The WSTA 13th Gulf Water Conference

Water in the GCC: Challenges and Innovative Solutions

State of Kuwait, 12-14 March, 2019

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Preface

Despite the extreme scarcity of water resources in the region, the GCC countries have done well in providing water for their ever-increasing population and rapidly expanding economic base and activities. However, the GCC countries are faced with major challenges manifested by increasing financial, economic and environmental costs associated with providing water supplies. These challenges are expected to grow with time under the current policies and management approaches driven by many external and internal drivers, which include rapid population growth, changing consumption patterns, low management efficiencies, and the expected impacts of climate change.

In the municipal sector, to meet escalating water demands under the current rapid population and urbanization rates and changing consumption patterns the GCC has to resort to desalination which is financially and energy-intensive and is associated with many environmental externalities including greenhouse gases emissions. These challenges are exacerbated by two factors, the first is the relatively high subsidies of water supply that impact the financial sustainability of the sector, and the second is that the GCC are still importers of desalination technology. In the wastewater sector, although the GCC countries have been providing commendable rates for sanitation services and are operating modern treatment facilities, reuse of treated wastewater is not fully developed, which represents a major lost opportunity under the prevailing water scarcity conditions.

Moreover, despite the fact that GCC countries are among the poorest in the world in renewable water resources, the agricultural sector consumes more than 85% of the total water uses, and is the main cause for the mining and quality deterioration of groundwater resources in the region. Water uses in the agricultural sector are exaggerated due to low irrigation efficiencies, cultivating high water consuming crops, unrestricted abstraction rights, and absence of water metering and tariffs. Finally, the industrial sector has been expanding rapidly due to GCC economic diversification policies, and its water consumption as well as its wastewater discharge is increasing at an alarming rate.

The current water policies addressing these challenges in the GCC countries will require major shifts if we want to have a sustainable water sector to continue to serve the socio-economic development needs of the region. What is needed is to mainstream innovation in the water sector at strategy, management, and operation levels. In this context, investments in technological and non-technological (financial, institutional, management) innovation will be essential. Innovative proactive solutions are necessary to address the water challenges we are facing now and in the future and to keep the long-term cost of the solutions viable and cost-effective.

The WSTA 13th Gulf Water Conference will focus on identifying innovative sustainable solutions for the major water challenges facing the GCC countries. The conference invited top keynote speakers and experts in the conference theme and sub-themes to address the sustainability-innovation nexus, share their knowledge, and transfer their experience. The conference will present and share innovative solutions from different countries in improving water sustainability and overcoming the water challenges in the arid GCC and Arab countries.

The WSTA 13th Gulf Water Conference is organized in the State of Kuwait in collaboration with the Kuwait Institute for Scientific Research (KISR) represented by the Water Research Center. The conference is organized in close coordination with the GCC Secretariat General and with sponsorship by the Arab Fund for Economic and Social Development (AFESD), Islamic Development Bank (IDB), and Kuwait Foundation for the Advancement of Science (KFAS). The conference is strongly supported and endorsed by the active UN organizations in the region of UNESCO Cairo Office, UN ESCWA, CEHA/WHO, UN Environment, and FAO; and the international/regional organizations of ICBA, ICARDA, ACWUA, IDA and EDS.

On behalf of the Conference Scientific Committee, I would like to thank all authors and panelists from various parts of the world for joining us in our Thirteenth Gulf Water Conference and sharing their experiences and innovative solutions in improving water sustainability and overcoming the water challenges in the arid GCC and Arab countries.

Prof. Waleed K Al-Zubari
Chairman
Conference Scientific Committee

Conference Objectives

- Evaluation and prioritizing of major water challenges facing the GCC countries.
- Presenting innovative technological and non-technological solutions implemented in the region and internationally to address water sector challenges.
- Facilitating an open discussion platform and network to share knowledge, experiences, and best practices between researchers, executives, decision and policy makers, private sector, and other stakeholders, on innovative water solutions in the GCC and other Arab countries and beyond.
- Recommendation of potential innovative solutions to eminent water challenges facing the GCC countries.

Conference Recommendations

The WSTA 13th Gulf Conference was held in the State of Kuwait during the period 12–14 March 2019, under the patronage of HH Sheikh Jaber Mubarak Al-Hamad Al-Sabah, The Prime Minister, represented by HE Dr. Hamed Mohammed Al-Aazmi, Minister of Higher Education, and the presence of HE Dr. Abdullateef Al-Zayani, GCC Secretary General, and was attended by more than 250 GCC, Arab and international water professionals from the executive, legislative, academic, NGO and private sectors. The Conference was organized by the WSTA in cooperation with and kind hosting by the Kuwait Institute for Scientific Research (KISR) and the GCC Secretariat General, and was supported by the international, regional, and local organizations of UNESCWA, UNESCO Cairo Office, CEHA/WHO, UN Environment, ICARDA, ICBA, IDA, ACWUA, EDS, Arabian Gulf University, Kuwaiti Ministry of Electricity and Water, OWS.

The WSTA 13th Gulf Water Conference focused on identifying innovative sustainable solutions for the major water challenges the GCC countries are facing. The conference invited top keynote speakers and experts in the conference theme and sub-themes to address the sustainability-innovation nexus, share their knowledge, and transfer their experience. The conference presented and shared innovative solutions from different countries in improving water sustainability and overcoming the water challenges in the arid GCC and Arab countries.

The conference calls on the GCC countries:

On desalination

1. To strengthen joint GCC efforts to localize and indigenize desalination industry and increase its added value to the economies of the GCC countries, including joint investments, research coordination, education and training programs, to contribute to the achievement of the sustainability and security of the municipal water supply sector.

On groundwater and surface water resources

2. To enhance groundwater storage by Managed Aquifer Recharge (MAR) through its various schemes (e.g., ASR, ASTR, SAT), while addressing related health and environmental risks when using impaired water, to help in aquifer restoration efforts and to establish an underground strategic reserves for emergencies, or for other beneficial conjunctive uses such as meeting agricultural demands.
3. To regulate groundwater utilization by enacting and implementing comprehensive groundwater legislation reaffirming state groundwater ownership, establishing appropriate institutional mechanism for stakeholders participation, and implementing economic incentive tools through an appropriate tariff for groundwater use based on groundwater economic valuation in order to provide a price-signaling mechanism and to raise awareness of groundwater value to help in groundwater restoration efforts.
4. To maximize the use of surface water by developing and implementing water harvesting programs to mitigate and benefits from the extreme flooding events of climate change.

On wastewater

5. To maximize wastewater collection, increase treatment level, and maximize treated wastewater reuse in appropriate sectors, through clear wastewater reuse strategies and plans, and addressing health and environmental risks including those emanating from pharmaceuticals and disinfection byproducts, and regulate and incentivize the private sector in the utilization of this renewable resource.
6. To support research and development efforts related to maximizing the beneficial utilization of wastewater, other than in irrigation, such as waste-to-energy schemes and sludge beneficial utilization in the fertilizers industry.

On municipal water management

7. To adopt a "Smart City" approach in urban planning and integrating the water sector with other city components of energy, mobility, infrastructure, and the built environment by fully utilizing the IT opportunities to achieve smart, intelligent, and efficient water management system in the GCC countries.
8. To prioritize enhancing energy efficiency in the water sector by auditing its energy use, benchmarking it with best practice, and developing energy efficiency programs, and the adoption of a life cycle and integrated assessment in technology choices in desalination and wastewater sector, and to diversify energy sources to increase the utilization of renewable energies in the water sector.
9. To meet international best practices and benchmarks for water supply and sanitation utilities, which include customer satisfaction and quality of service, leadership and capacity development programs operational optimization and resiliency, financial viability and sustainability, infrastructure stability, and environmental compliance.
10. To manage Non Revenue Water (NRW) levels at international best practices in order to enhance the municipal water supply efficiency, to reduce supply cost, and to enhance the utilities financial sustainability.

On agricultural water management

11. To support research and development efforts to enhance water productivity and water efficiency in the agricultural sector and to integrate approaches for desert farming in dry lands, with the aim to reduce the overall consumption of water in the agricultural sector.

On industrial water management

12. To increase water efficiency and manage demands in the oil and industrial sector, rapidly emerging as a major water user in the GCC countries, and enforce industrial wastewater treatment and reuse programs by appropriate legislation.

On public health and environmental protection

13. To adopt and enact legislations to develop and implement drinking water and sanitation safety plans based on risk assessment and management by all water utilities responsible for these two sectors in the GCC countries.
14. To plan and implement effective monitoring processes of the sanitation systems and other risk management interventions under a regulatory framework to ensure safe wastewater reuse for agricultural irrigation that is consistent with the national or international guidelines.
15. To enact and enforce legislation related to the protection of the marine environment from municipal and industrial wastewater and the brine reject from desalination plants.

On water sustainability and security

16. To further build on the GCC Unified water Strategy, adopted by the GCC as a guiding document for the development of national strategies, and activates its joint initiatives at the regional level by the General Secretariat.
17. To exert all efforts to achieve the water related SDGs targets which provide a practical framework for achieving water security and sustainability, to contribute to the improvement of current SDG indicator methodologies especially those related to groundwater-related challenges and based on the regional needs and existing knowledge, to research the water-related SDGs interlinkages in the region and identify their synergies and trade-offs, and to regularly monitor these targets in order to identify progress and weaknesses to formulate appropriate and optimum policies.
18. To invite and encourage governments, research institutions and researchers to make use of the technical output of the project Regional Initiative for the Assessment of Climate change Impacts on Water Resources and Socio-economic Vulnerability in the Arab Region (RICCAR) through the regional knowledge platform to assess the vulnerability of the water sector to climate change and to help in the formulation of adaptation plans.

The conference authorizes the WSTA Board of Directors to submit these recommendations to the GCC Secretariat General for presentation at the Water Ministerial Committee Meetings and to follow up the progress of its implementation. Moreover, the Board is requested to circulate these recommendations to relevant regional and local organizations and water-related forums.

Desalination and Water Treatment
www.deswater.com
doi: 10.5004/dwt.2020.25212

176 (2020) vii–ix
February

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