



## The rapidly changing global water management landscape

Rapidly changing global conditions will make water resources management and provision of services increasingly complex – more than ever before in human history. These changing conditions will be precipitated by issues like population (number and structure), urbanization, industrialization, economic development, growth of the global middle class and their increasing aspirations for a better standard and quality of life, environmental quality, ecosystems needs, changing societal attitudes and perceptions, and their interactions. Climate change and fluctuations are already adding extra levels of uncertainty.

Continued mismanagement and poor governance practices all over the world spanning several decades have ensured that water security for humankind is at a crossroads at present. Numerous policy and market failures in the water sector have received limited corrective attention from policy makers and governing institutions. The result has been misuse, over-exploitation and contamination of water all over the developed and developing worlds, though their magnitudes and extents vary over space and time.

There is an urgent need to formulate and implement future-oriented, business-unusual water policies and strategies that can reform and strengthen public institutions, properly manage urban and rural environments, increase public- and private-sector investments, encourage prompt adoption of available and forthcoming new technologies, consider good management practices irrespective of where they originate, and develop a new generation of capable managers and experts from different disciplines and sectors with good analytical and communication skills.

Historically, water management policies and plans have been mostly framed narrowly on a sectoral basis, with very limited consideration of future drivers from other sectors which are likely to affect water management increasingly profoundly, in both quantity and quality. Very seldom have water managers considered addressing societal attitudes and perceptions of water-related issues, and how they are likely to change in the future. The emphasis continues to be on short-term fashionable solutions like Integrated Water Resources Management and Integrated River Basin Management, neither of which has been able to provide sustainable and implementable policies or solutions for macro- and meso-scale projects and programmes over at least two generations. These non-performing concepts will become even more irrelevant in a future world which will be more complex, uncertain and unpredictable. Future water problems cannot be solved by using past paradigms and experiences that have not proven to be effective (Biswas & Tortajada, [in press](#)).

The dynamics of the human future will be determined not by any single issue but by the constant interactions between a multitude of them. Increasing population, urbanization, industrialization, globalization and human aspirations will require more economic and equitable development and improved management of natural resources. Ensuring food, energy and environmental security will require better and continually improving water governance over the long term. The common requirements for all the realistic solutions must include larger and more efficient investments, use of more knowledge, technology and expertise from all disciplines, functional institutions and legal systems, and intensified cooperation between countries.

The interrelationships between these issues are global in character. Accordingly, they are likely to be best understood and appreciated within a global framework. While the interrelationships may be global, within this there must be a wide variety of efficient and coordinated national and

local responses. The water-related problems of the future will need to be viewed, analyzed and resolved within global, regional and national frameworks. This will be a radical departure from the current practices and will not be an easy task.

During the coming uncertain and turbulent decades, policy makers and water resources planners will increasingly have to manoeuvre among the competing, conflicting and changing water needs of different uses and users. They will have to concurrently assure that enough water of appropriate quantity and quality is available reliably and cost-effectively to address water, energy, food and environmental needs to maximize human welfare. Water is, and will continue to be, one of the essential threads that will bind together all the major development concerns of the future.

In terms of access to clean water, currently some 2.5–3 billion people do not have access to it. After decades of obfuscation, the United Nations has finally admitted that over 2.1 billion people do not have access to ‘safely managed’ drinking water services (WHO, 2017). And this is still a serious underestimate.

To ensure that all these people, and the additional 2.3 billion expected by 2050, have access to adequate quantity and quality of water for all their needs, policies, management, development and governance will have to improve significantly. The address of Pope Francis (2017) and Martínez-Santos (2017) discuss this issue comprehensively.

In the Journal, not only throughout this year but also in previous years, we have encouraged our authors to challenge the prevailing wisdom in helping formulate good and implementable policies. The special issues on Integrated Water Resources Management (Vol. 30, Issue 3, 2014, especially the article by Giordano and Shah) and Integrated Watershed Management in Canada: Experiences of Watershed Authorities (Vol. 33, Issue 3, 2017) are excellent examples.

We also aim to continue providing a platform to disseminate high-quality research from regions where information is somewhat limited. One good example is the special issue on The Productivity and Profitability of Small Scale Communal Irrigation Systems in South-Eastern Africa (Vol. 33, Issue 5, 2017 – see especially Pittock, Bjornlund, Stirzaker, & van Rooyen).

In this issue, the last of 2017, the articles focus on policy options to promote urban and rural cooperation in water management (Civitelli & Gruère, [this issue](#)), desalination and the commons (Zetland, [this issue](#)), residential water use in Oman (Kotagama, Zekri, Harthi, & Boughanmi, [this issue](#)), groundwater management (Aarnoudse, Qu, Bluemling, & Herzfeld, [this issue](#); Jørgensen, Villholth, & Refsgaard, [this issue](#)), stakeholder perceptions (Ricart & Clarimont, [this issue](#)) and a participant-driven water poverty index in post-tsunami India (Juran et al., [this issue](#)). Offering a more technical perspective are analyses for reconstruction of long records of streamflow using tree rings in the upper Kurshab River (Chen, He, Bakytbek, Yu, & Zhang, [this issue](#)), precipitation forecasts for real-time decision making in hydropower operation (Peng, Xu, & Liu, [this issue](#)), and modelling the impacts of development of water resources in Thailand (Polpanich, Lyon, Krittasudthacheewa, Bush, & Kemp-Benedict, [this issue](#)). An article of special interest is that by Pathak, Kalra, and Ahmad ([this issue](#)) on temperature and precipitation changes in the Midwestern United States and their implications for water management.

As we do every year, we would like to express our most sincere appreciation to every one of our reviewers. Their extraordinary contributions have made our Journal more robust. We aim to continue disseminating high-quality research, and this would be impossible without the strong support of knowledgeable, experienced and committed reviewers. To our authors, we express our thanks for selecting our Journal to disseminate their work. Finally, to our readers, our invitation to continue using the work we publish and also to submit their papers for possible publication in the Journal. For 2018, we will continue with our objective of publishing high-quality articles that contribute to knowledge and to the formulation of wise and implementable policies. As Confucius said some 2500 years ago: ‘The essence of knowledge is, having it, to use it.’

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