

PROBLEM STATEMENT

Urban water systems across the globe are facing multiple challenges including increasing demand, lack of resources availability, water pollution and climate change. Despite the introduction of several frameworks, concepts and tools over the years to address these issues, cities today are still at risk of lack of access to safe water, with most of these challenges getting worse. New ways of thinking are needed to allow policy-makers and water managers to better understand how water systems work, and how to rethink and redesign effective and sustainable solutions, through systems change.

IMPORTANT FACTS

- **504 billion litres** of water is transferred to cities through **27,000 km** of the pipe network¹
- Approximately **3,000 new cities** need to be built in the next 40 years mostly in developing countries²
- At least **US\$22.6 trillion** is needed to refurbish/build new water infrastructure³
- **50-80% of wastewater** flows back into the environment without treatment⁴
- Capital investment for wastewater treatment provision is estimated between **0.3% to 6.3% of GDP**⁵
- Costs to operate and maintain wastewater treatment systems is estimated at **1.1% to 1.4% of GDP**⁶

WHAT IS SYSTEMS THINKING

Systems Thinking (ST) is a holistic way to investigate factors and interactions that could contribute to desirable outcomes, through integrated, interdisciplinary, transdisciplinary and participatory approaches. ST allows rethinking and redesigning of strategies and actions that address the root causes of problems and leverage synergies between people, environment and economic systems to achieve sustainability objectives.

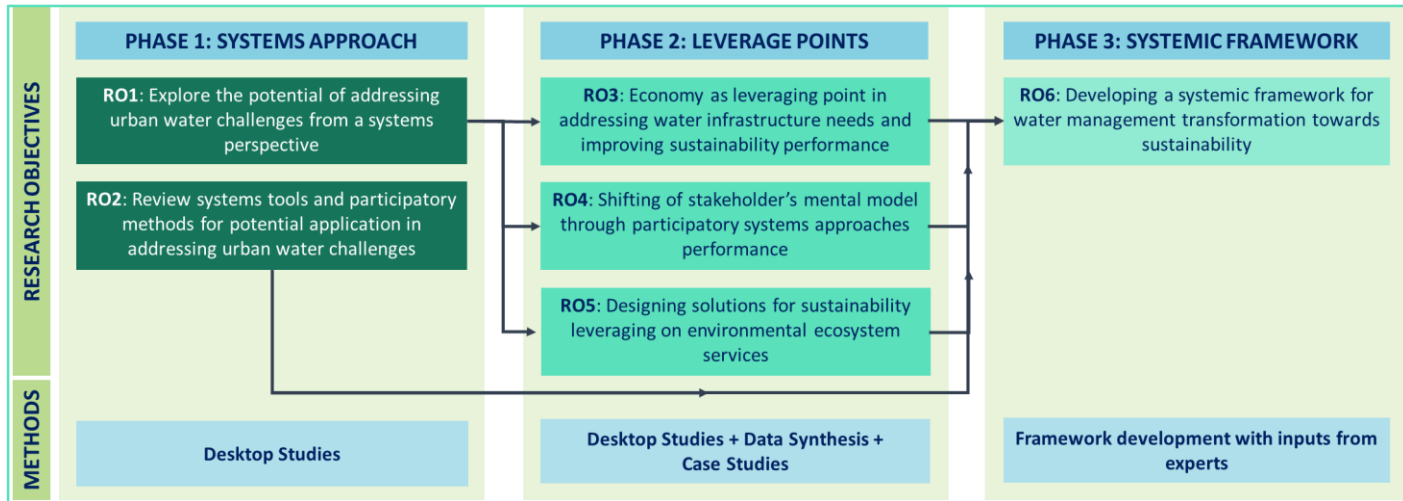
RESEARCH AIM

This research will investigate key leverage points that synergise people-environment-economy to enhance a ST approach, which can deliver the systems change required for the transformation of urban water systems towards sustainability.

References:

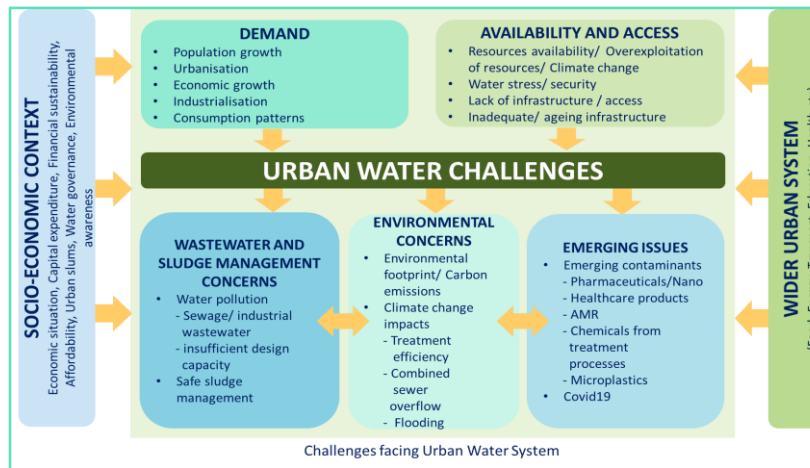
- [1] UN-Water (2020) *United Nations World Water Development Report 2020: Water and Climate Change*.
- [2] Koop, S.H.A. & van Leeuwen, C.J. (2015) Application of the Improved City Blueprint Framework in 45 Municipalities and Regions. *Water Resources Management*.
- [3] World Water Council (2015) *Water: fit to finance? Catalyzing national growth through investment in water security*.
- [4] McDonald, R.I., Weber, K., Padowski, J., Flörke, M., et al. (2014) Water on an urban planet: Urbanization and the reach of urban water infrastructure. *Global Environmental Change*.
- [5] Cashman, A. & Ashley, R. (2008) Costing the long-term demand for water sector infrastructure. *Foresight*.
- [6] Rozenberg, J. & Fay, M. (2019a) *Beyond the Gap: How Countries Can Afford the Infrastructure They Need while Protecting the Planet*.

RESEARCH OBJECTIVES/ METHODOLOGY

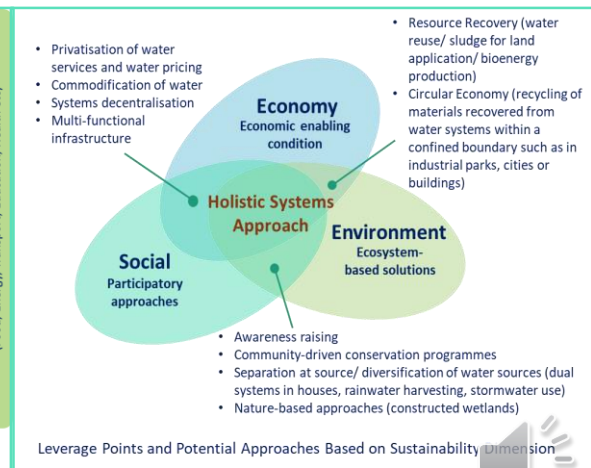


The research so far has identified three leverage points to be further investigated as to establish their applications to facilitate transformations towards sustainable urban water systems tailor-made to local needs.

RESEARCH OUTPUT SO FAR



WHAT'S NEXT



Leverage Points and Potential Approaches Based on Sustainability Dimensions