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IN ASSOCIATION WITH



Integrating Indigenous Knowledge systems into Water systems in South Africa

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Indigenous Knowledge Systems and Compendium Project

- IKS Working Definition:

- cumulative bodies of knowledge, practices, and beliefs that have evolved over generations through adaptive processes and been handed down through cultural transmission

- Compendium Project:

- RA work at Future Water - developing a compendium of case studies in Cape Town and Johannesburg, South Africa

- Compendium linked to DANIDA Pathways to Water Resilient Cities Research Project PaWS

- Case Studies of WSD and efforts to make water sensitive cities possible. . .water reuse and reclamation central to all these efforts and cases

- Today, I draw out Indigenous Knowledge aspects in existent NbS projects

- Focus on the local and indigenous knowledge practices in place that support water sensitive processes



Why Indigenous Knowledge Systems

- Oral/ Shared Traditions on Nature based Solutions around Water systems in Africa , and South Africa
- Importance of Knowledge Keepers
- Traditional Ecological Knowledge in community projects

- Historic background
- Key issues/ current debates
- Attention to ethics of practice, distortions of colonial influence on NbS, scientific evidence disputes, communities left in charge of cultivating indigenous knowledge systems and practices, qualifications of community experts
- International Perspectives
- Scientific knowledge/ intellectual property, collaboration with varied stakeholders, community engagement, potentially fragile ecosystems, in creased engagement with indigenous knowledge keepers and communities, ownership
- Future Directions

- How can attending to existent IKS in spaces allow for more uptake of WSD? How can connecting IKS in practice to WSD and NbS increase buy-in and ownership, or even understanding and acceptance?



Compendium Explained

Why the PaWS Project Compendium of Cases?

- **Introducing and contextualising NbS**
 - NbS with GI
 - NbS with SuDS
 - NbS in Africa
 - NbS in Cape Town and Johannesburg
 - Organisational Arrangements around NbS
- **Reasons for the compendium**
 - Knowledge sharing and best practices
 - Evidence building
 - Implementation guidance
 - Investment justification
 - Cross-sectoral collaboration
 - Climate resilience planning
 - Policy development support



IKS in the context of the compendium and PhD Process

Historical and Cultural Continuity

- Documenting traditional water knowledges and practices that have persisted despite historical disruptions
- Identifying knowledge transmission mechanisms within communities
- Mapping the spatial distribution of knowledge keepers in relation to water resources

Cape Town's Water Resource Management and Biodiversity Conservation

- Climate-responsive design strategies: How indigenous knowledge informs designs that respond to local climate patterns
- Integrated water harvesting: Traditional techniques adapted for contemporary urban contexts
- Climate change adaptation strategies: Community-based approaches to increasing resilience
- Decolonizing peri-urban water systems: Challenging dominant knowledge paradigms in infrastructure planning

Legal and Political Recognition

- Examining integrated governance models that incorporate traditional knowledge systems
- Documenting challenges in formal recognition of IKS in municipal planning processes
- Identifying policy frameworks that successfully bridge Western and indigenous approaches

Economic Development of Local Communities

- Social cohesion and reconciliation: How water-based projects strengthen community bonds
- Community stewardship models: Sustainable management approaches led by local knowledge keepers
- Decolonization of knowledge: Shifting power dynamics in decision-making processes

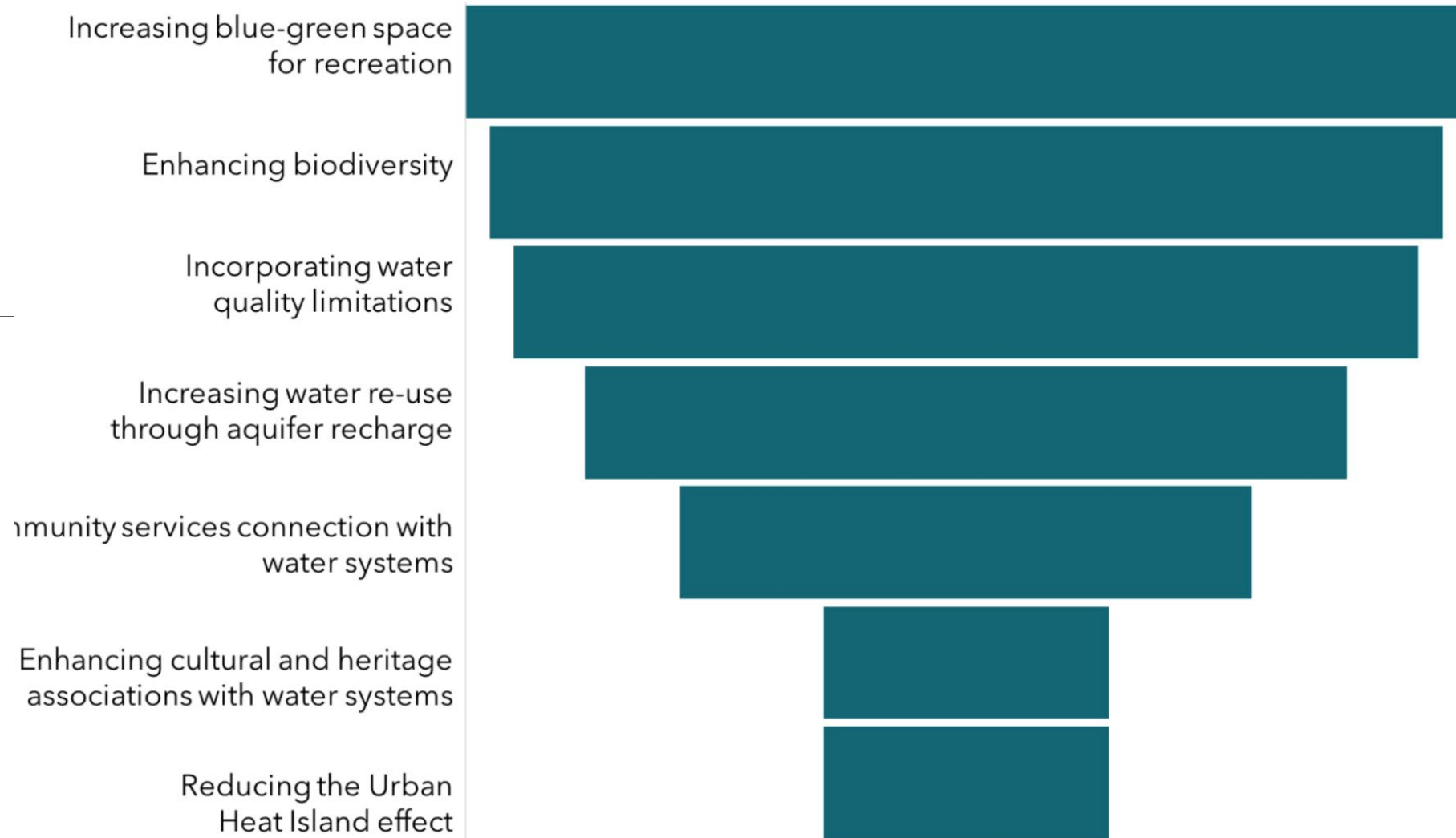
Compendium Case Study Applications – Special Attention Areas

Case Study Applications

Each case study in my compendium demonstrates practical applications of IKS in nature-based solutions, with special attention to:

1. Women's roles as knowledge custodians: Highlighting gender-specific knowledge and practices
2. Arts-based documentation methods: Using innovative approaches to capture and communicate IKS
3. Engineering adaptations: How traditional knowledge informs technical solutions
4. Economic benefits: Quantifying the value created through IKS-informed approaches
5. Climate resilience outcomes: Measuring adaptation success through indigenous metrics

The importance of Indigenous Knowledge Systems and Nature Based Solutions in Water Systems



The relative importance of the benefits rated by local expert stakeholders

The background of the slide is a blue-tinted photograph of a water treatment facility. It features a complex network of steel beams and walkways, with a long, straight channel of water in the foreground. The image is overlaid with several large, semi-transparent blue circles of varying sizes, which act as decorative cutouts, revealing the underlying scene. The overall aesthetic is clean and industrial.

IKS Cases

Case study 1 : Ezemvelo and agri-wise services - emergent from local will and interest

- Browns Farm, Phillipi Cape Town - Detention pond at Intsebenziswano Secondary School
- DRIVEN BY LOCAL RESIDENTS AS KKs – local residents as champions
- Facilitate understanding of the importance of the stormwater pond
- Building a perimeter walking / running track, using it for educational (biodiversity etc.)/affiliated school programs
- Vested interest in the environment from an economic perspective - creates more facilitators and engagement with the project
- Relying on local ecological knowledge – volunteers weed and engage with the space regularly
- Traditional knowledge on the landscape to inform the implantation of interventions
- Communal engagement with the space around water systems
- Indigenous plants to the area include:

Kei apple which can be used to create hedges, and other plants like freesias, scented agapanthus, night-scented gladioli, wild honeysuckle tree, sweet salvias, travelers joy, jasmine and the lemon-scented pelargonium

Case Study 2: Green Autonomy Ambassadors

- emergent from local needs and wants – engaging with CoCT and researchers to build their program and spread/influence

- Based in Eerste River , Cape Town - two spaces- provincial (Agri-Zone) and CoCT
- DRIVEN BY LOCAL RESIDENTS AS KKs – local residents as champions
- Use their knowledge on nature to connect to communities to stormwater systems
- Self sustainable model and holistic/layered approach
 - Cutting alien species - repurposed for firewood and communal needs
 - Nursery of indigenous plants
 - Fynbos institute – Education on indigenous plants and their benefits
 - Permaculture – Organic food and edible plants – catering company
 - Manufacturing of essential plants/oils
- Trading and Tourism – providing the community with experiences and teaching them around self sustainability
- Indigenous plants to the area include:

Kei apple which can be used to create hedges, and other plants like freesias, scented agapanthus, night-scented gladioli, wild honeysuckle tree, sweet salvias, travelers joy, jasmine and the lemon-scented pelargonium

Case Study 3: Mossel Bank River Conservation Team

- emergent from developer support/buoyed and maintained by local KKs

- The Mosselbank River, a non-perennial tributary of the Diep River flows in a north-north-westerly direction across the Greenville Development
- Their mission is to protect wetlands and promote environmental education as they that by working together they believe they can make a difference in preserving the natural beauty of Mosselbank River and its surrounding wetlands.
- Designated as a Critical Ecological Support Area (CESA)
- The Mosselbank River is easily overlooked, but it is crucial to people, other ecosystems, and our climate because it provides vital ecosystem services like flood control and water purification.

IKS Aspects

- Interactive interface which features the array of River Flora
- This list of indigenous plants at the site include *Athanasia crithmifolia*, *Conicosia pugioniformis*, *Chaetobromus dregianus*, *Chrysanthemoides incana*, *Dimorphotheca pluvialis*, *Dodonaea*, *Agathosma* sp., *Helichrysum revolutum*, *Athanasia*, *Eriocephalus racemosus*, *Ehrharta villosa*, *Pelargonium capitatum*, *Rhus laevigata*, *Athanasia trifurcate*, *Passerina*, *Thamnochortus spicigerus*, *Eriocephalus racemosus*, *Amellus tenuifolius*, *Athanasia crithmifolia*, *Carpobrotus edulis*, *Conicosia pugioniformis*, *Euryops linifolius*, *Ehrharta calycina* and *Ehrharta villosa*.
- The Mosselbank River is also home to a variety of fauna, including birds, crabs, and a freshwater turtle.
- MRCT regularly work on their food garden for the community

Case Study 4: PaWS Site – IKS Challenges

- Emergent from research efforts, momentum and local KKs still developing

- Fulham Pond, Mitchells Plein, Cape Town
- The overall objective is to identify opportunities for, and generate knowledge on, the physical and institutional integration of decentralised nature-based solutions into the urban water cycle to support and accelerate a transition towards water resilience in South African cities.
- Water shortages due to 2015- 2018 drought in Cape Town inspired PaWS project
- Finding ways to transition cities to be more water resilient through stormwater infrastructure
- Experimentation has been a big aspect of this project
- CPT has about 800 stormwater ponds
 - they reduce massive flooding but nothing else
 - they are sitting on highly potentially effective aquifers

IKS Aspects

- Local Ecological Knowledge
- Communal and historical knowledge
- Steeping Stone to local biodiversity
- Planting indigenous plants (*need to insert the plants types that have been planted)
- Building custodianship based on the historical landscape



The background of the slide features a photograph of a water treatment plant. The image shows a long, straight walkway or bridge over a series of rectangular basins. In the distance, there is a large, complex metal structure, likely part of the filtration or aeration process. The sky is overcast. The entire image is overlaid with a semi-transparent green color and several large, stylized leaf shapes in a slightly darker shade of green, creating a decorative, nature-themed aesthetic.

Analysis and Conclusions

Thematic Analysis – Initial Findings

- Initial observation
 - Indigenous Knowledge is an important aspect to analysing South Africa’s landscapes
 - Present in the current NBS systems
 - An important aspect of community sustainability
 - Needs more recognition
- Common themes
 - Oral and historical traditions preserve records of ancient and present landscapes
 - IKS can help understand human and communal interactions with landscapes
 - Many of the traditional practices have sustained throughout space, context and time
 - IKS that emphasis experiential awareness is helpful in multiple setting
 - Needs to be seen as a functional system to implementing innovations around water systems in south Africa
- Way Forward
 - Creating archives that speak to the historical importance of IKS in NBS and BGI
 - Writing into the vacuum around IKS that has been sustained by the colonial makeup of institutional knowledge
 - Advocating for community interventions that recognize this importance
 - Creating policy frameworks that support IKS
 - Collective insistence through increased collaboration in the field
 - Collaborations that continue to inform and expand on the current understanding on IKS in collaboration with scientific solution



Thank you for your attention!

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