

# Sustainable Infrastructure for Inclusive Green Growth Seminar

## Can Africa take the lead on Sustainable Water Infrastructure?

Stockholm WWW – 29 August 2018



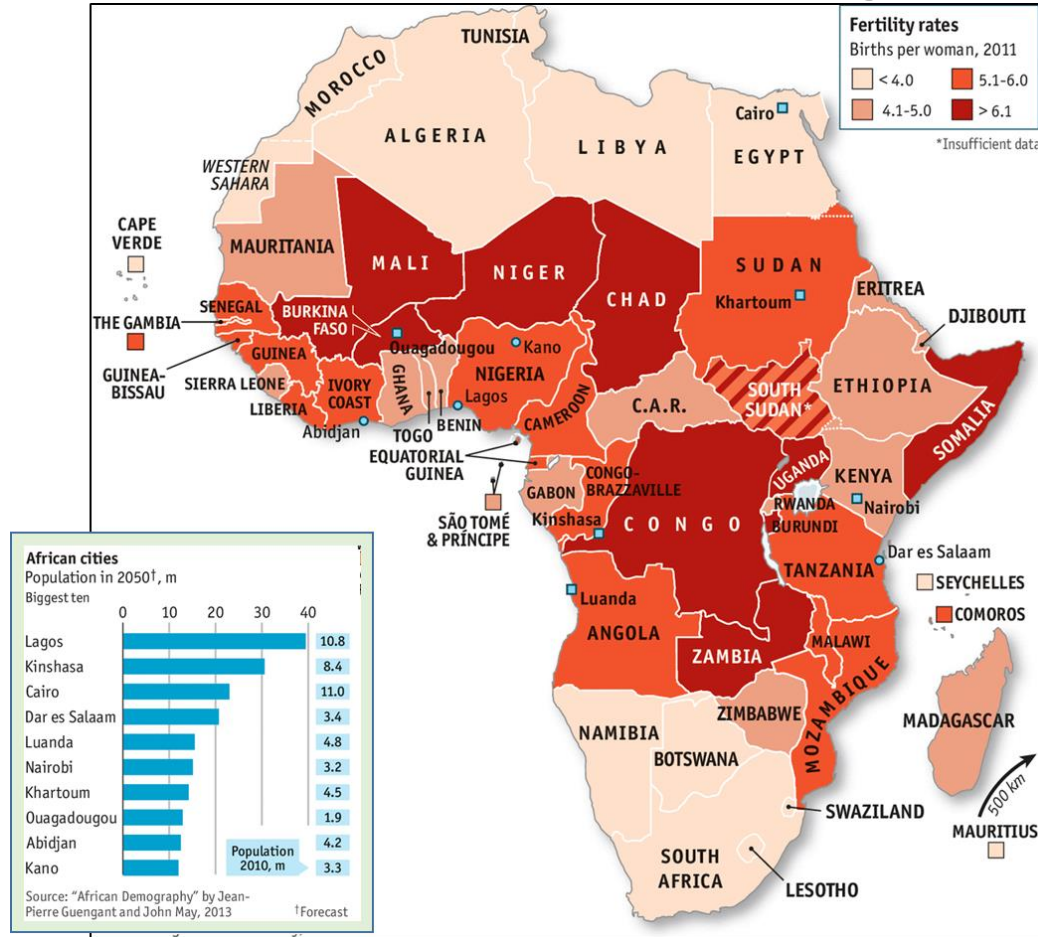
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# Outline

- Africa's unique development context
- Challenges and opportunities for sustainable water infrastructure
- Examples of sustainable water infrastructure in Africa
- The way forward towards mainstreaming sustainable water infrastructure in Africa (the role of MDBs)

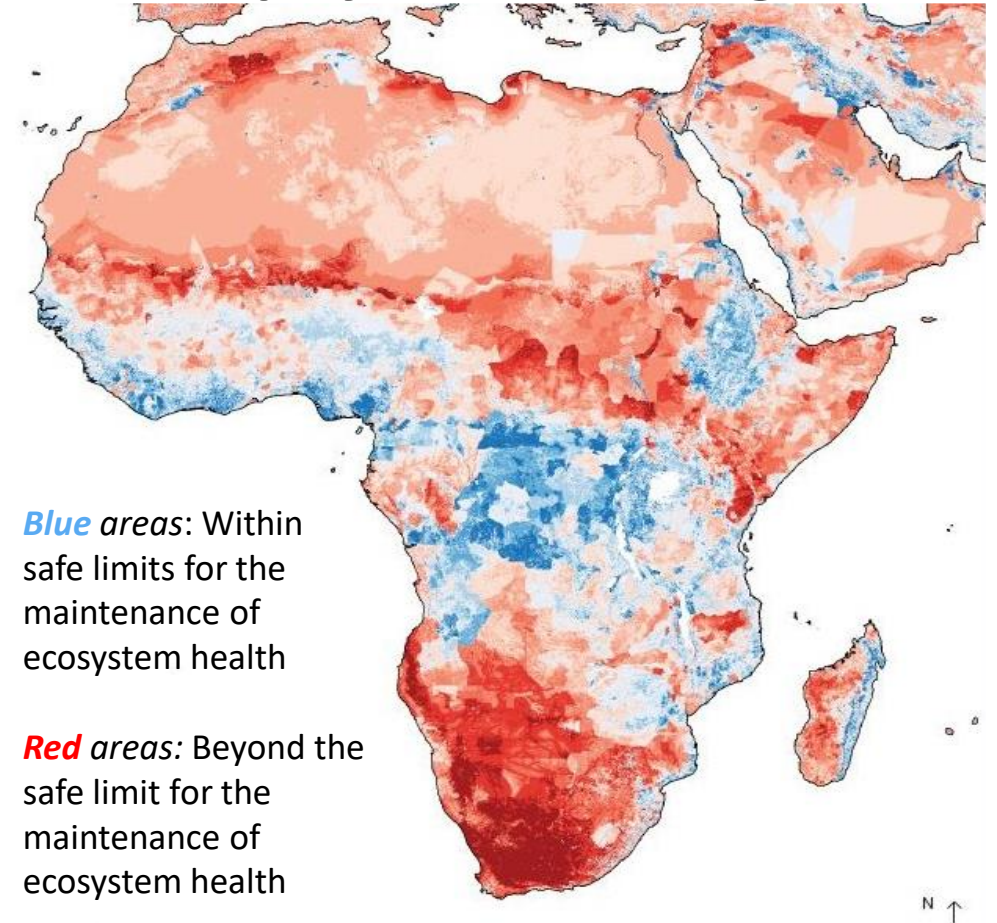
# Africa's development context: A water perspective

## Socio-economic challenges



- A diversity of economies and capacities
- One billion more people to feed by 2050s
- Rural poverty and rapid urbanisation

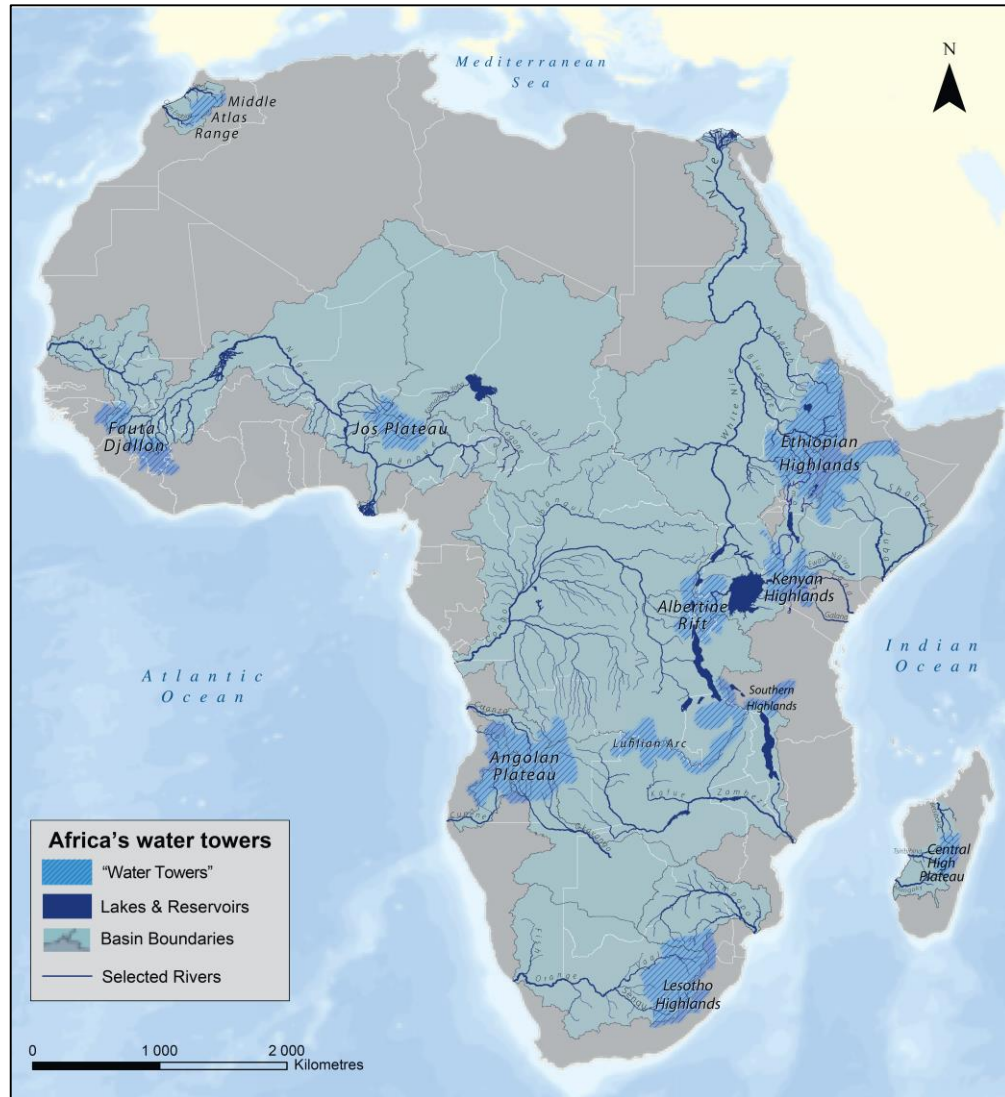
## Biophysical challenges



- Interconnected physical geography
- Complex and diverse ecosystems

# Africa's development context: A water perspective

## Complex and emerging governance challenges



- Multi-national transboundary rivers and aquifers (local and regional planning)
- Informal and formal governance arrangements
- Diverse policy and regulatory environments
- Inclusion, participation and transparency
- Operationalising (regional) plans: Translating plans to actions

### Coupled with:

- Rapid urbanization
- Climate change and low resilience to effects

# Challenges for sustainable water infrastructure

**Widespread implementation remains difficult....**

**Embedded bias to build conventional infrastructure**

**Inappropriate decision scales**

*Spatial*

*Temporal*

*Institutional*

**Inadequate appraisal considerations**

*Narrow set of outcomes of interest*

*Lack of visibility of lost services*

**Assumed lack of evidence**

*Uncertainty in performance*

*Inability to attribute benefits*

*Uncertainty in stakeholder behaviours*

**Siloed planning processes**

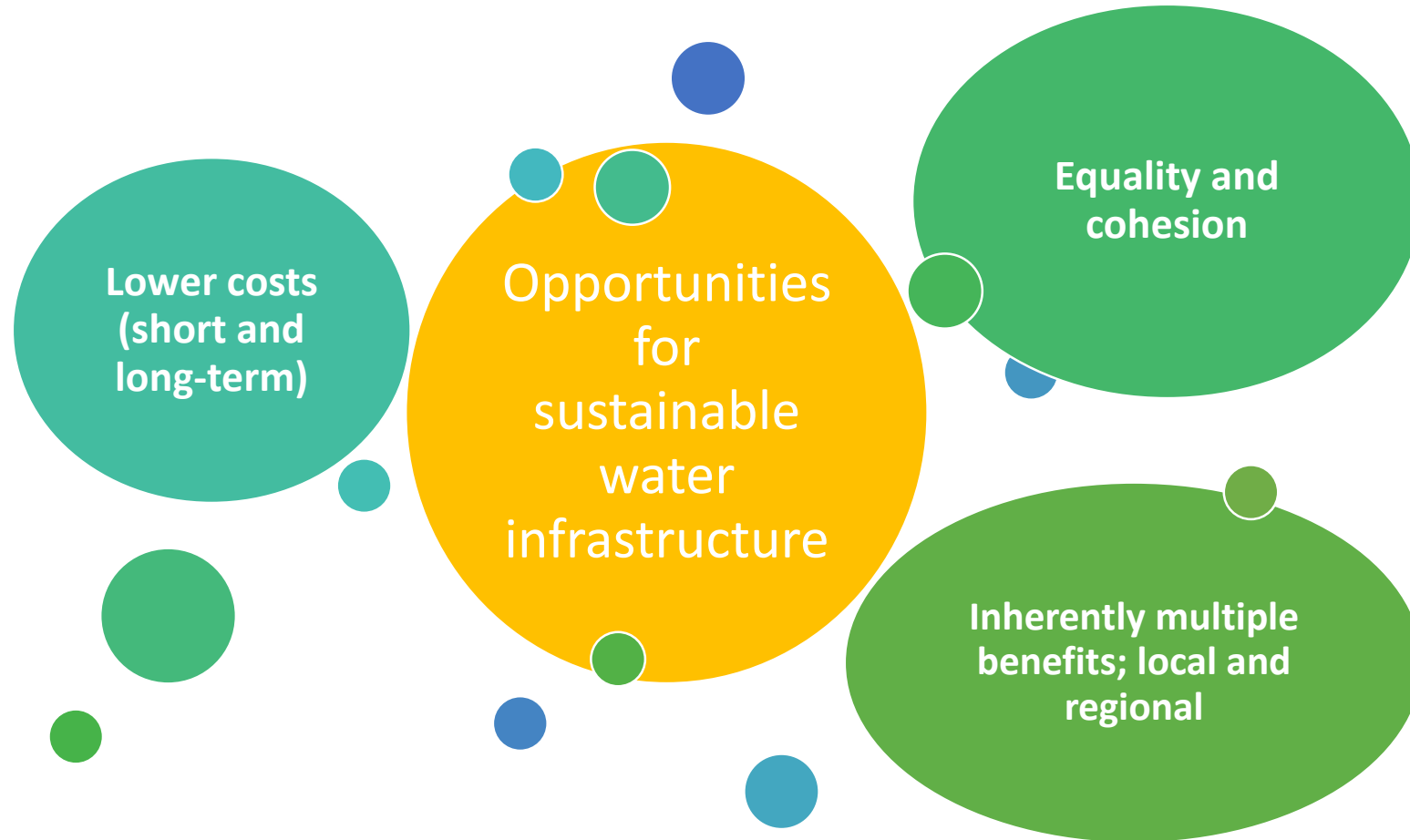
*Lack of awareness of emerging funding*

*vehicles and a capacity to access them*

*Lack of co-operation*

# Sustainable water infrastructure

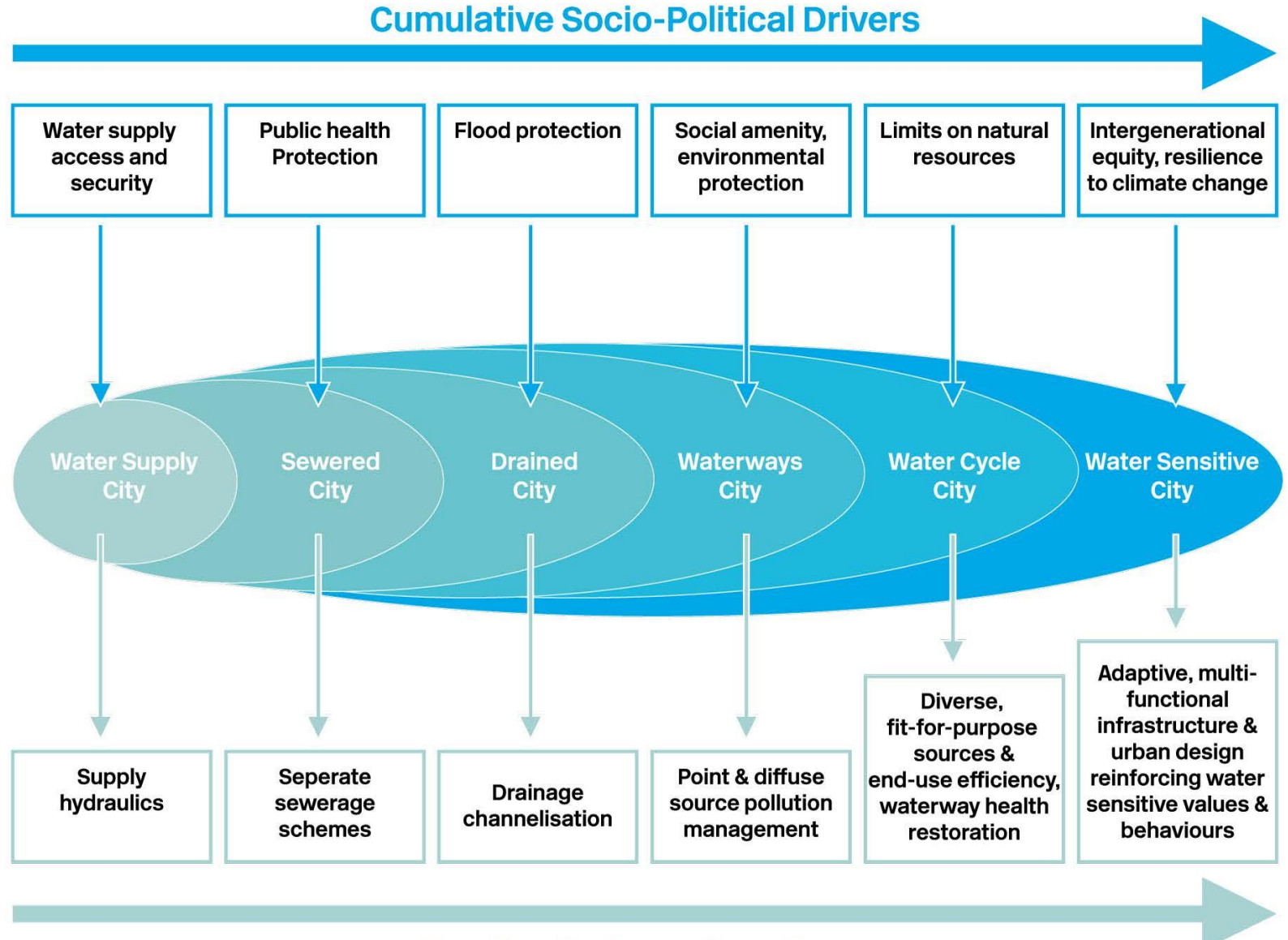
## *Opportunities for sustainable water infrastructure*



- Purposeful **blends** of **built** and **natural** infrastructure
- Delivers multiple benefits as a core mission, not an add on

# Sustainable water infrastructure

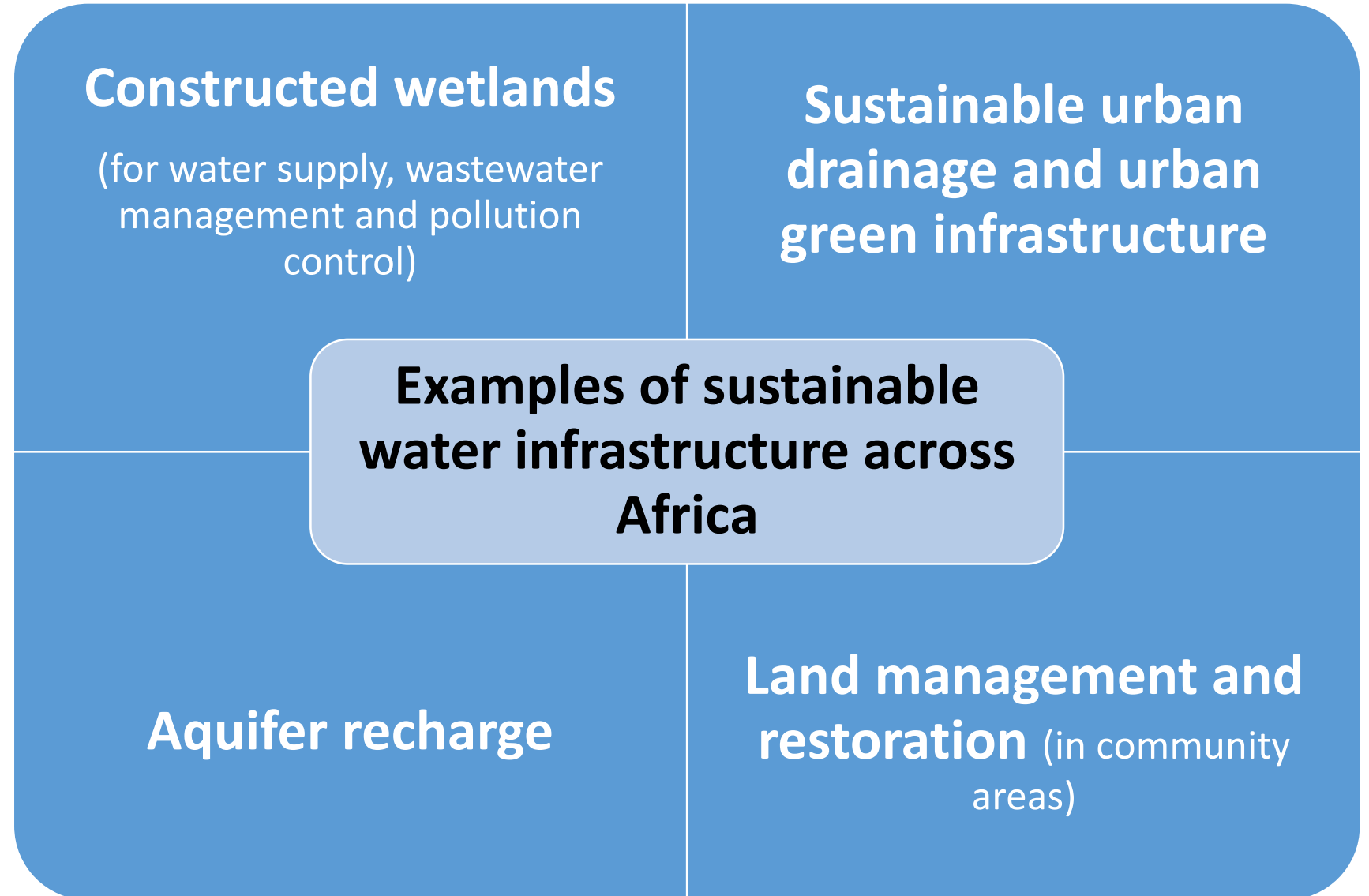
Typology of different city states in the transition towards water-sensitive city management (after Brown et al., 2009)



- Purposefully **blends built and natural** infrastructures
- Delivers multiple benefits as a core mission, not an add on

# Case examples of sustainable water infrastructure

A systematic search of academic and grey literature references reveals good practice is emerging in Africa, with examples of:





# Constructed wetlands

## Témacine, Algeria



Crescent-shaped 'garden' design at a historic site

Plans for 60 similar wetlands across Algeria

## Banana Investment Ltd, Tanzania



Papyrus wetland at a banana winery

Part of a circular system producing biogas, fertiliser and water for irrigation

## Ruaha School, Tanzania



Built by the school themselves, cost only \$2500

Effluent used to water fodder crops for cattle  
Used for education

# Sustainable drainage: Large and small scale

**Century City, Cape Town:** an upmarket development

Runoff treated in a large system of canals, constructed wetland and detention basins



Photo: University of Cape Town



Photo: Anne Fitchett

**Johannesburg:** Small scale participatory SuDS in an informal settlement

Drainage channel built from construction waste by researchers, residents and NGO

# Aquifer recharge



Photo: Ricky Murray, Groundwater Africa

## Atlantis, South Africa

Operating since 1979

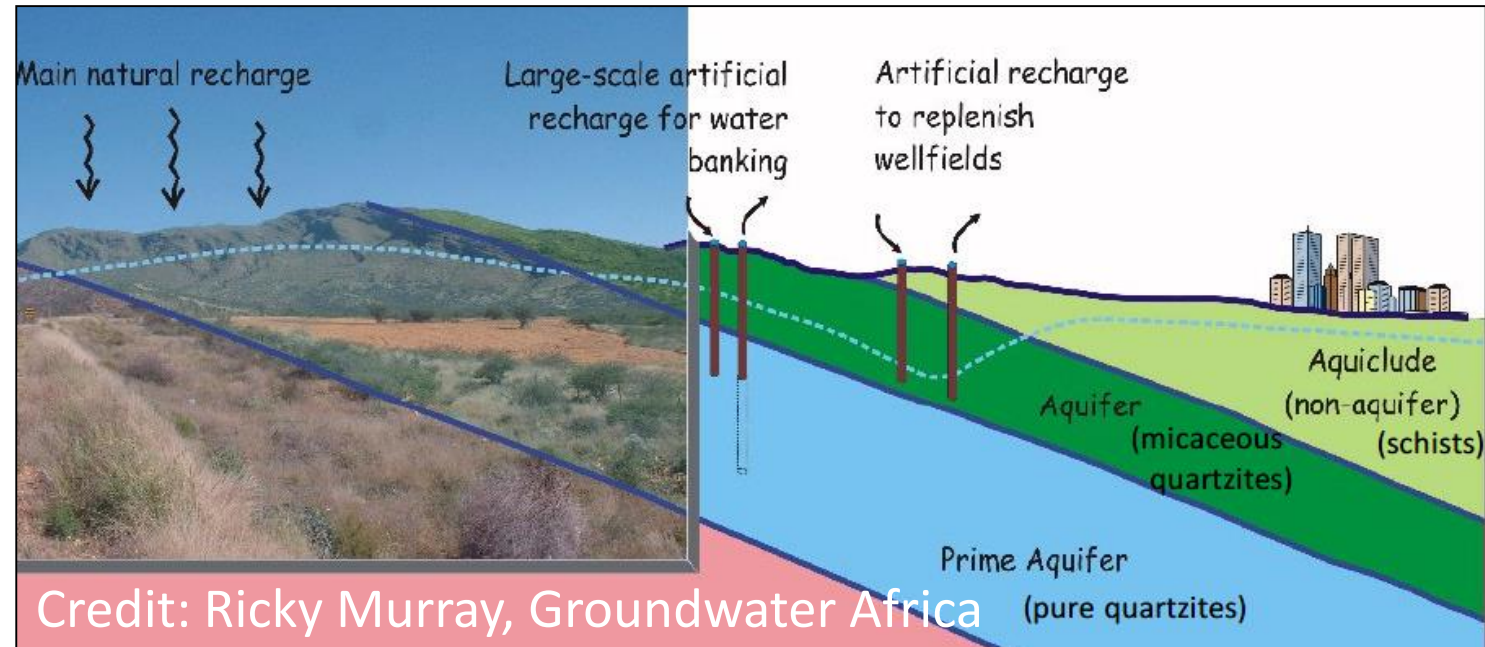
Coastal infiltration basins provide barrier against saline intrusion

## Windhoek, Namibia

Operating since 2004

Very arid area with only ephemeral supply.

Aquifer recharge avoids high evaporation loss from reservoirs.



Credit: Ricky Murray, Groundwater Africa

# Community land management and restoration



Photos: E-Thekwini  
Municipality

## **Buffelsdraai Community Reforestation, S. Africa**

Local 'Treepreneurs' exchange seedlings for household goods or school fees

Over 700,000 trees planted on 600ha of land

Co-benefits for biodiversity, jobs, education, poverty reduction, school attendance

## **Lake Naivasha, Kenya**

Payment for ecosystem services

Flower growers paid farmers to prevent soil erosion and pollution

Benefits for productivity of land, water quality, biodiversity and incomes



Photo: E. Obwocha; PRESA

# Emerging examples of zones of expertise

## Constructed wetlands ●

- Egypt: NRC (National Research Centre)
- Morocco: IAV (Institut Agronomique et Vétérinaire Hassan II)
- Tunisia: CERTE (Centre de Recherches et des Technologies des Eau)
- Tanzania: University of Dar es Salaam

## Water sensitive design ●

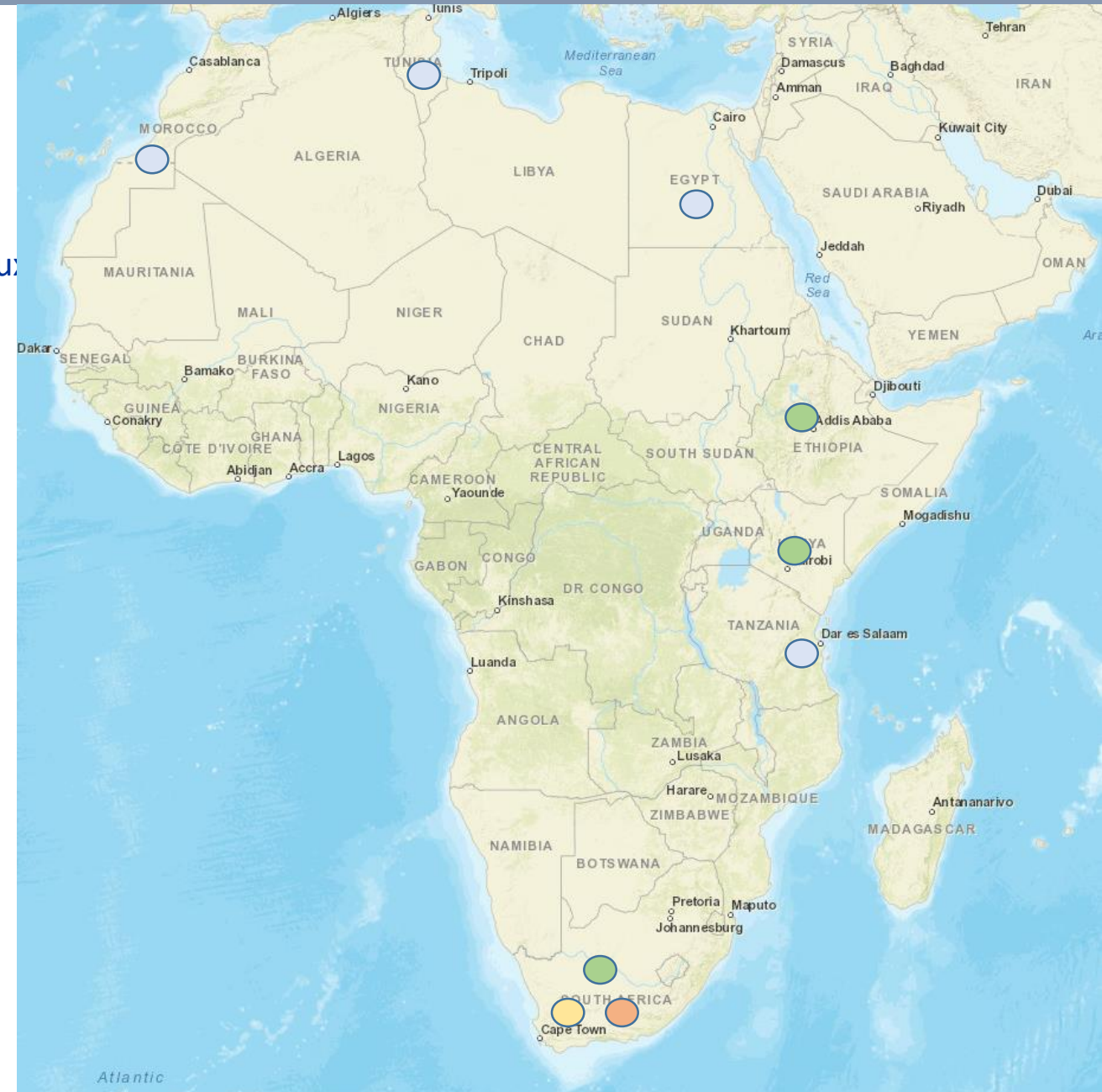
- South Africa: University of Cape Town

## Aquifer recharge ●

- South Africa: Department of Water Affairs

## Land management and restoration ●

- Ethiopia: African regional centre of eco-hydrology, Addis Ababa
- Kenya: Lake Naivasha Sustainability Initiative
- South Africa: eThekweni Municipality Reforestation Hub



# Conclusions

## **Africa: Development context**

- Rapid urban development: An opportunity as well as a challenge
- Local ecosystem services: The life-blood of many peri-urban and rural communities

## **Emerging lessons for delivering sustainable water infrastructure from across Africa**

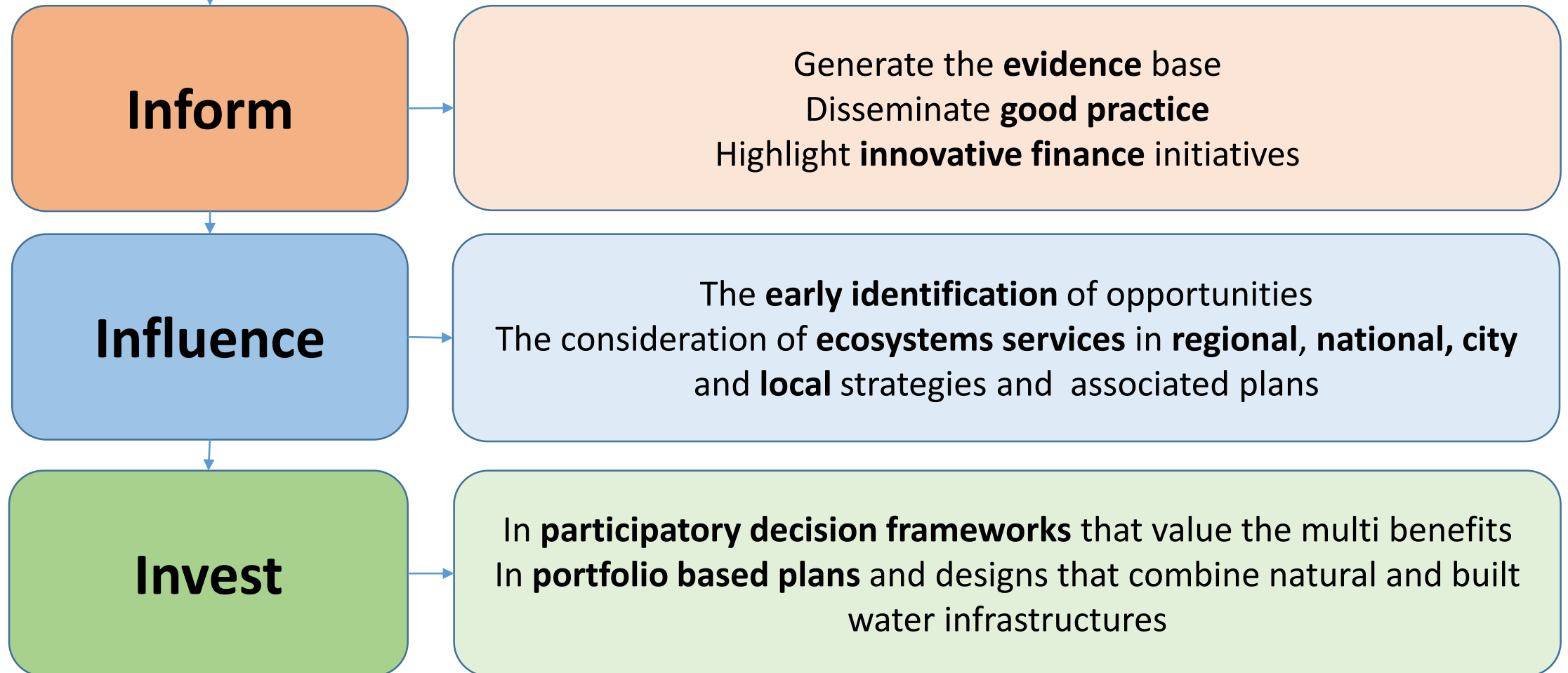
- Participatory co-design of infrastructure plans
- Provision for operation and maintenance funding
- Catchment-wide ecosystem-based adaptation and land management

## **Can Africa take the lead in sustainable water infrastructure?**

- The present-day proportion of urban green space across Africa is low, however, much of Africa's future urban space is yet to be built. This means the opportunity for SWI is now - but the window of opportunity is finite.

# The way forward: Role of MDBs

Multi-lateral Development Banks (MDBs) will be pivotal in shaping a sustainable water future in Africa.....



**THANK YOU**  
**For your**  
**ATTENTION**

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