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Newsletter

Pathways to water resilient South African cities (PaWS) project

Multi-layered management requirements of stormwater-linked Blue-Green Infrastructure (including SuDS) in cities

Julia McLachlan, Kirsty Carden, Amber Abrams

In our previous PaWS newsletters, we've explored stormwater ponds as opportunities for a city like Cape Town to embrace its Water Sensitive City vision by 2040.

Stormwater ponds can be recognised as Blue-Green Infrastructure (BGI) assets that use Nature-based Solutions (NbS) - complementing the current City of Cape Town by-laws, in which these ponds are zoned as OS2 for public open space and environmental conservation use.

BGI can provide multi-functional benefits such as enhanced biodiversity, flood prevention, heat mitigation, aquifer recharge, environmental education, etc.

This issue

Multi-layered Management of Blue-Green Infrastructure – Exploring the 'How to'

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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This multi-functionality is valuable for enhancing urban resilience *but what does it mean for the maintenance, management and ongoing stewardship of these ponds?*

Stormwater detention ponds occur in a varied urban landscape made up of houses, roads, shops, schools, and so on. Our ongoing research suggests that these ponds could function not only as integral elements of the City's drainage system but could also become civic assets by providing multi-purpose, blue-green public open spaces that provide a variety of activities or uses related to the stormwater pond's role for individuals, groups, communities, etc.

Many of the stormwater ponds are scattered across the Cape Flats, where, according to research, there is very little greenery, with Venter et al. (2020) recognising this as 'Green Apartheid'. There is also reduced biodiversity or even knowledge about the importance of biodiverse landscapes within urban areas.

In a recent Daily Maverick article, *'Natural heritage – reviving the Cape Flats' endangered botanical biodiversity, species and landscapes'* published 27 Aug 2024, Cllr Eddie Andrews, the deputy mayor of Cape Town and the Mayoral Committee member for spatial planning and environment, was quoted:

> "…*the Cape Flats is now very urbanised and nature reserves are often the only open spaces mitigating future climate change and providing ecosystem services, including the production of water via the Cape Flats aquifer*."

As areas of public open space, stormwater ponds across the Cape Flats therefore present another opportunity for addressing biodiversity deficits and building on the natural heritage, but…

How can Cape Town's stormwater ponds be managed and maintained as biodiverse, public open space?

In his paper, Re-Translating Nature in Post Apartheid Cape Town: The Material Semiotics of People and Plants at Bottom Road, Ernstson (2013) asserts that the existing problem is one of:

> *"…green spaces that fall outside nature reserves, or that rank low on its potentiality to sustain biological diversity fall off the map of this practice, receiving less funding and attention."*

He suggests the need for innovative approaches and a 'n*ew way of knowing and being in relation to urban green spaces'.*

Ernstson challenges us to re-think biodiversity protection, shifting from one which is expert-based to civic-led stewardship and ecological rehabilitation.

The involvement of local residents is key but he also identifies the need for intermediary organisations, such as Working for Wetlands and the Rondevlei Nature Reserve that provide support networks or go-betweens to assist with the civic action.

The sustainability of such projects rely on these organizations, not only for direct assistance, support and structure, but also as mechanisms for external partners such as research institutions (e.g. Future Water Institute, UCT) to facilitate payment protocols for particular local stewardship partnerships.

This approach towards the management of green spaces could be similarly applied to stormwater ponds with local residents being exposed to different opportunities that the ponds could provide.

Some examples of these – as have been trialled through the various activities as part of the PaWS project – are provided as follows:

- *Livelihood opportunities and Green Skills development*

Stormwater ponds exist within neighbourhood catchments thus presenting opportunities for local people to develop skills on the maintenance of both the water system as well as the vegetation that forms the landscape (including planting, weeding, mowing, etc.).

However, it is not just around the maintenance aspects where skills can be developed, e.g. removing litter to improve appearance, trimming plants, clearing blockages etc.

Knowledge about plants and the importance of protecting biodiversity is also created through learning about the placing and maintaining of stone-lined planted sections as well as through constructing and placing stepping stones as perimeter elements to protect or demarcate perimeters of wetland areas.

The different benefits of plants – not just ecological but also as part of cultural traditions, e.g. edible, medicinal – can be showcased by using these ponds as workshop and demonstration settings (i.e., Living Labs), to build knowledge amongst local interest groups, for example, the Cape Flats Dune Strandveld biome contains many examples of edible plants which would have sustained our ancestors.

As opposed to under-utilised landscapes of just grass or sand, diversifying the functions of stormwater ponds could create green skills opportunities for the development of floriculture, horticulture, and traditional medicine – as demonstrated by other Cape Town based community groups such as the Green Autonomy Ambassadors (Eerste River) and the Mosselbank River Conservation Team.

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- *Recreation and Amenity value*

Through strategic mowing and planting these ponds can provide attractive landscapes in the neighbourhood as well as acting as biodiversity 'stepping stones' (habitat areas to increase connectivity between protected areas) within the City, e.g. Fynbos corridor collaboration. Blue/green interventions can offer amenity functions, creating spaces for nature play and for picnics, exercise (e.g. a jogging track around the pond), community gatherings, etc.

- *Nature education for primary & high schools*

Multifunctional stormwater infrastructure provides significant opportunities for learning about our natural heritage (e.g. reviving the Cape Flats' endangered botanical biodiversity, species and landscapes).

NGOs such as Fynbos Life contribute to these learnings through their work with local interest groups (including schools) to plant and maintain indigenous knowledge gardens. The ponds allow for a range of citizen science opportunities at schools, for the monitoring of water quality, biodiversity, etc., and also provide a place for eco-clubs.

Learning materials such as those currently in development as part of the PaWS project (i.e. the 'Guardians of the pond' handbook) can be used to build knowledge amongst local primary and secondary school goers around the natural water systems and ecological habitats in their neighbourhood, and provide opportunities to set up broader networks with other NPOs and local schools.

- *Academic research*

Stormwater ponds such as the Fulham Rd ('School') pond that has formed the basis of the PaWS experimental site, provide excellent opportunities for longitudinal studies in the field of water science, functioning as living laboratories and spaces for local engagement and co-design. In the case of the PaWS project, learnings have been developed around sustainable stormwater management and the role of urban stormwater in these types of pond habitats in slowing and filtering stormwater run-off for Managed Aquifer Recharge (considering both water quality and quantity) – as well as local biodiversity studies.

In general, the transformation of monofunctional stormwater ponds into multifunctional blue-green infrastructure builds opportunities for more diverse relationships with and within the pond, as well as with local residents and other stakeholders.

To quote Ernstson (2013):

> *….if the "blueprint" of Bottom Road continues to sustain its many relations and to sustain its ability to travel to other spaces, that also 'nonexperts' can claim speech in relation to Capetonian urban nature, and that 'urban nature' can be re-translated as a substance for addressing injustices in an apartheid and postcolonial city.*

Until the next edition…….

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