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Briefing Paper No. 2: Water-responsive Urbanism in Africa

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Across Sub-Saharan Africa, cities are beginning to reimagine their relationship with water. While China's state-led Sponge City Program and the Netherlands' Room for the River (RfR) offer instructive precedents, African pathways are unfolding differently, defined by community initiative, urban informality, modest scale, and adaptive innovation.

This paper focuses on implemented and well-advanced projects that demonstrate how Nature-based Solutions (NbS) and Sponge City approaches are already being applied in practice across the continent. In Africa, water-responsive urbanism is emerging that integrates flood resilience with informal settlement upgrading and local livelihoods. From Mozambique's Chiveve River Rehabilitation and Cape Town's Liveable Urban Waterways, to Kenya's Sponge Towns and Ghana's Greater Accra Climate Resilient and Integrated Development, these projects demonstrate how Sponge City approaches and NbS can work within Africa's socio-economic and ecological realities.

Across the continent, demand is growing to scale up these proven interventions. Kigali, Rwanda, and Addis Ababa, Ethiopia, are advancing strategic frameworks for NbS integration; Dar es Salaam, Tanzania, is piloting urban greening for sustainable drainage; Accra, Ghana, is positioning itself as a hub for urban water resilience innovation; and in Nakuru, Kenya, the first phase of a Sponge City Project has been completed, with construction of physical infrastructure scheduled to begin in the near future.

Content

1 Mozambique:

Chiveve River Rehabilitation

Mozambique's 2,500km coastline and nine transboundary river basins make it one of Africa's most flood-prone nations. In the port city of Beira, the country's second largest city and among its most climate-vulnerable, the Chiveve Rehabilitation and Green Urban Infrastructure Project has become a leading example of Nature-based Solutions (NbS) in an African urban setting. Beira, routinely battered by tropical storms and seasonal floods, was catapulted into international attention following the devastation of Cyclone Idai in 2019. Implemented by the Administration for Water and Sanitation (AIAS) and financed by the German development bank (KFW) and the World Bank's Pilot Program for Climate Resilience, the project combined grey draining upgrades with ecosystem restoration.[1]

The project reopened a 3.5 km tidal river, rehabilitated degraded mangroves and created a 17-hectare urban park, reducing flood risk for tens of thousands of residents. The rehabilitation phase, completed in 2017, involved dredging the riverbed, clearing waste and sediment from the shoreline, and upgrading the fishing port. The second phased, finalized in 2021, established a multifunctional public park designed to serve as both a recreational space and a catchment and overflow area.[2] Because parks require substantial maintenance and the City Council of Beira lacked resources to sustain operations, income-generating activities were incorporated and a semi-autonomous Park Management Unit established.[3]

During the 2019 Cyclone Idai, the restored river system helped buffer stormwater and limit damage across central Beira.[4] Subsequent studies confirm that flooding and drainage have improved markedly.[5] River excavation removed substantial waste pollution, significantly improving local environmental conditions.[6]

Lessons Learned

The project revealed the social complexity of implementing NbS in dense urban settings. Rehabilitation required the displacement of informal households and a market area in Mangal, a low-income settlement where residents lacked tenure but valued proximity to the city centre.[7] Coordination and communication gaps emerged between government authorities, local communities, and development partners. Post-project assessment acknowledged that community concerns should have been addressed more directly, with targeted efforts to demonstrate concrete benefits for residents and businesses.[8] Stronger consultation and transparency in decision-making would enhance community ownership and long-term sustainability of NbS initiatives.[9]

Another area where this project faced difficulties was in the engineering of the green infrastructure. The principle of trying to retain all the mangrove trees was not followed in the implementation with part of the river margin totally cleared of mangrove trees.[10] Clearer guidance to the contractors and supervisors to prioritise the preservation of the habitat and flexibility in regard to construction targets could have saved hundreds of trees.[11]

Pathways Forward

- Align where possible legal and institutional frameworks.
- Create a dedicated NbS financing strategy to mobilize domestic and international resources and increase budgetary allocations for NbS investments.
- Local technical capacity is essential. Establish a national training programs on NbS design, implementation and maintenance to help municipalities bridge expertise gaps and mainstream ecosystem-based approaches into planning.
- Strengthen coordination mechanisms at national, provincial and local levels.
- Establish reliable data and monitoring systems.

2. Kenya

Sponge Towns: Kwa Vonza & Kajiado

Between 2016 and 2018, a consortium of Dutch and Kenyan organisations – South-East Kenya University (SEKU), SASOL Foundation and MetaMeta Research – implemented pilot sponge town projects in Kwa Vonza and Kajiado. In Kwa Vonza, interventions focused on household and neighbourhood scales, including roof and road water harvesting, gully rehabilitation, kitchen gardens using recycled water and roadside vegetation.[12] In Kajiado, the project introduced infiltration structures, a recharge park, and several weirs to improve groundwater recharge.

A notable innovation was the citizen's platform, both a WhatsApp group and a in-person forum that enabled residents to identify local problems and co-design solutions.[13] While this strengthened ownership and responsiveness, participation was uneven, with groups such as students and small business somewhat underrepresented.[14] Project teams made significant efforts to collaborate with local government in Kwa Vonza but collaboration proved difficult to sustain, particularly after leadership changes following elections. Without institutional buy-in, scaling the sponge approach beyond the household level remained difficult.

Scaling up Kenya's sponge town initiatives requires stronger institutional anchoring, financing mechanisms, and inclusive governance to move beyond isolated pilots. Priority actions include:

- Institutionalize sponge city principles within county development, water, and land-use planning frameworks.
- Developing hybrid financing mechanisms that combine donor funding, county budgets, and community contributions.
- Formalizing citizen platforms with engagement platforms with defined roles in project design and oversight.
- Building local technical capacity, to ensure the skills are present to design, monitor and maintain NbS and sponge towns.

Kibera Public Space Project

Led by the Kounkuey Design Initiative (KDI), the Kibera Public Space Project (KPSP) has, since 2006, developed a network of community-managed public spaces in Nairobi's largest informal settlement.[15] The KPSP's series of micro-interventions have been cited as a successful example of a bottom-up, NbS approach to slum upgrading.[16] Rather than imposing projects, KDI established cooperative partnerships with residents, helping to mitigate pre-existing conflict within the community and between the community and government.[17] Through small-scale upgrading measures, it emphasized capacity building and skills transfer to enable local innovations.[18]

Despite its longevity and innovation, the project has struggled to coordinate with government institutions and to secure land tenure. Instances of land grabbing have rendered some projects unusable, highlighting the vulnerability of community-led NbS in contexts of contested urban land.[19] Limited technical capacity for design and maintenance has also exposed the limitations of the "community-managed" model when scaled up.[20] The shift from green (48% at concept design) to grey solutions during implementation (35% completed) reflects not failure but pragmatic adaptation to local realities.[21] This grey reality emerges from multiple pressures: community preferences, space constraints in dense urban contexts, maintenance burdens, and opportunity.

Key Lessons from Kenya's NbS Pilots

1. *Institutional anchoring* through policy frameworks, land security and long-term financing, is essential for scaling NbS.
2. *Inclusive participation* is a major strength but ensuring representation across all groups remains a challenge.
3. *Maintenance* must be planned and resourced.
4. *Flexibility and learning* enable sustainability: implementers should treat NbS as evolving systems, re-visiting and adapting designs as environment and social conditions change.

3. South Africa

Cape Town's Liveable Urban Waterways

The Liveable Urban Waterways Programme (LUW) is Cape Town's flagship initiative to restore and rehabilitate degraded urban rivers and wetlands. Once natural systems, many of the city's 400km of canals were concreted, disrupting their ecological and social functions. Coupled with urbanisation, pollution and climate stress, this has left the city increasingly vulnerable to both floods and droughts. Inspired by sponge city and water-sensitive design principles, the LUW reimagines Cape Town not as a city managing water, but as a livable catchment system.[22] Through NbS, it transforms waterways into active green-blue corridors that support biodiversity, regulate water and serve the community.

The LUW approach rests on six interrelated principles: maintaining clean and healthy water; restoring connected ecologies and floodplains; accommodating floods through natural storage and recharge; creating safe and accessible public spaces; fostering community stewardship through co-design and education; and enhancing climate resilience and cultural value through nature-based restoration.[23]

A Liveable Urban Waterway has acceptable water quality, makes space for the water, has a functioning ecology, connects the waterway to the water table and floodplain, and connects communities.

The LUW Programme: Eight Projects Restoring Cape Town's Waterways

Since its inception, the Liveable Urban Waterways (LUW) programme has evolved from a policy vision into a citywide portfolio of action. To date, eight waterway rehabilitation projects are underway across Cape Town, representing approximately $5 million in investment.[24] Each project applies NbS and water-sensitive design principles to restore ecological function, reduce flood risk, and create accessible public spaces along degraded river corridors.

Here two projects are featured to illustrate the range of approaches driving Cape Town's water sensitive transition. The first, the Upper Liesbeek River Garden, demonstrates a community-led, low-cost model of urban waterway restoration; the second, the Green Point Urban Park, a municipally led, capital-intensive investment integrated into large-scale urban redevelopment. Together, they reveal how LUW advances ecological restoration, social inclusion, and climate resilience through adaptive governance and design.

Upper Liesbeek River Garden

The 9km Liesbeek river has undergone extensive urbanization over the past century.[25] Floodplain development and wetland loss led to frequent flooding, prompting canalisation of its middle and lower reaches in 1960s. Once polluted and unsafe, the upper stretch has been transformed through the Upper Liesbeek River Garden, a community-led initiative that restored ecological health and created accessible public space. Residents, supported by the Friends of Liesbeek, removed invasive species, stabilised riverbanks, and established a thriving garden that now attracts families and visitors. The project has generated employment through maintenance and gardening, while the restored space now attracts visitors.[26] It operates through local stewardship with selective municipal support, including initial invasive species clearing and minor infrastructure funding.[27] Sustained largely through donations, it illustrates how community initiative can restore degraded waterways, though challenges such as solid waste management and blocked stormwater outlets remain beyond local capacity.

Green Point Urban Park

Nestled between the Atlantic Ocean and Signal Hill in the suburb of Green Point, the Green Point Urban Park (GPUP) opened in 2011 as a 12-hectare public park and enduring legacy of the 2010 FIFA World Cup. Developed on the historic Green Point Common between the stadium and the Atlantic seaboard, the park forms part of the city's flood management and biodiversity network.[28]

Constructed at a cost of around $3.2 million, it captures and reuses natural spring water through a system of wetlands and ponds that support irrigation, biodiversity and urban cooling.[29] Previously a neglected and unsafe area, the park has been transformed into a well-maintained, secure and inclusive public space.[18] While access is monitored and security present, entry remains free and open to all, supported by municipal funding as one of the city's major green-infrastructure investments.[30] Managed by the City of Cape Town, the park exemplifies how large-scale, city-led interventions can integrate NbS, recreation and climate adaptation within an urban setting.

4. Ghana

Greater Accra Climate Resilient and Integrated Development (GARID)

The Greater Accra Climate Resilient and Integrated Development (GARID) is a joint initiative between the Government of Ghana and the World Bank. Initially financed through a $200 million International Development Association (IDA) credit, the project received an additional $150 million in 2024 to expand its scope and scale up interventions.[31] GARID was conceived in response to Accra's 2015 "twin disaster," when severe floods and a subsequent fuel depot fire claimed more than 150 lives, exposing Accra's infrastructural fragility and limited disaster preparedness.[32] The project aims to reduce flood risk and improve solid waste management in the Odaw River Basin within the Greater Accra Metropolitan Area (GAMA), home to nearly 20 percent of Ghana's population and the country's economic core.[33]

Three Key Governance Patterns Across African Implementations

1. Coordination across scales remains the central challenge.
2. Political continuity determines longevity.
3. Maintenance governance must be resolved at inception, not retrofitted.

The majority of GARID's financing supports climate-resilient drainage and flood-mitigation measures, which the World Bank reports is progressing well.[34] Since operations began in 2020, dredging of the Odaw Channel has commenced, and construction has started in several communities, including the Achimota and Nima drains.[35]

Although GARID is not formally designated as a Sponge City project, it embodies the same principle of water-responsive urbanism, integrating grey and green infrastructure, combining engineering works with ecological and community-based measures, such as wetland restoration, tree planting and sustainable solid-waste management. Social inclusion is a core component: the project established Community Development Committees (CDCs) and Community Liaison Officers (CLOs) to facilitate community participation, local monitoring, and co-design.[36] Implementation is coordinated by the Ministry of Works and Housing, with participation from the Ministries of Sanitation and Local Government. The project is scheduled to close in 2026, by which time it is expected to have reduced flood exposure for around 250,000 residents and strengthened the institutional capacity for climate-resilient urban planning in Ghana's rapidly urbanizing coastal corridor.

Toward an Africa Water-responsive Urban Future

Across Africa, water responsive urbanism is advancing through pragmatic, adaptive and community-anchored experimentation. These initiatives show that NbS and Sponge city initiatives need not be capital-intensive to deliver climate resilience, social inclusion and ecological restoration. The emerging African model emphasizes stewardship over control, participation over prescription, and learning over replication. The challenge now is to move from pilot to wide-scale implementation. With targeted support and cross-city knowledge exchange, African urban contexts can define a context-driven approach that contributes to global resilience agendas while responding to local realities.

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