

Local management models for Water Sensitive Public Open Space with multiple functions -- Cape Town, South Africa

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Abstract: Water sensitive design and other nature-based solutions are gaining increasing attention in the context of managing water in public open spaces (POS) in South Africa, particularly in terms of increasing cities' resilience to climate pressures and creating liveable urban areas. However, there is a dearth of effective and sustainable local management models for water sensitive public open spaces that can serve multiple functions, including flood alleviation, amenity and biodiversity. Using a retrofitted stormwater pond as a starting point for the development of a draft landscape management plan, this research highlights the importance of 'local anchors' in the long-term management and maintenance of multifunctional infrastructure. It has also shown that, whilst the local policy landscape reflects a strong commitment to water sensitive city transitions, current siloed governance structures within the City of Cape Town make the management of multifunctional POS very challenging.

Keywords: Multifunctional stormwater infrastructure; water sensitive cities; local management models

Climate change impacts and rapid urbanisation in South African cities contribute to water scarcity, flooding and environmental degradation, highlighting widening concerns about the resilience of conventional water infrastructure in post-colonial cities plagued by stubborn infrastructure deficits. While the need to shift to more resilient approaches that combine centralised water networks with more decentralised nature-based options is clear, how such hybrid transformations could be realised remains unclear, as does their implementation, integration and management within existing urban governance structures, particularly in these under-resourced, rapidly-urbanising and inequitable cities of the Global South. Water sensitive design (WSD) and other nature-based solutions (NbS) are gaining increasing attention in the context of managing water in public open spaces (POS) in South Africa, particularly in terms of increasing cities' resilience to climate pressures and creating liveable urban areas. However, cities have limited resources to fully engage with WSD and there is a dearth of effective and sustainable local management models for water sensitive public open spaces that can serve multiple functions, including flood alleviation, amenity and biodiversity. This research therefore aims to investigate, develop and propose such management models, in which developers, civil society and local communities all play a larger, more engaged role in supporting water sensitive city transitions.

Many South African cities make use of stormwater detention ponds – that largely function as mono-functional green spaces aimed at preventing flooding – to manage excess storm flows in built-up areas. Using nature-based methods to enhance aquifer infiltration, these stormwater ponds can help build resilience towards climate change impacts and recurring droughts, while enhancing water quality, supporting human wellbeing and improving the overall liveability of neighbourhoods. The process of repurposing an existing stormwater pond in Mitchell's Plain, Cape Town as part of a recent Danida-funded project, 'Pathways to water resilient South African cities' (PaWS1) that was aimed at enhancing water security, has provided a platform for initiating engagement with residents in the vicinity, pointing to exciting possibilities for collaboration between city departments, civil society and communities (Mclachlan et al., 2023). The focus of the next phase of this project (PaWS2) has been broadened to consider other hydrological functions, going beyond technical stormwater harvesting (SWH) objectives to also considering the design, governance and maintenance practicalities of transforming existing stormwater ponds into productive, multifunctional spaces. This necessarily includes consideration of the 'effective'

management models for these types of POS that include a range of functions - both positive (e.g., sports facilities / playgrounds) and negative (e.g., dumping and land invasion).

The research makes use of eight case studies of POS with stormwater management functions in different urban contexts in Cape Town, South Africa – including detention ponds, parks, green corridors, and urban wetlands. A mixed-methods approach is being used, combining qualitative interviews and surveys with local stakeholders, as well as quantitative data analysis on the performance of the POS in terms of flood alleviation, water quality enhancement, amenity and biodiversity. Additionally, a range of management models for the ongoing management of these spaces are being developed and tested, so as to take into account the local social, cultural and environmental context, as well as the available resources and institutional frameworks. Models are evaluated based on their effectiveness in achieving the desired outcomes, as well as on their sustainability and replicability – from both a municipal as well as local stakeholder perspective.

Using the retrofitted Mitchell's Plain pond as a starting point, a draft landscape management plan was developed and workshopped with city officials from multiple departments, civic organisations and other stakeholders. The plan details practical guidance on pond retrofits, including co-design, construction and maintenance activities – and highlights the different roles that the various stakeholders play in ensuring the sustainable management of facilities. Initial results have highlighted the importance of identifying and obtaining support from local anchor institutions or champions to assume 'ownership' of the POS and provide for those management and maintenance activities that are not routinely provided by the local authority; e.g. litter clean-ups, neighbourhood watch and security aspects, local-scale gardening, etc. The research has also shown that, whilst the local policy landscape reflects a strong commitment to water sensitive city transitions, current siloed governance structures within the City of Cape Town make the management of multifunctional POS very challenging.

The research aims to contribute to the development of effective local management models for the transformation of POS in South Africa into shared community space with multiple functions towards the ideal of a water sensitive city. The findings will be of interest to urban planners, landscape architects, environmental managers, and policymakers involved in the management of public open spaces and the promotion of sustainable urban water management practices.

REFERENCES

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