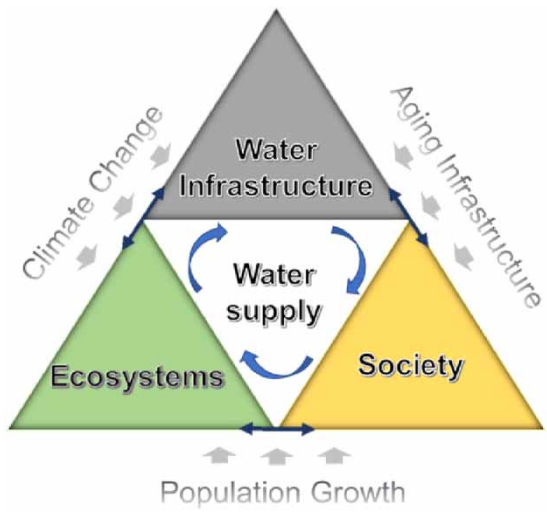
Editorial: Visions for a sustainable water future

AQUA carries a long tradition: the first issue was published in 1951. Today, 70 years later, we relaunch *AQUA: Water Infrastructure, Ecosystems and Society* with a renewed focus. Water plays a key role in the transition to a sustainable world. To mark the transition, we have invited thought-leaders in the water supply base to share their visions for a sustainable future in water. The challenge has been open-ended: 'If you carry in you a vision for such a future and can point at some of the elements we need to put in place for this to succeed, we invite you to submit a visionary paper.' This has resulted in an issue full of visions, hope and ideas.

The world is facing a tremendous challenge moving into the Age of Sustainability. This has implications for all aspects of water, society and life. *AQUA: Water Infrastructure, Ecosystems and Society* publishes peer-reviewed scientific and technical papers suggesting new solutions to providing sustainable water supply. The journal covers research and development in both water technology and management. New opportunities are explored in the area of water supply such as reclaimed water supply, grey water supply, rainwater harvesting, etc.

The journal aims to support water utilities and municipalities transition seamlessly from today to the sustainable water supply of the future. The transition includes exchanging old systems intelligently based on systematic asset management, preparing the new system for the effects of climate change and ensuring a human water supply without compromising ecosystems. To succeed requires an intelligent integration between society and nature, looking at land and related resources as well. It requires co-creation processes with all relevant stakeholders including so far underrepresented stakeholders such as women and minorities to ensure social welfare.



The journal's new scope is aimed at the following:

Water sustainability, i.e. Integrated management of water resources (IWRM), Water stewardship, Drivers and barriers for water sustainability, Designs for seamless interaction between utility and nature, Water and nature preservation and restoration and Applied methods to characterize water quality.

Water infrastructure, i.e. Resilient/Sustainable water infrastructure, Integrating the hydrological cycle in design and operation, Climate change adaptation, Water infrastructure design and planning, Ecological water designs, Asset management.

Water technologies, i.e. Advanced water treatment technologies and processes, Reclamation and desalination, Water treatment processes, residuals treatment and management, Environmentally friendly technologies, circular economy and water re-use, Modelling of source waters, treatment and distribution systems, Control and automation, Monitoring of ecosystem health, Industry 4.0/ Utility 4.0.

Water management and governance, i.e. Water system management and policy: Legislation, economics, public relations, crisis management, Water-energy-ecosystem

This is an Open Access article distributed under the terms of the Creative Commons Attribution Licence (CC BY 4.0), which permits copying, adaptation and redistribution, provided the original work is properly cited (http://creativecommons.org/licenses/by/4.0/).

doi: 10.2166/aqua.2021.001

Downloaded from http://iwaponline.com/aqua/article-pdf/70/4/401/919713/jws0700401.pdf
by guest

nexus, Industrial symbiosis, Facilitation of collaborative processes with stakeholders, The social impacts of water systems, Partnerships for good water governance.

The ideas are presented as follows.

Veronica Strang's visionary paper (Strang 2021) is calling for the water sector to pick up its major leadership role to play in addressing the global water crisis – really making a radical shift in approach. She challenges us by drawing on in-depth ethnographic research with indigenous communities and other water users in river catchments around the world, considering alternate cultural worldviews that encourage more sustainable beliefs and practices, and asking how larger societies might make imaginative use of these in contemporary and future engagements with water. The key word is 'conviviality' – living together - with other species.

Gustaf Olsson's visionary paper (Olsson 2021) challenges the supply water side of the urban cycle to pick up the mantle and become as monitored and controlled as the wastewater side. This could potentially revolutionize the operation of the integrated urban water supply system. Practically, that includes dealing with uncertainties by online monitoring, using feedback at all levels to correct deviations from 'normal' operation, handling disturbances, particularly in time scales too fast or too slow for human interaction and operating complex highly interactive systems as well as small-scale decentralized systems.

Guy Howard's visionary paper (Howard 2021) points out that with only 71% of the human population having access to safely managed water supply there is still a long way to go before we reach the sustainability goals outlined in SDG 6 – specifically target 6.1: achieve universal and equitable access to safe and affordable drinking water for all, target 6.2: achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations, and 6.3: improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally. These targets are all to be reached within 2030. Human resources, finance and technology transfer underpin tackling these challenges. To achieve these goals will require more public finance and better use of financial instruments that have proved effective in other sectors. Increasing our ambition will mean the world can achieve the aim of universal access to safe, sustainable, and resilient services and protect public health.

Kegong Diao's visionary paper (Diao 2021) deals with the eternal conflict between central and decentral systems and suggests an approach based on central control but decentral execution. During normal conditions the decentral systems act autonomously, but in case of a failure event, the systems will coordinate. Such a multiscale system will realize multiscale resilience. The idea is still in a conceptual stage for water systems but promises improvements in analysis and management capability. For further development complexity theory and biomimicry are promising concepts for inspiration.

Veera Gnaneswar Gude's visionary paper (Gude 2021) presents key developments essential to transform our water infrastructure, to address water centred socioeconomic issues and critical needs of ensuring resilience in water sector operations. This includes the ever-present question of water quantity and quality and technological and managerial solutions to continuously find solutions in that domain. A special focus on emerging global pollutants such as microplastics and PFAS (per- and poly-fluoro alkyl substances) and treatment alternatives are discussed. The role of used water (wastewater) in the wake of circular economy and recent outbreaks is discussed and the potential for energy and resource recovery possibilities and the critical role of wastewater treatment plants in controlling the spread of outbreaks are discussed in detail.

We hope you find inspiration, ideas and renewed hope in this issue. We count on you to make the inspiration count – to make it work and to create the future of sustainable water infrastructure for the benefit of all.

Guest Editors
Pernille Ingildsen
Hillerød Forsyning, Denmark

Shuming Liu
School of Environment, Tsinghua University, China

Downloaded from http://iwaponline.com/aqua/article-pdf/70/4/401/919713/jws0700401.pdf
by guest

REFERENCES

Diao, K. 2021 Towards resilient water supply in centralized control and decentralized execution mode. *AQUA — Water Infrastructure, Ecosystems and Society* **70** (4), 449–466.

Gude, V. G. 2021 One water – evolving roles of our precious resource and critical challenges. *AQUA — Water Infrastructure, Ecosystems and Society* **70** (4), 467–482.

Howard, G. 2021 The future of water and sanitation: global challenges and the need for greater ambition. *AQUA — Water Infrastructure, Ecosystems and Society* **70** (4), 438–448.

Olsson, G. 2021 Urban water supply automation – today and tomorrow. *AQUA — Water Infrastructure, Ecosystems and Society* **70** (4), 420–437.

Strang, V. 2021 Envisioning a sustainable future for water. *AQUA — Water Infrastructure, Ecosystems and Society* **70** (4), 404–419.

Downloaded from http://iwaponline.com/aqua/article-pdf/70/4/401/919713/jws0700401.pdf
by guest