



Water management in post-2020 world

The year 2020 will go down in history as one of the most challenging ones for humankind from all points of view due to COVID-19 and the accelerating impacts of climate change. Both have caused, and will continue to cause, both directly and indirectly, severe disruptions of global economic activities, overall development and the quality of life of billions of people. Every country has been affected in terms of supply chain disruptions in all sectors, including retail and food services, manufacturing and wholesale trade, travel, and the hospitality industry. Before the pandemic, it was expected that by the end of 2020, the number of people living in absolute poverty, that is USD1.90 per day, would be reduced to 615 million. Instead, the pandemic is now expected to push an additional 88–119 million people back into absolute poverty. Even before the pandemic, achieving all the Sustainable Development Goals and their targets appeared very challenging. With COVID-19, its likelihood has plummeted.

Even in normal times, but even more in these turbulent and uncertain times, all countries without exception need enlightened leadership, strong and functional institutions, robust legal and regulatory systems, formulation and implementation of long-term sustainable policies, and provision of efficient and timely services to all members of society, irrespective of socio-economic status. Regrettably, many of these have been missing in nearly all countries. Instead, many countries, whether developed or developing, appear to have questionable leadership, weak and ineffective institutions, and self-serving leaders whose main objective is to remain in power, with improvements in societal well-being a secondary or even tertiary objective.

One of the sectors that has been at the centre of attention is water. The pandemic the world is facing has reconfirmed once again, if any confirmation was ever necessary, how critical regular access to clean water is, not only for drinking but also for frequent handwashing and personal hygiene. In 2000, the Millennium Development Goals failed to recognize the paramount importance of clean water but focused on access to water alone, irrespective of quality. It was 15 years later that the Sustainable Development Goals acknowledged the relevance of access to clean water.

Emergence of COVID-19 has exposed the dire situations of hundreds of millions of people, in both urban and rural areas and in both developed and developing countries, who do not have access to drinking water, or who do not perceive that the water they receive is clean and can be drunk from the tap without health concerns. It has further exposed the lack of proper hygienic practices that is still prevalent all over the world, irrespective of the socio-economic status of the population.

The current global situation in terms of access to clean water and proper wastewater management is bleak. According to the 2020 report of the UN Economic and Social Council:

- Globally, in 2016, 25% of health care facilities did not have access to basic water services, and 20% had no sanitation services.
- Globally, in 2017, three billion people lacked soap and water at home; 47% of the schools in the world did not have handwashing facilities with soap and water; and 40% of healthcare facilities were not equipped to practice hand hygiene at the points of care.
- In 2017, 2.2 billion people did not have access to ‘safely managed drinking water’ – and this phrase does not even mean that households are actually receiving clean water that is safe to drink. Another 785 million people were ‘without even basic drinking water’.

For at least four decades, the UN has been proffering a brighter picture of access to clean water compared to the situation on the ground. The ground realities have been consistently gloomier than those the UN has been giving since 2000. The real global situation is almost certainly worse.

And it is not only in developing countries but also developed countries as well that people have problems getting clean water. Consider the world’s most powerful and richest country, the United States. At least two million Americans do not have access to piped water and basic sanitation. Many indigenous people in Australia, Canada and the United States still do not have access to clean water. In fact, their water supply conditions are significantly worse than in Phnom Penh, a city in a developing country whose residents have water, 24/7, which can safely be drunk from the tap.

Unfortunately, the International Drinking Water Supply and Sanitation Decade and the Millennium Development Goals put overwhelming emphasis on access to water and mostly neglected the question of whether the water supplied is safe to drink. As a direct consequence, most households in developing countries have lost all trust in the quality of piped water. COVID-19 will degrade their trust even more in the coming years.

One country where all the residents, poor and rich, have access to clean water is Singapore. Its national water agency has developed plans and implemented policies with a long-term perspective to ensure provision of clean water to both domestic and non-domestic sectors, and excellent wastewater management services, for nearly half a century (Tortajada et al., 2013). And the water supply is not only of appropriate quantity but also of quality.

Across the developing world, urbanization has been increasing, industrial and commercial activities are accelerating, more and more people are attaining middle-class income, and water use and consumption practices are changing. People are increasingly conscious of the importance of water quality for their health. People of the expanding middle class are likely to demand clean water in adequate quantity to suit their lifestyle. However, the decades of rapid urbanization and industrialization mean that all the nearby sources of water that can be economically developed are already being used. Thus, most urban centres in the developing world are now facing modest or serious water stress. In general, the strategy of the developing world, and a significant part of the developed world, has been to find new sources of water which can be developed to meet the

continually increasing water demands of the thirsty cities. Increasing needs and water scarcity make the old model based on water supply simply unattainable.

Climate change is making the reliability of water availability increasingly uncertain. Extreme hydrological events like prolonged droughts and heavy floods are becoming more frequent, and the duration of droughts is lengthening in many locations. This is creating great uncertainty with regard to the water security of cities.

Exacerbating this problem, very few cities in the world, whether in developed or developing countries, have managed to price water properly so that water utilities can have a functional and sustainable business model, giving them the funds for operation and maintenance as well as capital investments. Politicians the world over hesitate to put a price on water for fear of electoral backlash.

To manage urban water supply efficiently and equitably, and to ensure the water security of the world's urban centres for the future, managing both domestic and industrial demand has to be as important as managing supply. In the post-2020 world, demand and supply will have to be treated as two sides of the same coin if urban water security is to be assured.

It will be challenging for policy makers and the water profession to emphasize demand management, because managing supply has been the main approach for centuries. However, as urban water demand steadily increases and new sources of water become increasingly difficult and more expensive to harness, there will be no alternative but to give demand management greater priority. As the British poet Lord Byron wrote, 'Till taught by pain, Men really know not what good water's worth.'

The articles in this special issue of the *International Journal of Water Resources Development* are based on a workshop on water demand management in urban areas organized at the Institute of Water Policy, Lee Kuan Yew School of Public Policy, National University of Singapore. Participation was by invitation only and included leading figures from six continents and from different disciplines and sectors.

These papers were discussed in depth at the meeting. The authors then revised them, after which they were rigorously peer reviewed and modified further.

The Foreword is by Joo Hee Ng, chief executive of PUB (the Public Utilities Board), Singapore's national water agency. He notes that water scarcity 'is the result of policy failure, systemic management or both, leading to a gross discrepancy between supply and demand' (Ng, 2020). This is known by every city government and by every water utility. Why is it, then, that policies are not properly developed and that management is not improved?

The articles in this special issue consider the management of water demand in Singapore through a systems perspective (Hoo, 2019); water demand reduction in Australia, aiming at achieving the Sustainable Development Goal for water (Horne, 2019); structural and contingent factors in Spanish cities that have resulted in lower water consumption (Sauri, 2019); information-based interventions for household water efficiency in England and Wales (Lu, 2019); drivers of and challenges to water tariff reforms in Saudi Arabia (McIlwaine & Ouda, 2020); the importance of community-managed water and wastewater systems in Cochabamba, Bolivia (Helgegren et al., 2019); psychosocial and behavioural determinants of water conservation in the domestic sector (Russell & Knoeri, 2019); and psychological barriers to urban acceptance of recycled water (Nemeroff et al., 2020). In the non-domestic sector, articles focus on technological enablers and confidence building for effective water

demand management in Singapore (Seah & Lee, 2020) and drivers of productivity change in water companies in England and Wales (Molinos-Senante & Maziotis, 2020).

The viewpoints discuss systems perspectives on demand management during the Cape Town water crisis of 2015–2018 (Muller, 2019); how the well-known Orange County Water District in California has managed to obtain wide acceptance for potable water reuse (Markus & Torres, 2020); and Nestlé's strategies for water conservation (Galli & Vousvouras, 2020).

We invite all our readers to read each one of these articles. They provide rich analyses on this increasingly important area which can be used for further research and can also be applied in the real world to solve current and future water problems.

As we do every year, we would like to thank our International Editorial Board members for their valuable advice and suggestions, our authors for trusting us with their excellent articles, and most especially all of our internal and external reviewers, who have made this a better journal. Without them, the IJWRD would not be able to make these important contributions to knowledge generation, application and synthesis.

References

- Galli, C. C., & Vousvouras, C. (2020). Nestlé caring for water. *International Journal of Water Resources Development*, 36(6), 1093–1104. <https://doi.org/10.1080/07900627.2019.1700781>
- Helgegren, I., McConville, J., Landaeta, G., & Rauch, S. (2019). Importance of internal factors for community-managed water and wastewater systems in Cochabamba, Bolivia. *International Journal of Water Resources Development*, 36(6), 1031–53. <https://doi.org/10.1080/07900627.2019.1616536>
- Hoo, R. (2019). Managing water demand in Singapore through a systems perspective. *International Journal of Water Resources Development*, 36(6), 879–887. <https://doi.org/10.1080/07900627.2019.1684245>
- Horne, J. (2019). Water demand reduction to help meet SDG 6: Learning from major Australian cities. *International Journal of Water Resources Development*, 36(6), 888–908. <https://doi.org/10.1080/07900627.2019.1638229>
- Lu, L. (2019). Information-based interventions for household water efficiency in England and Wales: Evidence, barriers and learning opportunities. *International Journal of Water Resources Development*, 36(6), 926–939. <https://doi.org/10.1080/07900627.2019.1684244>
- Markus, M. R., & Torres, E. (2020). How OCWD made potable reuse palatable and avoided public opposition to its project. *International Journal of Water Resources Development*, 36(6), 1073–92. <https://doi.org/10.1080/07900627.2020.1793738>
- McIlwaine, S. J., & Ouda, O. K. M. (2020). Drivers and challenges to water tariff reform in Saudi Arabia. *International Journal of Water Resources Development*, 36(6), 1014–30. <https://doi.org/10.1080/07900627.2020.1720621>
- Molinos-Senante, M., & Maziotis, A. (2020). Drivers of productivity change in water companies: An empirical approach for England and Wales. *International Journal of Water Resources Development*, 36(6), 972–991. <https://doi.org/10.1080/07900627.2019.1702000>
- Muller, M. (2019). Some systems perspectives on demand management during Cape Town's 2015–2018 water crisis. *International Journal of Water Resources Development*, 36(6), 1054–72. <https://doi.org/10.1080/07900627.2019.1667754>
- Nemeroff, C., Rozin, P., Haddad, B., & Slovic, P. (2020). Psychological barriers to urban recycled water acceptance: A review of relevant principles in decision psychology. *International Journal of Water Resources Development*, 36(6), 956–971. <https://doi.org/10.1080/07900627.2020.1804841>
- Ng, P. J. H. (2020). Not a drop to drink. *International Journal of Water Resources Development*, 36(6), <https://doi.org/10.1080/07900627.2020.1820692>

- Russell, S. V., & Knoeri, C. (2019). Exploring the psychosocial and behavioural determinants of household water conservation and intention. *International Journal of Water Resources Development*, 36(6), 940–955. <https://doi.org/10.1080/07900627.2019.1638230>
- Sauri, D. (2019). The decline of water consumption in Spanish cities: Structural and contingent factors. *International Journal of Water Resources Development*, 36(6), 909–925. <https://doi.org/10.1080/07900627.2019.1634999>
- Seah, H., & Lee, N. (2020). Technological enablers and confidence building in end-users for effective non-domestic water demand management. *International Journal of Water Resources Development*, 36(6), 992–1013. <https://doi.org/10.1080/07900627.2019.1695587>
- Tortajada, C., Joshi, Y. K., & Biswas, A. K. (2013). *The Singapore water story: Sustainable development in an Urban City State*. Routledge.
- UN Economic and Social Council. (2020). *Progress towards sustainable development goals*. Report of the Secretary General. United Nations. https://sustainabledevelopment.un.org/content/documents/26158Final_SG_SDG_Progress_Report_14052020.pdf

Cecilia Tortajada and Asit K. Biswas
International Journal of Water Resources Development
 cecilia.tortajada@gmail.com