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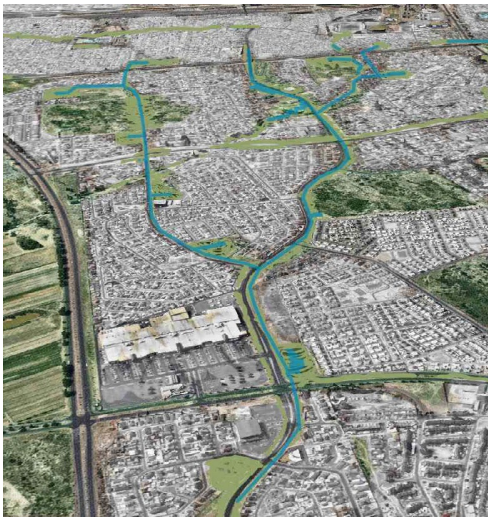
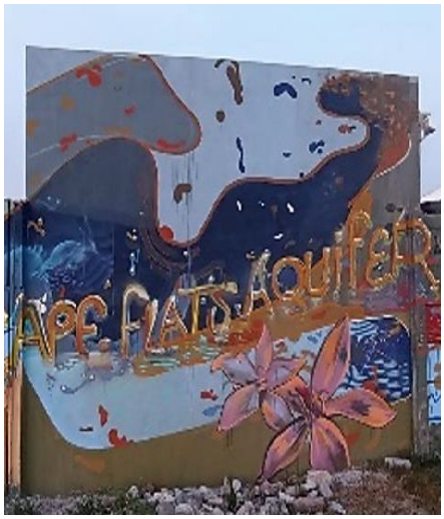
Newsletter

Pathways to water resilient South African cities (PaWS) project





The governance and institutionalisation of multifunctional BGI as nature-based solutions (NbS) in South African cities

Patience Mguni & Lise Byskov Herslund

After six years the PaWS project is coming to an end. This newsletter is the last in a series that have presented different aspects of the project to policymakers and other stakeholders since 2023 as follows:

1) the potential that Cape Town's 850-plus stormwater ponds hold for multifunctional retrofitting towards water resilience;
2) the potential retrofitted stormwater ponds hold as stepping stones to urban biodiversity;
3) the use of an Internet of Things (IoT) approach to enable a better understanding of the Cape Flats Aquifer groundwater recharge potential of stormwater harvested from a pond;

This issue

What does it take to integrate and govern multifunctional NbS in a way that builds resilience and promotes just outcomes in Cape Town?

About the project

The 'Pathways to water resilient South African cities (PaWS)' project is a collaboration between UCT's Future Water Institute, and the University of Copenhagen, funded by Danida MFA. Drawing on physical experiments and governance and social processes, it explores the potential for existing flood attenuation infrastructure to be adapted towards water resilient cities (read more here).

Contact: Kirsty.carden@uct.ac.za

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4) what multifunctional stormwater ponds may mean for Cape Town from an urban planning perspective;
5) the management requirements for stormwater ponds retrofitted into multifunctional Nature-based Solutions (NbS);
6) the benefits and limitations of nature-based water quality improvements;
7) how to enhance and sustain ecological literacy in children through knowledge sharing tools like NbS comics.

In this newsletter we bring the newsletter series to a close by reflecting on *what it takes to integrate and govern multifunctional Blue-Green Infrastructure (BGI) as NbS, in a way that builds resilience and promotes just outcomes in Cape Town.*

Stormwater ponds as multifunctional NbS for a water resilient future in Cape Town

Stormwater ponds can be thought of as Blue-Green Infrastructure (BGI) assets that have the potential to be retrofitted into multifunctional NbS to complement the City of Cape Town's aim to be a water sensitive city by 2040 (Newsletter 1; CoCT, 2019). In the PaWS project, we see NbS for stormwater management as hybrid natural and engineered measures that address *(i) flood risk, (ii) improve water quality and restore ecosystems, (iii) enhance biodiversity while, (iv) supporting human well-being and urban liveability* (Tanyanyiwa et al., 2024; Cook et al., 2024).

Planning, design and development of such multifunctional infrastructure requires an integrated cross-sectoral approach at city level as mandates for stormwater, biodiversity, recreation, water quality and urban health often sit under different departments.

Furthermore, NbS are a shift away from expert-led, top-down urban planning and development as they come with a fifth function, i.e., *(v) a collaboration imperative* that requires city, civil society, researchers and communities to work together (Naumann et al.,2023). In a way, NbS can be seen as 'disrupters' - disrupting existing relationships between people-infrastructures-place that can either worsen existing inequity through green gentrification or foster just transformations. Therefore, the way NbS are introduced to places needs to consider the local dynamics so as to steer towards positive place disruptions that foster justice, equality, and inclusion.

stakeholders (June 2019)

Stormwater ponds as NbS in Cape Town – Visions of resilient futures and addressing an unjust past

Cape Town remains one of the few cities in Africa to purposively pursue a climate resilience agenda and sustainable urban development in response to current and projected climate and development challenges. To this end, the city actively participates in transnational municipal networks (TMNs), particularly climate-focused networks like the C40 Cities and ICLEI. Through these networks, the city gains access to peer-learning opportunities and best practices, which have influenced its climate governance approaches.

NbS for stormwater management are a fundamental part of the city's vision to be a water sensitive city by 2040, and the PaWS project - using the learnings gained from the Fulham Pond retrofit in Mitchells Plain – has lobbied for multifunctional stormwater ponds to be leveraged as a key aspect of translating the city's aspirations for water resilience (Newsletter 1).

However, the feasibility of translating visions for resilient, water sensitive futures for post-colonial cities like Cape Town is confronted by the legacies of uneven spatial and (blue-green) infrastructure development - as a consequence of apartheid's segregatory planning (McLachlan et al., 2023; Mungekar et al., forthcoming).

These legacies also include a prevalence for expert-driven planning and governance (Harrison & Croese, 2022), the persistence of built infrastructure deficits (Eakin et al., 2025) and marginalized areas with little access to safe BGI for recreation and wellbeing (Venter et al., 2020).

It also means that in marginalized areas such as Mitchells Plain, relationships between the city and communities are often characterized by tension and mistrust, with few opportunities for multistakeholder collaboration in urban infrastructure governance.

There are currently various stakeholders in the management and governance of stormwater ponds functioning as BGI in Cape Town. Stormwater ponds are city-owned infrastructure and their design, development, operation and maintenance involve different departments across the city as our policy analysis shows (Mguni et al., 2022).

At the local scale, stormwater ponds are often little-understood by communities in places such as Mitchells Plain – where they represent nondescript, open green spaces that are prone to invasion by informal settlers and criminal activity resulting in constant surveillance but little engagement with the spaces by local residents (McLachlan et al., 2023). In other locales, it has been observed that this disconnect is addressed by NGOs who play a key role in linking city aspirations for water resilient futures with harnessing available city (and other) resources as well as the momentum in communities to stimulate engagement and stewardship of BGI at the local level; e.g., the Mosselbank River Conservation Team.

Government-supported poverty alleviation programmes such as the Expanded Public Works Programme (EPWP) are also important tools for the city to increase awareness, stimulate ecological literacy and get buy-in for the collaborative management of BGI around the city.

Researchers discussing Fulham Pond maintenance with community leaders

Finally, as researchers we have also played an intermediary role in the integration and governance of multifunctional stormwater ponds as NbS, translating both the city's visions for water resilience and interdisciplinary scientific research into a transdisciplinary project around the Fulham Pond retrofit.

What Fulham Pond has taught us about the governance and institutionalisation of multifunctional NbS in Cape Town

Over the past six years we have learnt several lessons about integrating and governing multifunctional NbS spaces such as the Fulham Pond.

First, by virtue of their inherent multifunctionality, retrofitted stormwater ponds require governance and maintenance structures that span multiple sectors and scales including local residents and civil society. This is because NbS are not solely about water management; with their multiple functions they cut across disciplines, sectors, mandates and levels of governance.

Ensuring flood risk reduction, water quality improvement, biodiversity enhancement, human wellbeing and amenity through collaboration mean that different city departments need to work together to plan, design, operationalise and maintain multifunctional stormwater ponds. Furthermore, the 'collaboration imperative' that comes with NbS means that city departments need to empower local communities and civil society to work with them to maintain these 'new' infrastructures.

Currently, there are ambiguities around who is responsible for managing and maintaining multifunctional ponds in Cape Town. In the case of Fulham Pond, maintenance needs to go beyond the biannual mowing and inlet/outlet clearing that city contractors do to include more regular litter clearing and removal of debris and blockages from the inlets and outlet, plus necessary repairs to the berm etc. There has also been an effort over the duration of the project through placement of boulders and bio-cement blocks (stepping stones) to make city contractors aware that the central wetland section of the Pond is a 'no-mow' entity.

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When mowing has been done, it has been residents who have directed city contractors on where to mow and which areas to leave intact, further highlighting the need for coordination of different stakeholders in the stewardship of multifunctional infrastructure.

A second key lesson has been that the planning, implementation and maintenance of multifunctional NbS must be tailored to the context around each pond, considering local needs, spatial opportunities and site-specific limitations, especially so for marginalised communities in cities like Cape Town.

While the concept of NbS has gained traction globally as a climate solution, the PaWS project shows that the translation of city visions of water resilience through NbS is a complex process for a post-apartheid city still struggling to shake off the legacies of unjust urban development. The initial resistance we faced from the community (Mguni et al., 2025) and the current difficulties in securing community stewardship of the Pond give a snapshot of the challenges and importance of realising water resilient and just futures for all in Cape Town.

A third lesson centres on the need for the city and residents to begin to view BGI such as stormwater ponds as legitimate infrastructure assets within the city's infrastructure systems and as such requiring an asset register and relevant management. This challenge is not unique to Cape Town, and is a blindspot for many cities globally (Langeveldt et al., 2021) based on urban (infrastructure) development practice often overlooking or undervaluing multifunctionality in infrastructure transitions (Alves et al., 2023).

Biocement blocks laid out as stepping stones around the wetland area of the pond.

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For now, most stormwater ponds act as monofunctional infrastructure that represent ambiguous spaces, security hazards or potential informal settlements for the city and many communities. There needs to be a process in which all stakeholders can unpack how multifunctional stormwater ponds can be recast as legitimate infrastructure with which to address some of society's needs and managed accordingly for a clearer understanding of their long-term performance potential. Such a process could also unpack the different values that various stakeholders place on BGI as well as the skills required to effectively manage multifunctional infrastructure.

The fourth lesson we have learned on our journey with Fulham Pond is around care, repair and healing as a governance mode for multifunctional NbS in post-apartheid cities where urban infrastructure remains a manifestation of the unjust legacies and continuing inequity (Mungekar et al., forthcoming). NbS are not implemented on blank canvases, rather their implementation needs to be ready to confront the current realities of South African cities, realities that have proven difficult to address thus far.

As 'disrupters' of existing people-infrastructure-place relationships, NbS do give an opportunity for a more inclusive approach to urban infrastructure development in which all stakeholders can slow down development processes and try to understand the tensions and mistrust with a view to fostering collaborative and restorative spaces that balance and mend relations between stakeholders and between marginalised communities and local BGI.

By fostering an emphasis on the care and repair of landscapes, relations between stakeholders and on visions of climate resilience, NbS may be governed towards just outcomes. From a governance perspective, the PaWS project cannot give sure-fire solutions for how to govern and institutionalise NbS like multifunctional stormwater ponds in South African cities. Rather we have cast a light, through our various processes and activities, on the conditions under which climate governance has to operate in post-colonial cities as well as the implications these may have for pathways towards water resilience through NbS in South African cities.

Invitation to residents for a pond visioning process – February 2025

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