1st GWOPA Expert Group Meeting 'Water and Sanitation Utilities in water scarce cities in the MENA region'

with the support of Department of Energy, Abu Dhabi

Context

According to UN-Water[1], Water scarcity can mean scarcity in availability due to physical shortage, or scarcity in access due to the failure of institutions to ensure a regular supply or due to a lack of adequate infrastructure.

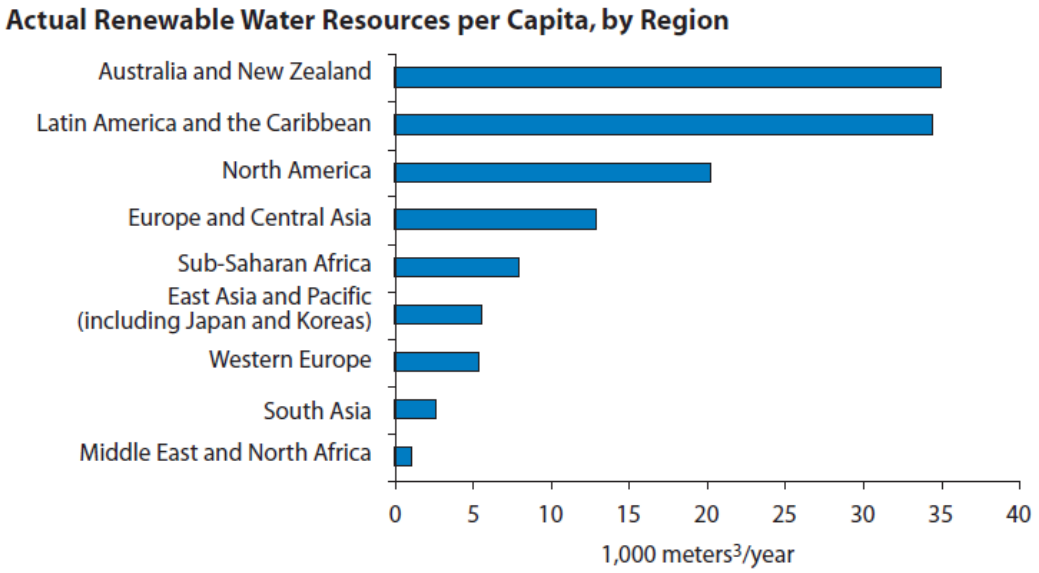
Water scarcity already affects every continent. Water use has been growing globally at more than twice the rate of population increase in the last century, and an increasing number of regions are reaching the limit at which water services can be sustainably delivered, especially in arid regions. Around 1.2 billion people, or almost one-fifth of the world's population, live in areas of scarcity. Another 1.6 billion people, or almost one quarter of the world's population, face economic water shortage (where countries lack the necessary infrastructure to take water from rivers and aquifers)[2]

Water scarcity, a definition[3]
"There are several ways of defining water scarcity. In general, water scarcity is defined as the point at which the aggregate impact of all users impinges on the supply or quality of water under prevailing institutional arrangements to the extent that the demand by all sectors, including the environment, cannot be satisfied fully. Water scarcity is a relative concept and can occur at any level of supply or demand. Scarcity may be a social construct (a product of affluence, expectations and customary behaviour) or the consequence of altered supply patterns – stemming from climate change for example. Scarcity has various causes, most capable of being remedied or alleviated. A society facing water scarcity usually has options. However, scarcity often has its roots in water shortage, and it is in the arid and semi-arid regions affected by droughts and wide climate variability, combined with high population growth and economic development, that the problems of water scarcity are most acute".

Water stress versus water scarcity[4]
"Water stress is when annual water supplies drop below 1,700 m^3 per person. When annual water supplies drop below 1,000 m^3 per person, the population faces water scarcity, and below 500 m^3 is termed absolute scarcity".

Water stress poses greatest threat to the **MENA** region (Middle East and North Africa) in particular, which is the most **water-scarce** region in the world.
The Middle East and North Africa is home to 6% of the world's population and less than 2% of the world's renewable water supply. In fact, it is the world's driest region with 12 of the world's most water scarce countries: Algeria, Bahrain, Kuwait, Jordan, Libya, Oman, the Palestinian Territories, Qatar, Saudi Arabia, Tunisia, the United Arab Emirates, and Yemen[5]. The region has currently the lowest Actual Renewable Water Resources (ARWR) per capita on the planet, as shown in the graph below:

[1] [1] http://www.unwater.org/water-facts/scarcity/
[2] http://www.fao.org/3/a-aq444e.pdf
[3] http://www.fao.org/3/a-aq444e.pdf
[4] http://www.unwater.org/water-facts/scarcity/
[5] http://blogs.worldbank.org/arabvoices/numbers-facts-about-water-crisis-arab-world



Source: FAO AQUASTAT 1998-2002
Note: Actual Renewable Water Resources (ARWR) is the sum of internal and external renewable water resources, taking into consideration the quantity of flow reserved to upstream and downstream countries through formal or informal agreements or treaties, and reduction of flow due to upstream withdrawal; and external surface water inflow, actual or submitted to agreements. ARWR corresponds to the maximum amount of water actually available for a country at a given moment. The figure may vary with time. The computation refers to a given period and not to an annual average. ARWR does not include supplemental waters (desalinated or treated and reused).

The conclusions on the current situation, according to a recent study of the World Bank[6], are quite alarming:

> "The Middle East and North Africa is a global hotspot of unsustainable water use, especially of groundwater. In some countries, more than half of current water withdrawals exceed what is naturally available; 82% of wastewater is not recycled, presenting a massive opportunity to meet water demands; The region has the greatest expected economic losses from climate-related water scarcity, estimated at 6–14% of GDP by 2050; Total water productivity in the Middle East and North Africa is only about half the world's average; Despite its scarcity, the region has the world's lowest water tariffs and the highest proportion of GDP (2%) spent on public water subsidies; Flood and drought risks are increasing and are likely to harm the poor disproportionately; Some 60% of surface water resources in the region are transboundary, and all countries share at least one aquifer, highlighting the importance of cooperative management of shared water resources";

Yet some parts of the region (namely the more prosperous members of the Gulf Cooperation Council) have some of the highest per capita water consumption rates in the world. GCC countries also see biggest gaps between renewable supply and demand: Bahrain uses 220% of its available renewable water reserves, compared to 943% in Saudi Arabia and 2,465% in Kuwait[7].

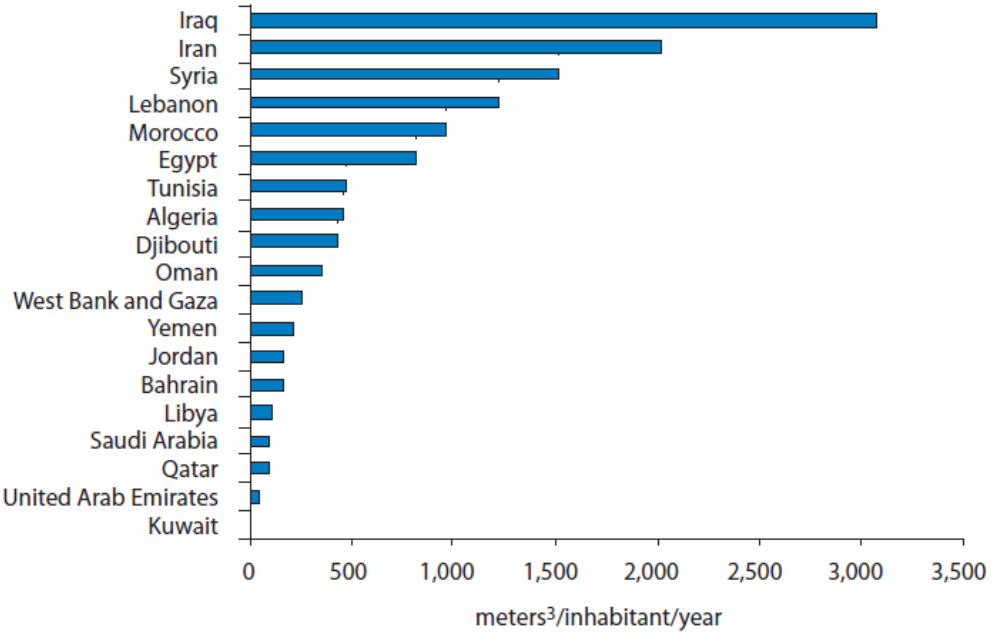
[6] "World Bank. 2018. Beyond Scarcity: Water Security in the Middle East and North Africa. MENA Development Report; Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/27659 License: CC BY 3.0 IGO."
[7] http://blogs.worldbank.org/arabvoices/numbers-facts-about-water-crisis-arab-world

And the future doesn't look bright, if the trends in terms of water resource management and consumption are to go on, on a 'business as usual' basis. According to World Resources Institute[8]:

> "14 of the 33 likely most water stressed countries in 2040 are in the Middle East, including nine considered extremely highly stressed with a score of 5.0 out of 5.0: Bahrain, Kuwait, Palestine, Qatar, United Arab Emirates, Israel, Saudi Arabia, Oman and Lebanon. The region, already arguably the least water-secure in the world, draws heavily upon groundwater and desalinated sea water, and faces exceptional water-related challenges for the foreseeable future."

Yet, all countries are not affected with the same acuteness and the disparities between countries which are just at the limit or above the "water poverty" line (1000 m3/capita/year) and those who are below -or well below- are very pronounced.

Total Renewable Water Resources per Capita, by Country (actual)



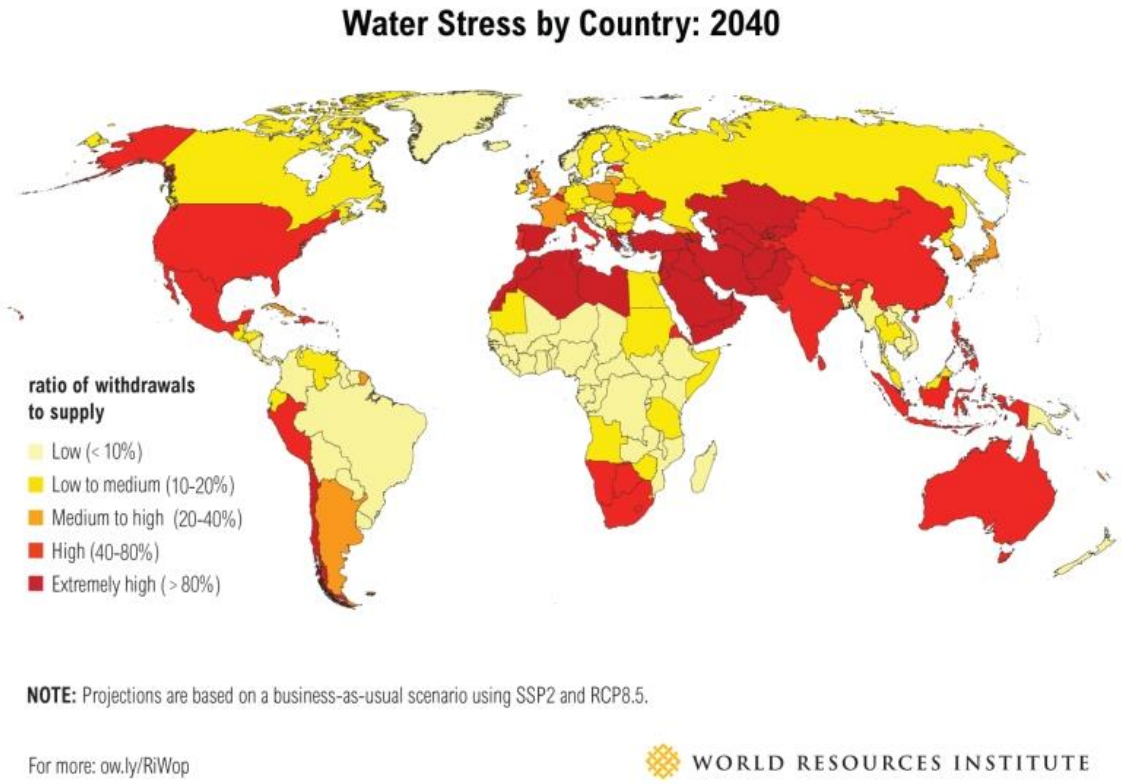
Source: FAO AQUASTAT 1998-2002

Note: Total renewable per capita combines the total internal renewable (IRWR) and external renewable water resources (ERWR) for each country. It is a measure of an average amount of water (in cubic meters) available per person annually.

The extensive study led within the framework of the Regional Initiative for the Assessment of Climate Change Impacts on Water Resources and Socio-Economic Vulnerability in the Arab Region (RICCAR)[9] shows that climate change will also put even more strain on the current available water resources. The temperature in the Arab region is increasing and is expected to continue to increase until the end of the century; precipitation trends are largely decreasing across the Arab region until the end of the century, although some limited areas are expected to exhibit an increase in the intensity and volume of precipitation; Throughout the Arab region and across all sectors and subsectors, the vulnerability of Arab States to climate change is moderate to high and is generally increasing over time.

[8] https://www.wri.org/blog/2015/08/ranking-world-s-most-water-stressed-countries-2040

[9] https://www.unescwa.org/sites/www.unescwa.org/files/uploads/riccar-main-report-2017-conclusion-english.pdf



RICCAR, and other regional platforms, are calling for more regional cooperation on data collection and development of capacity building initiatives at various levels to increase the resilience of the region to climate change and to address in particular the threats on water resources.

Even though most often water and sanitation utilities don't have the direct institutional responsibility of water resource management, they lay at the interface between those institutions and the end users - clients and citizens- and they are ultimately accountable to their users of the quantity and quality of water they bring to them.

Urban water utilities are facing an increasing need to improve the management of water resources and associated infrastructure in water scarce cities. Diversifying sources of water supply will become increasingly important whether through the construction of new storage facilities, the appropriate and sustainable extraction of groundwater, water trading or conservation, or the use of recycled or desalinated water. In addition, water and energy demand are deeply linked. Water utilities managers must pay attention to the risks and interdependencies that these twin challenges present.

GWOPA and the water and sanitation operators

The Global Water Operators' Partnerships Alliance (GWOPA, see www.gwopa.org) is a network of partners, led by UN-Habitat, committed to helping water operators help one another improve their capacity in providing access to water and sanitation services for all. Following the "Hashimoto Action Plan"

launched in Mexico in March 2006, the UN Secretary General's Advisory Board on Water and Sanitation (UNSGAB) requested UN-Habitat to establish this global mechanism to promote not-for-profit peer support arrangements between water utilities, so-called Water Operators Partnerships (WOPs). Noting that much of the responsibility in meeting the water and sanitation-related MDGs fell to water operators, UNSGAB recommended the scaled-up use of WOPs to help develop their capacity to sustainably deliver safe water and sound sanitation services.

Water operators are critical players in efforts to achieve sustainable and universal water and sanitation. But many operators today are not keeping pace with demand. They face a myriad of challenges including rapid urbanization, rising inequity, pressures on water resources, severe resource constraints and ineffective governance.

There is a growing understanding that strong local capacity can provide the foundations to respond to emerging challenges with meaningful and lasting solutions. Supporting water operators in their organizational development efforts to manage effectively over the long-term

WOPs are peer-support arrangements between two or more water service providers, carried out on a not-for-profit basis in the objective of strengthening operator capacity. They are based on the observation that capacity development supported by mentors can accelerate water operators' ability to meet the challenges facing the sector. They draw on the fact that much of the innovation and expertise to address water operators' challenges reside within utilities (not with consultants or other external experts), and that a growing number of these successful operators are highly motivated to share their expertise and innovation with others as "mentors" on a not-for-profit basis.

The EGM in Abu Dhabi

Objectives

GWOPA, with the support of the Department of Energy of Abu Dhabi, has gathered in Abu Dhabi during the World Future Energy Summit (WFES) on the 17th of January 2017 some of the key regional organizations dealing with capacity building for water and sanitation utilities - such as the Arab Water Council, the Economic and Social Commission for Western Asia (ESCWA) and the Arab Countries Water Utilities Association (ACWUA) -as well as regional knowledge institutions -such as MEDC and the Arabian Gulf Academy - and practitioners (relevant Ministries and utilities) from Abu Dhabi, Bahrein, Lebanon, Jordan, Palestine, Iraq, Egypt and Morocco, for a one day Expert Group Meeting. The EGM aimed at discussing the main challenges faced by the utilities in the region, and identified some of the local solutions, while academics and experts contributed to give overviews of the situation, notably in terms of water resources and regional trends.

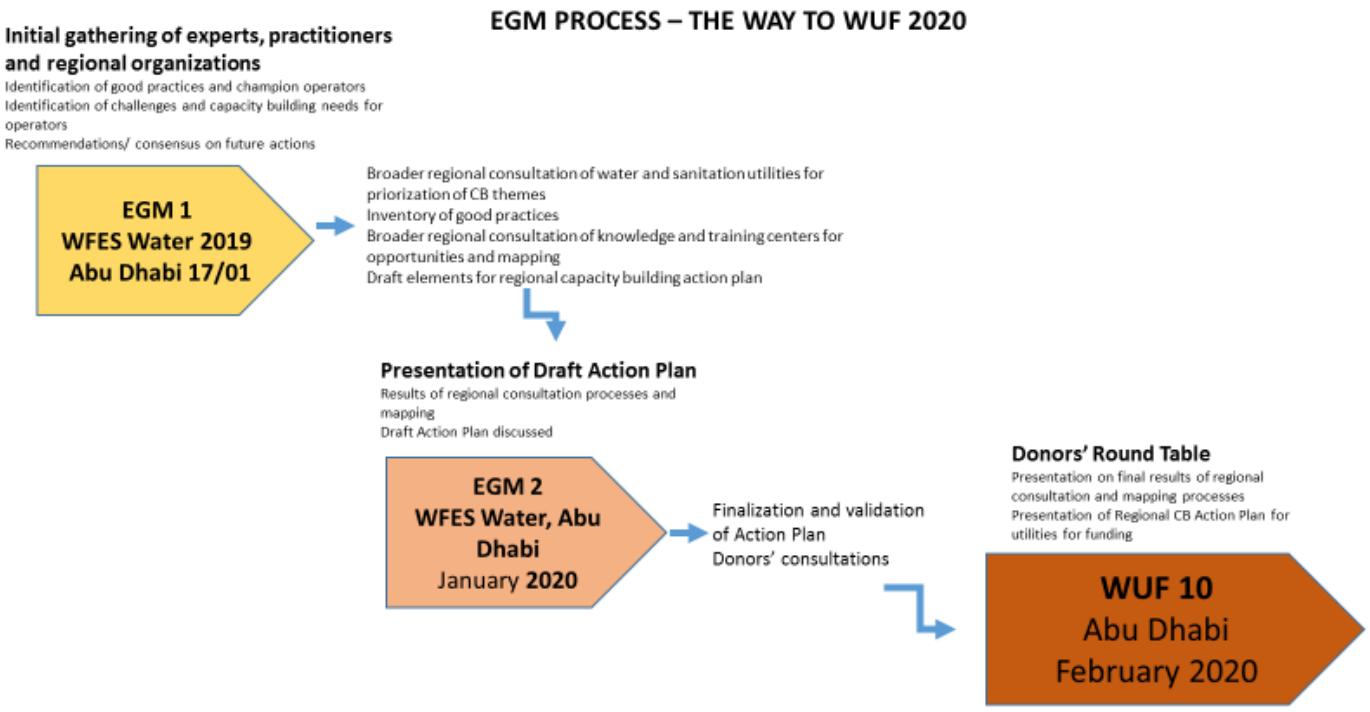
Regional institutions were invited to share with the audience information about their regional capacity building initiatives and other initiatives that could represent an opportunity. The objective was to take stock of the past and current initiatives and to propose to capitalize on them in order to develop a regional capacity building action plan for utilities on water scarcity.

Process

With this EGM, GWOPA initiated a regional consultation on the main challenges that utilities are facing and a regional mapping of utilities' good practices and resource institutions such as universities, training centers and regional capacity programmes.

The objective is to develop a Utility Capacity Building Action Plan which will bring together potential mentor utilities for WOPs and regional stakeholders which could provide other types of capacity building activities. Leading up to the 2nd EGM in 2020 at WFES, GWOPA will broaden the consultation, finalize the mapping of needs and sources in terms of capacity building, knowledge and good practices. Stakeholders will be invited to contribute to the drafting of the Action Plan which will be finalized at the 2nd EGM and presented to a donors' round table during the 2020 World Urban Forum (WUF10).

GWOPA hopes that this process will see the mainstreaming of WOPs as one of the preferred capacity building options for utilities in the region.



Program and discussions

Time	Issue	Speaker
09.00-09.15	**Welcoming of participants and key note address**	HE. Eng. Mohammed bin Jarsh Al Falasi, Undersecretary, Department of Energy, Abu Dhabi
09.15-9.25	**On the road towards the 10th World Urban Forum Abu Dhabi 2020**	Christine Musisi, Director, External Relations Division, UN-Habitat
09.25-09.35	**UN-Habitat and the urban basic services**	Vincent Kitio, Chief, Urban Energy Unit, Urban Basic Services Branch, UN-Habitat
09.35-09.50	**Presentation on GWOPA and on the EGM Process**	Anne Bousquet, Programme Officer, GWOPA, UBSB, UN-Habitat
09.50-10.05	**Roundtable of introduction of participants**	All participants
10.05-11.40	**Water and sanitation utilities in water-scarce cities in the MENA region**	
10.05-10.25	General context and overview	Eng. Samir Bensaid, Independent Expert – Introduction and concepts Pr. Waleed Khalil Zubari, Arabian Gulf University – Focus on Gulf Countries
10.25-10.40	**Coffee Break**	
10.40-11.40	Panel discussion 1 Utilities Local Challenges and Local Solutions Moderator: Eng. Samir Bensaid	Eng. Mokhtar Jaait (ONEE, Morocco) Eng. Jamal Krayem (ex-EELN, Lebanon) Eng. Jamal Fahmi Rashid Shadid (DoE, Abu Dhabi) Eng. Mohamed Moawad Mahmoud Nassar (MHUUC, Egypt)
11.40-12.40	**Q&A – other participants to share experience**	Moderator: Eng. Samir Bensaid
12.40-13.45	**Lunch Break**	
13.45-14.45	**Panel discussion 2** **Regional initiatives and Q&A** Moderator: Anne Bousquet	Mr. Ziad Khayat (ESCWA) Eng. Khaldon H. Khashman (ACWUA) Dr. Hussein El-Atfy (AWC) Mr. Andres Guerra (AEAS, Spain)
14.45-15.00	**Discussion – framing, concepts, focuses - expected outcomes of the EGM-**	Moderator: Anne Bousquet - plenary
15.00-15.15	**Coffee break**	
15.15-16.30	**Roadmap for implementation** **Planning towards events in 2020**	Moderator: Anne Bousquet - plenary
16.30-17.00	**Recap and wrap-up**	

The meeting was opened by Mr. Carlos Gascó, Executive Director of Energy and Water Policy, Department of Energy (DoE), Abu Dhabi, on behalf of the Undersecretary H.E. Mohammed bin Jarsh Al Falasi, Undersecretary.

Mr. Gascó welcomed the participants and reiterated the interest of DoE to support the initiative and contribute to this discussion between experts, that he wished to be very successful and productive. He gave an overview of the water sector in Abu Dhabi, where people can enjoy world class services, with 98% of the population connected both for supply and collection of water. Abu Dhabi has the ambition of closing the whole water cycle and of fully complying with the principles of Integrated Water Management, but the Emirate is facing some challenges.

First there is a need to improve and modernize the infrastructure as a priority due to the high cost of water production, the decreasing availability of water, worsened by the bleak perspective of climate change impacts. The utilities are focusing on reducing the cost of production, increasing the quality of water and the level of customer satisfaction. The Emirate is also very concerned with its dependency for food and is looking into solutions to become more autonomous, which means developing agriculture, which further increases demand for water. Currently the utilities are using three main types of water sources, ground and underground water as well as desalination. Underground water is really key and vital and handled with a lot of care and attention. Desalination is now picking up, with some constraints in terms of high cost and environment impact and Abu Dhabi is looking into developing waste water reuse, which strategic importance has been recognized recently.

The idea is to adopt a holistic approach; working on preservation and optimization of the resources. The Authorities are working on policy and regulation to increase utilities' efficiency. Demand management is also a key issue, due to the irrational pattern of consumption of the population, which is a common feature of the Gulf countries. While working on water demand management, efforts have to be made on NRW, through high policy targets and stricter regulations, which deliver the right signal to consumers and producers. Raising awareness on the value of this commodity (not only in terms of costs but on what it brings to the society and to the economy) -educating the consumers- is crucial. Nowadays, in the Emirates,

water management can not be envisaged without thinking of Energy, and the nexus Water-Energy- which is one of the themes of this Summit (World Future Energy Summit) is very strategic.

Mrs. Christine Musisi, Director of External Relations Division, UN-Habitat, also welcomed the participants and expressed UN-Habitat's gratitude towards the Department of Energy, for supporting this important regional initiative led by the Global Water Operators Partnerships Alliance. She highlighted the fact that Abu Dhabi is also hosting the World Urban Forum in 2020, a major event for UN-Habitat, which will strengthen the role of the Emirate as a convener of global experts and key stakeholders– another milestone being the holding of the 2019 WFES. Mrs. Musisi reminded the audience of the launching of the New Urban Agenda in 2016 which acknowledges the importance of water operators in localizing and achieving the SDGs. She invited the participants to join forces and contribute to the success of this regional initiative for capacity building of Arab utilities on water scarcity, as well as playing a role in WUF 2020.

Water and sanitation utilities in water-scarce cities in the MENA region

Overview given by Pr. Waleed Zubari and Samir Bensaid

Pr. Waleed Zubari, from the Arab Gulf University, Bahrein, opened the technical discussions with an overview of the situation in the Gulf Countries in terms of water resources and water supply services (full presentation in Annex).

The Gulf countries have an extremely poor water resources endowment, with the lowest per capita renewable freshwater resources in the world, rapidly declining due to escalating population growth. The unprecedented economic and social transformation is associated with continuous increase in water demands in all sectors. Yet, despite water limitation, GCC have done well in providing water for their municipal sector by resorting to desalination. Also, the reuse of treated municipal wastewater started to become a part of the water supply sources.

Considered as one of the top-ranked service providers in the world, the GCC companies supply water continuously 24/7, with high quality drinking water standards, to almost 100% of the population. Modern sanitation services cover 80-90% of the population, with modern treatment facilities (tertiary and advanced treatment levels). The majority of the providers are owned by governments, while others are converted into authorities/companies. Some others have been privatized (BOOT), under a governmental regulation framework.

The WS&S utilities face major challenges at two main levels: they have to cater with the demand of rapidly developing countries and expanding municipal water sector; while achieving the attributes of effectively managed utilities (EMU) to ensure their sustainability.

The escalating municipal water demand is explained by the rapid population and urbanization growth, characterized in this region by irrational consumption patterns. At the same time, the distribution networks have important physical losses.

To address the growing water shortage, the GCC have opted for a massive expansion in desalination to meet municipal water demands, a trend expected to continue in the next decade. But desalination comes with very important financial costs (subsidies), as well as economic costs (energy-intensive) and environmental costs (thermal brine discharge and GHGs). The desalination industry has limited added-value to GCC economies (imported technology).

Providers are characterized by a general low water efficiency (supply, use, recycling and reuse), which is reflected by the high per capita water consumption in many counties, the high physical leakage rate(high NRW) in distribution network in some countries (though there have been some recent major achievements in reducing physical leakage in many countries*).*

Progress could also be made in terms of recycling of grey water: at present, the Gulf Countries almost don't recycle their grey water. First, this is explained by a low level of efficiency in wastewater recovery (<50%) and a large mismatch between wastewater treatment levels and reuse (40%). This is very unfortunate as it is a major lost opportunity under GCC water scarcity conditions.

Financially, the companies could do also a lot better as the cost recovery is very low in WS&S (captive to government allocations) – the sanitation sector has literally zero cost recovery (except Oman and KSA). The countries face limited degrees of freedom in controlling demands (political economy; however, some recent changes have occurred in some countries – as in many other countries, the cost of water for the users is a political question). Many studies are also showing that the region will be particularly impacted by climate change and variability, with increasing temperatures, seal level rise and extreme events of floods and droughts.

Though the countries have bet on desalination for the future, one must highlight the high vulnerability of GCC desalination plants and water supply systems, exposed to numerous risks (natural or man-made, unintentional or intentional). Maritime contamination (e.g., nuclear and wastewater), maritime pollution (e.g., oil and chemical spills, red tide) natural disasters (e.g., cyclones, seawater flooding) and actual combats (e.g., targeting desalination facilities) are all serious threats to desalination plants. The water supply systems are vulnerable to power outage, hacking of SCADA system or even intentional contamination of the domestic water supply.

But challenges are not only 'material' or due to natural facts: the inadequate level of governance (in the water sector as a whole) impedes the implementation of optimized solutions. The institutional and legislative frameworks, the overall institutional capacity and human resources are not up to the challenges lining up. The absence of a Regional Benchmarking system, to measure performance and indicate best practices in the attributes of Effectively Managed Water Sector Utilities, is not helping.

Pr. Zubari emphasized the importance of regional cooperation to address common challenges. Amongst the existing initiatives, he highlighted the role of the GCC Water Resources Committee, which was established in 2002, and is hosted and coordinated by the Electricity and Water Directorate in the Secretariat General. It is composed of representatives from GCC water Ministries and Authorities, with a rotational chairmanship. Its mandate is to develop and manage water resources and uses, formulate water legislation and regulations, and to provide training and information exchange. So far, the Committee has developed several studies and manuals, such as the statistics Book (biannual), desalination in the GCC study, the Water Grid Study, GCC Laws on Groundwater and Surface Water; Desalination; and Wastewater and the GCC Unified Water Strategy and Implementation Plan 2035 (2016).

This is what the Committee is proposing for the way forward to its member countries, to implement its Strategy:

- Adopt a regional benchmarking system for WS&S utilities to enhance utility sustainability
- Establish an advanced joint R&D and tertiary education programs in desalination and wastewater treatment
- Enhance the capacity and performance of water supply and sanitation personnel (certification programs, e.g. ACWUA's)
- Diversify energy sources (renewables and alternative) and enhance energy efficiency and desalination and wastewater sectors
- Mitigate environmental impacts of desalination and wastewater sectors
- Increase wastewater collection rates, treatment capacities, treatment levels and reuse rates
- Increase supply efficiency and manage demands in the municipal water sector
- Establish a highly resilient system for potable water supply under emergencies (storage, alternatives water supply sources, early warning system,)
- Ensuring integrated municipal water planning and coordination

Panel discussion 1 highlights: examples from Morocco, Egypt, Abu Dhabi and Lebanon

The first panel discussion focused on challenges encountered by urban water utilities in the region, and good practices and local solution they have put in place to overcome those challenges (full presentations in Annex).

Mr. Mokhtar Jaait from Office National de l'Eau Potable et de l'Electricité du Maroc (ONEE) listed several types of impact due to water scarcity (and variability in time) in Morocco, from environmental impact such as aquifers' depletion or salt water intrusion, to social and financial impacts (non-continuity of services, increase of production and treatment costs etc.)

ONEE has developed three approaches to address the water scarcity challenges. The company has put in place an efficient water demand management policy (Non-Revenue-Water management and reduction of individual consumption through a set of measures and tools); has developed an ambitious alternative water resource plan, through desalination, reuse of treated waste water and artificial aquifer recharge. ONEE is also investing in R&D and capacity building (with for example the development of a GIS Decision support system on for optimization of alternative solutions)

In Tripoli in Lebanon, as presented by Mr. Jamal Krayem, water scarcity has a direct impact on the quality of the service provided to the population, especially in terms of hours of service available, which reflects directly on the revenue of Etablissement des Eaux du Liban Nord (EELN) as a decline of the quantity of water delivered mechanically involves a decline of the income through the billing. It causes also a stress on the production facilities and destabilizes the whole activities of the company, especially in the field of operation and maintenance as well as in funding the solutions to the various issues. The erosion of distribution network pipes together with the low pressure pauses a major contamination threat. The lack of water makes it very difficult to extend the network, especially to new neighborhoods. All in all, this situation sets up a vicious circle of lack of revenue, lack of human resources, poor services, customers dissatisfaction.

EELN has put in place several measures to mitigate the threats and impacts due to water scarcity: amongst others, the production capacity has been increased to the maximum limits allowed by groundwater, without depletion; the laboratory has been strengthened (equipment has been completed, including with the chemicals for analyses, staff was trained and an effective sampling program has been developed). About

70% of worn-out networks has been renewed with the assistance of the European Investment Bank, the French Development Agency and the Lebanese government, together with the renewal of about 25000 meters with the assistance the French Development Agency. Customer databases have also been cleaned up (GIZ in El Mina and AFD in the other parts of the city).

The measures have yielded good results and Mr. Krayem insisted on the necessity to build the capacity of utilities staff through different types of activities, and notably through water operators' partnerships, as the one with several Belgian operators in which EELN was engaged. He concluded that '*many utilities in development countries are in need of help and support, not only from their own governments or international institutions but also from similar operators which already has the required competencies. All bilateral actions can be implemented in a complementary way avoiding any overlapping in order to reach the objectives without wasting time or money. Thus, we must all partner when it comes to achieve the SDG's objectives in term of services or time*".

In Abu Dhabi, as explained by Mr. Jamal Shadid from the Department of Energy (DoE), Water services for domestic consumption is met almost 24/7 for all the customers and almost 99% of the population is connected. The coverage for waste water collection and treatment is also excellent with a coverage rate of 98% of the population. The infrastructure is very modern and the Abu Dhabi Utility is adopting some of the best practices, together now with an on-going tariff reforms, the People of Abu Dhabi are enjoying services of world class standards.

Though, water scarcity has important impacts that are likely to worsen in time with the effect of climate change; Even with the operationalization of new desalination plants, the production of drinking water reached a plateau back in 2011; the issue now is that consumers don't trust tap water and the utility has to make great efforts to focus on quality, while maintaining the supply level. Also, water scarcity affects the production of food with a high Agriculture sector demand extremely difficult to meet. Some research is going on with PAM to develop water reuse, which is the only way to increase water supply, but it is also very costly and many questions are yet to be solved.

The authorities are trying to increase the overall service efficiency by implementing a Demand Management policy and minimising water Losses. Actions are taken on public awareness. The idea is also to optimise the water resources allocation, by developing a new allocation policy based on a better understanding of the Value of Water (identifying the different sectors' needs in terms of quantity and quality…), which has implications on Governance at strategic and operational levels. Abu Dhabi is progressively adopting an Integrated Energy Management Model that encompasses all energy aspects including water.

Mr. Mohamed Moawad Mahmoud Nassar, from the Ministry of Housing and Utilities and Urban Communities (MoHUUC) of Egypt, gave an overview of the water sector in the country: While Egypt's main water resource is the Nile River, the country is below the level of water poverty.

Groundwater is a potential source of water within the country but with different characteristics in terms of quality, depth and quantities available. With limited Rainwater and flood waters both in quantity and timing, water scarcity has important impacts on the country, especially in a context of increasing population and therefore increased drinking water needs and agricultural expansions (water-food nexus). Pollution of waterways and degradation of water quality add to the challenge. Because of the low level of water in the Nile River, water treatment plants have to lower their intake level, which leads to increasing the water pollution and to the inability of the water treatment plants to achieve the required treatment for water. The inability of water treatment plants to work efficiently causes serious health threats for citizens. Water companies are unable to meet customers' demand, and consequently forcing them to seek other alternative

and more expensive solutions, which impact in turn on the level of satisfaction of the users. This is one of the explanations for the low rate of bills collection which causes weak corporate resources.

To address those challenges, MoHUUC has set out clear plans and future visions through the following steps;

- Regularly updated Master Plan to bridge the water gap in coordination with the concerned ministries (Planning, Irrigation, Agriculture, Health, Environment).
- The Holding Company for Water and Wastewater has prepared a Master Plan for water desalination to cover all governorates from 2014 to 2037. Several desalination plants have been implemented with total capacity of 300,000 cubic meters per day until the end of 2018. Desalination plants are expected to reach 747,000 cubic meters per day in 2022 and to reach 2.6 million cubic meters per day in 2037.
- Intensification of customer awareness campaigns in schools, mosques and churches on the importance of water consumption rationalization.
- Progressive increase of water tariff to gradually reach the actual treatment cost to ensure that customers will be keen to rationalize the water consumption.
- Programs of water leakage detection to reduce losses where the percentage of leakage loss is about 30%

Panel discussion 2 – Regional initiatives and opportunities – highlights – ESCWA, ACWUA, AWC and ANEAS

(Full presentations in Annex)

Mr. Ziad Khayat presented his organization, the United Nations Economic and social Commission for Western Asia, ESCWA

The Commission was established in 1973 with the purpose to stimulate economic activity in member countries (currently 18 Arab countries), strengthen cooperation between them, and promote sustainable development. ESCWA provides a framework for the formulation and harmonization of sectoral policies for member countries, a platform for congress and coordination, a home for expertise and knowledge, and an information observatory. ESCWA activities are coordinated with the divisions and main offices of the Headquarters of the United Nations, specialized agencies, and international and regional organizations, including the League of Arab States and its subsidiary bodies.

Mr. Kayat listed some of the capacity building activities coordinated or provided by ESCWA which could be an opportunity for utilities in the region.

First, the Regional Initiative for Establishing a regional Mechanism for Improved Monitoring and Reporting on Access to Water Supply and Sanitation Services in the Arab Region, the MDG+ Initiative, implemented with the Arab Ministerial Water Council and ACWUA; equally interesting, ESCWA is leading an initiative for the development of capacities of Arab Countries for Climate Change Adaptation using IWRM Tools based on RICCAR outputs. Together with ACWUA, ESCWA developed a training module for Human Settlements; In Tunisia, a Nexus pilot initiative was implemented with SONEDE, on the basis of the outcome on the initiative “Developing the Capacity of ESCWA Member Countries to address the Water and Energy Nexus for Achieving SDGs”. Under the frameworh of the Arab Integrated Water Resources Management Network (AWARENET), a regional network hosted by ESCWA for the development and

delivery of capacity development, some recent activities on Water integrity with focus on Regulation of water sector have also taken place.

In the perspective of developing the Regional Action Plan for utilities capacity building; ESCWA recommends taking into consideration the following aspects

- Monitoring, reporting and achieving the SDGs
- Assessment of climate change impacts on utility services and infrastructure and development of adaptation plans
- Water-energy nexus assessments for water utilities
- Human rights-based approach to water

In conclusion, Mr. Kayat insisted on the importance of water utilities in achieving water security in the Arab region, with the objective of "Leaving No one Behind" and insisted also on the need of empowering women at various levels, in the water sector and beyond;

The Arab Countries Water Utilities Association, ACWUA, is another important regional stakeholder. Mr Khaldon Khashman presented his organization: The Arab Countries Water Utilities Association (ACWUA) was founded as a result of an initiative by key water utilities experts in the Arab Region and is hosted by the Jordanian government in Amman. ACWUA's mandate is is to provide its services to its members -with water and wastewater utilities in the Arab countries- in the Arab region relying on its own resources and on the competencies inherent within the member utilities, with the objective of providing them with technical support to develop their performance in managing and producing and supplying water and wastewater services, taking into consideration their technical and professional needs

ACWUA provides technical certifications for operators and training courses on various key aspects of water management; For example, in Jordan, ACWUA developed a Non-Revenue Water (NRW) reduction plans for Jordanian utilities with the support of USAID; the Jordanian utilities have also benefited from knowledge sharing workshops and water utility management training.

ACWUA is also part of the MADAD Consortium - Promoting Sustainable Management of Water Services and Resources in Countries Affected by the Syrian Crisis- funded by the EU. The objective is to help the hosting utilities and communities to provide WASH service to Syrian refugees by reducing NRW and save water resources. North Lebanon Water Establishment (NLWE), Akkar (Qatlabeh,Akroum), Tripoli (El Fouar and Water Establishment (BWE), South Lebanon Water Establishment (SLWE) and Bint Jbeil are amongst the beneficiaries of this initiative.

Mainly with the support of GiZ and the DWA (German Water Partnership) ACWUA developed a series of manuals, such as the Energy Efficiency Reader and Guidelines for water and wastewater faculties to reduce the energy consumption and energy cost with some pilot implementations in Jordan, manuals about the requirements of Technical Sustainable Management in water and wastewater treatment facilities with pilots in Egypt (four facilities where audited and certified for the TSM requirements in Jordan , Egypt and Tunisia); the Water Tap Manual (Transparency - Accountability and Participation), implemented in number of utilities in Jordan, Egypt, Morocco and Tunisia; a Reader- Good Practices in Public Awareness experience in the MENA Region (Jordan, Lebanon, Egypt, Palestine, Egypt, Tunisia, Morocco and Yemen); manuals on utilities reform based on 10 case-studies of utilities management; etc;

ACWUA will also contribute to a major initiative, SWIM_H2020, funded by the EU: ACWUA will notably perform the "Socio-Economic Impact Assessments of Groundwater Over-Abstractions in Azraq Basin" in Jordan, will work on NRW in Algeria and other activities.

ACWUA encourages the strengthening of regional initiatives for utilities capacity building and suggested continued efforts on mapping best practices in water and waste water sector in the region, emphasizing efforts and co-operation between water associations in different regions, mapping the needs of the water operators in building capacity researches and institutional support and expanding the exchange of knowledge between different organizations.

Dr. Hussein El-Afty introduced his organization, the Arab Water Council (AWC) to the participants. The AWC, based in Cairo, Egypt, was established in 2004 with the objectives to shape a strong Arab voice to face the regional challenges and requirements for achieving the Sustainable Development Goals (SDGs), to develop regional strategies and provide policy directions, build human and institutional capacities in water- related issues, to initiate and strengthen regional and international cooperation and partnerships to tackle water-related challenges, for achieving sustainable development in the Arab Region, to coordinate efforts to incorporate Integrated Water Resources Management, promote sustainable solutions for shared water resources, tackle climate change impacts on water resources and promote Water/Energy/ Food Nexus (WEF), and to build capacities and disseminate knowledge as well as enhance the sharing of experiences and success stories.

The AWC has been tasked to develop water indicators for monitoring the level of services in the water sector and preparing the State of the Water reports (SDG6) targets and agenda 2030; The Council also contributes to the preparation of IUWM plans in water scarce cities, to the development of Wastewater reuse strategies (Challenges & opportunities); AWC promotes capacity building on IWRM through WDM training, also through training on the role of Private Public Partnership (PPP) in the integrated management of urban water; AWC is involved in other themes of training such as Governance institution/ reform/ policies & strategies, Water supply and sanitation for efficient systems (operators, practitioners & decision makers), legislation, regulation and standards (laws & codes), use of modern science and technology (RS & GIS) in the management of water resources, Climate risk management (awareness, national plans adaptation policies infrastructure – TOT) and Water quality management.

In the perspective of the development of the regional action plan on water scarce cities, Dr. El-Atfy recommended to strengthen regional partnerships and knowledge networks and cooperation. He suggested training on several priorities such as,

- ✓ Training on preparation of Integrated Utilities Water Management (IUWM) plans in water scarce cities including drinking water and sanitation;
- ✓ Training of the trainers (TOT) to raise the capacity of the users of the small scale water utilities (associations) to efficiently run facilities and make optimal use of existing infrastructure;
- ✓ SDG6 training , planning, developing , implementation mechanisms and monitoring plans;
- ✓ Water energy NEXUS and energy optimization for sewage treatment plants
- ✓ Developing a standard package/guideline for cost effective and efficient water systems;

He also recommended to develop the capacity of utilities and other stakeholders of the water sector by:

- ✓ Supporting and assisting the development of national and local strategies plans and road maps for scaling up water supply and wastewater reuse;
- ✓ Regional and national training to raise the capacity to access the available international funds;
- ✓ Developing economic instruments and creation of revolving sustainable funds (finance)
- ✓ Promoting stakeholders capacity for safe reuse of wastewater low cost technologies and best practices of wastewater treatment plan.
- ✓ Mapping out existing initiatives and knowledge (who is doing what?) while recognizing added value from synergies and complementarities;

- ✓ Assisting in assessing state of water developing IUWM plans in water sacristy cities (Alexandria, Egypt and Mogadishu, Somalia);
- ✓ Activating the role of the private sector in the management, operation and maintenance of water utilities;
- ✓ Promoting the concept of sustainable development (SDG6) with specific focus on gender equality and youth engagement.

With the idea of promoting interregional exchanges, GWOPA invited also the Spanish Association of Water and Sanitation Operators, AEAS, based in Madrid, Spain and represented by Mr. Andres Guerra. Many Spanish utilities face similar challenges in terms of water scarcity and have developed strategies and solutions which could be inspirational for their peers in the MENA region.

AEAS members provide service to 80% of population in Spain and the association supports the utilities in their relationships with relevant Spanish ministries on institutional and legal issues. AEAS is a national platform for cooperation between utilities in technical fields such as water intake, wastewater management, scarcity, etc. AEAS, a member of European Water Utilities Federation, EurEau, develops technical documents and guidelines, convene technical workshops for its members and holds congresses.

As Spanish utilities have had to face water scarcity issues since decades, they have developed valuable know-how and innovative solutions that could benefit utilities in the MENA region. AEAS could help in facilitating those exchanges together with GWOPA.

Guided discussion on priorities

Based on the panels 1 and 2, the participants discussed about the priorities for capacity building actions for utilities.

The following priorities have been identified, not necessarily by order of importance:

1. **Water Demand Management (as a package)**
   - NRW Management (Metering, illegal connections, technical losses etc)
   - Conservation
   - Public awareness, role of consumers, communications, stakeholder participation (including communities)
   - Institutional/policy development (i.e construction standards by-laws etc..)

2. **Planning**
   - Modelling tools and support to decision making- Risk management of extreme events (flooding, drought)

3. **Integrated urban water resource**

4. **Water/Energy/Food Nexus**
   - Low carbon emission in water production and treatment

5. **Water Supply Management**
   - Desalination
   - Extension of water production infrastructure
   - Unconventional water sources: reuse, aquifer recharge, etc.

6. **Financial sustainability**
   - Pricing policy taking into consideration Social equity (Human right > Pro poor) -, subsidies
   - Pricing structure policy

7. **Water governance reforms**
   - Relevant level for managing WSS under scarcity
   - Enabling institutional environment
   - Water integrity

Road map and way forward

The discussion first focused on the expected outcome of this consultation process and all participants agreed that the "recommendations" initially mentioned should be packaged in the format of a regional action plan for utility capacity building, to which various regional organizations and relevant institutions could contribute. It was agreed that this EGM would represent the first step of a regional consultation process which will be coordinated by GWOPA, and which lead to the development of an action plan presented during WUF 2020 at a donor roundtable, with an intermediate validation session at WFES 2020.

It was suggested that the consultation process should be broaden to more utilities with the objectives to understand their priorities in terms of capacity building (related to water scarcity challenges) and to identify potential champions which could share their knowledge with their peers.

The consultation should also include more knowledge institutions and broaden the mapping of regional initiative which could contribute to the action plan by providing training, expertise etc.

It was agreed that capacity building should be understood not only as training, but also as peer-to-peer exchanges or any other type of capacity building activity – stakeholders will be consulted to make concrete proposals.

The proposal will be elaborated by GWOPA once compiled all the relevant inputs from utilities and stakeholders. A draft will be circulated for second round of inputs before the session at WFES 2020 which will be dedicated to the validation of the Action Plan.

It was requested that GWOPA create an online platform to facilitate the exchanges between the organizations involved in the consultation process. GWOPA proposed to use its online platform tool and create this platform as one of the GWOPA's thematic Hub.

GWOPA and partners will then mobilize potential donors for the meeting at WUF 2020 where the Plan will be presented and discussed with potential donors for funding and operationalization.

These are the actions and steps agreed upon:

- Broaden the consultation to other operators from MENA countries and eventually from other Mediterranean regions challenged by water scarcity
- Identification of mentors among operators in MENA Region and from other regions with similar context of water scarcity
- Broaden the consultation to other knowledge institutions and regional initiatives in the MENA region and compile proposals of roles and interventions in the Action Plan
- Facilitate matchmaking process between potential mentors and mentees in the perspective of developing a pipeline of WOPs projects
- Compile inputs from all stakeholders in a Regional Action Plan for utilities' capacity building on water scarcity
- Circulation of draft Regional Action Plan for second round of inputs
- Mobilizing potential regional or sector donors for funding and operationalization
- Presentation and validation of Regional Capacity Building Action Plan at EGM2 (WFES, Abu Dhabi January 2020)
- Organization of a round table with donors at WUF (Abu Dhabi, mid-February 2020) and follow up for potential funding and operationalization

Time frame													
	2019											2020	
	January	March	April	May	June	July	August	Septembe	October	Novembe	Decembe	Jan	Feb
EGM 1, WFES Abu Dhabi, 1st step consultative process													
Circulation of outcome note of EGM1													
Mapping of regional opportunities													
Mapping of operators good practices													
Establishment of online community/Thematic Hub													
Updates on results of regional consultations processes through online community													
Drafting of action plan													
Consultations with potential donors and mobilization													
Circulation of draft action plan													
Preparation of EGM2													
EGM 2, WFES 2020, Abu Dhabi for validation of action plan													
Finalization of Action Plan													
Preparation of donor round table													
Mission 4 WUF donor round table for presentation of Action Plan													

Annexes

DR. ANNE BOUSQUET, INTRODUCTION TO GWOPA AND INITIATIVE

Abu Dhabi, 17th January 2019, WFES

1. What are WOPs?

WOPs are not to be used for money-making purposes. The costs of WOPs that need to be recovered should be done so on a cost-recovery basis only.

Not-for-Profit partnerships between two or more water and/or sanitation operators carried out in the objective of strengthening their capacity to sustainably provide quality services to all.

Partnerships take place between peer service providers, be they "operators," "utilities" or municipal departments.

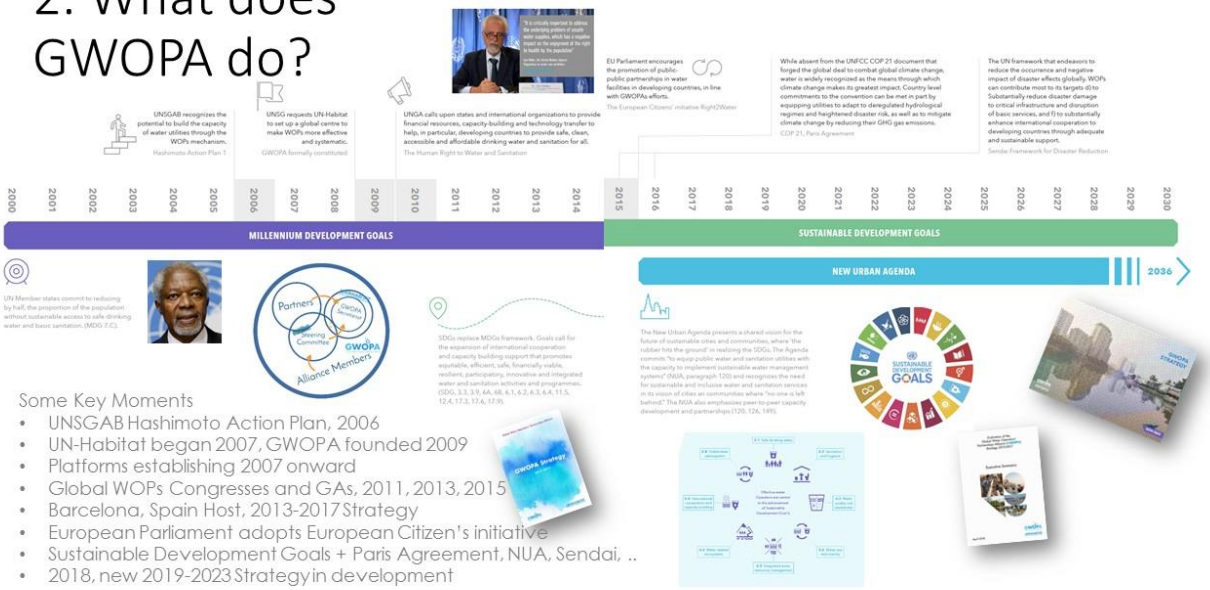
Mentors and Mentees

Inducing lasting change that takes into account social, environmental and financial considerations and contributes to the SDGs

Developing the capacity of local staff to improve performance, not doing it for them. Emphasis on learning for improved performance.

As long as they meet these criteria, PUPs, SUPs, O2O, WUPs, decentralized cooperation, city twinning… are all WOPs!

2. What does GWOPA do?



Some Key Moments

- UNSGAB Hashimoto Action Plan, 2006
- UN-Habitat began 2007, GWOPA founded 2009
- Platforms establishing 2007 onward
- Global WOPs Congresses and GAs, 2011, 2013, 2015
- Barcelona, Spain Host, 2013-2017 Strategy
- European Parliament adopts European Citizen's initiative
- Sustainable Development Goals + Paris Agreement, NUA, Sendai, ..
- 2018, new 2019-2023 Strategy in development

GWOPA Guiding Principles

A. **Inclusiveness:** GWOPA shall be as inclusive as possible and reach out to all stakeholders in the water supply and sanitation sector including public and private water operators, nongovernmental organizations and representatives of civil society, academia, and private sector players at the global, regional, and national levels.

B. **Non-profit based partnerships:** Partnerships established between water operators under the WOPs umbrella shall be built on a not-for-profit basis. Therefore, funding of partnerships – mainly done in the format of "twinning" of utilities – should cover direct costs only without profit of any sort for any participating party.

C. **Mutuality of benefit:** Mutuality of benefit shall be promoted whenever possible in implementing "twinning" and other activities of exchange of experience and expertise among utilities. Such mutuality shall be used as an incentive, whenever possible, for utility cooperation on non-profit basis.

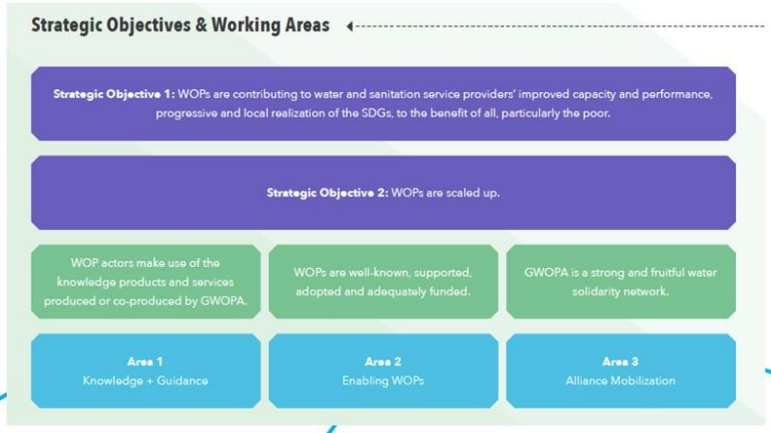
D. **Transparency:** GWOPA shall promote transparency in the water and sanitation sector on the global, regional, and national levels. The Alliance shall conduct its own activities in a transparent manner, providing clear and regular updates on activities, and equal opportunities for stakeholders to influence Alliance direction.

E. **Learning from the Past and Others:** GWOPA shall draw lessons and learn from past experiences to promote best practices for utility partnerships and capacity building.

F. **Supporting WOPs Processes Worldwide:** GWOPA shall not seek to recreate, but to reinforce, efforts worldwide to strengthen mutual exchange between water operators. In this sense, the Global WOPs Alliance supports all regional and global initiatives that champion WOPs activities and principles.

G. **Fostering Sustainable Change:** GWOPA shall support efforts to build lasting positive change within water utilities using mechanisms that are increasingly independent of external financial support.

H. **Building a Culture of Solidarity:** GWOPA shall embrace and promote a spirit of solidarity and mutual support between water operators and all other water sector actors working towards the goals of the Alliance.



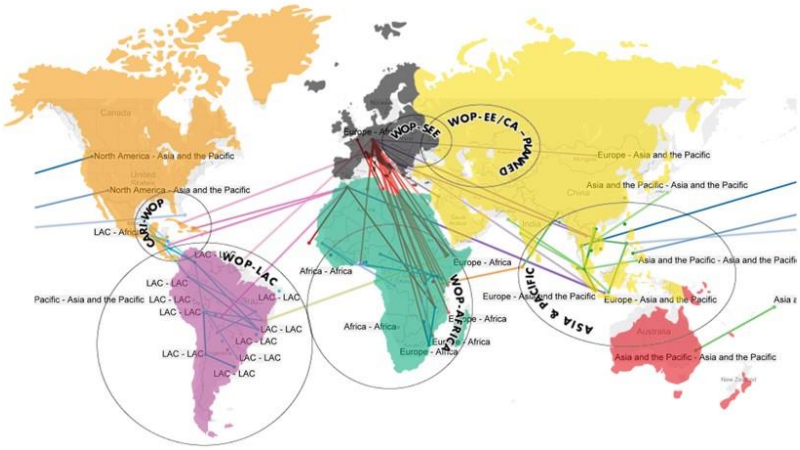
- Documenting and Researching practice
- Guiding Effective WOPs
- Guiding Sustainable Utilities
- Global WOP Observatory

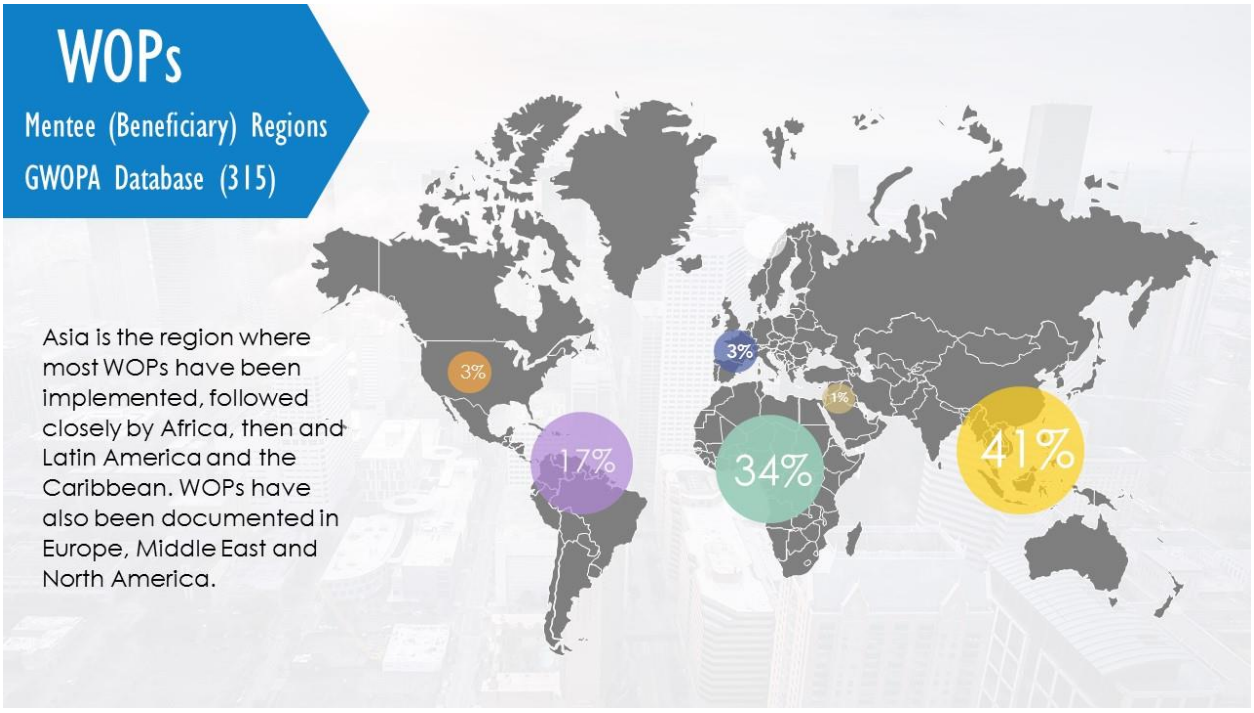
- Advocacy for enabling
  - Policies
  - Funding
- Awareness & Promotion

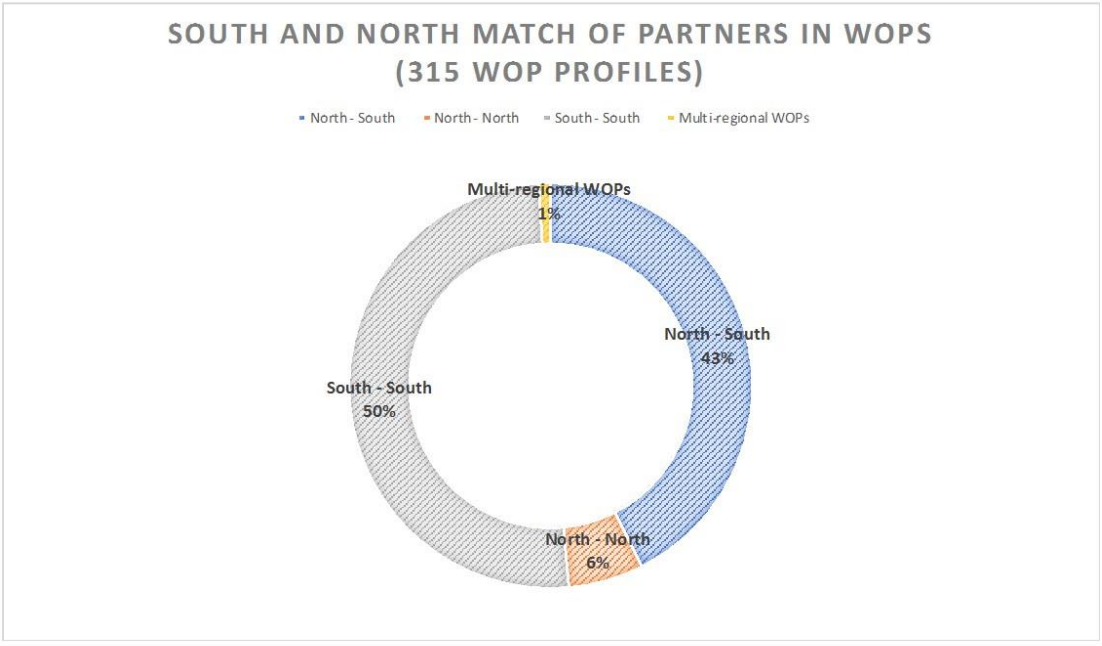
Mobilizing, connecting and leveraging involvement of:

- Members
- Partners
- WOP Platforms & Programmes

GWOPA Network of Regional & National WOP Platforms




WOPs
Mentee (Beneficiary) Regions
GWOPA Database (315)
Asia is the region where most WOPs have been implemented, followed closely by Africa, then and Latin America and the Caribbean. WOPs have also been documented in Europe, Middle East and North America.
3%
17%
3%
1%
34%
41%


SOUTH AND NORTH MATCH OF PARTNERS IN WOPS
(315 WOP PROFILES)
North - South
North - North
South - South
Multi-regional WOPs
Multi-regional WOPs
1%
North - South
43%
South - South
50%
North - North
6%

3. EGM PROCESS; Building the capacity of Arab water and sanitation utilities on water scarcity issues

Initiative approach

The objectives of the Process (EGM1 > EGM2 > WUF):

To design and set up jointly a capacity development action plan CDAP for water and sanitation utilities in water scarce cities in the Arab Region, in line with SDGs and the New Urban Agenda led by UN-Habitat to be presented at WUF10 in Abu Dhabi in 2020.

How

Identifying the priority themes for capacity building needs within Arab water operators, mapping and mobilizing potential capacity resources, within Arab operators themselves and beyond (others in similar context of water scarcity (Andalucía/Spain, Portugal, etc. – and other types of regional institutions)

Outcome (expected)

Organizing a round table at the WUF dedicated to potential donors (IFIs, Aid Development agencies, UN agencies…) in order to present the CDAP (WOP and training sessions) for funding

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DEPARTMENT OF ENERGY

EGM PROCESS; Building the capacity of Arab water and sanitation utilities on water scarcity issues

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DEPARTMENT OF ENERGY

PR. WALEED ZUBARI, ARABIAN GULF UNIVERSITY

OVERVIEW

GWOPA
Global Water Operators' Partnerships Alliance
UN-HABITAT
FOR A BETTER URBAN FUTURE

دائـــــرة الـــطـــاقـــة
DEPARTMENT OF ENERGY

Arab Water Utilities in Water-scarce Cities

General Context and Overview

Municipal Water Challenges in the GCC countries

Waleed K Zubari
Water Resources Management Program
College of Graduate Studies
Arabian Gulf University

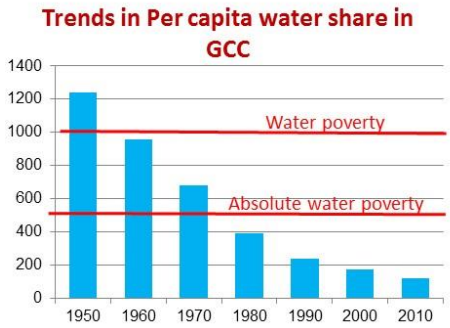
1st GWOPA EGM on 'Operators in water scarce cities', Abu Dhabi, 17th January 2019, WFES

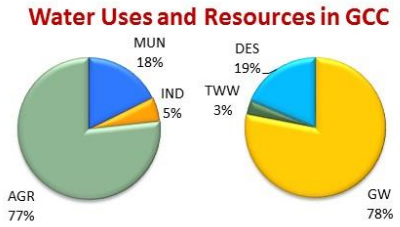
Overview

- GCC Water Resources & Uses
- GCC Municipal Water (WS&S) Utilities
- Main Challenges of Municipal Water (WS&S) Utilities
- WS&S Utilities Regional Coordination & Cooperation
- The Way Forward (adopted from the GCC UWS, 2016)

GCC Water Resources & Uses

- Extremely poor water resources endowment
- Lowest per capita renewable freshwater resources in the world, rapidly declining due to escalating population growth
- Unprecedented economic and social transformation associated with continuous increase in water demands in all sectors
- Despite water limitation, GCC have done well in providing water for their municipal sector by resorting to desalination
- Reuse of treated municipal wastewater started to become a part of the water supply sources





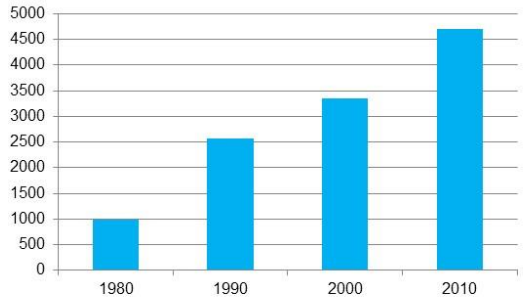
GCC Municipal Water (WS&S) Utilities

- Considered as one of the top-ranked service providers in the world
  - Water supply is being provided continuously 24/7, high quality drinking water standards, approaching 100% of the population
  - Modern sanitation services coverage 80-90% of the population, modern treatment facilities (tertiary and advanced treatment levels)
- Majority owned by governments, some are converted into authorities/ companies
- Some services are privatized (BOOT), government regulation
- WS&S utilities face major challenges at two main levels
  - Service provision in a rapidly developing countries and expanding municipal water sector
  - Achieving the attributes of an effectively managed utility (EMU) to ensure their sustainability

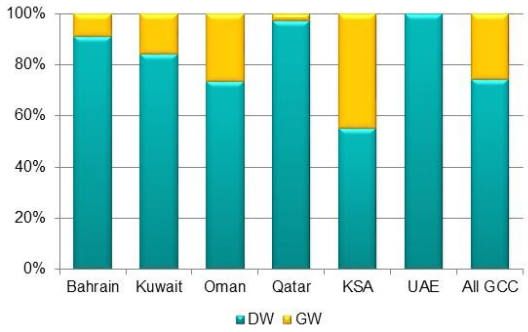
Main Challenges of Municipal Water (WS&S) Utilities

- Escalating municipal water demands:
  - Rapid population & urbanization growth
  - Irrational consumption patterns
  - Distribution network losses

MUN water consumption in GCC, in MCM



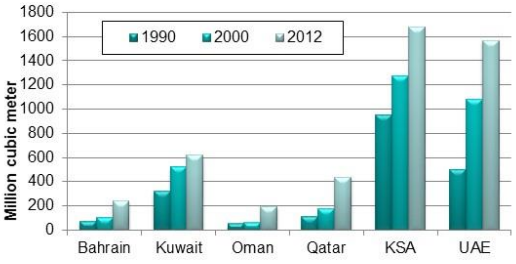
MUN Water Sources in the GCC, 2010/12



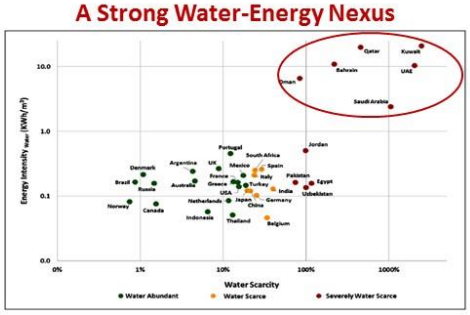
Cont., Main Challenges…

- Massive expansion in desalination to meet municipal water demands, a trend expected to continue in the next decade
- Associated with
  - Financial cost (subsidies)
  - Economic costs (energy-intensive)
  - Environmental costs (thermal brine discharge and GHGs)
- Desalination industry has limited added-value to GCC economies (imported technology)

Trends in Desalination Capacity in the GCC Countries, 1990-2012



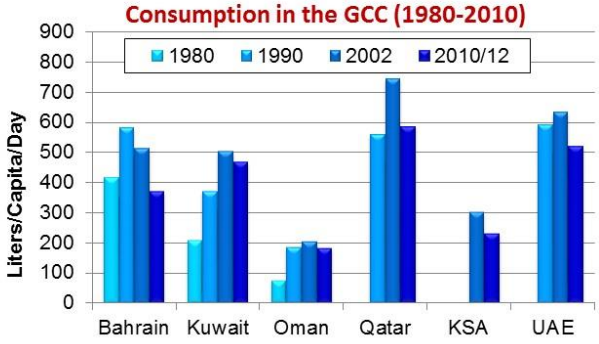
A Strong Water-Energy Nexus



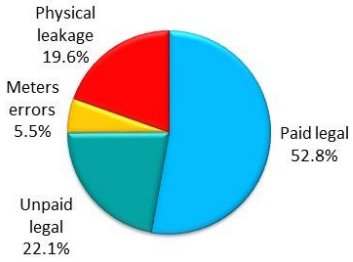
Cont., Main Challenges…

- **General low water efficiency** (supply, use, recycling and reuse)
  - High per capita water consumption in many counties
  - High physical leakage (high NRW) in distribution network in some countries – *recent major achievements in reducing physical leakage in many countries*
  - Very limited recycling of grey water

Trends in Municipal per capita water Consumption in the GCC (1980-2010)



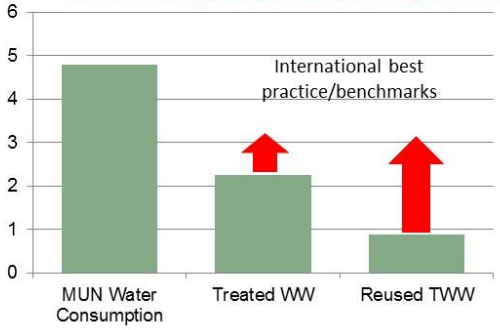
Component of Non-Revenue Water in the Municipal Sector in Bahrain (2010)



Cont., Main Challenges…

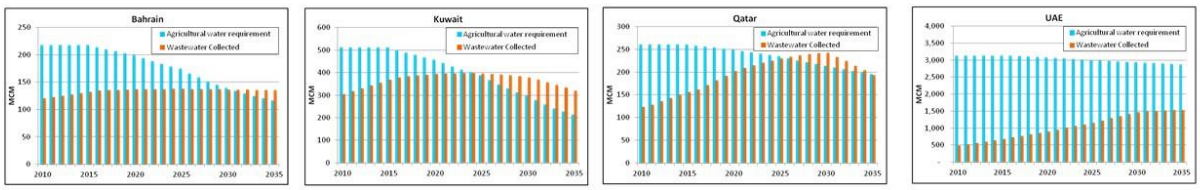
- Low efficiency in wastewater recovery (<50%)
- Large mismatch between wastewater treatment levels and reuse (40%)
- Major lost opportunity under GCC water scarcity conditions

Wastewater dynamics in the GCC Municipal water consumption, treated wastewater, and reused in 2012, in BCM



Potential water savings in the agricultural sector and potential wastewater contribution

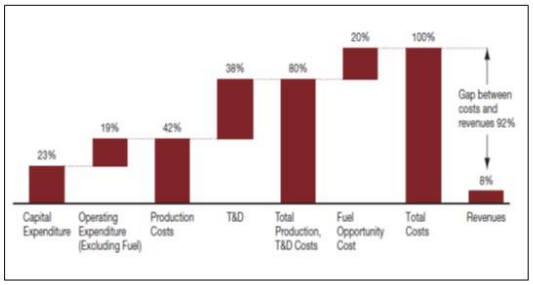
(GCC UWS Scenarios: Reduction of per capita water consumption to 250 l/d, increase wastewater collection rate to 60% minimum, increase IE to 60% min)



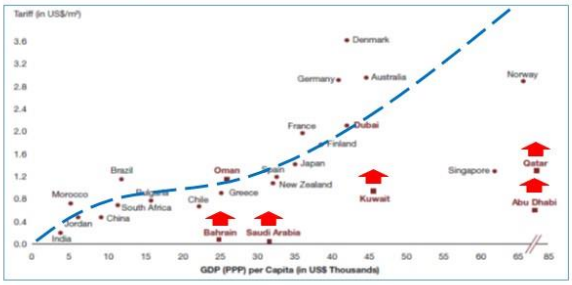
Cont., Main Challenges…

- **Low cost recovery in WS&S** (captive to government allocations) - Sanitation sector has literally zero cost recovery (except Oman and KSA)
- **Limited degrees of freedom in controlling demands** (political economy; however recent changes in some countries)

Average cost of water production, transmission, distribution and subsidies (%) in the GCC countries (Strategy&, 2014)



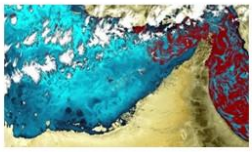
Water Tariff Compared to GDP per Capita (2012) (adopted from Strategy&, 2014)



Cont., Main Challenges…

- **Future impacts of climate change and variability**
  - Increasing temperatures, sea level rise, and extreme events of floods and droughts
- **High vulnerability of GCC desalination plants and water supply system;** numerous risks: natural or man-made, unintentional or intentional
  - **Threats to Desalination Plants**
    - Maritime contamination (e.g., nuclear and wastewater)
    - Maritime pollution (e.g., oil and chemical spills, red tide)
    - Natural disasters (e.g., cyclones, seawater flooding)
    - Actual combat (e.g., targeting desalination facilities)
  - **Threats to Water Supply System**
    - Power outage; Hacking of SCADA system; Intentional contamination of the domestic water supply

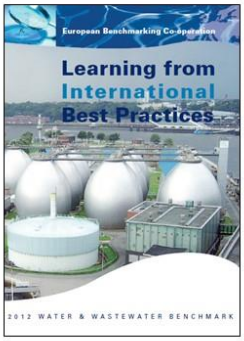

Oil Spills

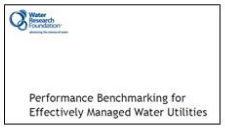

HABs


Cyclones

Cont., Main Challenges…

- **Inadequate level of governance (in the water sector as a whole)**
  - institutional and legislative frameworks; institutional capacity and human resources; data monitoring and sharing; stakeholders participation; Compliance; Dominance of sectoral planning and management, **…**
- **Absence of a Regional Benchmarking system:** to measure performance and indicate best practices in the attributes of Effectively Managed Water Sector Utilities
  - e.g., EPA 2018 for EMU: Product Quality, Customer Satisfaction, Employee and Leadership Development, Financial Viability, Operational Optimization, Infrastructure Stability, community sustainability, Water Resources Adequacy
  - e.g., IWA's 2012 for Sanitation utilities: environmental, personnel, physical, operational, quality of service, economic and financial)





WS&S Utilities Regional Coordination & Cooperation

The GCC Water Resources Committee

- Established in 2002, hosted and coordinated by the Electricity and Water Directorate in the Secretariat General
- Representatives from GCC water Ministries and Authorities, rotational chairmanship
- Mandates:
  - Development and management of water resources and uses
  - Formulation of water legislation and regulations
  - Training and information exchange
- Achievements
  - GCC water statistics Book (biannual)
  - Desalination in the GCC
  - Water Grid Study
  - GCC Laws on Groundwater and Surface Water; Desalination; and Wastewater
  - GCC Unified Water Strategy and Implementation Plan 2035 (2016)

The Way Forward (adopted from the GCC UWS, 2016)

- Adopt a regional benchmarking system for WS&S utilities to enhance utility sustainability
- Establish an advanced joint R&D and tertiary education programs in desalination and wastewater treatment
- Enhance the capacity and performance of water supply and sanitation personnel (certification programs, e.g. ACWUA's)
- Diversify energy sources (renewables and alternative) and enhance energy efficiency and desalination and wastewater sectors
- Mitigate environmental impacts of desalination and wastewater sectors
- Increase wastewater collection rates, treatment capacities, treatment levels and reuse rates
- Increase supply efficiency and manage demands in the municipal water sector
- Establish a highly resilient system for potable water supply under emergencies (storage, alternatives water supply sources, early warning system, ..)
- Ensuring integrated municipal water planning and coordination

PANEL 1. UTILIIES CHALLENGES AND LOCAL SOLUTION

Characteristics of Water Resources in Egypt

- Egypt is below the level of water poverty.
- The main water resource is the Nile River.
- Groundwater is distributed within the country but with different characteristics in terms of quality, depth and quantities available.
- Rainwater and flood waters are limited and irregular in quantity and timing.

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Challenges Facing Water Management in Egypt

- Limited Water Resources
- Population growth lead to;
  - Increase in drinking water needs
  - Increase the food production, which means agricultural expansions and additional water needs
  - Pollution of waterways and degradation of water quality, resulting inadequate resources for drinking water use.

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- The increase in the rates of development in Upper Nile and its effect on the water contained in the high dam, such as Al Nahda Dam.
- Effects of potential climate changes:
  - May lead to the reduction or increase of rainfall at the sources of Nile and thus decrease or increase the amount of water received in Egypt
  - High temperatures will increase water requirements.

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How water scarcity affects our utilities?

- The low level of water in the Nile River leads to the need to decrees the intake level of the water treatment plants, which leads to increasing the water pollution and the inability of the water treatment plants to achieve the required treatment for water.

- The inability of water treatment plants to work efficiently to overcome the pollutants water coming to them leads to serious health problems for citizens

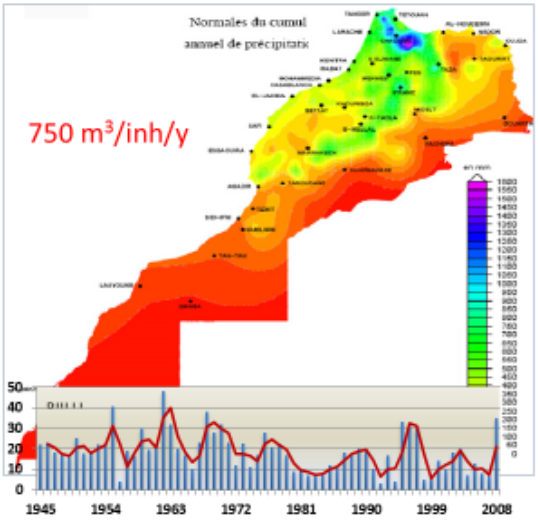
- Lack of water availability from the Nile leads to the inability of water companies to meet the water customer needs, and consequently forcing them to seek other alternative more expensive solutions.

- Failure to provide drinking water in quantity and efficiency required leads to customer dissatisfaction and therefore lack of bills collection which causes weak corporate resources.

المكتب الوطني للكهرباء و الماء الصالح للشرب
Office National de l'Electricité et de l'Eau Potable
المعهد الدولي للماء و التطهير
institut international eau & assainissement

How water scarcity affects ONEE, MOROCCO

Morocco : Water scarcity and variability in time and space



- Environmental and technical impact
  - Water quality degradation (eutrophication …)
  - Aquifers depletion
  - Salt water intrusion
  - underutilization of facilities

- Social impact :
  - Disturbance in continuity of service
  - Customer claims
  -

- Financial impact
  - More expensive solution (non conventional water, distant WR ..)
  - Energy consumption increase (Aquifer depletion)
  - Treatment cost increase

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EELN, City: TRIPOLI, Country: LEBANON

How water scarcity affects your utility?

- Shortage in securing the required water service, especially in terms of quantity, pressure and quality.
- Stress of production facilities.
- A decline in the rate of collection and consequently a decline of revenues.
- Destabilization of the activities of the institution, especially in the field of operation and maintenance as well as in funding the solutions to the various issues.

- High pollution risk due to erosion of distribution networks coupling with the low pressure.
- Increase the efforts exerted in the field of sensitization, awareness and to response to protest campaigns.
- The inability to provide service in the new neighborhoods in the city due to the shortage of water resources.
- The fragile service reality largely controls business choices, particularly in tariff policy.
- The shortage of human resources negatively affects the efficiency of the institution and the enthusiasm of its employees.

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دائـــــرة الـــطـــاقـــة
DEPARTMENT OF ENERGY

Department of Energy
City: **Abu Dhabi**
Country: UAE

How water scarcity affects water/and or sanitation services by the utilities in your country/city?

- Water services for domestic consumption is met almost 24/7 for all the customers in emirate of Abu Dhabi
- Water Services is connected to almost 99% of the customers
- Wastewater services is provided for collection, treatment and disposal for more than 98% of the populations.
- With Modern infrastructure and adopting best practices along with tariff reforms services are ranked among the top in terms of service of connection .
- Water scarcity affects the free hand production of food with Agriculture sector demand
-

How do our utilities address water scarcity?

Ministry of Housing Utilities & Urban Communities City: **Cairo**
Country: **EGYPT**

How do our utilities address water scarcity?

The Ministry of Housing, Utilities and Urban Communities has set out clear plans and future visions to meet the challenges through the following steps;

- Develop a Master Plan and periodically updated to bridge the water gap in coordination with the concerned ministries ..Planning.. Irrigation .. Agriculture ..Health .. Environment.

- Holding Company for Water and Wastewater has prepared a Master Plan for water desalination to cover all governorates from 2014 to 2037. Several desalination plants have been implemented with total capacity of 300,000 cubic meters per day until the end of 2018. Desalination plants are expected to reach 747,000 cubic meters per day in 2022 and to reach 2.6 million cubic meters per day in 2037.

- Intensify customer awareness campaigns in schools, mosques and churches on the importance of water consumption rationalization.

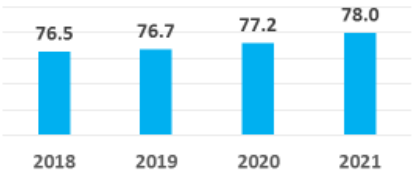
- Starting to move the water tariff to gradually reach the actual treatment cost to ensure that customers will be keen to rationalize the water consumption.

- Develop programs to detect water leakage to reduce losses where the percentage of leakage loss is about 30%

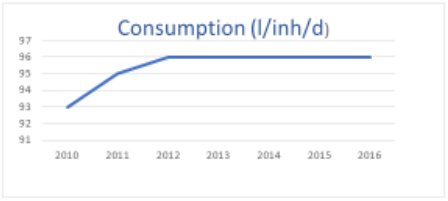
MOROCCO. ONEE's Policy to cope with water scarcity

Water demand management

- Non Revenue Water Management
  - Technical aspect
  - Commercial aspect

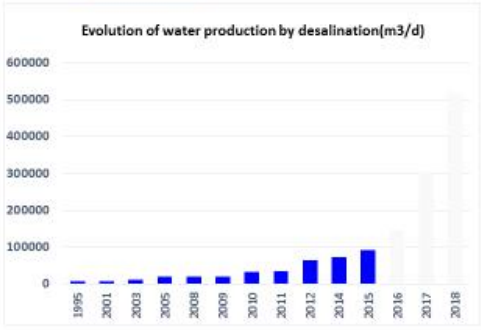


- Reduction of individual consumption
  - Public awareness
  - Pricing



Non conventional water resources

Desalination



Reuse of treated Waste Water

- **Industry**: phosphates washing in Mining cities (Khouribga, Benguerir
- Watering golfs and green areas : Marrakech, Bouznika, Essaouira, Ain Aouda, Laayoune, Dakhla

Artificial recharge : Tangier aquifer

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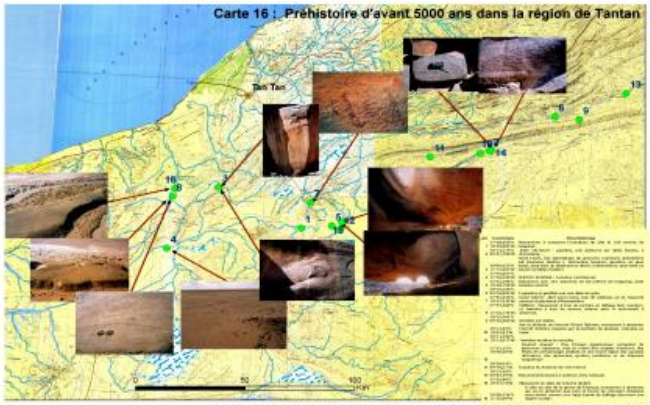
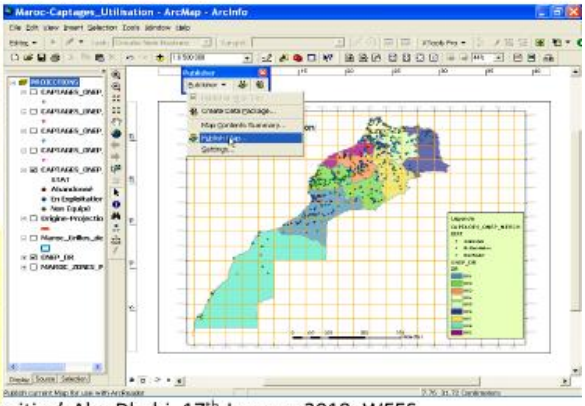
MOROCCO. ONEE's Policy to cope with water scarcity

R&D and capacity building

- Mechanisms of climate change and paleo-climate
- Decision support system (on GIS) for optimization and alternative solutions





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EELN, City: TRIPOLI, Country: LEBANON

How does your utility address water scarcity?

- Increase production capacity to the maximum limits allowed by groundwater, without depletment.
- Completing the laboratory's equipment, products for analyses, human ressources and effective sampling program.
- Renewal of about 70% of worn-out networks with the assistance of the European Investment Bank, the French Development Agency and the Lebanese government.
- Renewal of about 25000 meters with the assistance the French Development Agency
- Conduct a surveys to clean up the customer databases with the assistance the German Agency for International Support (GIZ in El Mina) and the French Development Agency in the others parts of the city.

- The implementation of the tariff according to the consumption of 35% of the subscribers so far.
- Consumption in El Mina (6000 subscriber) dropped from 300 l/c/d to 90 l/c/d.
- Setup a Performance Improvement Plan (GWOPA).
- Launch a partnership between the North Lebanon Water Establishment and three water and wastewater Belgian Institution CIL, SDWE and SPGE (GWOPA).

EELN, City: TRIPOLI, Country: LEBANON

The issues treated under this partnership are:

1. Setup of a human resources development program.
2. Organization of the waste water sector in North Lebanon.
3. Improve management of NRW (leakages, illegal connections, ...).
4. Enhance the network repairing procedures and records.
5. Implement a subdivision of service area into DMAs (District Metering Areas).
6. Launch a training program to allow change of expertise.
7. Create a specialized unit in the field of communication.

Any other comment

Water scarcity requires water security which must be based on:

- Good management of water resources
  - Master Planning
  - reallocation of water resources
  - Water Governance
  - Water Demand Management
  - policies in Agriculture…
  - Education in Universities and schools
  - Unconventional water resource in treated wastewater and reuse and declination.
  - Climate Change mitigation.

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EELN, City: TRIPOLI, Country: LEBANON

Any other comment

- Develop the best practices in utilities
  - Asset management
  - NRW Reduction
  - Maintenance Systems
  - Energy Efficiency
  - Reaching O&M cost recovery
  - Adaptation of water safety Plan
  - Developing a Sanitation Safety Plan
- Leadership empowerment in managing water utilities
- Building capacities and certifying operators and facilities.
- Financing
  - Financial sustainability through efficiency and tariff restructuring.
  - Involvement of the private sector in different types of activities

- Institutional Reform
  - Decentralized public owned utilities
  - Commercialization and corporatization

To assure these conditions, many utilities in development countries are in need of help and support, from not only their own governments or international institutions but also from similar operators which already have the required competencies.

All the bilateral actions can be implemented in a complementary way avoiding any overlapping in order to reach the objectives without wasting time or money.

Thus, we must be all partners when it comes to achieve the SDG's objectives in term of services or time.

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DEPARTMENT OF ENERGY

- Integrated water management (three taps) Ground , desalinated and Recycled
- Demand Side management
- Minimising water Losses
- Awareness
- optimising the water resources with appropriate allocation policy
- Understanding the Value of Water by identifying the sector needs and the quality/Quantity
- Governance at strategic and operational levels
- An Integrated Energy Management Model encompasses all energy aspects including water.

PANEL 2. REGIONAL INITIATIVES AND OPPORTUNITIES

ESCWA

- ESCWA was established in 1973 with the purpose to stimulate economic activity in member countries (currently 18 Arab countries), strengthen cooperation between them, and promote sustainable development.
- ESCWA provides a framework for the formulation and harmonization of sectoral policies for member countries, a platform for congress and coordination, a home for expertise and knowledge, and an information observatory.
- ESCWA activities are coordinated with the divisions and main offices of the Headquarters of the United Nations, specialized agencies, and international and regional organizations, including the League of Arab States and its subsidiary bodies.

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Arab Countries Water Utilities Association

The Arab Countries Water Utilities Association (ACWUA) was founded as a result of an initiative by key water utilities experts in the Arab Region.

- ACWUA is hosted by the Jordanian government.
- Agreement was signed between the ministry of water and irrigation presenting the Jordanian government and ACWUA's president in December 2008.
- ACWUA's HQ spaced on city of Amman (the capital of Jordan).
- Geographical scope: all the Arab countries, international organizations and privet sector working on the water industry.

ACWUA Vision

ACWUA, as a global center of excellence, will work in partnership with water and wastewater utilities in the Arab countries, on building capacities within the utilities, and on instituting best practices, in order for the utilities to achieve their objectives

ACWUA Mission

ACWUA Mission, is to provide its services to its members in the Arab region relying on its own resources and on the competencies inherent within the member utilities, with the objective of providing them with technical support to develop their performance in managing and producing and supplying water and wastewater services, taking into consideration their technical and professional needs

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Arab Countries Water Utilities Association

ACWUA's approach as a tool for capacity building in water and wastewater

- Technical Working Groups
- Certification & Training Courses
- Advisory & Consultation
- Projects, Research & Studies
- Best Practice Manuals and Operational Guides
- Best Practice Conferences & Exhibitions
- Arab Water Week International Conference & Exhibition
- E-learning Courses

- ACWUA Newsletter
- Technical Journal
- White Papers
- Press Releases

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Arab Countries Water Utilities Association

ACWUA Technical Working Groups (TWG)

Management of Utilities
- Cost Recovery
  - Non Revenue Water
  - Water for the Poor
  - Energy Efficiency
- Asset Management

Management of Water Resources
- Governance
- Master Planning
- Protection of Resources
- Adaptation to Climate Change
- IWRM

Utilities Reform
- Autonomy/ Commercialization
- Public-Public Partnership
- Private-Public Partnership

Benchmarking

Capacity Building & Training
- Training Strategy
- Certification

Water & Health
- Domestic Water Supply
- Waste Water Treatment and Re-use

Public Awareness

Quality Management Systems (QMS) Task Forces - Technical Sustainable Management (TSM Arab)

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Arab Water Council (AWC)

City of HQ: Cairo - Egypt
Geographical scope: Arab Region

AWC was established in 2004 with Objectives to:

- Shape a strong Arab voice to face the regional challenges and requirements for achieving the Sustainable Development Goals (SDGs).
- Develop regional strategies and providing policy directions.
- Build human and institutional capacities in water- related issues.
- Initiate and strengthen regional and international cooperation and partnerships to tackle water-related challenges, for achieving sustainable development in the Arab Region.
- Coordinate efforts to incorporate Integrated Water Resources Management, promote sustainable solutions for shared water resources, tackle climate change impacts on water resources and promote Water/Energy/ Food Nexus (WEF).
- Build capacities and disseminate knowledge as well as enhance sharing of experiences and success stories

MISSION: **The Arab Water Council** endeavors to promote better understanding and management of the water resources in the Arab States in a multi-disciplinary, professional and scientific manner; to disseminate knowledge, enhance sharing of experience and information for the rational and comprehensive water resources development of the region for the benefits of its inhabitants.

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AEAS, SPAIN

- The technical association of water and wastewater utilities in Spain (representative 80% of population)
- Managing legislative issues with Spanish ministries
- Member of European Water Utilities Federation, EurEau
- Meeting Point for cooperation among utilities in technical fields: water intake, wastewater management, scarcity, etc
- Technical documents, meetings, congresses

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Which capacity building activities are coordinated or provided by your organization which could be an opportunity for utilities in the region?

ESCWA

UNITED NATIONS
الاسكوا
ESCWA

- Regional Initiative for Establishing a regional Mechanism for Improved Monitoring and Reporting on Access to Water Supply and Sanitation Services in the Arab Region, MDG+ Initiative. Implemented with Arab Ministerial Water Council and ACWUA
- Developing the capacities of Arab Countries for Climate Change Adaptation Using IWRM Tools based on RICCAR outputs. Developed training module for Human Settlements with ACWUA
- Developing the Capacity of ESCWA Member Countries to address the Water and Energy Nexus for Achieving SDGs. Implemented Nexus pilot initiative with SONEDE in Tunisia
- Arab Integrated Water Resources Management Network (AWARENET): regional network hosted by ESCWA for the development and delivery of capacity development. Recent activities on Water integrity with focus on Regulation of water sector.

AWARENET Arab Integrated Water Resources Management Network

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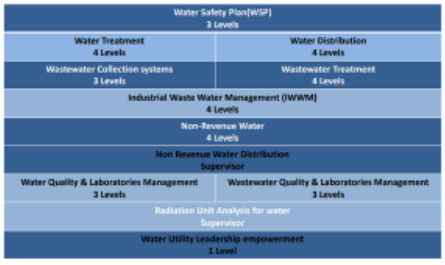
ACWUA

Which capacity building activities are coordinated or provided by your organization which could be an opportunity for utilities in the region?

1. Certification programs for operators

Developing and updating 35 certification programs



These training programs were revised by:

- Central of Accreditation and Quality Assurance (CAQA)
- Association of Boards of Certification (ABC)
- Umwelt Bundesamt (UBA)/ Federal office for environment (Germany)
- International experts (IWA and World Bank)

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2. Supporting the Arab Utilities in providing their customers with the best services possible

• Non-Revenue Water (NRW) reduction plan, knowledge sharing workshop and water utility management training in Jordan /funded by USAID. (NRW) reduction plan for Jordanian utilities and exchange local and regional experiences in management NRW

MADAD 1 &2 Project / funded by EU
MADAD Consortium - Promoting Sustainable Management of Water Services and Resources in Countries Affected by the Syrian Crisis. – Helping the hosting utilities and communities to provide WASH service to Syrian refugEes by reducing NRW and save water resources – Target the utilities and communities : • North Lebanon Water Establishment (NLWE) /Akkar (Qatlabeh,Akroum) and Tripoli (El Fouar and • Water Establishment (BWE)/ Qaa, Zabboud, Bejeje, Nabi Osmane, El Ain, Toufiquiye, Labwe, Moqraq, Khodor, Nassriyeh and Qab Elias • South Lebanon Water Establishment (SLWE)/Bint Jbeil

SWIM_H2020/funded by EU
"Identification of Non-Revenue Water (NRW) and Intervention for Leakage Reduction" in Algeria

3. Energy Efficiency :
with GIZ developed Energy Efficiency Reader and Guidelines.
- Jordan – Lebanon, funded by USAID, TOT

- **4. TSM Arab:**

TSM Arab in cooperation with GIZ , HCWW in Egypt and DWA :
- manuals about the requirements of Technical Sustainable Management in treatment facilities
- Experts certified to be editors
- 4 facilities audited and certified in Jordan , Egypt and Tunisia

5. Water Tap : Water Tap Manual-Jordan, Egypt, Morocco and Tunisia.

6. Utilities Management and utilities reform: Case studies in 10 Arab Countries and manuals developed (Lebanon, Palestine, Yemen, Tunisia, Morocco, Jordan, Algeria, Syria, Egypt and Mauritania).

7. Public Awareness: Reader- Good Practices in Public Awareness experience in the MENA Region: Jordan, Lebanon, Egypt, Palestine, Egypt, Tunisia, Morocco and Yemen.

8. Match making manual and agreements between members utilities and international utilities.

9. Projects, studies, researches and consultations (ex. Regulatory Framework and Strengthening National Standards for Wastewater)

10. Jordan: Water Sector Benchmarking - Phase II Regional Program (funded by UNESCO) Supporting gender mainstreaming component in Jordan's water sector strategy (2016-2025)

11. SWIM_H2020/funded by EU

ARAB WATER COUNCIL

Which capacity building activities are coordinated or provided by your organization which could be an opportunity for utilities in the region?

- Water indicators for monitoring level of services at the water sector and preparing state of the water reports (SDG6) targets and agenda 2030;
- Preparation of IUWM plans in water scarce cities;
- Wastewater reuse strategies (Challenges & opportunities)
- IWRM including WDM training;
- Role of private Public Partnership (PPP) in the integrated management of urban water;
- Governance institution/ reform/ policies & strategies;
- Water supply and sanitation efficient systems (operators, practitioners & decision makers);
- Legislation, regulation and standards (laws & codes);
- Use of modern science and technology (RS & GIS) in the management of water resources;
- Climate risk management (awareness, national plans adaptation policies infrastructure – TOT);
- Water quality management.

- **Enhancing the concept of IWRM, WDM & SDGs linkage and implementation**
- **Building resilience and raising awareness for local communities in water and environmental issues;**
- **Shared water Governance (water diplomacy – conflict resolution);**
- **Use of advanced technology to increase water efficiency and productivity at farm levels;**
- **Strengthening communication educational courses and awareness raising with (media, civil society, farmers and parliamentarian);**
- **Water, Energy, Food and Environment Nexus;**
- **Enhancing dialogues for decision makers on policies and strategies for better water management.**

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AEAS, SPAIN

Which capacity building activities are coordinated or provided by your organization which could be an opportunity for utilities in the region?

- Relationship with Spanish water and wastewater supply companies
- Know-how of the Spanish sector in scarcity, wastewater management, non-revenue water, etc

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Do you have any suggestion for utilities Capacity building activities relevant for the theme of the EGM?

ESCWA

- Monitoring, reporting and achieving the SDGs
- Assessment of climate change impacts on utility services and infrastructure and development of adaptation plans
- Water-energy nexus assessments for water utilities
- Human rights based approach to water

ACWUA

Do you have any suggestion for utilities Capacity building activities relevant for the theme of the EGM?

- Hosting the best practices in water and waste water sector in the region.
- More efforts and co-operation between water associations in different regions.
- Mapping the needs of the water operators in building capacity researches and institutional support.
- Expanding the exchange of knowledge between different assertions.

ARAB WATER COUNCIL

Do you have any suggestion for utilities Capacity building activities relevant for the theme of the EGM?

1. Support and assist developing national and local strategies plans and road maps for scaling up water supply and wastewater reuse;
2. Training on preparation of Integrated Utilities Water Management (IUWM) plans in water scarce cities including drinking water and sanitation;
3. Training of the trainers (TOT) to raise the capacity of the users of the small scale water utilities (associations) to efficiently run facilities and make optimal use of existing infrastructure;
4. Developing a standard package/guideline for cost effective and efficient water systems;
5. Regional and national training to raise the capacity to access to the available international funds;
6. Developing economic instruments and creation of revolving sustainable funds (finance)
7. Promoting stakeholders capacity for safe reuse of wastewater low cost technologies and best practices of wastewater treatment plan.

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AEAS

Do you have any suggestion for utilities Capacity building activities relevant for the theme of the EGM?

- Scarcity has been a problem in water utilities in Spain for a long time. It should be address by two different solutions: a)increasing the water offer (desalination, wells, dams) b)reducing non-revenue water
- Relationship between State and Water operators for financing challenges: infrastructures and non-revenue water reduction plan
- Technical analysis of weaknesses of water utilities

OTHER COMMENTS

ESCWA

- Importance of water utilities in achieving water security in the Arab region
- Leave No one Behind
- Women empowerment

ACWUA

1st GWOPA EGM on 'Operators in water scarce cities', Abu Dhabi, 17th January 2019, WFES

ARAB WATER COUNCIL

1. Mapping out existing initiatives and knowledge (who is doing what?) while recognizing added value from synergies and complementarities;
2. Assist in assessing state of water developing IUWM plans in water sacristy cities (Alexandria, Egypt and Mogadishu, Somalia);
3. Activate the role of the private sector in the management, operation and maintenance of water utilities
4. Promote the concept of sustainable development (SDG6) with specific focus on gender equality and youth engagement.
5. SDG6 training , planning, developing , implementation mechanisms and monitoring plans;
6. Water energy NEXUS and energy optimization for sewage treatment plants;
7. Strengthen regional partnership and knowledge network and cooperation.

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