

Pathways to water resilient South African cities: rethinking the governance of multifunctional blue-green infrastructure

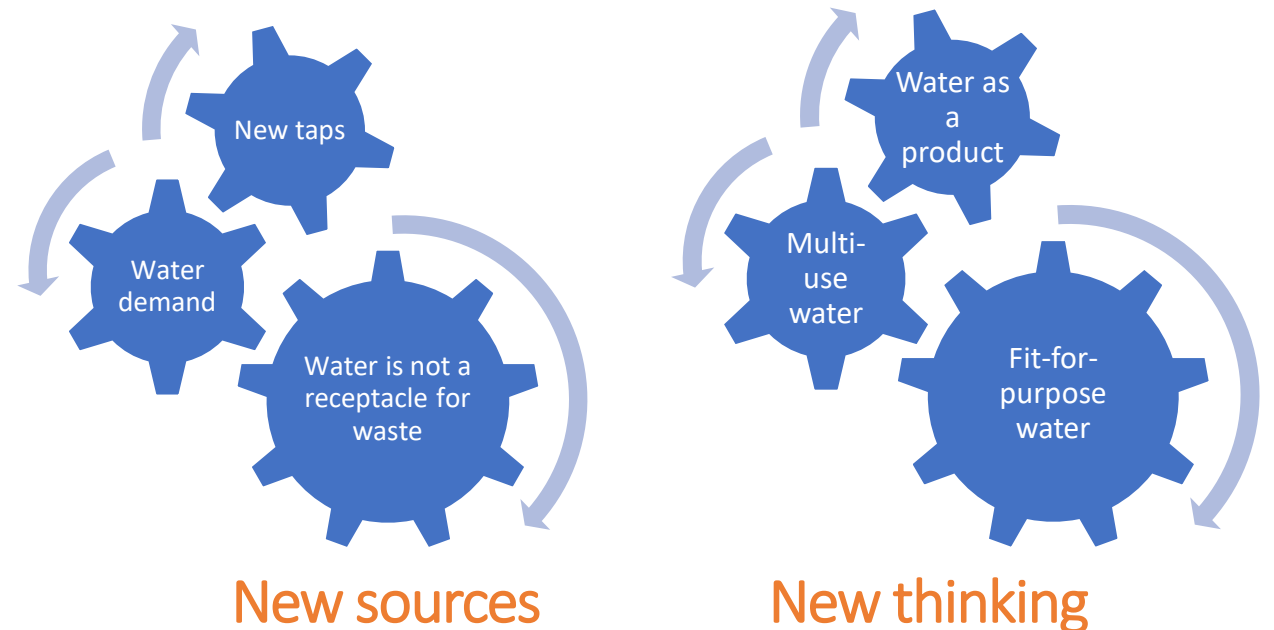
IFLA Africa Climate Change Working Group

Kirsty Carden

University of Cape Town

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- Integration across water sectors in response to multiple risks (breaking silos)
- Emphasising links between drought, flood and other water-related challenges
- Harnessing nature as a buffer to hazards (blue-green infrastructure / waterscapes)
- Demonstrating how WSD could improve water quality, water quantity, biodiversity and amenity – i.e., liveability
- Rethinking governance in terms of scale and actors
- **Water Sensitive Design (WSD) / Water Sensitive Cities (WSC)**



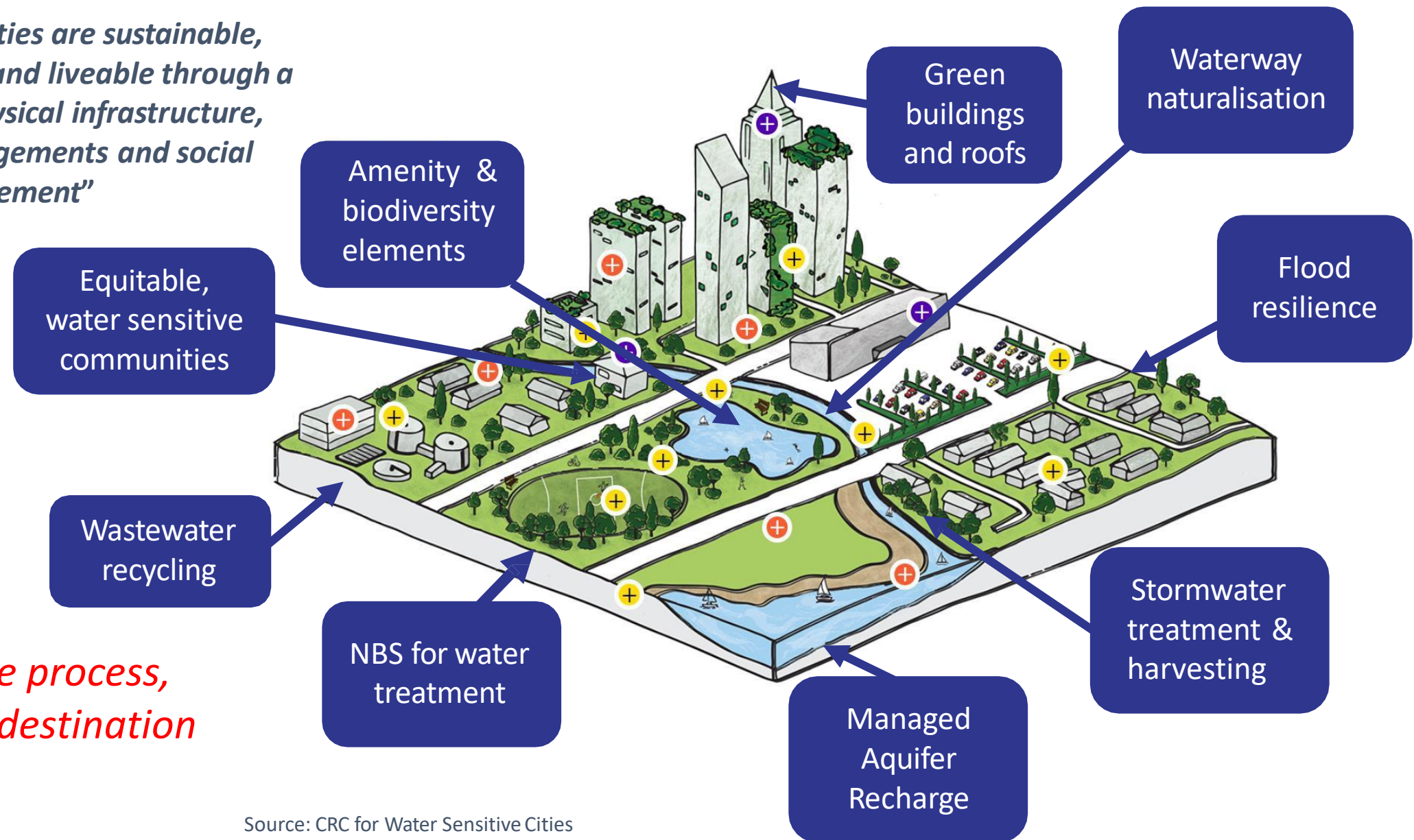
Definition - Water sensitive design

*“In its broadest context, WSD encompasses all aspects of integrated urban water cycle management, including **water supply, sewerage and stormwater management**. It represents a **significant shift** in the way water and related environmental resources and water infrastructure are considered in the **planning and design** of cities and towns, at all scales and densities”*

(Fletcher et al., 2014)

A Water Sensitive City

“Water sensitive cities are sustainable, resilient, productive and liveable through a combination of physical infrastructure, governance arrangements and social engagement”



*WSD is the process,
WSC is the destination*

Towards implementing water sensitive cities



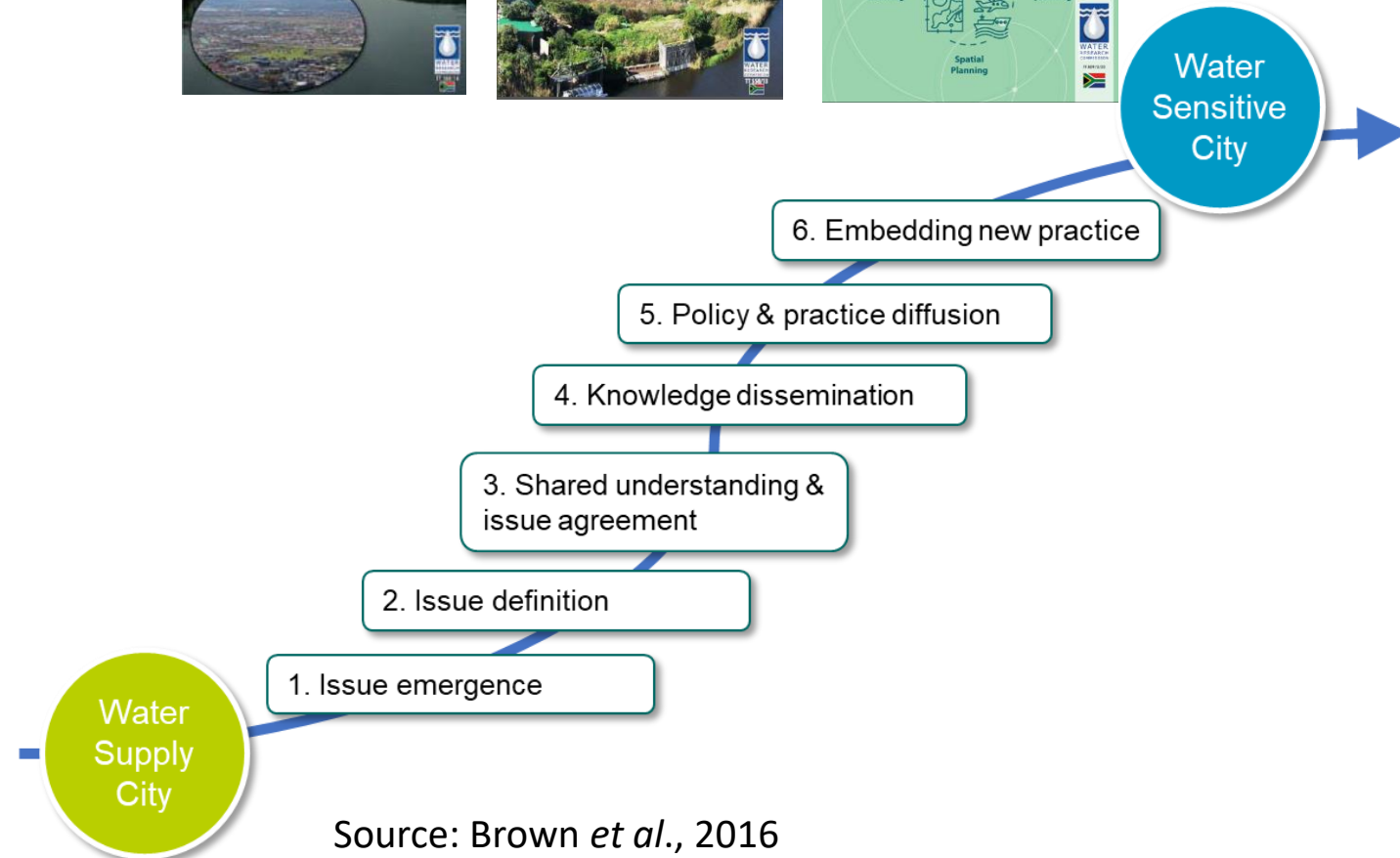
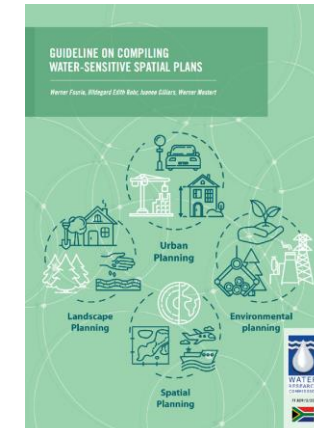
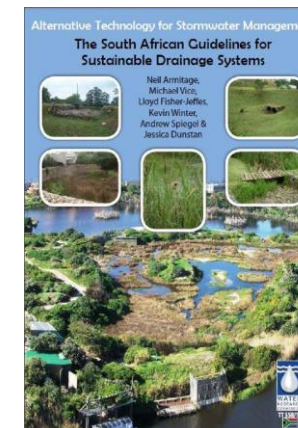
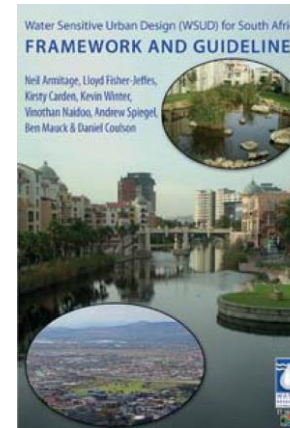
- What are our city's strengths and weaknesses?
- Is there an enabling environment?
- What actions can we take to support the city's transition?
- How do we motivate and engage stakeholders, and coordinate action?
- How can we measure progress over time?

“City to city learning”

Is there an enabling environment for water resilience?

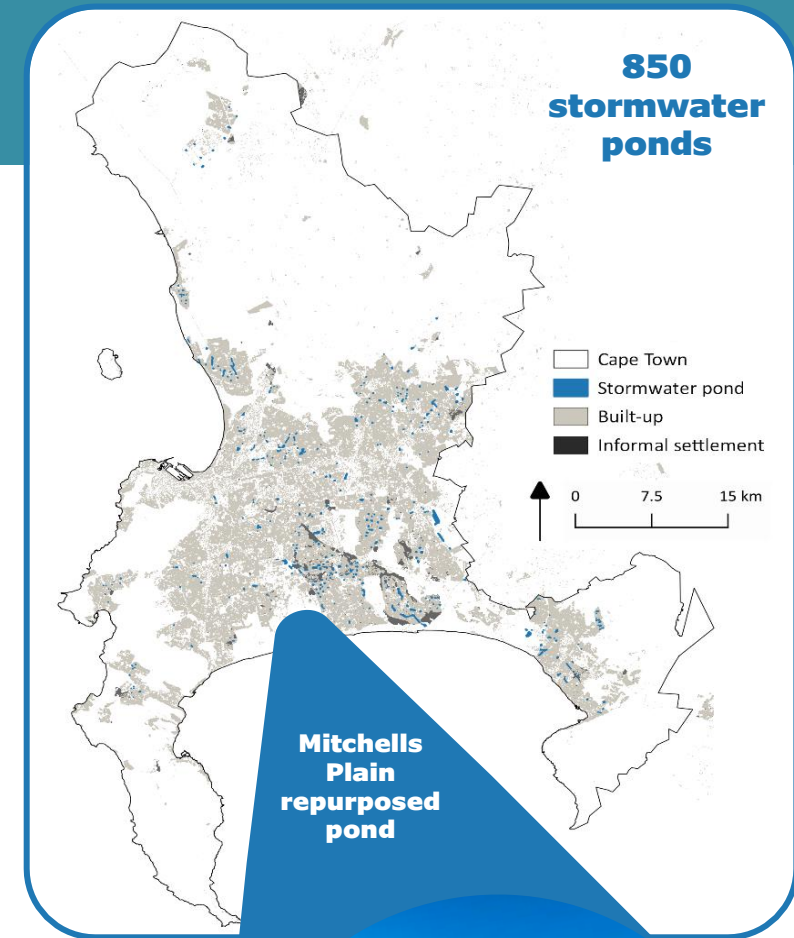
Grounding WSD/WSC concept in SA

- Incorporation into policy
- Consolidation of knowledge
- Identification and support for champions to drive this space
- Creation of knowledge and data sharing platforms
- Demonstration projects at scale
- Learning alliances



PaWS project - key elements

- Nature-based approaches that link storm runoff and wastewater to water supply
- Water sensitive (urban) design elements and landscape-based solutions
- Integration of built water infrastructure with green infrastructure in a decentralised manner
- Physical and institutional integration pathways (planning, policy)



*“to identify opportunities for the physical and institutional integration of hybrid, decentralized, **multi-functional** Blue-Green Infrastructure into the urban water cycle to accelerate a transition towards water resilience”*

Research questions and WPs

1. Can stormwater ponds be repurposed to allow for treatment and harvesting of surface runoff through MAR?
2. How effective are WSD elements being implemented in response to Stormwater by-laws?
3. What are the roles and responsibilities of different actors in the implementation and management of WSD?
4. What does an enabling governance environment for increased water resilience entail and how can it be supported?
5. What are different pathways for physical and institutional integration of WSD into the urban water cycle?

Work Package 1



Physical experimentation with and evaluation of WSUD options at different urban scales and options for their integration into the urban water system

Work Package 2



Exploring governance processes for integration of WSUD options in urban water governance and enabling the emergent transitions

Work Package 3



Management and dissemination

Blue-green infrastructure

Blue-green Infrastructure is... *“an interconnected network of landscape components, both natural and designed, that includes open, green spaces and water bodies (ephemeral, intermittent and perennial) which provide **multiple functions**”*

Multifunctionality is **explicitly and strategically planned for**, rather than being a product of chance



Multiple functions – PaWS project



Increasing water re-use

Enhancing cultural and heritage associations with water systems

Increasing access to blue-green space

Increasing equity

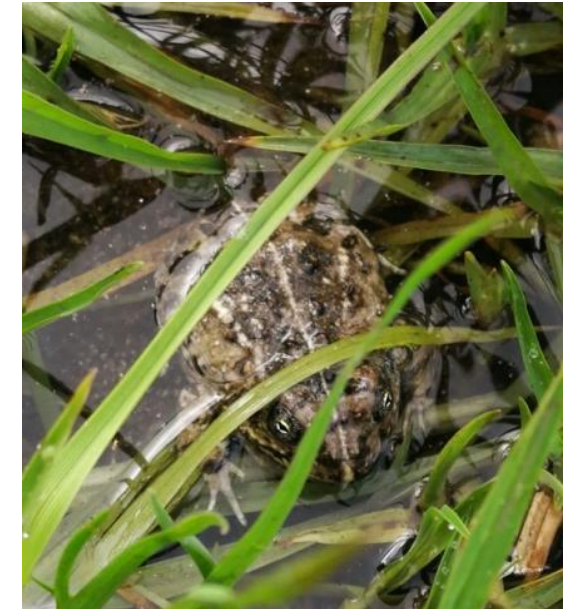
Reducing the Urban Heat Island effect

Managing water quality

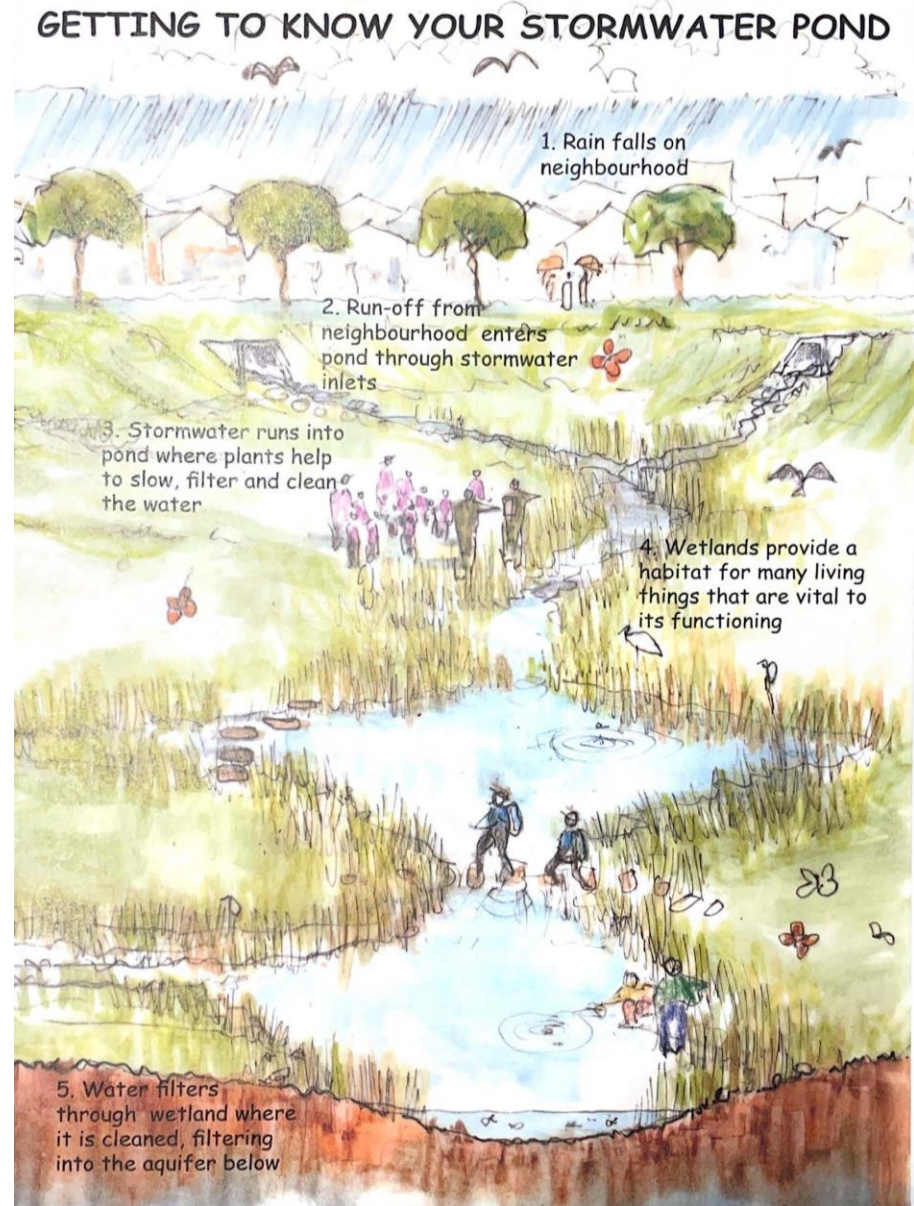
Flood control

Community services connection with water systems

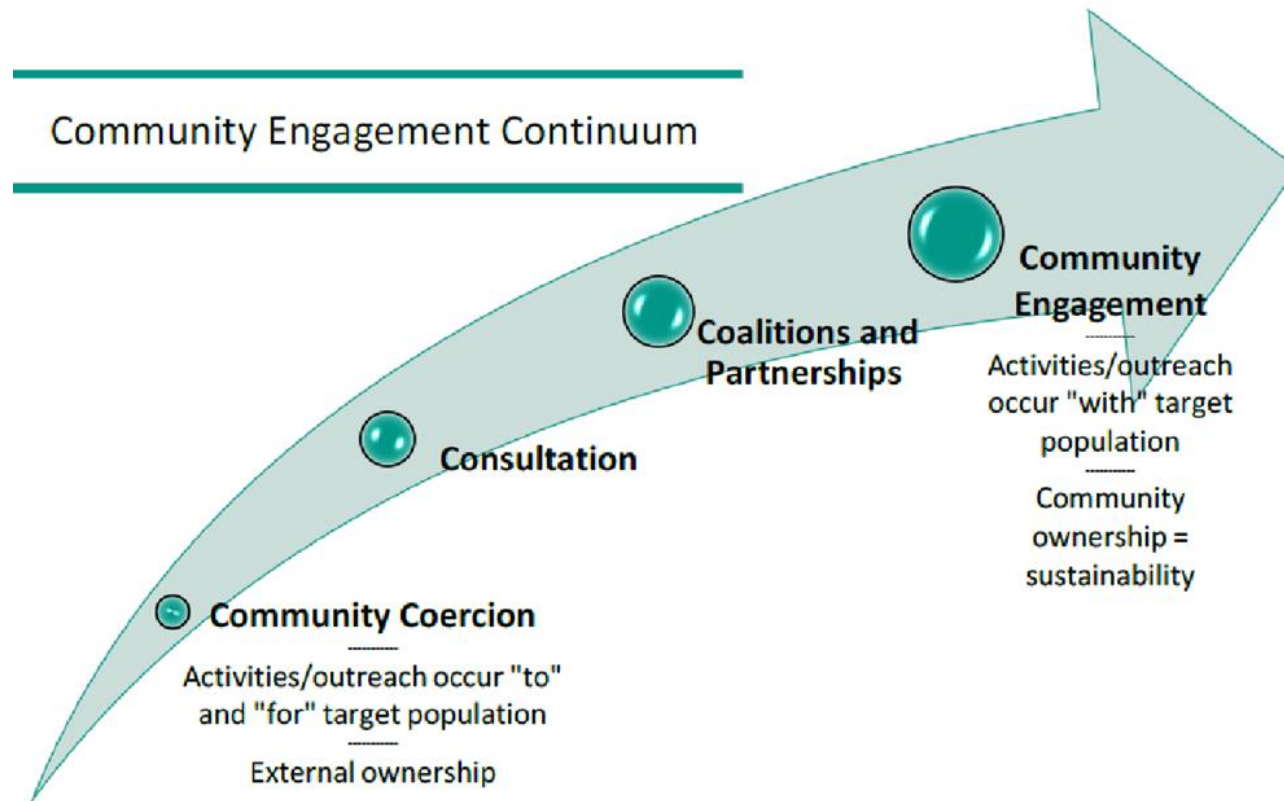
Enhancing biodiversity



- Support for added amenity and ecology benefits
- Co-design and input
- Space for WSD / SuDS (preventing land invasions)
- Assistance with monitoring
- Job creation opportunities
- Safety and security measures



Formalising local involvement



Maintaining momentum

- Coalition building
- Engagement buy in
- Sustainability efforts
- Identifying policy

Funding/ Partnerships

- Formal group registered to secure funding
- Friends, Co-ops, Civic organisations, Community improvement district

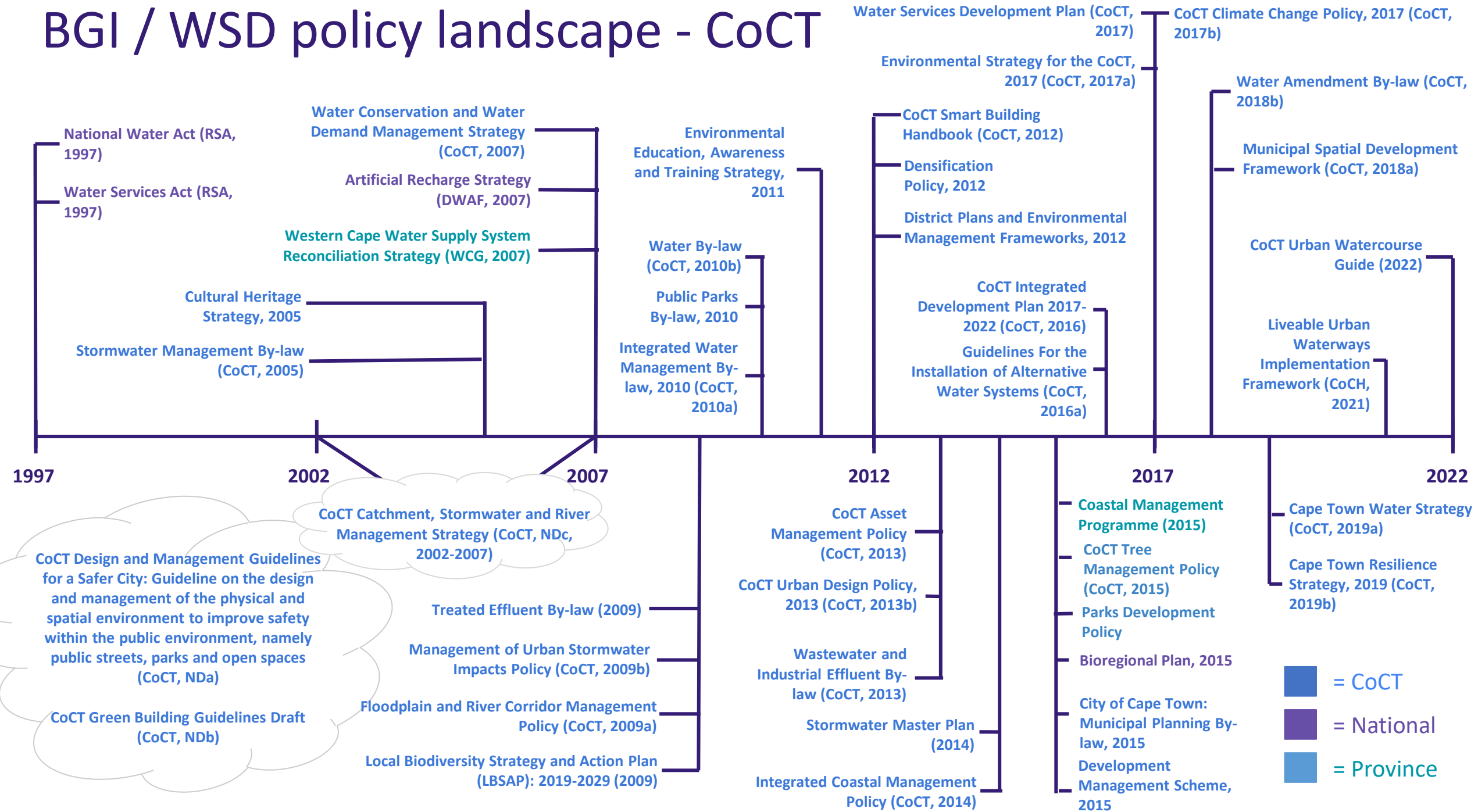
Maintenance and Management Plans

- Adaptive planning
- Clear SoPs and understanding of how maintenance will be funded

Evaluation and Monitoring

Cost-benefit / feasibility analysis

BGI / WSD policy landscape - CoCT



A BGI / WSD approach for South Africa

- Integration across water sectors in response to multiple and dynamic risks (breaking silos)
- Emphasising the links between drought, flood and other water-related challenges
- Optimising and integrating the management of all available water resources – surface, ground, wastewater and stormwater
- Harnessing nature as a buffer to risks and hazards (blue-green infrastructure / urban waterscapes)
- Rethinking governance in terms of scale and actors
- Creating liveable urban areas that place high value on water and strive to increase water use efficiency through water sensitive urban design

Building resilience through the use of multi-functional BGI allows us to engage with a more transformative vision for the future of urban water in SA



UNIVERSITY OF
COPENHAGEN



FUTURE
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Kirsty.carden@uct.ac.za

<https://futurewater.uct.ac.za/>

