member representing from MWE.

The management board is responsible for the following functions:

- Study and approve proposed policies and plans related to managing and steering the corporation's activities, and following up on implementation;
- Study and approve managerial, financial, and technical instructions within the corporation to be endorsed later on by the Minister;
- Prepare and approve performance indicators, evaluate and verify reports of the corporation's activities;
- Propose partnering with other parties or waiving part of its activities to other partners. And prepare terms

and conditions to be submitted to the concerned party for approval, according to effective laws and by-laws;
- Review and approve the annual budget and financial statements, as well as report on the annual inventory activities to the Minister for endorsement;
- Approve the proposed fiscal year plan and forecasted revenues and expenses in the budget;
- Study and approve water supply and sanitation service tariffs and submit them to the Minister for endorsement;
- Approve the applied incentive scheme; and
- Study and propose instructions and regulations.

Partnering with the Private Sector

The extent of private sector involvement in water services is limited to investment projects. And there are several forms of water projects that serve citizens:
- Water projects consisting of wells, pipe network, and water meters with tariffs prices higher than those of water utilities;
- Water projects consisting of wells, pipe network, and a constant tariff per subscription also higher than those of water utilities; and
- Private Wells selling water to tankers (in this case, two investors exist: the well owner, and the tanker owner) for high prices reaching up to 12 USD per cubic meter.

For instance, the private sector in Sana'a has a 44%-service coverage of area, while Ebb has a 32%-service coverage. With regard to partnering with the private sector in Yemen the following can be highlighted:

1. Management contract between a Dutch company (Vitens) and Ta'iz Water Supply and Sanitation Local Corporation. (Note: the contract involved both parties in management, with support for the concerned local corporation. Any internal decision made should be approved by both parties. A Dutch team has taken part in providing support to the management process, including planning, organizing, monitoring, and mentoring).
2. Service contracts, represented by:
   - Systems implementation contracts (accounting system, billing system, salaries, fingerprint identification, assets, and stores). These contracts include maintenance for the systems, as well as maintenance for the hardware and equipments.
   - Private sector contracted by the government for the implementation of water and sanitation projects.
   - Providing training and capacity building services through private companies contracted by the ministry of affiliated entities.
   - Auditing contracts (legal accredited accountants authorized by the Central Organization for Control and Auditing). This type of contracts was first introduced after awarding financial and administrative autonomy to the water supply and sanitation local corporations after 1997.

REGULATORY FUNCTIONS

There is no specific regulatory authority operational with the Yemeni water sector. However, until such an authority is established, NWSA is carrying out those regulatory functions such as establishing databases to track parameters that feed into the calculation of Key Performance Indicators (KPIs). Seventy two KPIs were identified in the urban sector water utilities' management; Table 1 below presents these indicators.

Table 1: Approved KPIs

Basic Items
ACC19: Total revenue collected– capital and operational costs
ACC21: Total revenue billed– capital and operational costs
ACC22: Operational revenue collected
ACC23: Total operational costs

Basic Items
ACC24: Revenue of current billed activity
ACC25: Staffing total cost
ACC26: Total energy cost
ACC43: Cost of electrical power for producing water
ACC44: Energy costs for treating wastewater
ACC47: Bank statement for expenditures
ACC48: Bank statement for revenues
ACC49: Bank statement for money transfers
ACC5: Training costs
ACC50: Bank statement for depreciation cost
ACC73: Total revenue of water billed
ACC74: Total revenue of sanitation service billed
ACC75: Total supplies (goods)
ACC76: Total supplies (services)
ACC77: Total miscellaneous supplies
BIL2: Total water connections
BIL29: Total debt
BIL3: Total wastewater connections
BIL30: Number of residential water connections
BIL32: Average billing for the first 5 cubic meters of water
BIL33: Total billed residential water quantity
BIL35: Number of subscribers to both water and sanitation services
BIL36: Number of residential wastewater connections
BIL40: Average billing for the first 5 cubic meters of wastewater
BIL46: Number of water connections of zero metering
BIL59: Water quantity sold to the governmental sector
BIL6: Total water production
BIL60: Water quantity sold to the commercial sector
BIL61: Total operational billed revenues to the residential sector
BIL62: Total operational billed revenues to the governmental sector
BIL63: Total operational billed revenues to the commercial sector
BIL64: Total operational revenues collected from the residential sector
BIL65: Total operational revenues collected from the governmental sector
BIL66: Total operational revenues collected from the commercial sector
BIL67: Indebtedness of the residential sector

Basic Items
BIL68: Indebtedness of the governmental sector
BIL69: Indebtedness of the commercial sector
BIL7: Total water billed – sold
BIL70: Number of governmental water connections
BIL71: Number of commercial water connections
FIX38: Total length of water network
FIX39: Total length of wastewater network
M31: Average limited-household income
M34: Average household members per water connection
M37: Total population covered per utility
OM72: Number of operational wells
OM8: Number of recorded blockages in sewer network
OM9: Number of cleared blockages in sewer network

Audit Approaches Applied

Auditing on water utilities is carried out by an external auditor commissioned through the Central Organization for Control and Auditing (COCA), which is a governmental institution that reports to the Presidency of the Republic. COCA audits and inspects activities the state's administrative body, and reports violations, which afterwards are referred to the judicial authority. Reports issued by COCA are discussed by the legislative authority as well. Basic functions include: inspecting all records, accounts and supporting documents wherever they exist in the governmental body.

The organization has the right to receive any relevant information and explanations necessary for the performance of its duties from the present and previous responsible officials in the units subject to the audit or other related units. In doing so, the organization can:

- Question and seek documented explanations from the relevant parties on any queries;
- Exceptionally and through the responsible minister or governor, the organization may require the attendance of the responsible official to the organization office to give any information or explanations, but the request for attendance must be justified.

CONCLUSIONS

Adopting an approach of administrative financial decentralization (local authority) is modernistic and essential for supporting and activating the development process in Yemen. Although not shaped by a pure Yemeni desire, the process of decentralization was obliged by funding agencies, through essentially connecting different aid provided to Yemen with Yemen's commitment to proceed with decentralization and engage local community in the decision making process. The reasons behind the need to implement this approach are:

1. An excessively strong, single, and centralized authority in Yemen (as the case in other developing countries) would significantly hinder its transition to democracy. Applying administrative decentralization would reduce central power, thus, achieving Good Governance, in a bottom-up approach, leading to further enhancement to democratic process in Yemen.
2. Administrative and financial decentralization is considered the best approach to reinforce efficiency, accountability, transparency, and ability to meet local demands. It also boosts local development, improves provision of services, and supports poverty reduction in the Yemeni community.

Evaluating and measuring the success and failure aspects of this experience requires comprehensive examination of the targeted communities or institutions, as administrative and financial autonomy might uncover economic, administrative or social issues related to the reluctance of individuals in authoritative positions within the communities or even the central government to partake in this process as they see it as a threat to their own power and authority. Accordingly, the success of this approach depends on building a concrete understanding of all stakeholders and the relationships and interests. However, donor agencies pushed for such decentralization based on experts judgment that this is the right approach without completely understanding the local context or the economic, political, administrative and most importantly social setup of the country. It became evident that funding agencies concentrated on processes rather than outcomes. Most important conclusions can be summarized below:

- The need to promote decentralization for a closer perspective of what is actually managed on the ground;
- The need to have a clear and concise plan to overcome obstacles in the way of decentralization;
- Decentralization is progressing slowly due to insufficient and unrealistic assessment of status in addition to the many issues Yemen has recently been through;
- The policy and strategy of the water sector are unnecessarily broadened;
- It is quite important to adopt operational strategies that focus on availability and quantity of resources for further upgrades, due to lacking resources;
- There is still a need for conducting further studies and establishing partnerships, as well as increasing and replicating projects;
- Capacity building and institutional development will improve and sustain services provided;
- Assets have already been transferred from the central authority to utilities in the relevant governorates and directorates. Ownership could also be transferred to the local community in the near future; and
- According to the new operational strategy, it is envisaged that reports will be more effective in presenting results more reflective about achievements in the future.

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JORDAN

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ACRONYMS

ACWUA	Arab Countries Water Utilities Association
AW	Aqaba Water
BOO	Build-own-operate
BOT	Build-operate-transfer
CIS	Customer Information System
DBO	Design-build-operate
GDP	Gross Domestic Product
GIS	Geographical information system
GIZ	German international development agency - *Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH*
HHU	Hand Held Unit
ISSP	Institutional Support and Strengthening Program
JVA	Jordan Valley Authority
KAC	King Abdullah Canal
LCD	Liter per Capita per Day
m^3	Cubic meters
MCC	Millennium Challenge Corporation
MCM	Million cubic meters
MENA	Middle East and North Africa
mm/yr	Millimeters per year
MWI	Ministry of Water and Irrigation
NGWA	Northern Governorates Water Administration
NRW	Non-revenue water
O&M	Operation and Maintenance
OMS	Operations Management Support
PMU	Performance management unit
PPP	Public private partnership
PSP	Private Sector Participation
SPC	Special Purpose Vehicle
Sq km	square kilometers
TNA	Training Needs Assessment
TWG	Technical Working Groups
UR	Utilities Reform
USAID	United States Agency for International Development
WAJ	Water Authority of Jordan
WUA	Water Users Association
YWC	Yarmouk Water Company

INTRODUCTION

Water and wastewater utilities in the Arab countries are confronted with many challenges as they strive to make organizational improvements. Water sector utility managers must consider a wide range of issues in their management improvement initiatives. General economic conditions, staff turnover, communication between internal management and external stakeholders, involvement of staff across the organization, aging infrastructure, rate issues, and limited staff resources are some of the issues managers address. In this case study we will focus on the strands of utilities reform and applied Public Private Partnership (PPP) models such as management contracts, Build-operate-transfer (BOT) and others. For the sake of better understanding for the case study, this chapter will illustrate the country back ground.

Country Background

The Hashemite Kingdom of Jordan (also known as Jordan) is an Arab Kingdom in Asia, on the East Bank of river Jordan, hence its name. The Capital is the city of Amman, and the official language is the Arabic language.

Jordan is located in the southwest part of Asia. Its total area is 89,342 square Kilometers (sq km) (land 88,802 sq km, water 540 sq km). It is comprised of 12 Governorates (Irbid, Mafraq, Ajloun, Jerash, Balqa, Amman, Zarqa, Madaba, Karak, Tafileh, Ma'an and Aqaba). It is bordered by Saudi Arabia to the north-west, Syria to the south, Iraq to the south-west, and Palestine to the east. It has access to the Red Sea via the port city of Aqaba, located at the northern end of the Gulf of Aqaba.

Topography, Water Resources and Climate

Jordan's terrain is mainly characterized to be mostly desert plateau in east, highland area in west. The Great Rift Valley separates East and West Banks of the Jordan River. The Dead Sea (the lowest point on earth) is in the Great Rift Valley (-408m), and the highest point is at 1,854m.

Jordan is a non-oil producing country; its main natural resources are phosphates, potash and oil shale. Jordan is considered one of the four most water scarce countries in the world. High population growth, the influx of refugees due to political instabilities in the region, the depletion of groundwater reserves and the impacts of climate change are likely to aggravate the situation in the future. The high population growth rate together with the country's rapid economic development has been accompanied by an increase in water demand, while the available water resources are insufficient, limited and decreasing. As it stands now, current total demand exceeds renewable supply. The difference comes from non-renewable groundwater abstraction and reclaimed water.

Water resources in Jordan can be categorized into:

1. Surface water resources: the Jordan River and the Yarmouk River, which are shared with Israel and Syria who leave only a small amount of water for Jordan.
2. Groundwater resources (12 renewable and non-renewable aquifers) which are overexploited and over-abstracted in an unsustainable manner.
3. Reclaimed water.

Figure 1 below depicts groundwater basins and surface water catchment areas in Jordan.

In general, more than 97% of Jordanians have access to an improved water resources, and 67% have access to improved sanitation. This is one of the highest rates in the MENA, and the government is working to maintain the access to water and increase access to improved sanitation to 85% during the next 10 years.

Jordan's climate is semi-arid; 90% of the country receives an average precipitation of less than 200 millimeters per year (mm/yr) and only the highlands receive more than 300mm/yr of rain. Precipitation rates decrease drastically to the east and to the west of the highlands. 92% of rainfall quantities are lost through evaporation. About 5% of the rainwater infiltrates into the ground and replenishes the aquifers while 3% is transformed into direct flood flow. Rainfall exceeding the limit for reliable rain fed agriculture (300 mm annually) covers only 4% of the land area in the North, North Western Highlands and in Jordan Valley.

Figure 1: Water Resources in Jordan
(Source: Water Sector Planning Support Project, BGR, 2004 – data provided by MWI)

Economy, Population and Social Development

The population of Jordan is 6,508,887 as of July 2012 with a growth rate of about 2.2%. Urban population is estimated at 79% of the total population, with Amman accounting to almost half of the population of Jordan. (CIA 2013)

Jordan's economy is among the smallest in the Middle East, with insufficient supplies of water, oil, and other natural resources, underlying the government's heavy reliance on foreign assistance. Other economic challenges for the government include chronic high rates of poverty, unemployment, inflation, and a large budget deficit.

Since assuming the throne in 1999, King Abdullah II has implemented significant economic reforms, such as opening the trade regime, privatizing state-owned companies, and eliminating some fuel subsidies, which in the last decade spurred economic growth by attracting foreign investment and creating some jobs. The global economic slowdown and regional turmoil, however, have depressed Jordan's Gross Domestic Product (GDP) growth, impacting export-oriented sectors, construction, and tourism.

Jordan's finances have also been strained by a series of natural gas pipeline attacks in Egypt, causing Jordan to substitute Egyptian gas used for electricity generation with the more expensive heavy fuel oils, creating an energy crisis that the country is facing and that the Government has to address.

Sector Overview

As mentioned earlier, Jordan is considered as one of the four most water scarce countries in the world, on a per capita basis of 147 liter per capita per day (LCD) for 2011 (ranging between 71 LCD in Jerash, to 230 LCD in Ma'an). A range of technical and financial challenges face the sector as listed in Table 1 below:

Table 1: Challenges Facing the Water Sector
(Source: Own, 2013)

Technical Challenges	Financial Challenges
• Limited water resources, • Uncontrolled population spread, • Old water networks, • High rate of water loss, • Systems inefficiencies induced by the governance and institutional structure of the water delivery system, • Institutional structures not providing incentive framework to retain **qualified** staff and manage sector efficiently.	• Inability to cover the capital and operating expenditures within the currently applied tariffs which are non-dynamic and are not linked to service delivery costs, • Limited resources of funds, • Deceasing central government support, • High cost of searching and developing new water resources, • Increasing cost of service delivery due to increasing cost of production inputs.

In order to deal with these challenges, the Ministry of Water and Irrigation (MWI) through the adoption of a long-term plan is working to:
1. Improve the provided services through restructuring and rehabilitation of networks.
2. Reduce non-revenue-water (NRW) through procedure improvement.
3. Provide new resources and maximize the efficient use of available resources.
4. Rely on loans, grants, service charge collections, and on Government support to cover the shortfall caused by low cost recovery of Operation and Maintenance (O&M) costs and total cost in all the governorates in Jordan.
5. Revisit the tariff structure to improve cost recovery and direct the subsidy to those who are actually in need of it.
6. Develop an environment conducive to engaging private sector in the water sector.

Jordan's water resources are located far away from its population centers, in particular the Greater Amman area where almost half of the country's population lives and which lies at about 1,000 meter above sea level. To address this challenge, Jordan has developed extensive water supply infrastructure to provide water for both irrigation and municipal uses. The key elements of Jordan's overall water infrastructure are:
1. Al Wahda Dam on the Yarmouk River,
2. King Abdullah Canal (KAC) in the Jordan Valley which is fed primarily by the Yarmouk River, the Mukhaibah springs near the Yarmouk River and a number of wadis draining into the Jordan Valley,
3. As-Samra wastewater treatment plant that treats most of Greater Amman's wastewater and discharges it to the Zarqa River,
4. King Talal Dam on the Zarqa River from where the water returns to the KAC downstream of Deir Alla for irrigation in the Lower Jordan Valley.

As mentioned earlier, total current demand exceeds renewable supply, and there are competing sectoral and economic interests affecting the supply priorities, especially between domestic and agricultural use. The difference between the demand and supply comes from non-renewable groundwater abstraction and reclaimed water. Additionally, MWI is working to increase the use of non-conventional water resources like:
1. Wastewater reuse
2. Disi Water Conveyance Project (320 km long) from the non-renewable Disi aquifer to the capital Amman and other parts of Jordan.
3. Desalinated water, as part of the projected Red Sea-Dead Sea conveyance system project.

In terms of use, and according to the 2010 water budget, fresh water used for agriculture amounted to around 400 million cubic meters (MCM), and reclaimed water used for agriculture amounted to around 103 MCM. As for the municipal use, it amounted to around 350 MCM and industrial use stood at around 40 MCM. The issue with the above numbers is that agricultural water use is of low economic return, due to the very low tariff and heavy subsidy, as well as the little quantitative restriction on over-abstraction of groundwater, especially in the highlands. The agricultural sector's use amounting to around 65% of the water use contributes to not more than 3.2% of GDP.

In terms of resources, and according to the 2010 water budget, groundwater resources amounted for 56.72%, and surface water 31.84%. More details are presented in Figure 2 below.

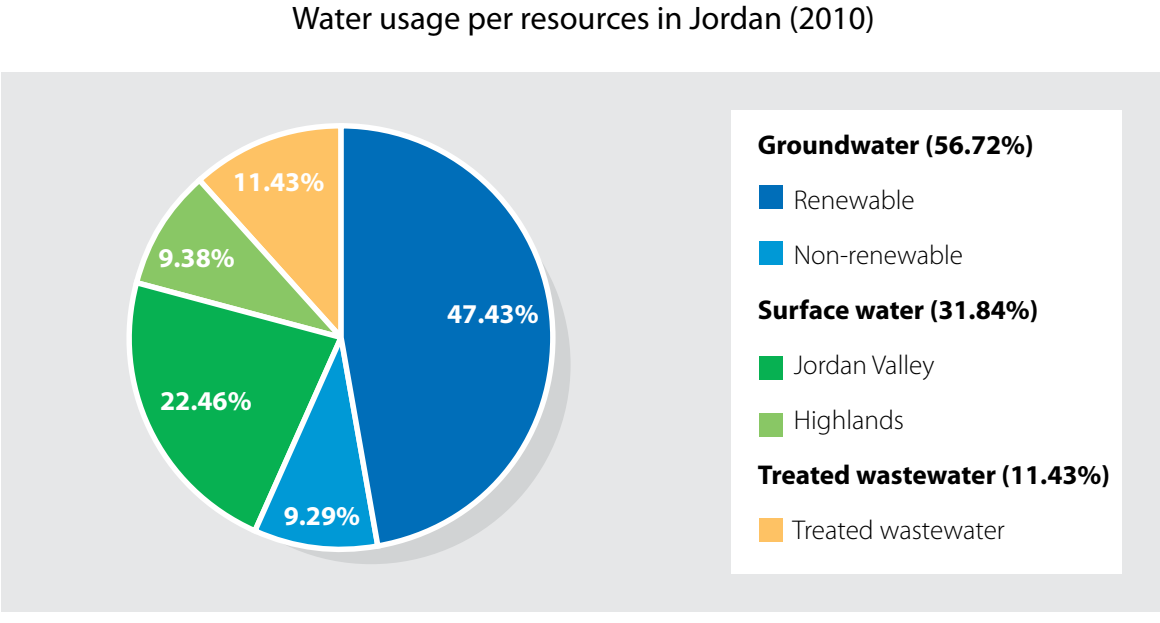

Figure 2: Water Uses per Resources in Jordan - 2010
(Source: Water Budget 2010, MWI)

The extraordinary topography of Jordan poses technical challenges in terms of supplying water to the population through the networks, due to the heavy dependence of the sector on the energy to be able to provide water. Pumping is the major cost item in the sector's budget, where the Water Authority of Jordan (WAJ) is the largest electricity consumer in the country, using about 14% of Jordan's national energy production. This comes at an extremely high cost, especially with the energy crisis the country is facing and increasing electricity prices. This is taking a toll on the water sector, and making it all the more difficult to attain cost recovery, especially with the subsidized tariff. Moreover, the increasing energy costs and difficulty in financing capital expenditures and operating costs and covering subsidies is slowing capital investments. However, those same factors are good incentives for MWI and policy makers to engage more in efficiency initiatives – energy and otherwise, and to improve water allocation decisions among subsectors, and study and adopt policies that target subsidies to the underprivileged.

Water Sector Governance Framework and Institutional Setup

Three main organizations comprise the Jordanian water sector:

1. The Jordan Valley Authority (JVA), which is an autonomous organization under MWI, and responsible for water management in the Jordan Valley (construction, operation and maintenance of dams, supplying irrigation water to farmers, bulk supply of water to municipal and industrial sectors, and overall development of the Jordan Valley including land planning and development of tourism.
2. WAJ, which is responsible for supplying water to the municipal and industrial sector as well as wastewater collection and treatment across Jordan. It works on groundwater development and use and the operation of municipal utilities, and owns the three limited liability companies corporatizing water utility operations in several governorates:
   - Miyahuna, covering the Amman Governorate.
   - Aqaba Water Company (AW), covering the Aqaba Governorate.
   - Yarmouk Water Company (YWC), covering the four northern governorates (Irbid, Mafraq, Ajloun and Jerash).

The remaining six governorates are served by WAJ itself. Noteworthy is that water is produced in one company/governorate and transferred across boundaries to other governorates in most cases.

3. The MWI, which is responsible for formulating water strategies and policies; performing water resources planning and developing national master plans; monitoring and evaluating water resources; and conducting water, wastewater, and irrigation studies. Under the Ministry a Performance Management Unit (PMU) is working to monitor the performance of, and audit the corporatized utilities; and develop PPPs and promote private sector participation (PSP) in water services and management.

   MWI is the head of both organizations (WAJ and JVA). Each of these organizations has its own organizational structure, responsibility, and mission.

Legal/Regulatory Framework

The MWI was established in 1992 (By-law No.54/1992) issued by the executive branch of the Government under the Jordanian Constitution. The establishment of MWI was in response to Jordan's recognition of the need for a more integrated approach to national water management.

WAJ was created in 1988 by virtue of Law No.18/1988 and its amendments as an autonomous corporate body with financial and administrative independence, responsible for the provision of water and wastewater services and the management of water resources and regulating ground water use. WAJ Law was amended in 2001, where Article 28 was introduced to allow for PSP in water and wastewater service delivery through the assignment of any of WAJ's duties or projects to any other body from the public or private sector, or to a company owned totally or partially by WAJ. This amendment enabled WAJ to corporatize utilities and enter into Build-Operate-Transfer (BOT) contract arrangements and other PSP options. Prior to that, WAJ outsourced services to the private sector including design and construction services and management contracts.

JVA was created by virtue of Law. No.19/1988 amended by new Law No.30/2001. As explained previously it is responsible for developing the Jordan Valley and the area south of the Dead Sea, and for developing water resources there for irrigation and for operating the multi-source supply system for Amman and the KAC in coordination with WAJ.

PMU is considered the unit within the sector that is charged with monitoring the water utilities– among other functions. In details, its functions are:

1. The regulatory functions of technical monitoring and performance auditing of the private water companies in the country by applying agreed- upon performance indicators;
2. Developing PPPs and promoting PSP in water services and management;
3. Planning and providing strategic advisory services to decision makers (involvement topics include tariff restructuring recommendations, sector reform, PPP contracting…etc.); and
4. Applying commercial principles on the retail side of municipal water supply and wastewater treatment.

It is envisaged now that the PMU will assume a more regulatory role and become an interim regulatory body in the sector as a first step and precursor to becoming a fully fledged regulatory body.

Sector Documents

Though there is no one water law governing the sector and setting its policies, however, in addition to the applicable laws and by-laws that were listed in the section above, policy and strategy and planning documents exist that provide the direction and guidelines for the section:

1. Water policies for the following key areas:
   - Irrigation water policy: This policy is compatible with the Water Strategy and is in conformity with its long-term objectives. It addresses in more detail water-related issues of resource development: agricultural use, resource management, the importance of technology transfer, water quality, efficiency, cost recovery, management and other issues. (MWI 2010a)
   - Water policy: Sets the principles guiding the performance of the water sector. It addresses the issues of the water strategy in the sector; its institutional development; private sector participation; water pricing and cost recovery; human resources; water resources management; water quality and the environment; service levels related to water distribution; public awareness; and conservation and efficiency measures. (MWI 2010b)
   - Groundwater policy: It sets out the Government's policy and intentions concerning groundwater management aiming at development of the resource, its protection, management and measures needed to bring the annual abstractions from the various renewable aquifers to the sustainable rate of each. (MWI 2010c)

- Wastewater policy: the principles guiding the development of wastewater management. It addresses developing and managing wastewater as a resource; wastewater collection and treatment; reuse of treated effluent and sludge; pricing of services and other miscellaneous issues. (MWI 2010d)

2. Water Strategy in Jordan - MWI (2008-2022): It establishes the vision for each of the major areas of the Water Sector. It identifies plans for Jordan future water and the actions that will be taken to ensure that water is available for people, business and nature. It sets the vision of what Jordan seeks to achieve by 2022. It looks at all aspects of the water cycle from rainfall to collection, treatment and discharge, the practical steps needed to implement effective water demand management, efficient water supply operations and well developed institutional reform. (RWC 2009)

3. WAJ Strategy (2008-2012): It sets the strategic directions and objectives of WAJ that are in alignment with sector policies and overarching strategy. It is developed based on the balanced score card approach, addressing the areas of customer satisfaction; financial aspect; operational aspect and human resources aspect. (RWC 2009)

4. JVA Strategy (2011-2014): It sets the strategic directions and objectives of JVA that are in alignment with sector policies and overarching strategy. It addresses the development of conventional as well as non-conventional water resources; improving irrigation water management; surface water resources management; socio-economic development of the Jordan valley; protecting the Red Sea and the soil in the Jordan Valley; investment promotion in the area; and performance improvement.

The Role of the Private Sector

MWI is committed to securing water services at affordable prices and acceptable standards. It is also committed to extending these services to remote and less developed areas (MWI 2010b). With all the technical and financial challenges it is facing, it is more and more turning to engaging the private sector in developing the water sector (capital investments as well as management contracts). It intends, through private sector participation, to transfer infrastructure and services from the public to the private sector, in order to improve performance and ensure the delivery of services to the population.

The role of the private sector is being expanded with management contracts, concessions and other forms of private sector participation in water utilities being considered and adopted as appropriate. The concepts of BOT/ Build-own-operate (BOO) are also implemented. The private sector role in irrigated agriculture is also encouraged and expanded through Water Users Associations (WUAs).

Furthermore, and since MWI started to promote PSP and PPP approaches in the water sector, WAJ established the three limited liability companies (Miyahuna, AW and YWC) that provide services to six of the 12 governorates in Jordan, and provides the remaining six with services itself with initiatives of functional outsourcing in three of them. AW and YWC were given title to the assets in the Assignment Agreements, but Miyahuna was provided only with the right to use the assets.

WAJ has also been responsible for all wastewater treatment and disposal throughout the kingdom, but handed over responsibility for this function to the corporatized companies in their respective Assignment Agreements. The major As-Samra wastewater treatment plant is a BOT project serving both Amman and Zarqa governorates, and managed by WAJ. The remaining parts of Jordan are served by WAJ administrative units.

PSP also has been applied through outsourcing services and the involvement of the private sector in different functions/business processes in operation and maintenance of water supply and water disposal, whereas service contracts on billing and revenue collection and network operation & NRW, have been put into application. Such contracts have been developed to be contracted out implementing the performance based compensation.

Another example for private sector involvement is the Improvement of Energy Efficiency Program supported by German International Development Agency (GIZ) where the MWI and WAJ developed an approach for performance based energy service contracting in the water sector. (Humpal et al. 2012)

STRANDS OF APPLICABLE REFORM

As per MWI's water policy: "a significant reorganization of the water agencies will be necessary to increase efficiency and responsiveness. (MWI 2010b). The MWI will remain as a government entity responsible for sector governance. The role of the Ministry will center on providing policy formulation, decision making, and centralized data collection. WAJ is moving to separate its bulk water supply and retail functions. The majority of the retail water delivery functions in Amman are managed by Miyahuna, the WAJ owned Water Company. In JVA, the private sector will be called upon to assume a proper role in development as well as operation and maintenance activities that are being restructured on a more commercial basis. (MWI 2010b)

The Government remains committed to securing water services at affordable prices and acceptable standards. It is also committed to extending these services to remote and less developed areas. It intends, through PPP, to transfer infrastructure and services from the public to the private sector, in order to improve performance and ensure the delivery of services to the population.

The role of the private sector will continue to be expanded with management contracts, concessions and other forms of private sector participation in water utilities being considered and adopted as appropriate. The concepts of BOT/BOO will remain to be considered, and the impact of such concepts on the consumers shall be continually assessed, and negative impacts mitigated. The private sector role in irrigated agriculture shall also be encouraged and expanded. Emphasis will be placed on the social benefits in conjunction with the private investments. (MWI 2010b)

The management of the water sector is very much centralized, and political interference is usual. The so called "autonomous" water companies are not actually independent (MWI 2010b). Regulatory functions remain limited to monitoring the performance of the companies through performance indicators. It has been generally accepted in the sector that the key principles of separating policy, regulation, implementation and introducing commercialization of operations together with PPP were very sound and relevant to Jordan's case. Furthermore, the importance of sector coordination cannot be stressed enough as key to improving sector performance, and governance is the key to sustaining and accelerating the reforms and addressing the problems created by vested interests.

Several strands of reform were introduced in the water sector in Jordan. On a broader basis, reform plans aim at establishing - through institutional setup - commercial principles within the sector (increasing the participation of the private sector in water resources management) and separating the wholesale from retail.

As a precursor, the reform initiatives were preceded by amending WAJ's law no 18/1988 by adding a clause that allows the creation of partnerships and involvement of the Private Sector in the provision of water and sanitation services, and the development of models working on commercial concepts. However, even with that, it is not always possible to sustain the financial feasibility and gain the interest of the private sector partners for PPP projects. The contradiction between the public sector's interest and the benefit oriented focus of private sector interest can be a major challenge for PPP approaches.

Decentralization and Commercialization

The two concepts that work perfectly in alignment are decentralization and commercialization. Jordan is progressively moving to decentralize water and sanitation services. Whereas previous to the reform initiatives services were provided by what were called "WAJ Governorate Offices" that were totally deferential to WAJ in all decision making aspects, these Governorate Offices became water administrations in the governorates with more flexibility and decision making power, yet still fiscally linked to WAJ Central. Then came the corporatization step, whereby a special purpose company is created to undertake the water and sanitation services. It remains state owned, but in all other respects operates as a commercial company operating in the private sector. The objectives of corporatization are that:

1. It provides a basis for ring-fencing the services and separating government from direct involvement in services provision; It creates an organization which is both accountable and transparent;
2. Incentives can be established to encourage managers and staff to be more commercially oriented;
3. It may free the organization from civil service constraints in relation to procurement or human resources management;
4. It is often easier to build consensus for corporatization (relative to PSP options) because ownership and management of the sector remains in public hands; and
5. It provides operational and financial autonomy.

In Jordan, three limited liability companies were created:
- Miyahuna, operating in Amman governorate, established in 2007.
- AW, operating in Aqaba governorate, established in 2004.
- YWC, operating in the four northern most governorates, established in 2011.

The other dimension is commercialization, which can be reflected with increasing private sector participation. At the lower end of the scale, technical assistance and operational and management support programs shift gradually towards outsourcing specific operational and/or managerial functions, then stepping up the pace towards management contracts for the whole utilities, and at the other end of the scale is fully fledged PPP contract such as BOT and Design-build-operate (DBO).

The Jordanian experience in water sector reform moved up the scale of commercialization synchronously with moving up the scale of decentralization, applying various models in between, as is explained below.

Modernization through the Operations Management Support (OMS) Program

The OMS program was initiated as a first step towards commercialization as well as setting the stage for WAJ water administrations. The overall objective of the OMS was the countrywide improvement of the operational efficiency of water supply through comprehensive technical and financial management consulting services to help reorganize, restructure and transform the regional water administrations of Jordan into commercial business entities attractive for private operators to be run under performance-based management contracts. Under the umbrella of the program which lasted for 12 years (1994–2006), advisory services were provided to WAJ in developing an organizational concept for the regional water administrations; recommendations and elaborations for improved management information systems and financial management and accounting procedures; capacity building for financial managers and staff as well as vocational training for O&M staff; establishing an internal audit unit; analysis of staff performance and developing Training Needs Assessments (TNA) and associated capacity building plans; assistance in the preparation of management contracts and involvement of private sector; and assistance to the PMU in its transformation into a monitoring body to supervise the performance of private operators.

Micro PSP and Service Contracts

Stepping up one level higher on the scale of decentralization, WAJ engaged local private sector companies to provide defined services and functions. The advantages of Micro PSPs are:
1. Working the fast track (avoiding lengthy project preparation and reducing opportunity costs).
2. In terms of engaging local expertise, usually the off-takers are familiar with the local conditions and would come up with a sustainable long term solution.
3. They also provide a higher level of flexibility in terms of targeted problem solution, scalable contract size depending on available budget and engaging WAJ personnel.
4. Micro PSPs lead to much needed short term improvements and short payback periods and deficit reduction.

Micro PSPs entail outsourcing clearly identified functions/business processes in O&M of water supply and sanitation such as billing and revenue collection; sewerage connections; network operations; leak repair services; water service connection replacement; well drilling; customer surveys and Geographical Information System (GIS) services; and vehicles repairs and maintenance. The contract is a performance based short term contract.

The Micro PSP model was applied in Madaba between 2006–2011 for extended contract duration, and following the successful implementation, rolled out in Karak and Balqa (2011 and still running). Madaba's case will be taken as model Micro PSP in Jordan.

In Madaba (a city 30 Km to the south of Amman, with an area of 100 sq km, with about 150,000 inhabitants, 22,000 subscribers and 130 LCD), the objectives of engaging private sector in a Micro PSP were to improve the quality of service provided; to reduce water loss; to reduce illegal water connections; and to train and enhance the performance of Madaba staff. Before the implementation of the Micro PSP, the situation in Madaba was dominated by severe problems in the customer management as customers were lost due to faulty application processes; billing was often incorrect due to estimations, and bills were not distributed due to poor information systems; and collection was ineffective. This led to very high NRW (ranging between 49-66% during the 10 years before the Micro PSP started). The contract was performance based, and the success

of the project exceeded all expectations. In addition to fulfilling all institutional development and operational indicators, financial results obtained showed that net billed water increased 75% in the first year of operation, and net collections increased dramatically from 0.9 million JD in the base year 2005, to 1.3 million in 2006, 1.8 million in 2007, and 1.9 million 2008.

Management Contracts

Management contracts are considered an important vehicle through which managerial, corporate and technological skills are transferred to public organizations. The public sector in this case transfers O&M responsibility to the management contractors, leaving them free to make daily management decisions without bearing commercial risk. In such an arrangement, the private contractor represents the public authority but has no legal relationship with the customers, although has to collect the charges from them. On the other hand, the public authority retains financial responsibility of investment and operational cost. The contractor receives an agreed upon management fee and can earn more through performance based incentives, but at the end of the day, the public authority has to pay the agreed upon management fee even if the private contractor does not make any profits.

In Jordan, this type of contract was implemented in several cases, such as the LEMA water company in Amman, the Wadi Musa and Ma'an wastewater treatment plants, the Northern Governorates Water Administration (NGWA) management contract and currently the YWC. LEMA's management contract in Amman will be taken as model.

In 1999, WAJ contracted a joint Jordanian-French venture, LEMA, to manage Amman's water and sanitation services. The contract was under a fixed plus performance incentive scheme. The population served under contract was approximately 2 million (330,000 subscribers, 15% of them commercial, and about 60% of them consuming water at a price less than average operational cost). Working under its contract, LEMA updated customer data, which led to improved billing and more accurate data on the Customer Information System (CIS). LEMA also worked to replace defective meters, and established meter reading routes on the GIS using Hand Held Units (HHUs), and increasing customer service offices. Eventually, the contract was extended until 2006, and achieved the following:

1. Higher collection rates and revenues and reduced NRW;
2. Reduced response time and improved network maintenance and repairs and decreased working ratio;
3. Improved staff training and implemented higher wages and incentives;
4. Extensive use of computerized techniques and Information Technology;
5. Transparent performance and credibility with customers.

Noteworthy is that management contracts were done with WAJ administrations (or WAJ itself) such as the case of LEMA, and with corporatized utilities, such as the case of YWC.

Other PPP Models (BOT, DBO)

On the upper scale of decentralization and commercialization, other PPP models are applicable such as BOT, DBO and others. The private sector is an important source of funding for infrastructure development, which removes a portion of the fiscal burden from the government and transfers it to implementing consortiums. In order to attract this funding, Jordan has utilized BOT contracts in the development of water infrastructure. Funds for building are contributed by the government through contractors who build and operate a facility for a time and then transfer control back to the government.

The most significant of these involves the As-Samra BOT contract for wastewater treatment. This plant serves approximately 45 percent of Jordan's population with 267,000 cubic meters per day (m^3 /day) of effluent, or nearly 100 MCM/year. To update the facility and build a pre-treatment plant, another 25 year BOT contract was negotiated in 2003 and signed with As-Samra Wastewater Treatment Plant Company Limited – a Special Purpose Vehicle (SPC). Effluent from the plant was to meet Jordanian standards for discharge into wadis. Treated wastewater was reused for irrigation. Jordan contributed around 50% of the project's capital (through local budget and a grant provided by the United States Agency for International Development (USAID), while 20% came from the implementing consortium's equity, and 30% from a consortium of banks as a loan to the implementing consortium. In order to achieve cost recovery for this project, wastewater tariffs in Amman and Zarqa Governorates were increased by about 12% in 2001. Noteworthy is that As-Samra wastewater treatment plant will undergo a further expansion and technological upgrade, which are expected to meet

the needs of Amman and Zarqa through 2025. The planned project is also expected to improve long-term sludge management and disposal practices and benefit Jordan's scarce water resources. Construction started in 2012 and expected to last three years. The project is being implemented under another 25 year BOT contract with the same SPC. The Millennium Challenge Corporation (MCC) is funding USD 93 million of the USD 223 million cost of the As-Samra expansion project, with the government of Jordan contributing USD 20 million of the cost and private debt and equity sources handling the remaining USD 110 million.

Another major BOT contract that is currently being implemented in Jordan is the Disi bulk water conveyance system. The Project consists of the development of a well field system with 55 wells, a 325 km pipeline, a new concrete reservoir east of Amman at Abu Alanda, and connection to an existing reservoir at Dabuk, northwest of Amman. Five emergency turn-outs along the pipeline will help secure a water supply to towns along the route as well. The Project is being implemented under a 25 year BOT contract with MWI and WAJ. By virtue of this contract, WAJ will pay on a take-or-pay basis a water tariff for the delivery of the bulk water by the Project to the two reservoirs, and it will then sell the bulk water to Miyahuna.

Other forms and/or models that were implemented in Jordan include the DBO agreement for the construction and operation of the Zara-Ma'in water treatment plant, the objective of which was to design, construct and operate a 47 MCM/year water treatment plant to desalinate brackish groundwater and convey it to Amman. Contract duration was two years for construction and 2-7 years for operation. The plant is currently run by Miyahuna.

REGULATORY FUNCTIONS

In summary, regulatory functions optimally include ensuring the provision of good service by the private sector, and in exemplary situations setting and controlling the tariffs. In Jordan, WAJ is required to undertake a multiplicity of roles; sometimes it is the operator, sometimes a contracts supervisor, and sometimes a regulator. The regulatory structure for most of the PPP projects is by contract, and WAJ is directly in charge of the regulation and monitoring of the contracts, in addition in some cases to external technical and financial auditors to review the performance of contractors to determine the respective performance incentive.

In other cases, and specifically in the cases of the corporatized water companies, PMU is the entity within the sector which is responsible for monitoring and reporting on their performance and achieving the targets per their assignment agreements. However, PMU's role does not go beyond this point, and in terms of tariffs only provides advisory services to decision makers on the subject. Noteworthy is that currently the PMU is being groomed to become an interim regulator within the sector under the USAID funded Institutional Support and Strengthening (ISSP) Project, as a first step before turning into a fully fledged regulator of the sector

NEXT STEPS

There is an institutional restructuring strategy, supported by donor activities, including USAID's ISSP in the water sector. Its objectives are to:

1. Establish a National Water Council to review and to put external expert weight behind major legislative initiatives in the sector. The council was created, but still needs to be active.
2. Separate WAJ as a bulk supplier of water from water companies and corporatized municipal services that provide retail water services, and JVA as a bulk supplier for irrigation water.
3. Strengthen Water Users Associations (WUAs) in the Jordan Valley to assume O&M management of irrigation water there.
4. Set up a sector regulator to monitor WAJ and company performance and contractual arrangements.
5. Review water legislation per envisioned roles for all sector organizations, as well as drafting a consistently new water law.

ISSP program has been working on executing this strategy for the past two year, with one more year to go, after which another follow-on project is expected to be funded by USAID also to continue the reform activities.

CONCLUSIONS

Throughout the world for more than a generation, water sector reforms have brought the following truths to light:

1. The reform process requires the full commitment of policy makers to correctly balance financial and political objectives;
2. Success generally cannot be attained until the external environment has been reformed - specifically the role of the owner of the infrastructure assets;
3. Real reform never comes by way of a "quick fix"; and sector improvements without fundamental reforms will never fix deep seated sector problems;
4. Financial sustainability must lie at the heart of reforms;
5. Utility managers must be left to take their business decisions;
6. The best way to improve utility performance is to pay attention to the end users; and
7. Regulators play the leading role in sector reforms.

At the end of the day, Jordan was successful in improving services provided to its people through PSP initiatives, whether it be on the capital investment level, or on the more operational and management levels. It undertook a large number of initiatives that covered the whole spectrum of PPP, learning from each project and moving forward. In more specific terms, a number of lessons can be drawn from Jordan's experience in water sector reform activities and engaging the private sector in providing water and sanitation services in the country:

1. Change process ownership by the public partner is a key to ensuring smooth and successful change process. To achieve this, political support from the highest ranks is crucial. However, and for the sustainability of a private operator contract, raising awareness and disseminating information on reform amongst the grassroots is also a key to promote dialogue and build consensus.
2. Baseline knowledge and information available at the beginning of a PSP process is quite often insufficient and unreliable leading to problems in target definitions during contract development or later in implementation of PSP and the assessment of performance. It is essential to improve data availability and reliability thus strengthening grounds for PSP and the cooperation base of the two partners.
3. To ensure interests of the public partner and achievement of objectives, a strong and competent monitoring body for PSP is a must; this should be in place before the contract starts and have clear responsibilities and procedures only for contractual performance or interpreting targets.

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PALESTINE

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ACRONYMS

ACWUA	Arab Countries Water Utilities Association
BOT	Build-operate-transfer
GDP	Gross Domestic Product
ICA	Israeli Civil Administration
JWC	Joint Water Committee
JWU	Jerusalem Water Undertaking
LCD	Liter per Capita per Day
m^3	Cubic Meters
MCM	Million Cubic Meters
MENA	Middle East and North Africa
NWC	National Water Council
O&M	Operation & Maintenance
PCBS	Palestinian Central Bureau of Statistics
PNA	Palestinian National Authority
PPP	Public Private Partnership
PWA	Palestinian Water Authority
TWG	Technical Working Group
UNRWA	United Nations Relief and Works Agency
UR	Utilities Reform
WBWD	West Bank Water Department
WHO	World Health Organization
WSSA	Water and Sewage Authority

INTRODUCTION

Water and wastewater utilities around the Arab countries are confronted with many challenges as they strive to make organizational improvements. Water sector utility managers must consider a wide range of issues in their management improvement initiatives. General economic conditions, staff turnover, communication between internal management and external stakeholders, involvement of staff across the organization, aging infrastructure, rate issues, and limited staff resources are some of the issues managers address. The focus of this case study is the reform undertaken in the water and sanitation sector in Palestine, especially with the challenges of water scarcity and the Israeli occupation. For the sake of better understanding for the case study, this chapter will illustrate the country back ground.

Country Background

Location and Size

Palestine is located at the eastern coast of the Mediterranean Sea, to the south of Lebanon and to the west of Jordan. It is divided geographically into four regions: the Jordan Valley and Ghor; coastal and inner plains; mountain and hills; and the Southern Desert. However, Palestine as stands today consists of two physically separated parts; West Bank and Gaza Strip.

Topography, Geology and Soils

Despite its small geographical area, Palestine is characterized by a great variation in topography and altitude, as seen in the West Bank where variation ranges between 1,020m above sea level to 420m below sea level. This variation directly affects climate and distribution and diversification of agricultural patterns- from irrigated in the Jordan Valley to rain fed farming in the mountains, while Gaza Strip is essentially a foreshore plan gradually sloping westwards.

Figure 1: Map of Palestine

(Source: http://www.palestinehistory.com/arabic/sights/images/maps_pal3.jpg)

Major soil association in Palestine is terra Rossa and Brown Rendzians dominating the central high land of the West bank, in Gaza Strip the most common soil type is crumosols.

Climate & Climate Change

Palestine lies within the Mediterranean zone. Gaza Strip in particular is part of the Mediterranean coast. The climate is characterized by long, hot, dry summers and short, and cool rainy winters. In the West bank the average amount of annual rainfall is 532 mm, whereas it is lower in Gaza with an annual average rainfall of 358 mm.

Regional climate change implications for Palestine over the next 50 years are expected to consist of a decrease in annual average precipitation, an increasing incidence of drought, and an increase in extreme climatic events. A number of key areas are negatively affecting human and economic development in Palestine such as water resources, agriculture and food security, public health, and tragedy risk reduction. The Palestinian National Authority (PNA) is currently denied to work as a political authority regarding the management of climate risk, due to the Israeli occupation. There is however a climate change adaptation scheme for Palestine 2008-2009.

Population

According to the Palestinian Central Bureau of Statistics (PCBS), the total population of the Palestinian Territory in mid 2011 was about 4.17 million: 2.58 million in the West Bank and 1.59 million in the Gaza Strip. Data revealed a decline in the average household size in the Palestinian Territory during the period 1997-2010, from 6.4 persons in 1997 to 5.9 in 2010.

Population density in the Palestinian Territory is generally high at 693 persons/km^2, particularly, in the Gaza Strip at 4,353 persons/km^2 compared to lower population density in the West Bank at 456 persons/ km^2 in mid- 2011.

Socio-economic Indicators

The labor force participation rate is 41.0% of the total labor force (persons aged 15 years and over) in the 1st quarter of 2011, of which 43.2% is in the West Bank compared to 37.0% in the Gaza Strip. The female participation rate in the labor force is very low, at 14.7%, compared to male participation rate. 16.7% of the female rate is in the West Bank and 11.0% is in the Gaza Strip, against 66.7% for males of which 69.0% is in the West Bank and 62.5% is in the Gaza Strip. Unemployment in the 1st quarter of 2011 stood at 21.7%: 17.4% of whom are in the West Bank and 30.8% in the Gaza Strip. Data revealed that 14.1% of households in the Palestinian Territory suffered from deep poverty in 2010 according to consumption patterns (8.8% in the West Bank and 23.0% in the Gaza Strip).

The Economic Cost of the Israeli Occupation

Throughout the Israeli military occupation of the Palestinian territory, a systematic policy has been followed to exploit the Palestinian resources and properties. The imposed Israeli measures and activities have prevented Palestinians from accessing much of their land and from exploiting most of their natural resources; it isolates the Palestinians from global markets, and fragments their territory into small, badly connected "cantons".

Per Capita Gross Domestic Product (GDP) has increased over the period from 2007- 2010 in the West Bank, while in Gaza Strip the case is completely different; per capita GDP has decreased over the same period. This is attributed to the Israeli siege and war over the Strip.

Sector Overview

In Palestine, water and wastewater are essential components of the economic, social and political fabric. Water is key to any economic and social development. The Palestinian Water Authority (PWA) is responsible for building and developing water sector bodies; building and rehabilitating destroyed infrastructure through donor-funded projects; and delivering water and wastewater services to Palestinians, who had been deprived of such facilities under the occupation.

West Bank water sources consist of renewable groundwater, with an estimated annual capacity of 669 million cubic meters (MCM), as well as valleys and torrents with an average supply of 215 MCM. Extending north towards Israel, the coast aquifer is the primary water source in the Gaza Strip. Though it is renewed every year by around 45 MCM, the actual annual consumption from the aquifer amounts to 167 MCM, subjecting it to excessive attrition, leakage into the sea, and pollution. Almost 90% of water extracted from the aquifer does not fit human consumption.

Annual discharge of the Jordan River is estimated at 1,320 MCM when it pours into Lake Tiberias, but drops to 115 MCM when it reaches the Dead Sea.

Total Palestinian use of groundwater in the West Bank is estimated at 118 MCM any year. In 2009, however, this amount decreased to 94 MCM, including 50 MCM used for the irrigation of 90,000 dunums of land and 44 MCM for household and industrial purposes. Of this, water wastage exceeds 35%. In addition, approximately 54 MCM is purchased from the Israeli Mikorot Company. The majority of this quantity is groundwater extracted from wells dug by Israel in the West Bank. Accordingly, the Palestinian consumption totals 172 MCM of water. In the West Bank, water supply is estimated at 65 liters per capita per day (LCD). Despite large investments in water service delivery, 123 residential areas, with a total population of 180,000 citizens, are still deprived of local water networks.

In light of its deteriorated status, Palestinian and international attention to develop and rehabilitate the water sector emerged soon after the PNA was established. All over the occupation period, the Israeli authorities systematically neglected the water sector, rendering the water infrastructure effectively fragile and marginalized. The Israeli authorities also deprived the Palestinian people from controlling, developing and managing their own water resources in accordance with national needs.

Palestinian water resources, including those shared with the Israeli side, are estimated by 2,989 MCM per year. Of this, groundwater constitutes approximately 1,454 MCM. Surface water includes water generated by the natural flow of the Jordan River around 1,320 MCM and water flowing from torrents around 215 MCM. In general, almost 2,570 MCM is used for various purposes. Out of this quantity, Palestinians use only 271 MCM, or 11%, whereas Israel consumes the remaining 89%. In spite of their inalienable right thereto, Palestinians are further prohibited from accessing and using the Jordan River water.

Renewable groundwater sources in the three aquifers (Western Aquifer, North-eastern Aquifer, and Eastern Aquifer) within the West Bank borders are estimated at 669 MCM per year. Whilst Palestinians use less than 15%, Israel is in full control of approximately 85% of these aquifers.

Consumption in the Gaza Strip is estimated at approximately 167 MCM for various purposes, including 82 MCM for drinking and industrial purposes and 85 MCM for agricultural uses. As this quantity far outweighs the storage capacity of Gaza aquifer by almost three times, water quality has deteriorated to an extent that does not meet the minimum standards approved by the World Health Organization (WHO). Current statistics show that less than 10% of the water extracted for drinking purposes in the Gaza Strip can be considered as potable.

The water sector infrastructure is not in a better condition. In first place, the Israeli occupied has implemented a policy of deliberate negligence in the Palestinian water sector. Of the services it is bound to deliver in its capacity as the occupying power, Israel's investment in the water sector did not exceed 1%. According to available statistics, only five wells were developed for drinking purposes to serve Palestinians.

In short, water supply in both the West Bank and the Gaza Strip is still below the required level. The majority of Palestinian residential areas suffer from water shortage. As a general average, Palestinian water consumption is not more than 80 LCD. Especially in residential areas not connected to water supply systems, with a population of approximately 180,000, residents use less than 25 LCD.

In Jerusalem, Israel has deliberately neglected development projects of the water and wastewater sector. Through a set of laws and administrative decisions, the Israeli Gihon Water Company attempts to withdraw the franchise of the Jerusalem Water Undertaking with the intention of controlling the remaining Palestinian service bodies in occupied East Jerusalem. Due to Israeli policies targeting Jerusalemites, water has become a rare asset there.

As for wastewater, although wastewater networks cover most of the Gaza Strip, West Bank networks are restricted to and partially cover major cities. The United Nations Relief and Works Agency (UNRWA) installed sewerage networks throughout most West Bank refugee camps. The remaining towns and villages in the West Bank lack wastewater networks and rely on cesspits. Compared to three in the Gaza Strip, only one wastewater treatment plant is in operation in the West Bank. Wastewater collection pools and inoperable old treatment plants pose health hazards and threaten citizens' lives. Wastewater produced in Palestine is estimated at 106 MCM per year, including 50 MCM in the West Bank and 56 MCM in the Gaza Strip. Added to this is approximately 39 MCM of untreated sewage discharged by Israeli settlements and respective industrial estates on Palestinian land in the West Bank. Around 10% of locally produced wastewater is treated and only a minor portion thereof is reused.

Most major cities, including Hebron, Nablus, Gaza, Beit Hanun, Jenin, Tulkarem, Ramallah and El-Bireh, are connected to sewerage networks. UNRWA installed sewerage networks in the majority of refugee camps in the West Bank, but with the exception of Jabalya refugee camp, sewerage collection systems are not in place throughout refugee camps in the Gaza Strip. Palestinians connected to sewerage networks comprise 35% in the West Bank and 65% in Gaza.

In mid 1970s, however, some sewerage collection pools and primary wastewater treatment plants were built in Tulkarem, Jenin, Central Gaza, and Northern Gaza. These have been operating beyond the available maximum capacity, causing wastewater to discharge and overflow to nearby areas. Until this day, wastewater flows from Palestinian cities into the West Bank valleys and natural currents. Sometimes, wastewater flows into the Green Line, whereby the Israeli side collects and treats it in treatment plants constructed at the expense of the Palestinian people. Though Israel does not take account of the value of the treated wastewater, which it exploits for its own uses, wastewater treatment cost is deducted on a monthly basis from Palestinian clearance revenues. In the Gaza Strip, both partially treated and untreated wastewater is discharged to the sea, resulting in grave damage to the marine environment and consumers of sea products.

The PNA constructed four wastewater treatment plants, including three in the Gaza Strip with a partial treatment capacity of 35 MCM per year, and one in El Bireh city with a treatment capacity of 2 MCM per year. Currently, work is underway to finalize the remaining phases of three other wastewater treatment stations. Other treatment plants are either awaiting implementation or awaiting approval of the Israeli Civil Administration (ICA).

In terms of connection to public networks, available data for 2010 showed that 91.4% of households in the Palestinian Territories are connected to public drinking water networks, of which 96.9% were in the Gaza Strip and 88.5% were in the West Bank.

About 54.4% of Palestinian households are connected to cesspits through which wastewater is disposed, of which 59.5% were in the West Bank and 18.0% were in the Gaza Strip. 52.1% of Palestinian households are connected to a public sewage network of which 40.1% were in the West Bank compared with 81.9% in the Gaza Strip.

Institutional Framework

It can be said that the PWA has literally inherited a disastrous situation with respect to the regulation of the water management services. Through the ICA, the Israeli authorities have controlled monitoring, supervision and control mechanisms of water resources management and/or water supply to Palestinian residential areas. Along with the Presidential Decree No.(5) of 1995, the Law No.(2) of 1996 on the Establishment of the Palestinian Water Authority, which identifies PWA's objectives and responsibilities, is the first legal framework that governs the water sector in the PNA territory. However, PWA has still been incapable of taking the initiative to manage and restructure the sector. Whilst certain reasons originate from the Law itself, others are affected by external factors, including overlapping powers and tasks prescribed by several laws approved by the Palestinian legislature. Also, former legal terms of references had acquired a legitimate status before the PNA was established.

To ensure that its objectives are achieved, PWA had decided to review the current service system. Accordingly, PWA separated water supply and wastewater management services from local government units and worked towards establishing independent bodies, which assume full responsibilities implementing the cost recovery principle. Within this framework, PWA believes that three regional facilities should be established in the West Bank. These will be distributed to three geographical areas: (1) Northern governorates (Jenin, Tulkarem, Nablus and Qalqiliya); (2) Central governorates (one facility); and (3) Southern governorates.

The current Institutional setup (See Figure 1) of the Palestinian Water and Wastewater Sector in the West Bank consists of four functional levels, namely: (1) Customers; (2) Water Distribution; (3) Water Supply; and (4) Policy, Planning, Development and Regulation.

The policy approval role was allocated to an inter-ministerial entity, namely, the National Water Council (NWC); policy development, sector planning and regulation roles are the responsibility of PWA through the Ministry of Agriculture and other line Ministries. However, the National Water Council is a non functioning body. It has neither approved nor added to the policies and strategic guidance of the water sector, and more importantly the wastewater component.

Water supply matters are handled by a series of organizations, namely: The West Bank Water Department (WBWD), the PWA, various municipalities with springs and wells, as well as a number of private and agricultural operators of springs and wells.

The Jerusalem Water Undertaking (JWU) and Water Supply and Sewerage Association utilities, numerous Municipalities, Joint Service Councils, Village Councils and Water User Associations have the responsibility of distributing water supply to the beneficiaries– the domestic, industrial/commercial and agricultural customers.

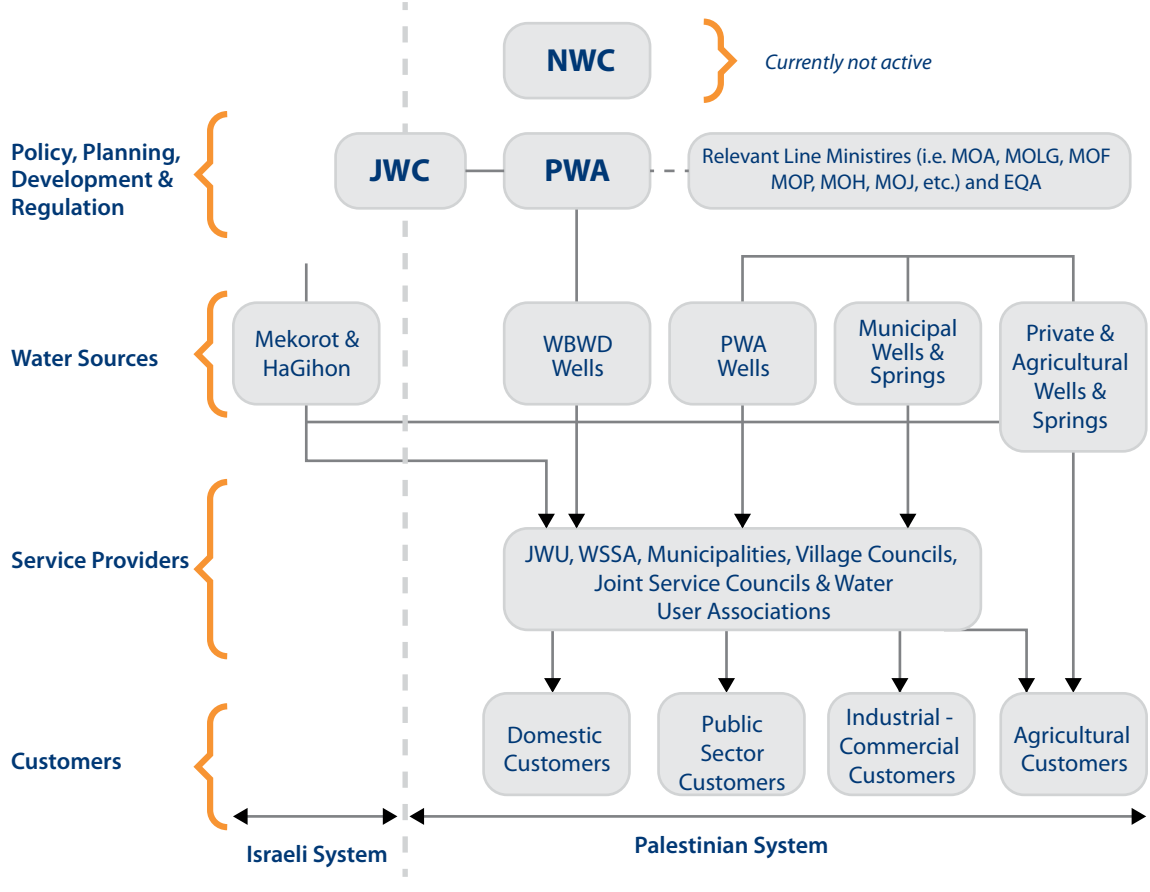

Figure 2: Institutional Arrangement for the West Bank Sector

(Source: PWA (2008) Water Governance Program and World Bank (2007))

This current institutional setup has been viewed in terms of what is working and how well it is working; and what is not working, and why not. Fundamentally, institutional arrangements are always illustrated and viewed in a top down format.

Expectations of PWA were perceived to be quite high. More was expected in terms of additional water resources and availability, more distribution networks in rural areas, better financial returns, and the availability of master plans for the water and wastewater sectors. In all institutions there was a lack of communication strategies and communication plans, which in part contribute to the infrequent dialogue. PWA is not on the level power level as the ministerial stakeholders and this proves to be a sensitive issue. Continuous dialogue should be taking place between PWA and its stakeholders as water and wastewater treatment and reuse are strategic elements that need constant attention.

Legal/Regulatory Framework

The main Palestinian domestic legislations governing the water and sanitation sector are the following:

- Water Law, No.3/2002 (and proposed amendments)
- Environment Law, No.7/1999
- Local Authorities Law, No.1/1997
- Internal Regulations of the PWA, Resolution No.66/1997
- Agriculture Law, No.2/2003
- Environmental Assessment Policy, approved in 23 April 2000

The Legal Scope for Private Sector Participation in Public-Private Partnerships

There are no macro legislative impediments that preclude assigning or delegating certain services to private or public enterprises to be provided in the water sector, yet the existing legal framework is inadequate to fully govern and regulate such providers and their management on the operational level. However, such a gap can be bridged on contractual basis without the need to introduce major legislative amendments. In light of the real experience in public services and utilities such as telecom, electricity and gas, contractual arrangements between licensing authorities and licensees might be doable and reliable and designable to achieve the intended results within the legal status quo. In this respect, a legal review proposes the following:

1. There are no constitutional specific provisions concerning the water sector in general that preclude private ownership or operation of water services. The PWA can under the current laws enter into privatization agreements after coordination and cooperation with the relevant said parties and ministries to delegate the responsibilities conferred to it by the law.
2. The water sector is the responsibility of PWA and the relevant ministries, but the law does not prevent those bodies from granting concessions or other Public-Private-Partnership (PPP) schemes such as Build-operate-transfer (BOT) agreements.
3. Issuing regulations by the Council of Ministers might be needed to satisfy the legal requirements, but the agreements themselves may accommodate the relevant terms and conditions that reflect the adopted policies.
4. Any related agreements should be based on the law and should be very carefully drafted and designed to incorporate functional controls and guarantees to ensure effective performance. If such schemes are considered, adopted and approved from a political perspective, it is strongly advisable that it should be done in a manner that does not allow for controlling private shareholders at the beginning and open the sector gradually.

Sector Documents

The vision, goals, policy and strategic principles for the management of the water sector were developed following the establishment of PWA in 1996. The National Water Policy is based on the principles of sustainable development, and was developed to guide the structure and tasks of water sector institutions and the water sector legislation.

A Strategy for Water Management in Palestine was later issued by PWA in 1999. Strengthening national policies and regulations, and enforcing water pollution control and protection of water resources are among the eight key elements of the Strategy. In particular, there is a need to "improve the legal framework by introducing new rules and regulations that provide incentives and enforcement mechanisms". In addition, "legal regulatory and institutional instruments will be developed to enforce pollution control and protection of water resources through coordinated efforts with relevant institutions".

REFORMING THE PALESTINIAN WATER SECTOR

Before a discussion about the need for water and wastewater sector reform, it is important to look at the situation from an historical perspective for a better understanding of the status quo.

By 1950 after the 1948 war, the West Bank was under Jordanian control and the Gaza Strip was under Egyptian control. This control was accompanied by the establishment of administrative bodies for the water sector, such as the JWU and WBWD. Following Israel's control of the Arab territories (West Bank, Gaza Strip, and Golan Heights) after the 1967 war, Israel assumed control of all water resources: surface and groundwater, declaring them the property of the State of Israel, and access to these resources would require a special permit that could only be issued by a military governor. Israel then restricted the work of the existing JWU and WBWD. Following another military order in 1972, Israel established the Bethlehem Water and Sewage Authority (WSSA). Israeli control over water resources continued even after the Declaration of Principles Agreement in Oslo, Norway (Oslo Accord- Gaza and Jericho First) in 1993 which included as one of its six permanent status issues water rights.

A Joint Water Committee (JWC) was established to deal with the development of water and wastewater related projects in the West Bank. Most projects require the prior approval of the JWC, which also applies to Israel's projects within the boundaries of the West Bank (most of which are to service settlements). As a result of the legal jurisdiction granted to Israel in Area C (61% of the West Bank's area), projects which have obtained

the JWC's approval are required to obtain a construction permit from ICA if the project or any portion of it falls within Area C. This layer of bureaucracy has reinforced Israel's control over most aspects regarding the development of both the water and wastewater sectors.

With the emergence of PNA, PWA was established with an independent legal stature (including an independent budget, reporting to the President of the PNA and would have a head of operations designated by the President of the PNA.

The Water Law founded the NWC led by the President of the PNA. This law remained in effect until it was replaced with Water Law No. 3 of 2002. Its purpose was to develop and manage water resources, increase output, improve quality, preserve the water resources, and protect the water resources from pollution and depletion. The law declared all water resources to be public property and entrusted the PWA with the management of both the water and wastewater sectors in addition to the projects associated with them. It also stated that all water and wastewater projects (digging of wells, exploration, extraction, collection, desalination, water treatment, and the establishment and or operation of any water/ wastewater facility) must initially obtain a permit from the PWA.

The Water Law entrusted the PWA with the role of regulator and supervisor, by means of establishing regional water utilities, but without granting them the operational tools. This in turn left the establishment of these facilities in the hands of the PWA and a certain amount of responsibility to Local Authorities. It should be noted that the relationship between the organization of the sector and the establishment of its infrastructure was not clarified. This left the inception of regional utilities distributed between various entities that include civil societies.

It should be duly noted that the Local Authorities Law No. 1 of 1997 dictates that local authorities are responsible for managing services, including water (drinking water). This includes supplying residents with water suitable for drinking or any other purpose, determining service requirements: water meters, pipes, organization, distribution, determining subscription prices and preventing the pollution of canals, wells, and spring.

The Basis for the Reform Plan

The basis for the reform plan of the Palestinian water sector were primarily two reviews; namely the Norwegian funded study and report entitled "An Audit of the Operations and Projects in the Water Sector in Palestine: The Strategic Refocusing of Water Sector Infrastructure in Palestine" (commonly referred to as the PWA Audit) and the AMAN Organization's report on the PWA. The reports looked into the existing discrepancies in the PWA's management of the water sector on the organizational, operational and administrative levels, the multiple references and authorities, Israeli control of the Palestinian water sector and Palestinian projects, as well as suggested that the water law be revised. They also discussed the contradictory reality which left the regulatory role unenforced.

Based on the outcomes of the reviews, it was noted that the historical situation of institutions and their legal foundations suffer from an unprecedented fragmentation on the levels of their internal institutional and legal aspects, in addition to the Israeli occupation, Israeli domination of the JWC and Civil Administration and their jurisdiction in area C that required permits for executing projects.

The PWA's new leadership began working on trying to understand the reality of the sector and its contradictions in order to determine what can be done to stop the deterioration of services and work on reversing the situation.

Another review was conducted in 2009 by the World Bank entitled: "Assessment of Restrictions on Palestinian Water Sector Development - April 2009". The report held Israel accountable for much of the deterioration of the water sector in the occupied Palestinian territories and recommended that the PWA conduct a comprehensive reform of the water sector.

The World Bank's report was followed by another one published by Amnesty International entitled: "Palestinians Denied Fair Access to Water- October 2009". The report also held Israel accountable for much of the water crisis in the occupied Palestinian territories.

The last two review reports also indicated that despite the Israeli occupation's massive responsibility in the deterioration of the water sector in its two divisions: water and wastewater, Palestinian institutions were also to be held accountable as well. The reports also expressed the need to improve the sector's situation.

The Reform Plan

The PWA submitted a request to the Council of Ministers for approval of a comprehensive reform plan for the water sector that aims to develop the institutional situation of the water sector in a way that will ensure suitable water services for Palestinians residing in the West Bank and Gaza Strip. It will also work towards achieving Palestinian water rights, preserve and improve the management of water resources, and ensure the sector's sustainability. The PWA's reform plan was adopted by the Council of Ministers by means of Legislation No.13/13/04 in December 2009, to be implemented between 2011-2013. The reform covers the following elements: institutional, legislative and administrative.

The PWA realizes that the reform plan would not provide a radical solution for the water crisis due to the Israeli occupation. However, it seeks to accomplish better management of the water sector by concentrating on the development of institutions in order to build a sector that can run with optimal efficiency under the status quo, and contribute to the establishment of a Palestinian State.

The reform plan consists of several fundamental elements which are closely interrelated:

1. The Institutional Water Sector Review, to propose a preferred institutional arrangement which will be derived by consensus;
2. The Legislative Review that will complete the submission to the Council of Ministers of the preferred institutional arrangement from the institutional review by providing a revised water law that will be compatible with the newly proposed institutional arrangement;
3. Capacity Building Program, which aims at providing capacity building and technical assistance to enable the PWA to conform with the responsibilities entrusted to it, in accordance with the submitted institutional and legal reviews, hence the new strategic vision. The PWA shall define its principles regarding long term strategies, plans and programs as a result of refocusing the sector, upon approval by the Council of Ministers. These principles shall help the sector avoid the threat of failure from the inability to manage, preserve and benefit from their water and wastewater resources.
4. In parallel, introducing changes to the administrative and organizational structure of the PWA to coincide with the new structure that will be suggested by the institutional review in alignment with a new integrated institutional vision which shall be achieved by means of an organizational reform and change management program.

In the short term, the program aims to rectify utility service procedures in a way that will ensure equitability in the provision of high quality services. It will also improve capabilities, recover operating costs of water facilities and organize them more effectively. In addition to that, the program seeks to achieve more sustainable management of strategic water resources by means of enhancing: institutional knowledge, policies, monitoring capabilities, following up and the application of the water law. It will also increase awareness of managing water demand, by means of applying policies that will help to preserve the water resources.

The long term goals of the program are to establish capable institutions within the framework of sustainable development and a legal framework that shall clearly define the roles, responsibilities and interrelationship between institutions in the water and wastewater sector, as well as those institutions that share responsibility on the periphery of the sector.

In addition to emphasizing infrastructure requirements, the reform program will also focus on improving the strategies and investment policies regarding the supply of water and sewage provision and project design and implementation. This will be done to expedite the growth of the infrastructure in a way that fullfils the country's requirements.

Status of the Reforming Program

1. The Institutional Water Sector Review: Finishing the final report and setting the scenarios. Recommendations in this regard include:
   - Establishing the Ministry of Water;

- The PWA to remain as independent regulator of the water sector - reporting to the Prime Minister;
- Establishing water utilities to provide water and sanitation services based on full cost recovery;
- Converting West Bank Water Department to the National Water Authority (bulk water provider at national level) - financially and administratively independent;
- Restructuring Project Management Unit to respond to the requirements of the water and sanitation;
- Transferring some of the Project Management Unit to the private sector and civil society organizations and strengthening the relationship and partnership between public and private sector; and
- Adding some of the tasks and responsibilities for the Project Management Unit related to the technical development of the service providers.

2. Legal review: completion of drafting the new law according to the new proposed institutional setting.
3. Capacity Building: under implementation.

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SYRIA

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ACRONYMS

EIB	European Investment Bank
GDP	Gross Domestic Product
GIZ	German international development agency - *Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH*
HR	Human Resources
IMF	International Monetary Fund
IT	Information Technology
IWA	International Water Association
IWRM	Integrated Water Resources Management
JICA	Japanese International Cooperation Agency
KFW	German Development Bank
MDG	Millennium Development Goals
NRW	Non-revenue Water
O&M	Operation and Maintenance
SOP	Standard Operating Procedures
WDM	Water Demand Management

INTRODUCTION

Water and sanitation utilities around the Arab countries are confronted with many difficulties and challenges as they strive to make organizational and institutional improvements. Water sector utility managers must consider a wide range of issues in their management improvement initiatives. General economic conditions, staff turnover, communication between internal management and relevant external stakeholders, involvement of staff across the organization, aging and occasionally decaying infrastructure, applied tariff, and limited staff resources are some of the issues managers address.

This case study will focus on utility reform examples that have been applied in the Arab world, such as partnerships with the private sector, private sector involvement and the involvement of local and municipal establishments in utilities management as well as other numerous examples.

Country Background

The official name is the Syrian Arab Republic. The capital is Damascus and Arabic is the official language. The government is run by a parliamentary presidential republic system; the legislative authority is the unicameral People's Council.

Syria consists of 14 governorates which in turn are subdivided into 66 regions, which are further subdivided into 292 sub- districts. The largest governorate is Homs, constituting 22% of the total area of the national territory, and the smallest governorate is the capital Damascus with 118 square kilometers (km^2), i.e. approximately 0.06% of the total area, while the most populated governorate is Aleppo with about 5 million inhabitants in early 2010, and the least populated in the governorate of Quneitra.

Geographical Location, Area and Population

Syria is located in West Asia on the eastern coast of the Mediterranean Sea. It is located in an area which has been considered to be the link between Asia, Europe and Africa, in the northern part of the Levant to be precise. It borders Jordan to the south, Iraq to the east, Turkey to the north and Lebanon to the west. The Golan Heights border occupied Palestine to the southwest. Syria has a coast on the Mediterranean that extends across the western part of the country.

The total area is 185,180 square kilometers and the current population is about 23,695,000 inhabitants.

Figure 1: Map of Syria

(Source: http://geology.com/world/syria-map.gif)

Land and Water and Climate

Syria contains a varied topography of mountains, deserts, oases and plains. The highest peak in Syria reaches 2800 m and is located to the south of the Anti-Lebanon Mountains.

There are 18 rivers of which the two largest are the Euphrates and the Orontes. The Euphrates comprises 600 km within Syria. 55% of the total area in Syria is desert and the ratio of water bodies is 1.1% of the total area. Syria is considered to be an arid to semi-arid country. Rainfall is distributed disproportionately across the country, whether spatially between the different basins, or time wise from year to year and according to different seasons. Rainfall amounts vary between 100 mm /year in the desert to more than 1200 mm /year in the coastal area. Areas where rainfall rates exceed 350 mm /year comprise only about 14.5% of the total area.

Economy, Population and Socio-economic Development

Syria is one of the developing countries, and is classified 97th globally and 12th in the Arab world in terms of quality of life. It is classified 107th globally in terms of human evolution, and 111th according to a report of the International Monetary Fund (IMF) in 2009 to estimate the Gross Domestic Product (GDP) per capita, [GDP = US$ 105.238 billion, per capita rate is 5,043 US$ (2010))[http://ar.wikipedia.org/wiki/%D8%B3%D9%88%D8%B1%D9%8A%D8%A7 - cite_note-8#cite_note-8]. Furthermore it ranks 64th globally in terms of purchasing power per capita, and 75th globally in terms of the state general budget. The prevailing economic system in Syria is the socialist system. However the state started moving towards a moderate capitalist system or what is known as the social market system.

The Syrian people are considered to be a developing nation with a rate of four children per woman. Syria ranks 7th in the Arab world and 54th globally in terms of population size. Most of the Syrians are educated,

since the government guarantees a free of charge education at all levels. However in terms of employment the country ranks 69th globally in terms of the labor market strength. The average life expectancy of the population is 74 years. With this percentage, Syria ranks 95th globally and 8th in the Arab world in terms of quality of life index. Although there are no statistics for the Syrian expatriates and those with Syrian origins, some estimates however calculate their number at about 18 million. Most of the population is Muslim of different denominations, as well as a high percentage of Christians in Syria and outside. Most of the Syrian population is Arab as it makes up nearly 90% of the population, versus 8% of Kurds and 2% of other ethnic groups and minorities, which include Armenians, Turkmen and Circassians.

Syria possesses various resources and investments, such as agriculture, which constitutes an important component of national income, as well as industry, commerce and services. Tourism also contributes to the country's development, especially with the many ancient ruins and castles on one hand and the moderate climate on the other. Furthermore there are a number of underground resources, most importantly: oil, natural gas and phosphate, some of which achieve self-sufficiency, while some materials have to be imported.

Achieving Millennium Development Goals Indicators

The Syrian government is determined to accomplish the Millennium Development Goals (MDGs), which are an integral part of the five-year plan that aims to improve the living conditions of Syrian citizens, which is why the provision of safe drinking water and secured sanitation services is a high priority of the Syrian government. In that respect, the Syrian and German governments agreed during their negotiations in 2007 to focus the cooperation framework within the field of development and modernization of the water sector. Thus the German development cooperation focuses on supporting Syria in a comprehensive process of modernization and reform of the water sector with the ultimate objective of ensuring the sustainable use of scarce water resources at the present time.

Sector Overview

Rainfall quantities have been decreasing significantly according to the probability of occurrence for the tracked years. This issue is directly affecting water resources (both surface and underground), where traditional amounts of renewable water are decreasing from more than 16.5 billion m^3/year in a moderate resources year, to about 13.289 billion m^3/year in a dry year with an occurrence probability of 75% (i.e. probable recurrence of once every 4 years), and all the way below 11.445 billion m^3/year in severe drought year - probable recurrence of 95% (i.e. probable recurrence of once every 20 years).

The importance of water resources have been increasing in Syria from day to day as it is impossible to achieve any significant increase in economic development activities without available water. Furthermore food security is linked to sustainable water and environmental security. The water situation within the Syrian Arab Republic underlines the need for a strict adherence to a general medium and long-term strategy that includes developed policies and procedures synchronized with processes that work towards maintaining the sustainability of natural resources.

The Government's National Objectives in the Sector

The government has a key role in the regulation and policy development of the drinking water and sanitation sector; this role includes:

- Maintaining stability at the macroeconomic level: Investments in the water sector assets are usually large and for the longer term. The poor decision-making process with regard to the huge investments leads to a weak economic output in the economy as a whole. This naturally applies to all large public investments that require huge sums of capital. The traditional question concerns the choice between small investments that meet the growing demand for several years before adding other investments, or large investments that meet the demand on the longer term, but which also require a high economic level. With the situation in Syria, where there are a lot of restrictions on the budget, many water establishments choose the short-term investments and then neglect the basic maintenance work which results in a deterioration of assets and a full "depreciation" before the actual end of their economic lives. The central planning system in Syria has certainly made relatively high levels of coverage among the population; however the level of services and their standards could be greatly improved if managers were allowed to manage available resources appropriately.
- Encouraging regional development: Drinking water services are a key component in the regional development strategies alongside other infrastructure elements such as roads, electricity, etc. That is why the water investments are part of the national planning process where limited funds are allocated

according to national priorities within the water sector itself and between the water sector and other sectors. A tenth five-year plan – as is explained below - attempted to provide a specific plan with indicators, where the planning takes care of the "how to" achieve the expected economic results rather than the mere implementation of investment objectives.

- Ensuring social justice: The water investments should achieve the social justice goals of the state per the MDGs as well as other policies agreed upon in this aspect. According to these policies all citizens should receive their specific basic needs and these must be equal among all social groups. However in reality, citizens with limited income and who have irregular water supply might need to buy water from tankers for much higher prices per cubic meter compared to higher- income citizens who are provided with regular drinking water.
- Maintaining public health standards: Providing residents with safe drinking water on a permanent basis as well as sanitation services is the basic requirement for the high standards of a population's public health. Because water-related diseases do not recognize existing boundaries between different communities and groups, thus these are strong reasons for the presence of consensus among decision-makers regarding the need to maintain high public health standards.

The Institutional Framework of the Sector

A number of ministries carry the responsibilities of planning and decision-making with regards the budget for the drinking water sector:

1. The Ministry of Housing and Construction: proposes sectoral planning and implements the government's program (the Tenth Five Year Plan) in the sectors of water and sanitation, which delegated to 13 institutions in Syria to execute it according to the plan, to manage and maintain its fixed assets. The Ministry of Housing and Construction is the main developer of this sector's policy, the planner of the human, financial and technical resources as well as the responsible party for setting service standards. However the relationship between the Ministry of Housing and Construction and other institutions is often a traditional one where the Minister heads the Board of Directors in order to make decisions concerning the budget, as well as mediating between institutions in political processes of multiple funding character.
2. Ministry of Irrigation: responsible for the planning of water resources and the allocation of water for different sectors. Although irrigation currently consumes 90% of the currently available Syrian water resources, the organizational role of the Ministry of Irrigation to ensure priority for drinking water is still somewhat weak, as is the case in the Barada and Awaj basins, where farmers compete with other economic sectors on groundwater.
3. Ministry of Local Administration: the governorates constitute the basic framework for regional management in Syria (except for major cities that have a special status) and are responsible for ensuring that all activities in the governorates harmonize with the directives of the central government. The governorate council -elected by the citizens- is responsible for the preparation and approval of the development plans and budgets and coordinating with the concerned central ministries. The decree No.14 has assigned the governorates with a powerful role of overseeing the activities of the drinking water sector, which allows the local "voice" to be heard. However it is also known that this alone is not enough to make it effective.
4. Planning and International Cooperation Commission.

These above mentioned ministries are responsible for planning for the water sector, but there is no available water policy or legislative framework to manage water resources for all sectors in Syria, because the policies and laws represent operational tools for the objectives of the government at the national level, and the introduction of planning to the various sub-sectors. Thus the most appropriate option adopted by many countries, is having an institutional body (commission) at the level of the prime ministry, such as the Water Resources Council, which includes all ministers who represent all interests in the water sector. Such a body clarifies the responsibilities of ministries and arbitrates between the interests of irrigation and domestic water uses.

Legal and Regulatory Framework of the Sector

The legal framework which defines the functions and responsibilities of public institutions for safe drinking water and sanitation in Syria consists of laws (approved by the People's Council), presidential decrees (signed by the President) as well as ministerial decisions. The main governing laws include:

- Amendment of the Basic Labor Law No.50 of year 2004;
- Contracts Law No.15 of year 2002;
- Law No.2 of year 2005- tasks entrusted to institutions, companies and public facilities;
- Water legislation Law No.31 of year 2005.

The presidential decrees include:
- Decree No.14 of year 1984- tasks entrusted to water and sanitation institutions;
- Decree No.54 of year 2006- basic financial law;
- Decree No.489 of year 2007- basic financial law for institutions, companies and establishments of an economic nature.

The ministerial decisions include:
- Resolution No.528 of year 2005- Consolidated operational law for drinking water and sanitation institutions in the governorates;
- Executive and internal regulations

Key Sector Documents

The drinking water sector in Syria is one of the key sectors targeted in the reform at the national level. The efforts to restructure and improve the content of water policies and orientations have been reflected in the process of preparation of the Tenth Five-Year Plan (2006-2010). The plan has been developed in line with the economic and social trends and according to the social market economy. It emphasizes the efficiency of production and sustainable economic growth on one hand, and the fair distribution of income and improvement of the situation of underprivileged social groups on the other. As for the water and sanitation, the Tenth Five-Year Plan has allocated Chapter 15 to this particular sector and formed a vision for the year 2025 which aims at: "Providing services that meet the people's needs through high-quality institutions that manage and sustain water resources for drinking purposes, to ensure the right of all citizens to have safe drinking water and treated wastewater."

The plan also sets a group of goals to be achieved by 2025, which focus on: "Providing citizens with safe and sustainable water; a sustainable management of water resources that are allocated for drinking purposes for present and future generations; financial independence in the management of water institutions; independence in management decisions and shifting towards decentralization; capacity building and training of staff; and the adoption of the participation approach and stakeholder engagement before the implementation of water supply and wastewater projects. "

The five-year plan sets the following quantitative key targets for the water and sanitation sector:

1. Services Provided:
   - Securing safe drinking water for 99% of the urban population and 93% of the rural population.
   - Providing sanitation services for 98% of the urban population and 65% of the rural population.
   - Providing wastewater treatment plants that cover 85% of the urban population and 15% of the rural population.
   - Providing minimum 80 liters of drinking water per capita per day at the national level.

2. Performance:
   - Reducing non-revenue water in the drinking water establishments to 22% in urban areas and 27% in rural areas.
   - Achieving an average rate of cost recovery for Operation and Maintenance (O&M) of drinking water systems for the years 2006 to 2010 as follows:

2006	2007	2008	2009	2010
55%	60%	65%	75%	90%

   - Achieving an average rate of cost recovery for O&M of sewage networks and treatment plants for the years 2006 to 2010 as follows:

2006	2007	2008	2009	2010
25%	30%	35%	30%	50%

   - Training 100% of employees in senior management positions.
   - Training 20% of the technical workers.

3. Administrative Development:
   - The maximum level possible of autonomy in the management of human and financial resources.
   - Participation of the private sector in undertaking a number of specific tasks.
   - Applying the participatory principle.

4. Local Development Plans:
   Plans are adopted at the local level and implemented by water and sanitation establishments and their economic units, which go hand in hand with the specified national policies at the country level. Local plans have significantly been affected by cooperation programs with donor agencies such as the German Development Bank (KFW), and the German Agency for International Development (GIZ), as well as by the technical support program that is sponsored by the European Investment Bank (EIB) and the Japan International Cooperation Agency (JICA).

5. Enhancing Revenues and Controlling Costs:
   In 2005 priority operations and the actions required to improve the performance of water and sanitation establishments were identified. The goal was to help the establishments achieve cost recovery and make decisions at lower hierarchy levels. Three establishments participated in this project: Damascus Water Authority, Rural Damascus and Aleppo (in addition to the Ministry of Housing and Construction). Accordingly the following actions were identified to improve the overall effectiveness in the management of the sector:
   a. Enhancing revenues through developing a billing system and meter reading system; developing an efficient system for collection; developing a meters system including technical specifications, calibration, operation time and maintenance; penalizing illegally use of water; and amendment of the water tariff system.
   b. Creating additional funding for the sector through enabling water establishments to enter into investment projects with other parties; and modifying existing procedures in order to establish credit lines to be used when required.
   c. Cost control: to be achieved for (1) operating costs through providing the appropriate equipment for leak detection; acquiring suitable Information Technology (IT) systems for controlling and management of water networks; flexibility in ensuring sustainable water resources for water establishments; developing a training system for human resources; determining (technical and administrative) water losses in drinking water networks; and updating the accounting system and modifying the assets amortization rates. (2) as for general costs, to be achieved through developing the administrative system in water establishments, organizational structures, Standard Operating Procedures (SOPs), Human Resources (HR) and fair distribution of work among the available resources; and determining the basis and standards for the preparation of economic feasibility studies for water projects.
   d. Improving management effectiveness through preparation of maps and charts of water networks as implemented in reality both inside and outside the organizational charts; preparation of a Syrian code for the design and implementation works of drinking water projects; development of warehouse structures as well as their management systems; modifying existing procedures for the development of the selection system for evaluating suppliers and consultants; modifying the unified labor law including the remuneration of employees (salaries, compensations and incentives ....); amendment of the financial ceiling for procurement, contracting, re-evaluation of the procurements and the monopoly of imports that is granted to certain public sector companies; and developing and adoption of water demand management (WDM) related projects.

6. Integrated Water Resources Management (IWRM):
   In accordance with the previously mentioned, a program was developed consisting of five components that were designed to ensure sustainability and protection of water resources in Syria through "IWRM", with the first component, that provides support for the drinking water and sanitation establishments, aiming at strengthening economic and technical management of the establishments; the adoption of an accounting system based on business principles in order to get the necessary economic information for guiding the establishments; and the transfer of knowledge related to advanced models of operating establishments to Syria. As for the second component that was specifically designed for the Ministry of Housing and Construction, it aims at strengthening the guiding and administrative roles of the ministry, as well as strengthening the management capacity of its employees.

APPLIED REFORM COURSES

Over the past decade Syria has attempted to apply its own vision of an economic reform, following the principles of the social market economy. The Syrian government is trying to reduce the socio-economic cost for this transition from the planned economy, and aspires to overcome the current obstacles in the face of economic growth. Although it is agreed that the reform process has achieved certain progress since its

launch in 2000, it has been observed that due to a number of domestic and external restraints, the reform's pace has not yet achieved the originally expected acceleration so far. Narrowing down on the water and sanitation sector, the reasons behind such reform are:

1. To improve performance: Improving the technical and financial performance through applying incentives, encouraging a shift of an operational culture based on implementation of procedures to one that is results based, as well as the changes in legal relations between centralized government institutions and water and sanitation services.
2. To secure new sources for funding: Many of the water and sanitation institutions have a large number of unfinished or delayed reform tasks which require significant funding, to rehabilitate or replace their assets. Therefore privatization and delegation of administrative authorities are some of the things that have been pursued in an attempt to expand the involvement of the private sector and reduce demand on the state budget. However the borrowing costs are usually lower in the public sector because of more sovereign guarantees than in the private sector where the investment costs reflect the borrowing risks. This is especially true for the water sector with its large investment costs and the length of lifecycle of investments.
3. To meet the new legislative requirements: Reform may come after the submission of new legislations for a sustainable management of the water resources sector as a whole. There are in fact initiatives to shift from a centralized administration (which is currently applied) to the local level, after which changes in the operational framework must be made in order to delegate administrative authority to the local level.

Applying Commercial Principles

Syria considers supplying water to its citizens first and foremost a social issue and according to the applicable rules and regulations, the Board of Directors has the right to propose to the Ministry of Housing the economically required water prices to achieve cost recovery. But the final decisions on tariffs that are applied are taken at a higher political level (the prime minister) and are guided by principles rather than a purely economic perspective.

The tariff model applied for drinking water in Syria is an ascending block tariff. The last three amendments to the tariff have occurred in 1997, 2001, and finally in 2007. The tariff ranges from 2.5 to 30 Syrian Pounds per cubic meter of domestic consumption. The cubic meter of commercial subscription is priced by 30 Syrian Pounds. The sanitation services tariff is a percentage of the water services tariff, which is only paid by connected subscribers.

The approach of transitioning to a public water company operated by commercial principles usually implies the full cost recovery in public services that are capable of charging certain fees. These strategies are usually accompanied by internal financial management reforms, which is one of many aspects of the public administration reform. In the case of Syria the water and sanitation tariffs are fixed at a low level, which requires a significant subsidy by the state, or there is a possibility to recover the O&M costs if the current tariff levels and structure are modified.

Decentralized Management

There is a broad understanding adopted by the government in Syria about the need to achieve decentralization of responsibilities from the center to the governorates, municipalities and concerned local authorities, to ensure that unnecessary approvals from the center do not cause unnecessary delays, to improve coordination between the sectoral ministries that provide services, as well as to improve the effectiveness of decision-making at operational levels that actually provide the services. The ministries, governors and directors have a general common understanding for this matter. The programs that target decentralization require redefining and balancing of powers between the center and local levels of authority, as well as development of local capacities and administrative efficiencies. There are a number of strategies that are looked into to help achieve decentralization in the water and sanitation sector:

1. Delegation of authority or transfer of management authorities to lower levels, which aims to improve the efficiency of centrally managed services by delegating more authority in the daily decision-making to local managers. This achieves the objectives of administrative efficiency even if the overall strategy was taken into consideration in the management of services within the organization on the level of economic units or operational level.
2. Delegation of authority to provide services or redistribution of operational responsibilities to other bodies, whether in the public or private sector according to clear underlying terms for the level of service, its standards and comprehensive coverage principles. This achieves the objectives of administrative

efficiency. This may also be a good strategy to apply in some areas where water is provided through a large meter. Here the responsibility of managing the network is handed over to a community association that is responsible for the management of water services "internally".

3. Transfer of authorities to community based organizations at the local government level (local administration), which aims at increasing efficiency and empowerment of citizens' participation in decision-making. This is usually done through the local government. It may achieve administrative efficiency and the goals of good governance, as well as being one of the goals of the five-year plan, although local representation has not yet reached its full potential.

Merging of Services - The Case of Damascus and Rural Damascus Water Authorities

Damascus Water Authority that serves the city of Damascus was created in 1984 under Presidential Decree 14/1984. It was created to replace the Ein Al-Fijeh water establishment that was originally formed under the name of the "society of water owners" in Damascus in 1924 (the first civil cooperative society in Syria whose members had easement rights on Al-Fijeh water).

As a result of the large number of implemented projects in cooperation with local and foreign companies and the accumulated experience concerning all types and sizes of water institutions, it now owns, from a technical point of view, qualified and professional staff that enables it to assume a leading role among water establishments in Syria.

The Rural Damascus Water Authority is another establishment created to serve the residents of the Rural Damascus Governorate under a Decree in 1984, due to the absence of a public body in the area before, and because all water distribution services in rural Damascus had previously been provided by local municipalities. Supplying water was one of the many duties for these municipalities and was organized mainly within the local framework according to local priorities and available resources. Until Rural Damascus Water Authority was founded, there was no form of coordination or cooperation between municipalities to exploit resources optimally or to rely on common working standards. However since the foundation began its work, it unfortunately did not raise its standards to the level of expertise that can be found in Damascus Water Authority. As a result, despite the creation of a single water institution for Rural Damascus, it did not improve coverage, quality of service, nor the economic performance of the institution during the past years.

In April 2009, a presidential Decree authorized the Damascus Water Authority to merge the functions and responsibilities of Rural Damascus Water Authority with its own. This decree did not only increase the subscribers of Damascus Water Authority from about 450,000 to about 900,000 subscribers, but also led to a huge augmentation in the number of employees from about 2,000 to more than 4,000. In addition to the capital, the service area currently includes 11 other cities, while the estimated number of served citizens by the new institution reaches to more than 6 million customers. The service covers an area stretching from Lebanon in the west to Jordan in the south and Iraq in the east. It was believed that the transition to a unified and comprehensive enterprise produces a number of benefits, mainly due to the more coherent and integrated method of water resources management.

Although the presidential Decree sets no clear targets for this merger, key stakeholders recognize generally that the decision to merge the two institutions was made with the overall aim to provide equal and more reliable water and sanitation services for a growing number of consumers, particularly in the drinking water and sanitation service area in Rural Damascus. To achieve this ambitious goal, a cooperation agreement was drafted with the Germans to provide consulting services including the following strategic elements:

- Primarily focus on the organizational and administrative aspects that can be improved without major reorganization of the institution or changes at the legislative level, to facilitate "quick successes";
- Develop an appropriate plan of action in a joint manner with the management of Damascus City for Water Supply and Sewage Authority in order to implement those short-term measures, taking into account the potential initiatives that will be supported by cooperation agencies and other partners;
- Develop a range of practical and generally accepted options jointly with the management of Damascus City for Water Supply and Sewage Authority for medium term development, which takes into account the full application of the potential merging benefits at all levels, including final changes, both on legislative and regulatory levels.

Based on the strategic goals of the merge, the process was divided into two separate phases; (1) carry out an assessment of challenges and opportunities of the merge and identify measure to improve operational

efficiency; develop a strategic plan and associated work plan; develop criteria and model for replicability of the merge in other public entities; and develop functions and operational workflows, and (2) support the management of the institution in effectively coordinating the activities supported by development partners in line with the institution's investment and the organizational development policy; assist the management of Damascus City for Water Supply and Sewage Authority through a systematical follow-up of the merging implementation and effective monitoring of developing performance indicators for water and sanitation services; report to the public administration periodically on the achieved progress in the merge process; and assessment of the status quo of three other water institutions in the country in order to present a unified proposal for a concerted business structure for water institutions.

The establishment started its support for the institutional restructuring process after the merger in mid 2010, while collaborating with a German consulting consortium and with the aid of a grant by the KFW. A part of the first phase was carried out, but due to the political circumstances that Syria is experiencing, work on this project was suspended by the German side. However the establishment continued its normal work without a significant change in the overall structure of the institutional work, planning to resume the work later.

Modernization of Services

An action plan was developed to modernize the drinking water and sanitation sector in Syria. The purpose of it is to identify the work programs and activities that are required in the drinking water and sanitation sector to achieve the objectives of the five-year plan, which includes:

- Improving work procedures;
- Raising the level of operational efficiency of the water and sanitation sector, expanding the provision of services and improving water quality;
- Providing high-quality, excellent services to customers;
- Improving financial performance and reducing the deficit;
- Adopting best international practices, and attracting the best expertise and transferring knowledge;
- Developing human resources;
- Working according to commercial principles.

During the preparation of the plan the following issues were considered:

- Linking it to the objectives of the five-year plan;
- Setting priorities;
- Identifying those responsible for the implementation (Ministry - Directorate - Institution);
- Developing a follow-up mechanism (for research, development and monitoring).

The plan included the following programs:

Program
1. The regulating role of the ministry
1.1 Establishment of the regulating office
1.2 Improvement of monitoring the performance of institutions
1.3 Facilitating performance improvement
1.4 Analysis of the Five-Year plan indicators
1.5 Considering the social aspects during the management of the sector (random housing - the rural areas)
2. Improvement of the service quality
3. Knowledge management
4. Reducing Non-revenue Water (NRW)

5. Achieving financial sustainability
5.1 Development of a financial control system
5.2 Applying a unified accounting system
5.3 Development of the management within the governmental financial support.
5.4 Development of the tariff structure
5.5 Improvement of collection
5.6 Reducing costs
6. Professional development of human resources
6.1 Developing the skills of the operators in wastewater treatment plants and drinking water projects
6.2 A Leadership program for young workers
6.3 Development of the incentive systems (depending on the performance of employees for economic and administrative bodies)
6.4 Development of a special educational system/ curricula for the drinking water and sanitation sector.
6.5 Continuous development and training of workers
7. Participatory approach
7.1 Developing a participatory approach between the Ministry and the institutions (e.g. Guiding Strategy).
7.2 Developing a participatory approach between the Ministry, the institutions, citizens and Non-governmental Organizations (NGOs).
8. Private sector participation
8.1 Developing the role of the private sector partnership unit.

The plan has been defined and developed in cooperation with GIZ. It is currently applied by the Ministry of Housing and water institutions, depending on local efforts after the cooperation was suspended from the German side due to the conditions in Syria currently.

Other Forms of Reform

As another form of reform, a guiding strategy was developed for the sector. The purpose of the guiding strategy is:

1. To be aware of the current situation of drinking water and sanitation, and prepare future plans in each governorate, so that water and sanitation institutions can develop their own plans and prioritize their projects according to specific criteria;
2. Determine the overall vision, the strategy, list of projects, goals and financial requirements for the ministry;
3. Strengthening the capacity of the ministry and the institutions in strategic planning, monitoring and evaluation by providing technical support to water and sanitation institutions and providing them with manuals, work methodologies and training, so that each institution can prepare its own guiding strategy in consistency with the strategy and direction of the ministry which harmonizes with the governmental five-year plan;

The issues that were taken into account when developing the guiding strategy were:

- To accomplish the strategy document with the necessary forms in addition to supporting and developing the capacities of staff in the ministry and institutions in the field of strategic planning;
- Determine clear criteria and a clear methodology for the selection of projects according to priority;
- Determine the water situation and assess future plans for the drinking water and sanitation sector in each governorate, as well as propose short-medium and long-term plans that include proposed solutions and actions;
- Develop a manual that defines and explains the stages and steps that the project should undergo (project lifecycle) in order to achieve the optimum benefit from the project and in accordance with internationally adopted principles in project management;
- Develop a guide that explains the used terminology and concepts in the preparation of the guiding strategy and aim at unifying some of the terms for all concerned parties, such as: the regulating role of the Ministry of Housing and Construction, integrated management, strategic environmental impact assessment, the project lifecycle and project planning stages;

- Develop a guide to monitor and evaluate plans and strategies; and
- Develop working manuals that include environmental planning and management, feasibility studies, design, implementation, evaluation and rehabilitation of projects.

The performance indicators identified for the sector in accordance with the standards of the International Water Association (IWA) are listed for reference in the table below:

Code (IWA)	Name of PI (Unit)
Economic and Financial Indicators	
Fi31	Operating Cost Coverage Ratio *(ratio)*
Fi46	Non-revenue water by volume *(%)*
Fi28	Average Water Charges for direct consumption *(SYP/m^3)*
	Collection Efficiency *(%)*
Fi32	Delay in Accounts receivable
Fi5	Unit Running Cost for Water *(SYP/m^3)*
Fi7	Personnel cost (internal)
Fi10	Electrical Energy Costs (%)
	Investments per capita
Physical Indicators	
Ph5	Standardized Energy Consumption (kWh/m^3/100m)
Ph12	Metered Customers *(No./customer)*
Operational Indicators	
Op3	Network Inspection *(%/year)*
Op8	Meter Replacement *(-/year) or (%)*
Op5	Active Leakage Control Repairs *(No./100km/year)*
Op31	Mains Failures *(No./100km/year)*
	Sewer System blockages
Personnel Indicators	
Pe19	Total training *(hours / employee / year)*
	Management Training
	O&M / Technical Training
Pe1	Employees per connection (*No. / 1000 connections)*
Pe14	Meter Management Personnel (*No. / 1000 meters)*
Pe12	Transmission, Storage and Distribution Personnel (*No. / 100 km)*
Pe23	Absenteeism *(days / employee / year)*
Quality of Service Indicators	
Qs3	Population coverage Water Services *(%)*
	Population served – sewer connection
	Population served – WWTP service
Qs18	Quality of Supplied Water *(%)*
Qs12	Continuity of Supply *(%)*
Qs26	Service complaints pr connection *(No. of complaints/1000 connections/year)*
	Average response time to customer complaints
	Water Consumption per capita and day

The preparation for the guiding strategy document started through the modernizing program for drinking water sector in Syria, in cooperation with GIZ. A large part of the components of the document was prepared but not completed because the cooperation was suspended by the German side as a result of the current conditions in Syria.

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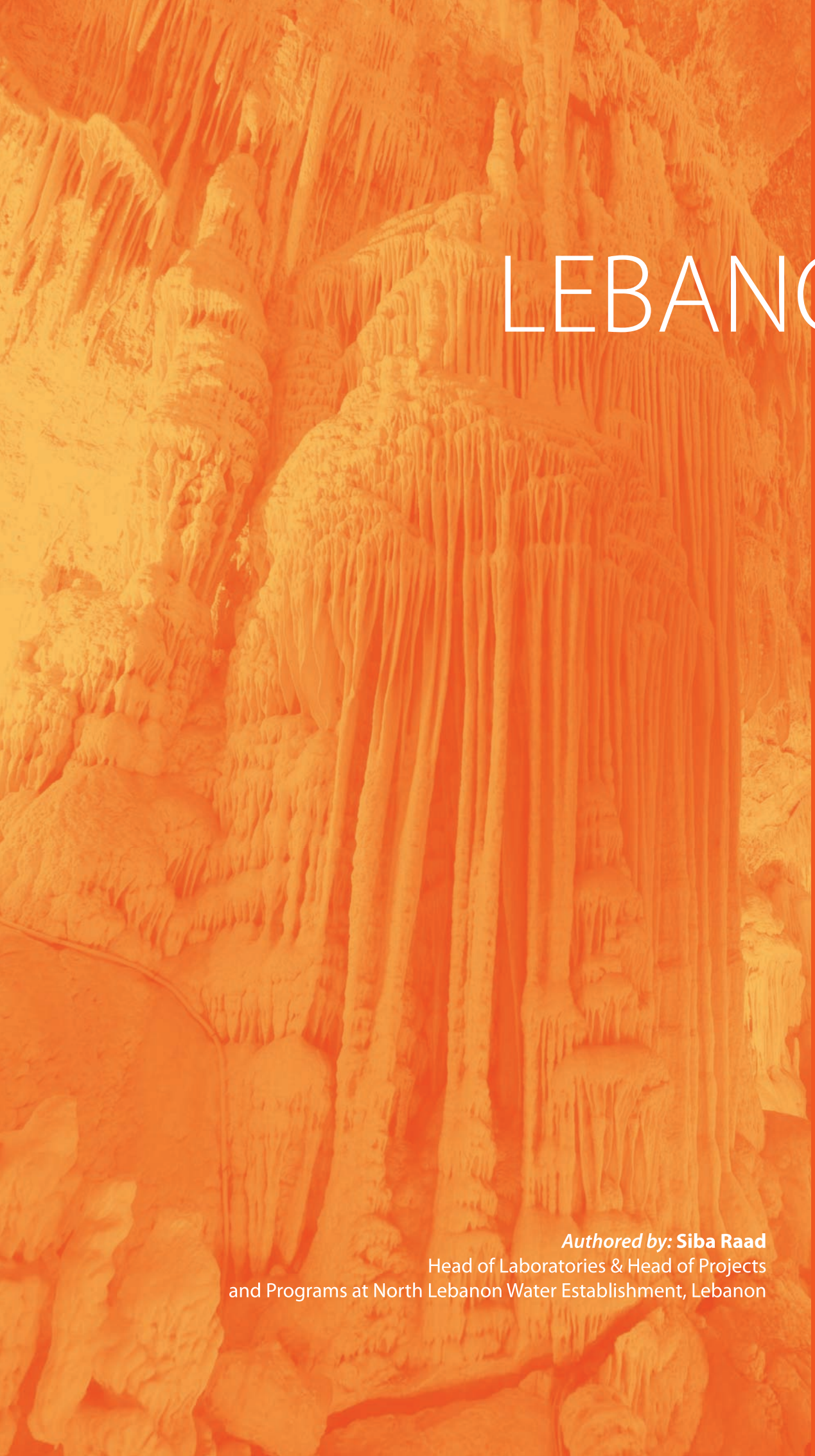

LEBANON

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ACRONYMS

AFD	Agence Francaise de Developpement (French Agency for Development)
BLWE	Beirut and Mount Lebanon Water Establishment
BOT	Build-operate-transfer
BWE	Bekaa Water Establishment
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (the German Agency for Technical Cooperation)
GMAO	Gestion de la Maintenance Assistee par Ordinateur (Computerized Maintenance Management System)
ha	hectare
IWRM	Integrated Water Resources Management
LAN	Local Area Network
MCM	Million Cubic Meters
MDGs	Millennium Development Goals
MOEW	Ministry of Energy and Water
NLWE	North Lebanon Water Establishment
O&M	Operation and Maintenance
PIMS II	Public Inquiry Management System II
PPP	Public-private partnership
SLWE	South Lebanon Water Establishment
X7	Customer Service System

INTRODUCTION

Water and wastewater utilities around the Arab countries are confronted with many challenges as they strive to make organizational improvements. Water sector utility managers must consider a wide range of issues in their management improvement initiatives. General economic conditions, staff turnover, communication between internal management and external stakeholders, involvement of staff across the organization, aging infrastructure, rate issues, and limited staff resources are some of the issues managers address. In this case study we will focus on the strands of utilities reform and applied models of Public Private Partnerships (PPP) such as management contracts, Build-operate-transfer (BOT) and others. For the sake of better understanding for the case study, this chapter will illustrate the country back ground.

Country Background

Lebanon is the country of fascination and tourism, and the East gate to the West. It was named after the root "LBN" meaning White-likely a reference to the snow-capped Mount Lebanon, as well as a reference to the nature of its white limestone rocks.

Location, Area, and Population

Lebanon is located east of the Mediterranean Sea. It is bordered by Syria to the north and east and Palestine to the south. The country's total area is 10,452 square kilometers, and has a 225km coastline on the Mediterranean. The population of Lebanon is estimated to be 4.5 million people.

Lebanon is characterized with its natural and geographic diversity, open plains and coastal regions, and hilly and mountainous regions. Lebanon's topography can be divided into four main longitudinal strips from north to south aligning the Mediterranean Sea. These strips are: the coastal strip, the central plains, and Anti-Lebanon Mountains chain.

Land, Rivers, Lakes, and Dams

Availability of water resources in Lebanon is basically dependent on precipitation. Water resources are composed of: Surface water (existing are around 2,000 natural springs spread across the country with total water produced from these resources possibly exceeding 1,200 Million Cubic Meters (MCM)/year, as of 2010). Groundwater resources are another resource (with nearly 650 existing governmental wells that have an annual capacity of around 270 MCM, as of 2010). As for storage of surface water, there are two main dams (Qaraoun Dam and Shabrouh Dam), with a total storage capacity of around 235 MCM, of which only 45 MCM/ year is being used for drinking and irrigational purposes. Figure 1 below illustrates the geographical distribution of water resources within the North Lebanon Water Establishment for instance.

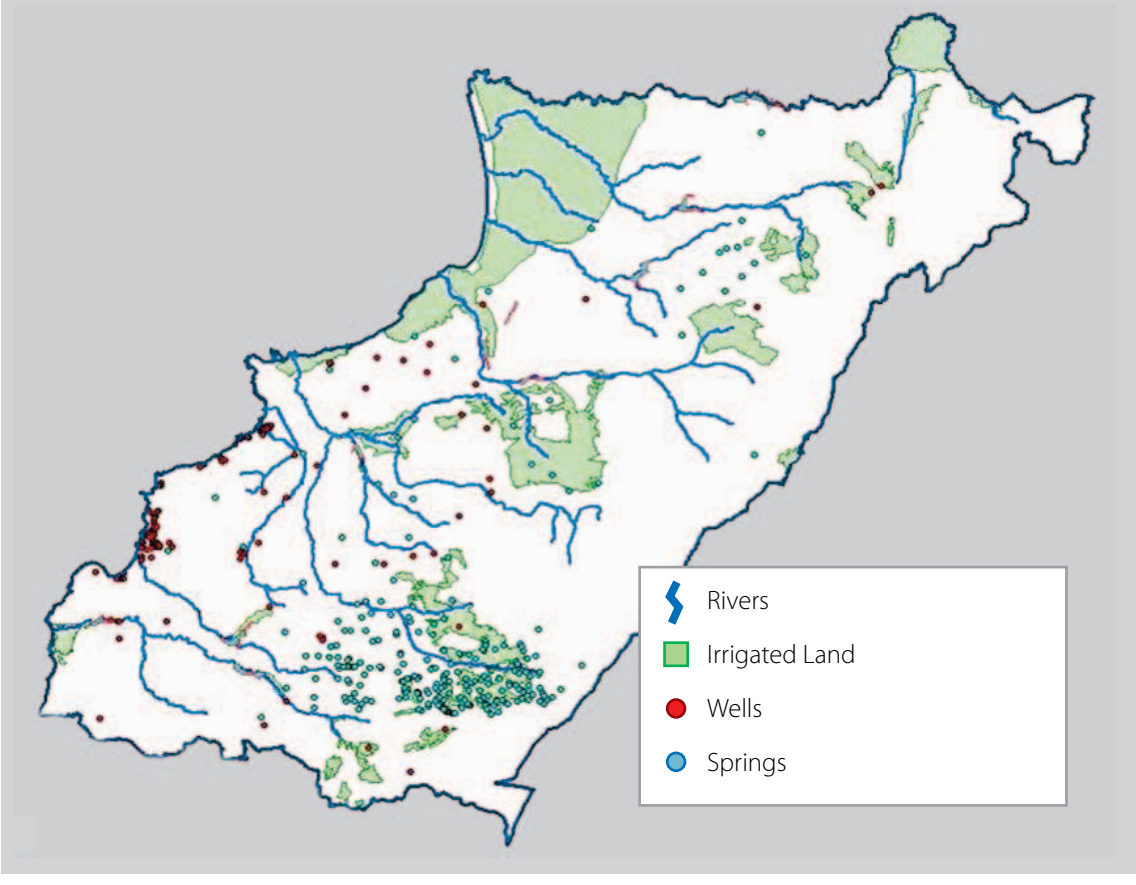

Figure 1: Water Sources for the North Lebanon Water Establishment
(Source: Geographical Information System
(GIS)/Technical Directorate/North Lebanon Water Establishment, 2013)

Climate and Climate Change

Lebanon is characterized by a typical Mediterranean climate, moderate in summer and relatively cold in winter. Snow falls on high peaks and forms the main reserve of water. Winter season is characterized by heavy rains (January to April). On the other hand, arid conditions are prevailing in the remaining months of the year. Lebanon has been impacted by the global climatic changes, a situation that became evident with decreasing total precipitation annually and more occurrences of hot and dry seasons. It is anticipated that this effect will cause a 40% reduction of the snow cover, by year 2040.

Economy and Socio-economic Development

Lebanon greatly depends on Services and Tourism sectors, Construction sector, Industrial sector, as well as Agricultural sector. Population growth in Lebanon is 1.8%. As a result of the Central Bank's conservative policies and prevailing security conditions, Lebanon's economy has overcome negative consequences of the global recession. These circumstances succeeded in safeguarding the country from negative repercussions of the global economic downturn that occurred. Nevertheless, none of the positive economic results have either improved social conditions and livelihoods, or have addressed hot issues, like electricity, social security, public health, privatization, and the promised reforms of Paris Conference 3, and especially those related to the general debt.

Towards Achieving Millennium Development Goals of Water

Ensuring Environmental Sustainability is one of the Millennium Development Goals (MDGs), under which the following indictors are delineated:

- Embedding principles of sustainable development into the State's policies and programs, as well as preventing loss and over-exploitation of natural resources;
- Reducing biodiversity deterioration and achieving significant reduction by the year 2010;
- Reducing number of people lacking safe potable water and basic sanitation up to half; and

- Achieving a remarkable improvement in livelihood conditions of at least a million people living in poverty by the year 2020.

Looking at the progress achieved so far, it is not apparent that Lebanon will manage to fulfill this goal. However, further data analysis reported recently in 2008 shows that Lebanon is progressing toward achieving the MDGs in a timely manner. Generally speaking, some progress in Ensuring Environmental Sustainability has been recorded in 2006 through ranking Lebanon 36 at a 133-international scale, while it came first at the Arabic regional level, according to the Environmental Performance Index of MDG. Unfortunately, the July-August War caused severe environmental damages, thus, further increasing the economic burden. Till today, the provision of clean water has remained a critical issue nationwide, which can be attributed to many factors like the increasing water demand; the tremendous losses in the distribution networks; and the high level of water pollution. In 1996, only 9.3% of water subscribers received water continuously, compared to the goal of 90% by the year 2015. Nowadays, access to water has increased rapidly and has already reached percent subscribers of 67.4%.

With respect to residential solid waste management in Lebanon, it is turning to a real environmental problem with more than 700 uncontrolled disposal sites. 50% of solid waste is being treated in those sites by burning, which has severely polluted groundwater and air.

Following July-August 2006 War, biodiversity significantly decreased and land cover aggravatingly deteriorated. The War has left behind more than a million cluster bombs all over the Lebanese territory. Not to mention wildfires that cleared out around 2,350 hectares (ha) of natural forests.

Water Sector Overview

Water sector in Lebanon is one of the most important sectors that may impact other sectors like Economy, Country Development, Environment, and Poverty Reduction. Water use should be planned and managed in a comprehensive and integrated way on the urban and rural levels, thus securing sustainable development of the sector and providing suitable services to citizens.

Institutional Framework of the Sector

In the past, and prior to establishing water agencies, the Ministry of Energy and Water (MOEW) was entrusted with studying and executing infrastructure projects for the water sector. Thereafter, management and investment responsibilities were assigned to the local water committees according to the Decree no. 4517 dated December 13, 1972. However, and because of poor services provided by those committees, the government established water agencies on the provincial level in mid nineties. These agencies have merged local water committees into a total of 22 agencies. As a result of the merger, the deficit and shortcoming of those old local water committees were transferred to the new structure, whether on the administrative or human resources level, or the financial and technical levels.

All in all, the established water agencies were unable to upgrade services to the appropriate level, due to their insufficient financial capacity, and the unqualified human resources. Most of the studies conducted in this regard, have analyzed the balance between accessible water quantities and rising demands, and concluded that insufficient water quantities for various uses do exist.

As a result of the impacts aforementioned, reforming and restructuring of the water sector became more and more urgent, which finally commenced in 2000. With external and internal assistance, Lebanon embarked on carrying out a large scale restructuring process, by further tuning needed qualifications, and assigning duties to both MOEW and Water Agencies at that time. All aspects related to national administration, water policies and monitoring, and establishing standards in the sector were assigned to MOEW. In addition, all agencies working in the water sector were consolidated into four regional establishments that work under the umbrella of MOEW. Figure 2 below shows the provincial distribution of the four water establishments, and namely they are:

- The Beirut and Mount Lebanon Water Establishment (BMLWE)– Headquarters office in Beirut
- The North Lebanon Water Establishment (NLWE)– Headquarters office in Tripoli,
- The Bekaa Water Establishment (BWE)– Headquarters office in Baalbek,
- The South Lebanon Water Establishment (SLWE)– Headquarters office in Saida.

Figure 2: The Provincial Distribution of the Water Establishments
(Source: North Lebanon Water Establishment / Technical Directorate)

The above listed water establishments were provided with more authorities to raise the level of services, through providing more services and addressing local issues, and paying more attention to the participation of the private sector in providing water services.

Currently, MOEW is responsible for monitoring, controlling, evaluating, counting and examining water resources, estimating water demand and sectorial allocation, in addition to monitoring quality of surface and groundwater and setting standards.

Within this new framework, Lebanon launched a new management approach of the water sector that is based on a much clearer division of duties along with empowering active local stakeholders, to enable them undertake duties, and encourage the involvement of the private sector. Lebanon also worked on applying an integral approach of managing demand and resources. Additionally, technical issues were addressed in terms of quantity and quality through executing ten-year improvement programs.

Legal and Regulatory Framework of the Sector

The water sector in Lebanon is governed by Law 221 of May 29, 2000 and its amendments, which is based on integrated water resources management (IWRM). The Law mandated the consolidation of all water agencies, committees, and projects into four water establishments, through which authorities have been defined for each as mandated in the Law 221 above. There also exist a number of by-laws and regulations that also govern those public water establishments.

Law 228 was issued in 2001, to induce private sector participation and to regulate and organize privatization activities through defining terms and scope. This Law coordinates efforts of the economic sector when partnering with the public sector through defining delegation rules, and monitoring privatization projects through independent regulatory bodies established under this Law for those purposes.

The objectives of those laws were to distinctly separate between the overall general level and the lower detailed level of management of the sector, and to promote decentralization policies through giving more autonomy to the water establishments for their daily management of services. Law 228 encourages the water

establishments to adopt commercial principles in their management, to qualify for future partnerships with the private sector. The extent of private sector participation is defined based on actual needs for providing the best services, taking into consideration the social and economic conditions.

From a regulatory perspective, the MOEW is mandated with those types of responsibilities in addition to its main role of managing water resources. In this context, the MOEW is mandated to technically monitor the four water establishments, including provisions for pollution prevention, setting standards, and ensuring compliance with pertinent legislations. Moreover, the Ministry performs financial monitoring in liaison with the Ministry of Finance. However, such monitoring and control responsibilities of the MOEW are greatly hindered by weak or limited enforcement capacity due to the absence of needed statutory and regulatory instruments.

Main Documents Directing the Sector's Management

The main documents that have an essential role in directing the performance and management of the sector are:

1. Law No.221 of year 2000;
2. The National Strategy for the Water Sector, formulated by the MOEW and ratified by the Ministerial cabinet by resolution 2 at session 46, dated on March 9, 2012. The Strategy addresses several issues such as (but not limited to):
   - Optimizing the use of surface water resources from springs;
   - Artificial recharge of groundwater aquifers;
   - The storage of surface water in dams and lakes;
   - The construction of transmission lines, distribution networks and reservoirs for drinking water;
   - The installation of water meters for customers in the country;
   - Broadening services of wastewater collection and treatment;
   - Reconsidering organizational structures of water establishments and improving performance;
   - Re-organizing the MOEW and setting up performance evaluating mechanisms for the sector;
   - Providing adequate human resources and developing competency and capacity;
   - Encouraging planning and assigning outlay responsibilities;
   - Managing Irrigation sector and ensuring sustainability;
   - Restructuring tariffs of drinking and irrigation water as well as applying sanitation tariff;
   - Preparing for and supporting the participation of the private sector; and
   - Finalizing the issuance of the Water Code (Code de l'eau).

STRANDS OF APPLICABLE REFORM

Lebanon has embarked on applying a new reform model to water utilities that calls for the consolidation of services, and encourages the application of commercial principles, in addition to engaging with the private sector to deliver services.

Consolidating Services and Encouraging the Application of Commercial Principles

In this context, the Government of Lebanon issued a special law for the water sector, Law 221 of May 29, 2005. The Law is based on IWRM, and has resulted in the consolidation of all water agencies, committees, and projects into four public provincial establishments. Through this new formula, functions of planning, implementation, and investment related to drinking water, sanitation, and irrigation, were all brought together within those establishments. The following is a delineation of authorities and duties assigned to the public water establishments:

- Study, implement, invest in, maintain, and rehabilitate infrastructure projects for drinking and irrigation water distribution, as well as the collection and treatment of wastewater according to the Master Plan for Water and Sanitation, or based on prior Ministerial permission;
- Suggest new tariff for water and sanitation services, taking into consideration the social and economic conditions of the country; and
- Monitor quality of distributed drinking and irrigational water, as well as quality of wastewater upon discharge and also treated effluent.

Partnering with the Private Sector and Improving Services

A number of forms of partnering with the private sector were applied in Lebanon, such as services contracts, management contracts and others. Previously, there were no laws or regulations in place that supported establishing partnerships with the private sector for the management of the water sector on a larger scale. Currently, the need is to develop on laws that would enable BOT contracts, in an effort to finance large scale projects.

In terms of partnerships with the private sector, the North Lebanon Water Establishment worked on such a partnership through a service and management contract for the city of Tripoli with the support of the French Agency for Development (AFD), according to the following terms and conditions:

1. Operator: Ondeo Company of Lebanon; duration: 2003 – 2007; contract price: €4.6 million.
2. Objectives and performance indicators:
   - Technical indicators: service sustainability, quality of distributed water, and technical productivity (efficiency) of the network; and
   - Commercial and financial indicators: billing percentage, billing coverage (collection rate), and payments to suppliers.
3. The aforementioned objectives revealed improved performance, but targets were not achieved for billing average, cost recovery, and efficiency of networks.

Nevertheless, the PPP experience can be described as successful in terms of achieving remarkable improvements in this case specifically through:

1. Implementation of information management systems, including GIS; Customer service system (X7); Public Inquiry Management System (PIMS) II, Human Resources Management; Computerized Maintenance Management System (GMAO); and Network connectivity and Local Area Network (LAN).
2. Improving services provided from a technical standpoint:
   - Production related: improvements on the processes of monitoring and control of pumping, and providing continuous water supply (24 hours a day);
   - Infrastructure related: improvement on the processes of detecting leaks, and maintenance activities; and
   - Water quality related: the establishment of a new laboratory equipped with state-of-the art equipments and tools, improving the processes related to the tests applied, and follow-up.
3. Improving services provided from a commercial standpoint, such as the fees collection process and the public enquiry management system.
4. Introducing improvements on the communication and reporting system.

Principles Adopted in the Regulatory Process

Benchmarking

In 2009, the MOEW commissioned the German Agency for Technical Cooperation (GIZ) to support the public water establishments in Lebanon in establishing a Performance Monitoring and Benchmarking system with pertinent indicators. The system aims at monitoring and benchmarking performance of the four public water establishments in various technical, financial, and managerial areas. That in turn, is meant to enable the evaluation of current status and help address weaknesses and challenges, as well as maintain strengths, to achieve the required level of performance and improvements.

Approved Performance Indicators

In collaboration with GIZ, the MOEW set a number of performance indicators for technical, financial, and managerial aspects, to be implemented as a pilot before rolling them out and generalizing their use within the sector. Those indicators included:

- Technical indicators such as percentage of service coverage; and quantities of water sold.
- Financial indicators such as total Operation and Maintenance (O&M) cost; personnel cost as a percentage of the total O&M cost; energy cost as a percentage of the total O&M cost; fees collection rate; and coverage ratio.
- Human resources indicators such as number of staff per 1000 water subscribers; and annual number of training hours per employee.
- Level of service indicators such as number of customer complaints; and percentage of water quality conformity to applied standards.

To monitor all the above listed indicators, GIZ designed specific forms with data to be inputted into them in each of the water establishments on a monthly basis, to feed into an executive information system also developed for the same purpose, and that calculates from the data parameters the required indicators, noting that monthly reports are required from the water establishments by MOEW analyzing and explaining the indicators. However, due to lacking infrastructure and equipments and tools needed to obtain the required parameters within the four establishments, estimates are used instead in some cases on a monthly basis and inputted into the system, without sending the results back to the ministry for examination, evaluation and comparative analysis.

RESULTS OF THE REFORM PROCESS

The most important result of the Reform included the issuance of Law no. 221 of May 29, 2000, which constitutes a transitional point towards improving the performance of the sector, and reforming it and creating a sound base for accountability. However, delaying the issuance of related by-laws and regulations that govern functions and responsibilities of water establishments till the end of 2005, has hampered the aforementioned law from being enforced.

Still the water establishments have not attained complete autonomy from an administrative or financial standpoint, as was expected when the law was acted. Nevertheless, the Law brought about the issuance of a number of regulations that allowed for PPP in Lebanon, within a limited framework of service contracts, and to a lesser extent management contracts. From the Tripoli experience, it became evident that developing legislation on a broader scale is required and important; through the management contract implemented in Tripoli, tangible improvements occurred, and the city of Tripoli was the first to enjoy a continuous supply of water on a daily basis.

It can be safely said that short term priorities of the sector include attaining administrative and financial autonomy gradually within the four establishments, in order for them to focus on improving the quality of services provided, improving coordination between the various sectorial entities, and enhancing central monitoring and control. In parallel, it should be highlighted that there is a pressing need for the development and approval of a new set of laws that allow for a wider implementation of PPP, including investment opportunities through BOT contracts.

LESSONS LEARNED

Lebanon is applying a new approach to managing the sector based on clear separation of authorities and responsibilities, empowering active local active entities in performing their duties. It also entails encouraging public–private partnering. Furthermore, Lebanon has adopted IWRM for meeting demands and managing water resources, in order to reach optimum usage and sustainable development.

The ultimate goal of consolidating the water agencies into four discrete establishments was to improve quality and efficiency of services provided by reducing the number of service providers within one district, thus, creating and benefiting from economies of scale, which should lead to a decrease in associated costs. That also allowed for the introduction of the principles of autonomy commercialization, which in turn, would enable the water establishments to better work with the private sector in the future. As for the process of monitoring and evaluating performance, the fundamental system was set out, either by the Ministries or by the Establishments which have already adopted key performance indicators within their operations and programs, which enhances the spirit of accountability and continuous performance improvement.

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السـادة / الجمعية العربية لمرافق المياه (أكوا)

تحية طيبة وبعد،

أرجو إعلامكم بأن المصنف بعنوان "Water Utilities Reform Case Studies From The Arab Region"،

إعداد: Arab Countries Water Utilities Association (ACWUA)

قد تم منحه رقم إيداع في مركز الإيداع في دائرة المكتبة الوطنية تحت رقم الإيداع المبين أدناه.

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