

## PROJECT EXEMPLAR

# Climate Adaptation and Policy Reform in The Gambia's Transport Sector



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## KEY PROJECT INFORMATION



### Country / Region

The Gambia, West Africa



### Sector

Transport (Road infrastructure)



### Investment Value

\$52.60 million (with \$3.11 million recommended adaptation budget)



### Implementation Period

2024-2031



### Key Partners

World Bank Group (WBG), National Roads Agency (NRA), National Water and Electricity Company (NAWEC)



### Beneficiaries

140,000 people



# THE ADAPTATION STORY

## Context and adaptation challenge

Climate change is intensifying longstanding pressures on The Gambia's transport sector, which is already strained by rapid population growth, urban expansion, and rising mobility demand. The road network, particularly outside major urban centers, remains vulnerable and uneven in quality. The country's distinctive geography amplifies these challenges: The Gambia is a long, narrow strip of land aligned along the Gambia River, stretching inland from the Atlantic coast. As a result, climate stresses vary significantly between low-lying coastal areas in the west and the hotter, more climate-exposed inland regions upriver.

**Rural accessibility remains heavily dependent on seasonal roads and river-road connectivity, both of which are frequently disrupted during the rainy season.**

This limits access to markets, schools, and health services and can isolate remote communities for extended periods. **Climate change is expected to worsen these constraints through increasing exposure to extreme heat, more intense rainfall**

**and flooding, drought conditions, and wildfire risk.** These hazards accelerate pavement deterioration, overwhelm drainage systems, damage embankments and crossings, and increase the frequency and cost of road repairs.

These impacts interact with structural vulnerabilities, including limited redundancy in transport routes, the critical role of a small number of strategic links and crossings, and constrained institutional capacity to integrate climate risk into planning and maintenance. Without adaptation, climate impacts will compound socioeconomic fragilities, raise long-term maintenance burdens, and widen rural-urban disparities. Strengthening climate-resilient transport infrastructure must therefore be paired with policy and institutional reforms, including improved road safety and traffic management, updated transport frameworks, and evidence-based asset management tools to guide resilient maintenance and investment.



# What was GCA's role?

GCA provided targeted technical assistance to the World Bank Group (WBG) to embed climate resilience into The Gambia's transport investment under the Africa Adaptation Acceleration Program (AAP). GCA led **national- and asset-level climate hazard and vulnerability assessments, risk quantification, and transport network analysis** to identify high-risk corridors, critical links, and communities most vulnerable to disruption. This evidence base informed the prioritization of road assets and enabled cost-effective adaptation investments, avoiding blanket resilience upgrades.

GCA also supported the **identification, appraisal, and economic justification of adaptation options**, and developed **design and implementation guidelines** to strengthen climate-resilient standards.

In parallel, GCA supported **policy and institutional analysis** to help integrate climate risk into sector planning, contributing to capacity building and the advancement of a climate-resilient National Transport Masterplan.



Rural road transport, The Gambia (credit: GCA)

# Results and impact

Through its climate risk screening and transport network analysis, GCA demonstrated that The Gambia's transport system faces rapidly escalating risks from extreme heat, pluvial and fluvial flooding, with impacts concentrated on a small number of critical road segments and river crossings that connect communities to markets, healthcare, education, and the Port of Banjul. By mid-century, inland areas could experience more than 168 days per year above 40°C, reaching up to 290 days in some locations. Such **extreme heat accelerates pavement deformation and lifecycle deterioration, while flooding remains the most immediate cause of access disruption**. Events historically expected once every 25 years are projected to occur approximately once every two years, fundamentally shifting design and maintenance requirements.

GCA's assessment enabled prioritization of the most climate-exposed and critical corridors, informing the selection of approximately 100 km of roads from a wider 600 km network. The analysis links each key hazard to impacts and practical adaptation measures (see the table next page), and GCA developed technical guidelines for heat-resilient pavements, improved drainage, elevated road sections, and climate-informed bridge design. **Climate risk and adaptation recommendations were also embedded in procurement documents, improving cost accuracy and helping ensure implementer readiness**. These inputs shaped a focused investment package supporting climate-resilient road upgrades for 225 rural communities. GCA's complementary policy analysis highlighted fragmented mandates, limited use of risk data in maintenance planning, and capacity gaps, and **recommends strengthening coordination, embedding climate adaptation in transport legislation, and accelerating implementation of priority reforms** to enable sustained resilience outcomes.

| INDICATOR                                           | RESULT / TARGET                                                                                                                                                                                                                  |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Direct and indirect losses                          | Flooding-driven damage could reach up to 5% of total road asset value annually by 2050, with indirect impacts (service disruption, trade, food security, access to services) adding an estimated 10-20% on top of direct losses. |
| Benefit-cost ratios (BCR) of adaptation investments | Economic appraisal shows strong returns for targeted adaptation measures, with BCRs reaching up to 7.2 for priority rural road and bridge upgrades.                                                                              |

## Climate hazards, impacts, and prioritised adaptation measures:

| KEY CLIMATE HAZARDS                                                                                       | IMPACTS ON INFRASTRUCTURE, SERVICES AND USERS                                                                                                                                                                                                                                                                                                                                                                                        | PRIORITIZED ADAPTATION MEASURES                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>Pluvial flooding</b> | <p><b>Infrastructure:</b> Localized flooding of roads and bridges; pavement and shoulder damage; erosion and washboarding of unpaved roads.</p> <p><b>Services:</b> Frequent disruption of rural access to markets, schools and healthcare; increased travel times due to flooded links.</p> <p><b>Communities:</b> Temporary isolation of villages and reduced access to essential services during high-frequency rain events.</p>  | Improved roadside drainage and culverts; elevating low-lying road sections; protecting embankments and shoulders; prioritizing vulnerable rural links for upgrading.                   |
|  <b>Fluvial flooding</b> | <p><b>Infrastructure:</b> Severe damage to roads and bridges near river corridors; bridge scour, overtopping and potential structural failure; impacts on ferry crossings.</p> <p><b>Services:</b> Major connectivity losses affecting trade routes and access to ports and regional markets.</p> <p><b>Communities:</b> Prolonged isolation, disrupted food supply chains, and reduced access to health and education services.</p> | Redesigning bridges using future hydrological conditions; raising road alignments; erosion protection; upgrading river crossings; prioritizing high-risk corridors and critical links. |
|  <b>Extreme heat</b>    | <p><b>Infrastructure:</b> Rutting, cracking and deformation of paved and unpaved roads; accelerated deterioration of surfaces and foundations.</p> <p><b>Services:</b> Reduced reliability of transport corridors due to gradual asset degradation.</p> <p><b>Communities:</b> Indirect impacts through reduced accessibility and increased maintenance-related disruptions.</p>                                                     | Use of heat-resilient pavement materials (polymer-modified binders); improved surfacing and stabilization; updated design standards accounting for higher temperature thresholds.      |

# KEY LESSONS

## LESSON

1

**Policy and institutional analysis is essential to sustain infrastructure resilience beyond individual projects.**

## WHAT WE HAVE LEARNT

This project shows that climate-resilient infrastructure investments cannot achieve lasting impact without addressing underlying policy and institutional constraints. While The Gambia has multiple climate and sector strategies, GCA's policy analysis revealed fragmented mandates, overlapping frameworks, and limited use of climate and asset-condition data in transport planning and maintenance. By linking climate risk findings to concrete recommendations, such as embedding adaptation into transport legislation, strengthening inter-agency coordination, and improving data governance, the project helped move resilience beyond asset-level upgrades toward systemic change. Integrating these reforms alongside physical investments ensures that climate resilience is institutionalized within planning, budgeting, and operations, reducing the risk that future infrastructure is designed without climate considerations and enabling adaptation to be sustained at scale.

## REPLICABILITY

MDB operations in similar contexts can replicate this approach by pairing climate risk assessments with targeted policy analysis early in project preparation. Embedding policy reform actions within investment programs, such as legislative updates, coordination mechanisms, and data systems, helps institutionalize resilience as a core function of government institutions, rather than a project-specific aspect.



## LESSON

2

# Integrating climate risk assessment across the project cycle strengthens bankability and reduces implementation risk.

## WHAT WE HAVE LEARNT

The project demonstrates that climate risk screening adds greatest value when embedded end-to-end, from upstream prioritization through design and procurement. GCA's assessment enabled the World Bank Group to select the most climate-exposed and socio-economically critical 100 km of roads from a much larger national network, so scarce resources were targeted strategically. Importantly, priority risks and economically appraised adaptation measures were incorporated into procurement documents, requiring bidders to account explicitly for climate risks and demonstrate delivery capacity. This reduced uncertainty around scope and pricing, improved contractor readiness, and strengthened investment quality, moving adaptation from analysis into implementation through climate-informed procurement.

## REPLICABILITY

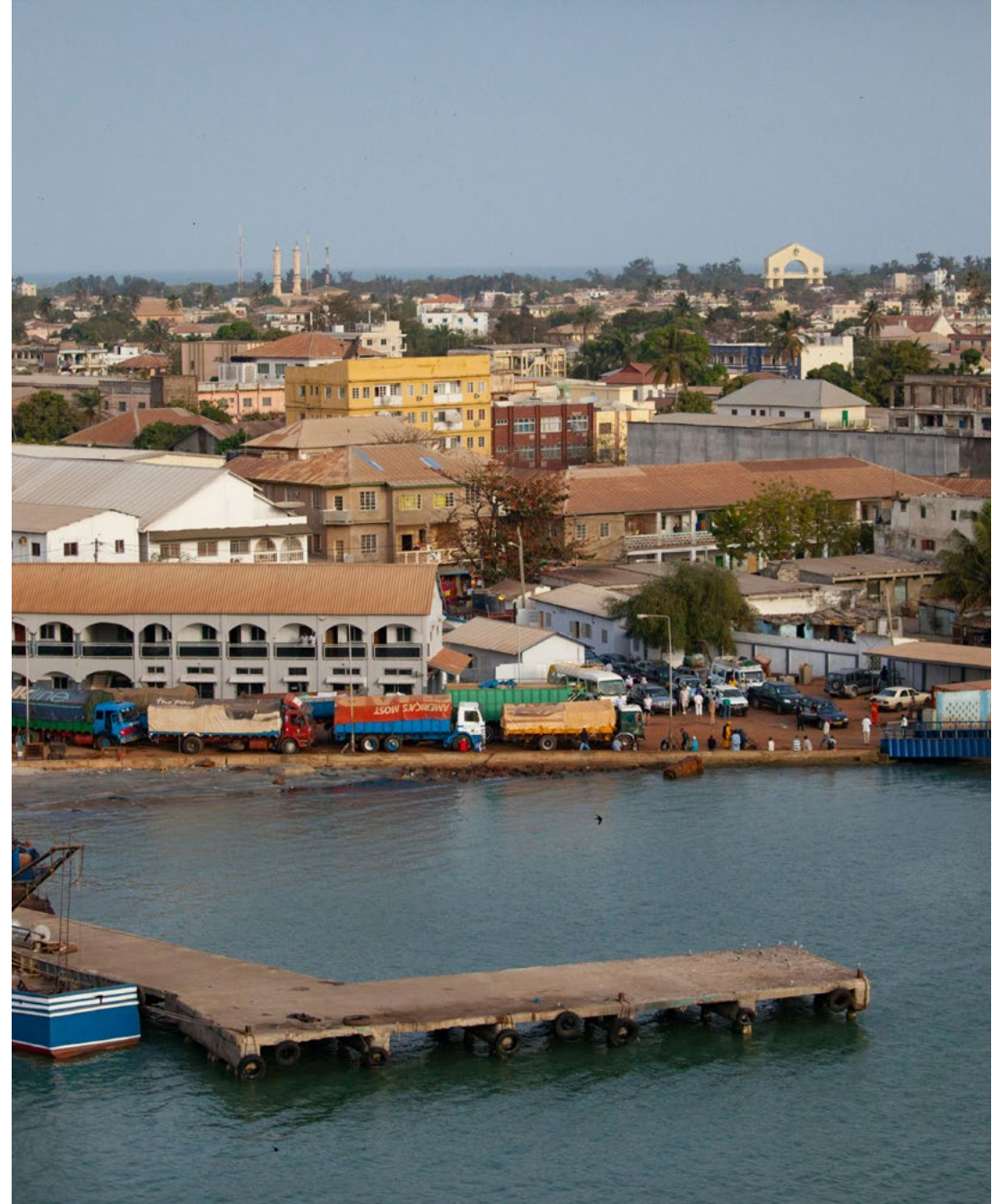
MDB-financed infrastructure projects can integrate climate risk screening across project preparation, design, and procurement to strengthen bankability and reduce implementation risk. Standardizing this approach helps improve project bankability, reduces delivery risk, and supports the operationalization of climate resilience rather than treating it as a stand-alone analytical exercise.



River infrastructure, The Gambia (credit: GCA)

# Actionable insights for MDBs

| THEME                                      | INSIGHT                                                                                                                                                                                                                           |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Investment prioritization</b>           | Climate risk screening combined with network criticality and socio-economic analysis helps target limited resources towards the most high-impact corridors under constrained budgets.                                             |
| <b>Project design and procurement</b>      | Embedding climate risk findings into technical guidelines and procurement documents supports accurate pricing of adaptation measures, improves contractor readiness, and translates resilience from analysis into implementation. |
| <b>Policy and institutional frameworks</b> | Aligning infrastructure investments with targeted policy and institutional measures helps embed climate resilience in sector planning and operations beyond individual projects.                                                  |



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