



Achieving Water Security In A Changing World

October – 2020

Webinar Series
Whitepaper



The Abdullah Bin Hamad Al-Attiyah International Foundation for
Energy & Sustainable Development



INTRODUCTION

ACHIEVING WATER SECURITY IN A CHANGING WORLD

The Abdullah bin Hamad Al-Attiyah Foundation for Energy and Sustainable Development provides robust and practical knowledge and insights on global energy and sustainable development topics and communicates these for the benefit of the Foundation's members and community.

In 2020, the Foundation hosted a webinar series, in partnership with Refinitiv, to explore key trends and insights as the coronavirus pandemic impacts the energy industry and hastens the transition to renewable energy. The most recent webinar in the series explored the potential of treated wastewater to ease worsening water stresses in the Middle East and North Africa (MENA) and increase access to safe, clean water for sanitation, and human consumption.



Webinar Series

H.E. Abdullah Bin Hamad Al-Attiyah founded the Webinar Series as a platform for knowledge exchange and support for the global community in the quest towards a sustainable energy future. The quarterly events, which have been hosted in Qatar for three years, are a crucial networking and learning opportunity in the calendar of industry CEOs.



Of the United Nations' 17 Sustainable Development Goals (SDGs), goal No.6—access to clean water and sustainable sanitation to all by 2030—is undoubtedly among the most important. Yet worldwide, 2.1 billion people—or four in ten of us—lack access to safe drinking water services. Six in ten, —that is 4.5 billion people—, lack access to safe sanitation. Two in five people must do without basic hand-washing facilities.

Therefore, creating and implementing environmentally friendly wastewater management solutions will be crucial to achieving the SDGs and ensuring water security. Water-scarce countries, in particular, should harness all available water sources, including the reuse of treated wastewater for a variety of applications.

- Water shortages weigh on regional GDP and can cause geopolitical strife as rival countries compete for scarce resources.
- Wastewater can ease MENA's acute water stress, but a sceptical public needs reassurance about the safety of recycled water.
- Policymakers should first focus on less controversial wastewater uses such as for industrial processes like oil and gas production and district cooling.

The public—and many decisionmakers—have yet to be convinced that treated wastewater can be safely used in applications, where that water could ultimately enter the human food chain, whether it be to irrigate and fertilise agricultural land or for direct consumption.

However treated wastewater could ease some of MENA's biggest water challenges, boosting economic growth, and reducing geopolitical



Konstantina Toli,
Theme Leader & Senior Programme Officer,
Global Water Partnership Mediterranean (GWP-Med)

tensions as neighbouring countries vie for the arid region's diminishing water resources.

In MENA, 71% of the economy and 61% of the population is exposed to high or very high water stress, according to Konstantina Toli, Theme Leader & Senior Programme Officer at Global Water Partnership Mediterranean (GWP-Med).

"It's not only about water per se, it's about the economy, it's about our lives, our ecosystem," said Ms. Toli, noting that progress in achieving SDG No.6 was lagging proscribed targets. "We need a new water culture. We need consumers and decisionmakers to understand the value of water."

MENA is the most water-stressed region globally, according to the World Resources Institute. Iraq, south-west Yemen, the Levant, and much of Iran and Morocco are among the areas where this stress is most acute. Despite chronic water shortages, only about 18% of MENA's wastewater is reused. The wealthy Gulf relies on water desalination for its water, but this typically involves a costly, energy-intensive process.

IMPROVING WATER EFFICIENCY



**Mr. Abdourahman HG Maki, Land and Water Officer,
Food and Agriculture Organization of the United Nations**

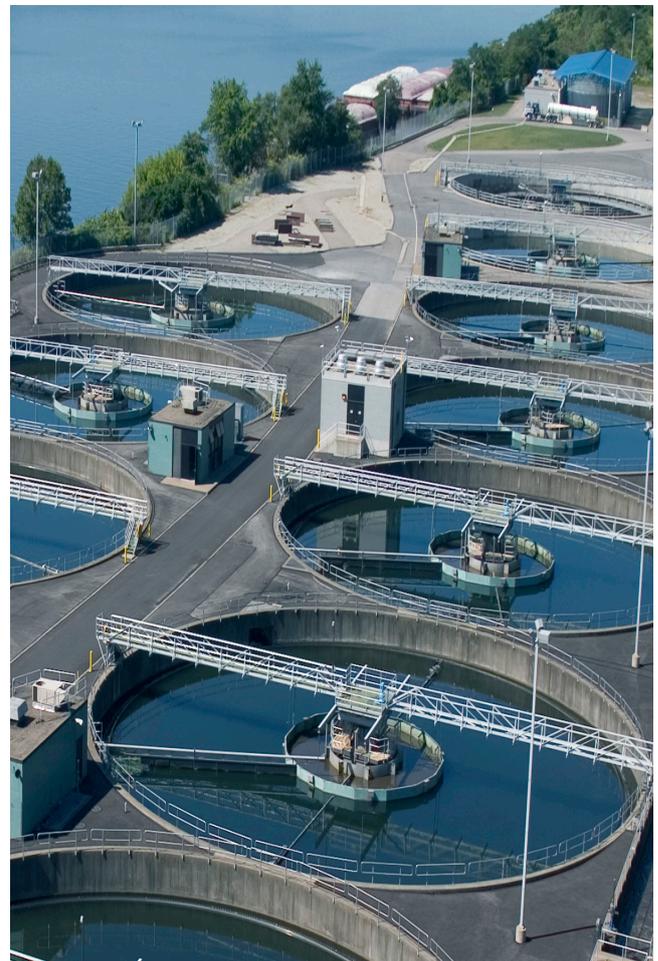
"We need solutions, and what are the solutions? We need to improve water efficiency, [upgrade] wastewater treatment, and expand sustainable water desalination, sustainable water management, and wells. These will eventually increase our water security and to do them requires political will," Ms. Toli emphasised.

Agriculture accounts for around 85% of MENA's freshwater consumption, with the industry's water use likely to increase further as the population expands along with food demand, said Abdourahman HG Maki, Land and Water Officer at the Food and Agriculture Organization of the United Nations.

Biosolids, the nutrient-rich by-product of the wastewater treatment process, is an effective fertiliser. In contrast, wastewater has long been used in agriculture but was found to have potentially adverse effects on health and crop quality. This led the World Health Organisation (WHO) to publish the first guidelines on wastewater use in agriculture in the early 1970s. These were updated in 1989 and 2006 to take into account recent scientific research, said Mr. Maki.

Growing worries about antimicrobial resistance and the Covid-19 pandemic led the WHO to issue a technical brief this year on wastewater management. Such concerns do not mean wastewater is unsafe, just that it must be appropriately treated, panellists said.

The varying quality of treated wastewater undermines its reuse potential. Audience members were asked in a poll during the webinar about what they believed were the most significant barriers to the mainstream reuse of industrial water. Among respondents, 33% cited high treatment costs, and 24% said the lack of public acceptance. In comparison, the potential chronic toxicity of the treated water and lack of a one-size-fits-all solution were each named by 10% of participants.





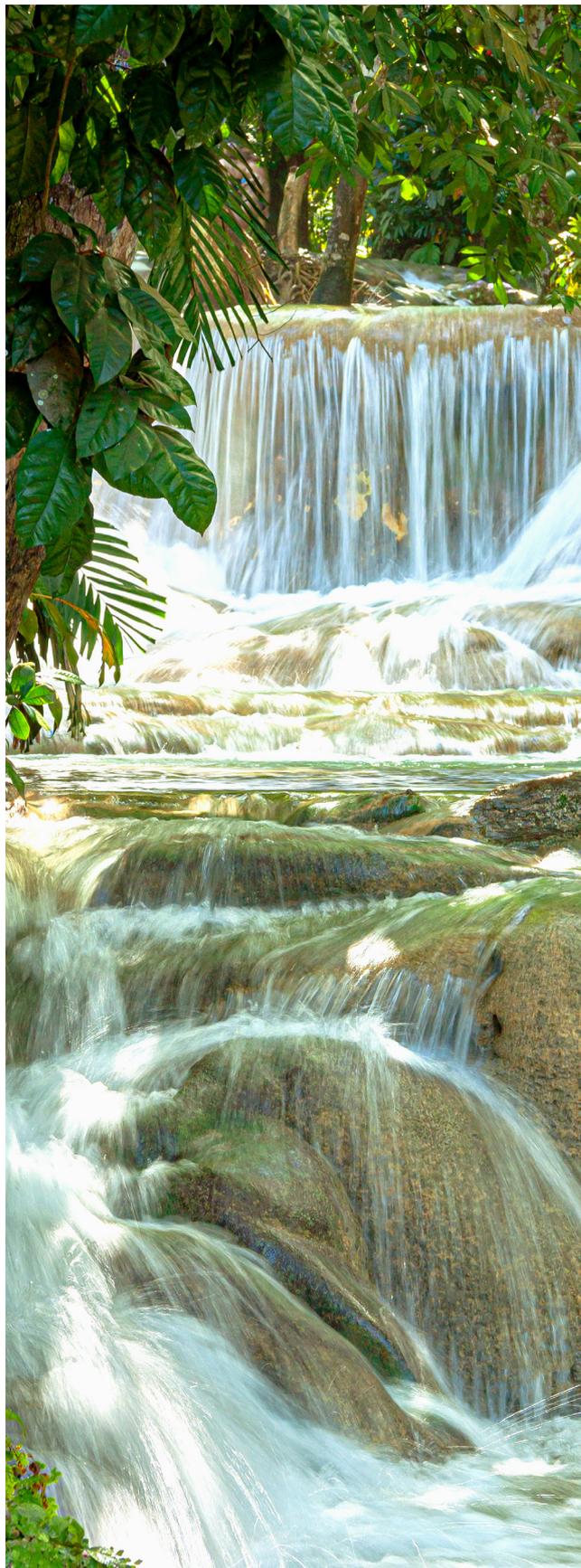
Dr. Jauad El Kharraz, Head of Research, Middle East Desalination Research Center

"Public acceptance of wastewater use is highly connected with the [level] of water scarcity in the country," stated Dr. Jauad El Kharraz, Head of Research at the Middle East Desalination Research Center. "The rate of wastewater treatment is still low in many MENA countries."

Wastewater treatment plants are often poorly maintained and operated beyond the designed capacity, which in turn jeopardises the quality of the treated water.

"While [the] growth of wastewater will be driven by population growth, wastewater will need investment to extend collection and treatment networks," said Dr. Kharraz. "Most importantly, wastewater recycling needs to be explicitly included in national water planning policies and [media] campaigns to ensure public acceptance."

Only half of wastewater is treated, and only 20-30% of what is treated is being reused, Mr. Maki noted. "People aren't confident enough to mix potable water networks with treated wastewater even though it could be of the same quality or even better," stated Mr. Maki.



TREATED WASTEWATER

Much like how kitchen taps deliver drinking water and bathroom faucets provide water unsuitable for human consumption, treated wastewater requires different quality levels depending on its subsequent use.

"If we treat water in order to be used for potable water, then we have to apply the highest levels of treatment," said Ms. Toli. "If we're talking agriculture, there are different levels of treatment depending on the end-use. It's different to grow vegetables or to grow fodder", added Ms. Toli.

Mr. Maki said it was vital to monitor the quality of treated wastewater. "This is what undermined social acceptance ... it's one of the most difficult issues, it can [decide] whether a decisionmaker puts in the money required," the UN official emphasised. Mr. Maki added, "Decisionmakers don't want to be responsible for supporting using waters that could cause health issues later on."

In many Arab countries, regulations and standards related to water use have been implemented in a piecemeal fashion. "It's therefore worth considering an overhaul of regulations and standards to be harmonised and simplified," said Dr. Kharraz.

Although still energy-intensive, seawater desalination has become significantly more energy-efficient over the past few decades thanks to various factors such as superior membrane chemistry and higher-efficiency pumps. Most important, however, has been advances in energy recovery devices, which have cut energy consumption by up to 60%.

"There's big progress in this area, and I expect in the next five years there will be margin to improve this further," highlighted Dr. Kharraz, noting renewable energy-powered

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Stephen Cole,
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Speaker:



Mr. Abdourahman
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Water Officer, Food
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Speaker:



Dr. Jauad El Kharraz,
Head of Research,
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Speaker:



Johnny Obeid,
Vice President,
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Middle East

desalination plants are starting to gain traction. As such, desalination—along with recycling wastewater—can play a sizeable role in reducing regional water stress.

A second poll quizzed the audience on the strategies that governments and water utilities should deploy to strengthen water security and sustainability; 34% of respondents recommended expanding the use of treated industrial water, and 31% want to increase desalinated seawater production. Adding treated wastewater to potable water networks was suggested by 12% of participants, with a further 6% advocating higher water prices.

"We need to expand the use of treated wastewater—it's very low in the region except [for] Jordan and some countries who are



Johnny Obeid, Vice President, Veolia Water Technologies - Middle East

very water-scarce," said Dr. Kharraz. "Water pricing policies is an important aspect to take into consideration because there's high water consumption per capita in the region."

With the public sceptical over allowing treated wastewater into the potable water supply, policymakers are better served to

focus first on uses for treated wastewater that are uncontroversial, said Johnny Obeid, Vice President, Veolia Water Technologies - Middle East.

For example, the oil and gas industry is a major water consumer, injecting the liquid into rock to extract hydrocarbons. The sector could treat and reuse this water. Similarly, around 20 Gulf industrial facilities deploy treated wastewater, mostly in district cooling systems for residential real estate developments.

"Treating the effluent of industrial wastewater has a good environmental impact," said Mr. Obeid. "In the Gulf, more and more water is needed at oil fields for injection to recover the oil in the reservoirs. Treating this water, which is a big volume, to the quality needed to reinject it is a very good idea to preserve big amounts of water," added Mr. Obeid.

Although public opinion may be initially challenging to sway, necessity could prevail in changing popular perceptions about the safety of treated wastewater, especially as the concept of the circular economy becomes orthodox thinking. Water is fundamental to life, so every drop is precious whether the source is the sewer or seasonal rains.



OUR MEMBERS

Currently, the Foundation has over 15 corporate members from Qatar's energy, insurance, and banking industries as well as several partnership agreements with business and academia.



Our partners collaborate with us on various projects and research within the themes of energy and sustainable development.





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