PATHWAYS TO WATER RESILIENT SOUTH AFRICAN CITIES – MAPPING URBAN WATER MANAGEMENT GOVERNANCE PROCESSES

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**Keywords**

Water resilience; water sensitive design; urban water governance

**SDG link**

SDG 6; SDG 11; SDG 17.

# Background

Water scarcity is a major concern for South African cities whilst climate change impacts and rapid urbanisation also contribute to problems with drainage, highlighting widening concerns about the resilience of conventional water infrastructure. Water management is an essential part of urban sustainability from both a physical infrastructure and governance perspective. Existing centralised water provision and management models are increasingly viewed as ill-suited for addressing resource pressures. Furthermore, as urbanisation rates outstrip infrastructure service provision capabilities, the traditional hydro-social contract wherein the State, through municipalities and utilities, retains the role of principal provider and manager of water services as a public good, is no longer fully tenable. Water Sensitive Design (WSD) is posited as a complementary approach to addressing some of the deficits of conventional urban water management. This concept takes a total urban water cycle view through the integration of built water infrastructure with nature-based approaches for decentralised water supply. WSD contributes to reducing storm runoff volumes and peak flows, improves infiltration, and reduces pollutant loads, thus returning urban rainfall-runoff processes to natural hydrological cycle flows. Sustainable water supply options such as rainwater/stormwater, groundwater, greywater and treated wastewater allow cities to function as catchments, thus realising the value of water in all its competing uses. Recognising the need to build resilience through alternative water management approaches, the cities of Cape Town and Johannesburg have sought to integrate WSD into the urban fabric over the past few years through targeted policy interventions (e.g. by-laws). However, progress in the cities’ emergent transitions towards water sensitive futures has been slow – as a result of a dearth of city-specific business cases to support a more coherent adoption of WSD, and a lack of coordination of roles and responsibilities. There is a need to build evidence for contextual resilience-building initiatives through engaging in physical and governance experimentation in cities to provide a space for the reconfiguration of capacities, resources and agency of institutional, business and civil actors in support of transformative change.

**Highlights**

* Increased awareness of sustainability transition challenges that confront the water management sector as well as of the potential solutions that WSD may provide.
* Empowerment of social networks of champions working on facilitating the hybridization of conventional water infrastructure with nature-based solutions.
* Potential pathways for the physical and institutional / policy integration of nature-based solutions into the urban water cycle.

# Methodology

The overall objective of this project is to identify opportunities for the physical and institutional integration of hybrid, decentralised nature-based solutions into the urban water cycle to support and accelerate a transition towards water resilience in South Africa. Cape Town is used as a case study for the potential for harvesting stormwater using existing, well-established flood attenuation infrastructure. In Johannesburg, other opportunities for integrating a suite of nature-based solutions that are starting to emerge as a consequence of the recently-drafted Stormwater Manual were examined. The mapping component included an evaluation of current water management challenges and green infrastructure processes, associated institutions, policies and supporting legal frameworks – based on desktop studies and semi-structured interviews – in order to facilitate an inventory of WSD as well as the identification of key stakeholders in the development, planning, implementation and management of different WSD options.

**Results and Findings**

In tandem with identifying and establishing the physical experiment case studies, the first year of the project included evaluating urban water and green infrastructure regimes and niches through systems and actor analyses of each city. The stakeholder interview processes helped to establish some of the larger systemic water-related issues facing each city – which could potentially hinder or support the transition towards WSD. For example, in Cape Town, whilst the drought provided an impetus for city and provincial engagement with WSD as a means of relieving stress on infrastructure and augmenting water supply, there remain barriers to the transition towards water sensitivity. Firstly, although many city departments have made inroads into the WSD space, the coordination and network-building that is essential for the sustained uptake of WSD in any context remains a challenge. Furthermore, in light of the water and sanitation deficits plaguing Cape Town, the ‘taps-and-toilets’ narrative maintains a hegemony that cannot be easily dislodged by WSD, as in most developing cities around the world. In the Johannesburg case, WSD seems to be gaining traction as a policy response to drought and flooding across provincial and city scales. However, the actor and system analyses reveal that while there are some front-runners working actively for the uptake of WSD, the approach has yet to gain sustained traction with the broader institutional practitioners and consultants. A particular barrier to the broader uptake of WSD seems to be the lack of an integrated water management approach in the city as different governance actors address their mandates in silos. In both cities the most significant factors hindering the transition to water sensitivity are the lack of WSD-specific skills and the confidence in an approach which has as yet limited proof of concept, which leaves some city practitioners apprehensive about the practical implementation of WSD elements in their day-to-day professional practice.

Ongoing phases of the project will include convening transition arena workshops in both cities, in which the system and actor analyses will be discussed with participants to enable a common understanding of the transition challenges and opportunities of implementing WSD towards building resilience. Further transition arena workshops will consist of site visits to the decentralised experimental cases / pilots to allow for collective hands-on learning and exploration of physical WSD options and possibilities. Participants will also evaluate operational and management implications of chosen WSD options at various scales and contribute to identifying additional place-based actors necessary to include in the transition arenas.

# Conclusion

Through mapping the various WSD options as well as the identification of participants for the multi-actor transition arena processes (i.e. developing an inventory of key stakeholders in the planning and implementation of WSD), the project has started to address the governance and policy implications of hybridising conventional water infrastructure with nature-based solutions in both Cape Town and Johannesburg. The ongoing project will result in outcomes relating to increased knowledge on and capacity to utilise stormwater attenuation infrastructure for both water supply augmentation and water quality improvement, as well as increased knowledge of the sustainability transition challenges that confront the water management in both cities. The series of transition arena workshops will contribute to and culminate in a co-created water sensitive futures vision-building exercise, developing shared agendas for moving the two cities towards sustainability in the water management sector.

Acknowledgements

This research was funded as part of the Danida-funded project, ‘Pathways to water resilient South African cities’.

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