

PROJECT EXEMPLAR

Urban Flood and Gully Erosion Risk Management in the Congo Basin



GLOBAL
CENTER ON
ADAPTATION

KEY PROJECT INFORMATION

Country / Region

Gabon, the Central African Republic (CAR), the Democratic Republic of the Congo (DRC), the Republic of the Congo (ROC), and Burundi

Sector

Urban

Investment Value

US \$300M+ across multiple countries

Implementation Period

Varies

Key Partners

World Bank

Beneficiaries

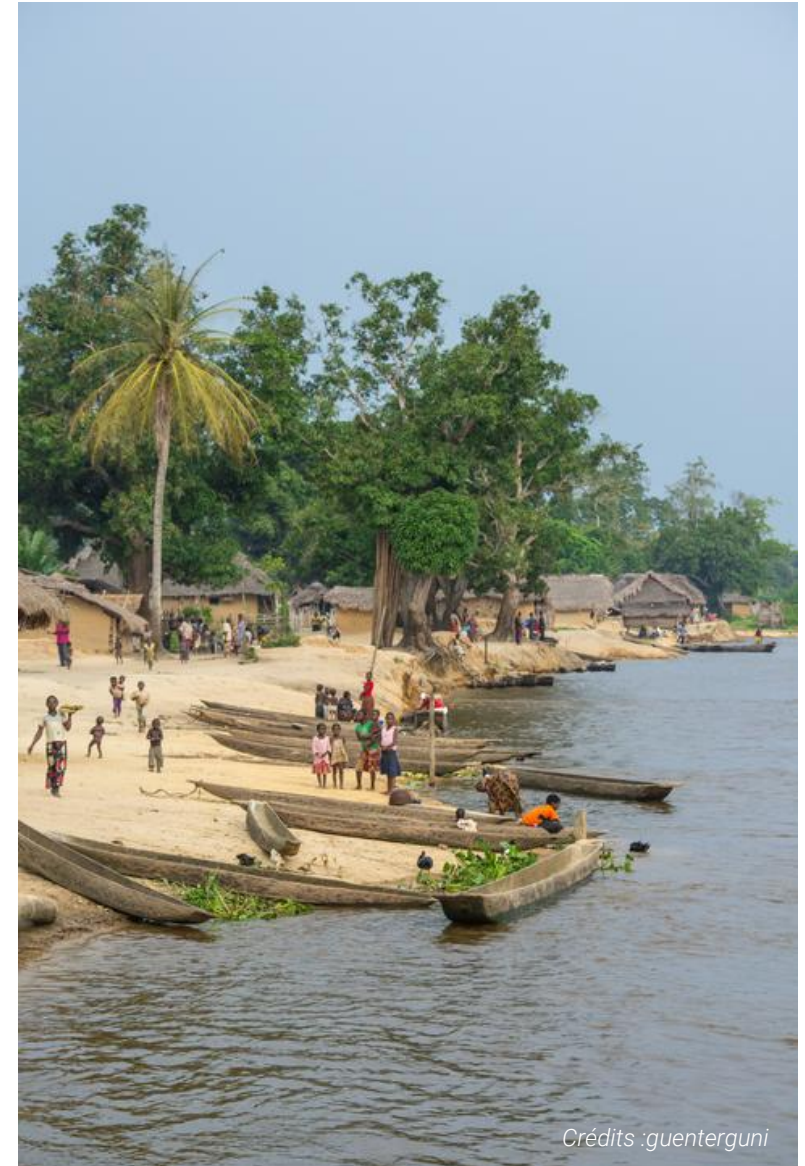
2M+ people across multiple countries

THE ADAPTATION STORY

Background and needs

The Global Center on Adaptation (GCA) supported the World Bank in the preparation and implementation of multiple investment projects throughout the Congo River Basin. The World Bank projects across the basin region share common objectives aimed at enhancing urban resilience to climate-related hazards, such as floods and erosion, while improving access to basic urban infrastructure and services. Key components in these projects focus on climate-resilient urban infrastructure development, capacity building, and contingency emergency response.

The objective of GCA's support to the World Bank was to increase resilience to floods and erosion in five countries: Gabon, the Central African Republic (CAR), the Democratic Republic of the Congo (DRC), the Republic of the Congo (ROC), and Burundi. All five countries face extreme urban climate vulnerabilities driven by widespread poverty, fragile political landscapes, and limited adaptive capacity. Rapid, unplanned urbanization combined with increasingly frequent extreme weather—such as devastating floods and droughts—disproportionately impacts the urban poor and marginalized groups, often resulting in massive economic losses and displacement. A history of conflict and systemic fragility further drain essential financial resources, hindering long-term adaptation efforts and trapping the region in a cycle of environmental and economic instability.



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What was GCA's Role?

GCA identified home-grown Nature-Based Solutions for Water Management (NBSWM) practices already in use in each country and evaluated their technical and economic viability through pre-feasibility analysis. Solutions were compiled into a Compendium of NBSWM Investments for reducing flood and erosion risk. The Compendium emphasized context-specific measures that built upon existing local practices and will yield multiple co-benefits (such as income generation and food production), and which are therefore likely to be adopted and sustained over time, despite limited local institutional capacity. This work also identified enabling conditions and financing requirements necessary to implement interventions and replicate these measures at a larger scale.

GCA's work was developed in partnership with local stakeholders and validated by relevant national ministries, and will inform future investments by World Bank and national government. Our primary implementing partner was OCA Global, working with GlobalCAD, Meteosim, and ResALLiance.

Results and Impact

The project resulted in compendium documents for all five sites. These documents outlined the technical, operational and economic considerations relevant to each measure, and identified key reforms necessary to implement these projects in each location, including those necessary for establishing an enabling environment for delivering and scaling up NBSWM practices.

To support long-term uptake, GCA also worked with government ministries to build capacity around NBSWM practices, through peer-to-peer learning workshops for technical staff. In each country, a field manual for designing and implementing NBSWM was delivered and field-tested, to help local government stakeholders identify and implement future measures.

Climate hazards, impacts and prioritized adaptation measures

KEY CLIMATE HAZARDS	IMPACTS ON INFRASTRUCTURE, SERVICES AND USERS	PRIORITISED ADAPTATION MEASURES
Pluvial flooding	• Frequent inundation of boulevards, peri-urban areas, and densely populated neighbourhoods. • Disruption of urban mobility and local commerce . • Clogging of undersized drainage canals, exacerbated by urban waste and sediment . • Exposure of low-income residents to waterlogging and health risks. • Direct damage to real and personal property	• Restoration of existing central vegetated drainage strips into infiltration swales • Conversion of impervious pavements; introducing street trees and • Implementation of bioswales
Erosion and gullies	• Long-term erosion and landslides threaten urban/peri-urban settlements. • Loss of cultivable land and reduced agricultural productivity . • Riverbank collapse • Disruption to mobility, with knock-on effects on access to services and livelihoods • Sediment extraction and high debris flow obstructing river channels.	• Installation of native species, e.g. vetiver and banagrass hedgerows along contours to stabilize soil • Integrated agroforestry and reforestation on moderate slopes • Construction of wooden check dams in gullies to slow water flow and trap sediment • Riverbank naturalization using native / non-invasive bamboo and Phragmites, etc.

KEY LESSONS

What we have learnt

Our engagement emphasized the importance of coordinating with key ministries at both the local municipal and national levels to ensure alignment with existing governance structures. By conducting a rigorous review of current interventions, we identified measures that are already functioning effectively on the ground. This allowed us to focus our efforts on finding strategic ways to improve and upscale these proven solutions, ensuring that our recommendations are not only technically sound but also politically viable and rooted in local success.

Replicability

The project's success is built on a training approach that bridges the gap between classroom learning and real-world application, integrating theoretical modules with hands-on training using practical, in-the-field examples. The regional approach facilitates the identification of critical lessons across the wider Congo Basin. By analyzing similar geographic, natural, and urban conditions, these strategies can be adapted and applied to different locations throughout the Congo River Basin and provide a standardized blueprint for climate-resilient urban planning.

Actionable insights for MDBs

THEME	PRIORITISED ADAPTATION MEASURES
Emphasize NBSWM and green-grey practices for flood risk reduction and erosion management	MDBs can support ministry clients with "design-ready" knowledge products that emphasize hybrid interventions that integrate traditional engineering with nature-based techniques. These solutions should include a mix of NBSWM interventions and traditional 'grey' measures to reduce peak flows and mitigate ravine expansion. Investment planning that introduces hybrid NBSWM measures from the pre-feasibility stage can ensure future investments are ready for municipal funding pipelines.
Emphasize maintenance as a key consideration in package design and funding	Integrating operation and maintenance cost considerations into NBSWLM within municipal and sectoral budgets is essential to ensuring the long-term sustainability of these projects. Bundling NbSWLM financing with adjacent expenditure streams (e.g. solid waste management to reduce drain clogging) can improve affordability and reduce lifecycle costs.
Consider a landscape approach to NBS interventions	MDBs can prioritize 'bundled' packages, and multiple related interventions implemented at the landscape scale rather than single measures assessed in isolation. Using NbSWLM upstream can reduce runoff and sediment, thereby limiting the length and intensity of engineered works needed at hotspots, including in dense urban areas. NbSWLM project budgets might also be combined with related municipal and donor envelopes (e.g. solid waste management to reduce drain clogging; urban greening programs) to improve overall financing feasibility and cost-effectiveness.

