



## Editorial

Some of the most important global concerns at present are climate variability and change, as well as their implications for water resources management. Extreme climatic events have become development challenges of increasing significance from the economic, social and environmental viewpoints, for countries in the global North and South.

Floods that displace thousands of people and prolonged droughts that cause reservoirs to decline to record lows have serious impacts on water quantity and quality and thus on availability. These extreme events are becoming more frequent and are impacting the economies of entire countries, constraining livelihoods and affecting the environment. Only in 2017, hurricanes and tropical storms affected hundreds of thousands of people in places such as the United Kingdom, United States, Ireland, South Asia and the Caribbean islands. In terms of intensity, the 2015 and 2016 floods in Houston were 500-year events. Overall, efforts have focused mostly on rescue and repair operations, improvement of infrastructure and planning for future extreme events.

In order to provide water in the required quantity and quality for all sectors (domestic, agriculture, livestock, energy, environment, etc.), adaptation and mitigation strategies have to ensure that resources are conserved, and that supply is maintained, and even increased as necessary, even under conditions of stress.

Uncertainties related to climate change and variability and the associated complexities have made non-climatic factors more relevant, primarily those related to policy-making and implementation, governance, management, development and technological innovation, to mention only some of them. Water scarcity and pollution have been very serious concerns, not only in drought- or flood-prone areas but also in those where rainfall is relatively abundant but subject to poor management, creating potential conflicts between uses and users upstream and downstream. Since planning for greater resilience is becoming a more common feature of metropolitan and regional plans in some developed countries, water security measures have also acquired more importance.

Of direct significance to water resilience are surface water bodies and aquifers that are increasingly polluted and whose catchment areas are degraded due to urbanization, spreading of built-up areas and uncontrolled development, putting pressure on natural resources, food, energy and biodiversity resources. From the urban planning perspective, plans that reveal confusion and contradiction between the priorities and imperatives of domestic supply and flood risk management are not uncommon. In the mountains, springs are drying up, seriously affecting the livelihoods of mountain communities. In the deltas, ecosystems and the populations that depend on them are threatened by water scarcity and pollution resulting from conflicting interests and lack of collaboration between upstream and downstream countries. The effects of changing climate are stressors added to the long list of existing ones.

Some of the many needs and wants that will still require more time to be translated into action are institutional adaptive capacity; policy innovation; social learning processes; trans-boundary environmental management that considers changing climate; inter-state, inter-basin and intergovernmental collaboration under scarcity conditions; and flexible infrastructure that contemplates ecological design options, for example under the hydrological impacts of growing urbanization or shifting policy salience. Lack of long-term planning, inter-agency collaboration

and political consensus, as well as of high-quality data and analytical and financial capabilities, are a few of the many factors hampering their implementation.

To foster in-depth discussions on the policies and governance necessary to build the resilience of cities to droughts and floods in the short, medium and long-terms, the Institute of Water Policy, Lee Kuan Yew School of Public Policy, National University of Singapore, organized two workshops on this topic: one at the Lee Kuan Yew School of Public Policy and the other one during the Stockholm World Water Week. In both workshops, discussions focused on how cities prepare, cope, learn from, manage and recover from these extreme events. They also considered aspects such as changing paradigms, policy responses under uncertainty, scenario development, institutional responses (formal and informal), adaptive forecasting, governance perspectives, infrastructure development, overall investments, and technological innovation.

Most of the cities studied are in Asia (China, both the mainland and Hong Kong, India, Japan, Malaysia, Singapore, Thailand, Vietnam) but those in Australia, England, Kenya, the Netherlands and United States were also discussed. Presentations focused on regions such as the Mekong, the Pearl River Delta and the Himalayas. The UN's Sustainable Development Goals, the Sendai Framework for Disaster Risk Reduction, and experiences and lessons learnt from the perspective of the Japan International Cooperation Agency were discussed at length.

Analyses were not limited to the cities but included the basins and regions from which urban populations obtain their resources and on which their resilience depends. Since the discussions also included the broad framework of sustainable development, a relevant question was whether cities affected by extreme events would be able to provide, and improve, basic services such as water supply and sanitation, and thus achieve the Sustainable Development Goals by 2030. Even if aspirational in nature, these are goals the world is aiming at.

This special issue includes 13 manuscripts, of many more that were presented and discussed at the two workshops. The manuscripts that were not finalized in time to be included in this volume will be published in later issues of the Journal.

At the workshops we were fortunate to have renowned experts in the fields of water resources, geography, engineering, development and urban planning. This allowed us to analyze the urban resilience paradigm associated with floods and droughts from a very comprehensive perspective.

The co-editors of this issue are James Horne, former deputy secretary of the Australian Department of Sustainability, Environment, Water, Population and Communities, and now a visiting fellow at the Australian National University; Larry Harrington, former research director at the CGIAR Challenge Programme on Water and Food and now an adjunct professor at Cornell University, and me. With it, we aim to contribute to the body of literature on the resilience of cities to floods and droughts, a topic of enormous importance not only at present but also for the future. At the *International Journal of Water Resources Development* we remain interested in contributing to the much-needed advancement of knowledge in the related fields and its dissemination. We extend an open invitation to those experts interested in putting their ideas forward to consider our Journal for their publication.

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