The Prague Statement

on

A Need for Action to Develop Water Resources Management Systems

by the International Association of Hydrological Sciences (IAHS)

Recognising the human right on access to safe water and protection from water hazards of every individual as enshrined in international law,

Noting with satisfaction the current and past efforts made by governments, agencies and community groups to provide access to safe water, to protect the environment and to mitigate water hazards,

Acknowledging that there is a global water crisis with critical needs for immediate action,

We, the delegates to the conference of the International Association of Hydrological Sciences in Prague, June 20-26, 2015 are deeply concerned by the water problems humanity is experiencing with increasing frequency and severity and express the following concerns and recommendations.

The hydrosphere is experiencing a global water crisis caused by uneven freshwater availability in space and time, overexploitation, environmental degradation and the more frequent occurrence of floods and droughts. In fact, 842,000 people die annually from inadequate water supply and the annual economical damage induced by floods is nearly 14 billion US dollars (average 1980-2014). This crisis is fuelled by often fragmented water management and by economic problems, especially in water-scarce regions. Low efficiency of water resources management systems, in terms of high water losses and energy consumption, is no longer sustainable and may cause irreversible damage to our societies if not promptly mitigated. At the same time water demand is ever increasing in many parts of the world, due to population growth, economic development and changing lifestyles, exacerbating the risk of unsafe water supply.

Devastating floods around the world belong to the largest disasters in terms of economic loss and financial damage. These floods are expected to increase further as a result of land use change (such as the intensification of agricultural management and surface sealing due to urbanisation), modifications of the river system (such as river training and harnessing) and more intense precipitation extremes related to climate change. More importantly, the number of people and the economic value of assets in flood prone areas have increased throughout the world, as a result of urbanisation and encroachment of floodplains, exposing an increasing number of people to floods. These factors all contribute to increased flood risk to both humans and their economic goods.

Water resources management systems are the artefacts put in place to make freshwater available to people and to protect them from water threats. Their correct functioning is essential for people's wellbeing. Immediate action is therefore needed to evolve water resources management systems in order to address the present challenges of the global water crisis.

A call for immediate actions of governments

We call upon all local, regional and national governments and urge them to develop effective solutions to the water crisis by developing water resources management systems:

- In order to address problems of freshwater availability and supply, the full spectrum of technical, organisational, economic, political, legal and social approaches should be considered, and implemented as needed.
- In order to address flood risks, a holistic approach of integrated flood risk management should be adopted that considers all phases of the disaster cycle – mitigation, preparedness, response and recovery.

- In all instances, a sustainable approach should be adopted ensuring that long-term issues are addressed. A comprehensive monitoring of the status of water resources is therefore needed to be able to adapt to changes in a flexible and ecologically sustainable way.
- Instruments of managing water resources management systems should be tailored to the local hydrological, legal and societal situations to adapt to the dramatic global changes in the environment and society.
- Cooperation of all stakeholders is needed based on a participatory approach, involving users, planners and policy-makers at all levels, in particular at the river basin scale.
- Water resources management systems are a cultural heritage of humanity, yet the infrastructure to manage them efficiently and effectively is ageing and the requirements are changing. A balanced approach of preservation and adaptation is needed to meet the needs of a changing world.
- The evolution of water resources management systems requires a sound scientific basis. Advice from the scientific community should therefore play an essential role in planning their future configuration and management.

A call for immediate actions of the international scientific community

We also call upon members of the international scientific community and urge them to develop practical and implementable methods and techniques to support adaptation of water resources management systems to the current and future challenges.

- Adaptation of water resources management systems should build on observed evidence and rigorous system understanding. An improved understanding of hydrological processes is therefore needed, in particular at the local scale, and put into the context of broader river basin and groundwater issues.
- An interdisciplinary and transdisciplinary approach is required to understand the multiple triggers of the water emergencies, and elaborate visions and solutions that are viable technically, environmentally and socially.
- Assessment of the water future and management options is often carried out through scenario analyses. While useful for a set of questions, they do not usually account for dynamic feedbacks. Novel methods of socio-hydrology are needed that represent the long term feedbacks between hydrology and society in an explicit way.
- The value of monitoring of water resources cannot be overestimated, particularly during times of change. Novel, efficient and accurate monitoring systems are needed in support of research and management practice.
- Approaches to adaptive management are needed that identify priority targets and lead to feasible solutions. Given the multiple uncertainties, robust vulnerability-based approaches should be particularly developed that are people-centred and aim at reducing their vulnerability and enhancing their resilience, and give favourable outcomes under a broad spectrum of possible futures.

A call for immediate actions of research funding agencies

Finally, we call upon the research funding agencies at both national and international levels and urge them to provide funding that is commensurate with the challenges of the global water crisis.

- Enhanced funding is needed to improve the understanding of hydrological processes at all scales. Fundamental research is equally important as applied research, and is equally likely to become societally relevant, albeit over longer time scales.
- Funding is needed to address the big questions of the water future through both small and large research groups. Interdisciplinary research within projects and across projects is essential to make

progress in understanding and developing environmentally sustainable water resources management systems.

- Given the paramount role of adaptive management, long term funding is essential, in particular for Hydrological Observatories that unravel the long term feedbacks between water-related processes.
- Networking between scientists around the world is already receiving substantial funding. Mobility and international collaboration should continue to be funded at a high level.
- The support of young water scientists through structured doctoral programmes and other initiatives should be strengthened. The young generation will be the managers of the water resources management systems of the future, so investing in their education will pay back multiple times.

Adopted by acclamation, in the city of Prague, Czech Republic, on this 26th day of June 2015