

Nature Based Solutions for Climate Resilient Infrastructure in Africa

Africa's infrastructure – including roads, railways, and essential public services – is increasingly affected by climate related events such as floods, droughts, and extreme heat.

These disruptions can cut off communities, damage the economy, and place the greatest burden on people with the fewest resources.

To address these risks, the Global Centre on Adaptation (GCA), through the Africa Adaptation Acceleration Programme (AAP), works with governments and partners to make infrastructure stronger and more climate resilient. This includes combining traditional engineering solutions with Nature based Solutions (NbS) such as tree planting, restoring natural floodplains, or using vegetation to stabilise land.

A case study carried out under the ARCAN Monitoring, Evaluation and Learning Midline Evaluation, examines whether using Nature based Solutions improves the Value for Money (VfM) of climate resilient infrastructure investments. It focuses on GCA's support to the design of the World Bank funded Second Tanzania Intermodal and Rail Development Project (TIRP 2) – a USD 200 million rail project with links across the transport, agriculture, and water sectors in Tanzania.

Climate Proofing Infrastructure Is Essential for Tanzania

Tanzania faces a wide range of climate risks, and these are expected to intensify in the coming decades. Climate related disasters already cause major damage to the country's infrastructure, interrupt essential services, and affect the health and livelihoods of communities.

In this context, GCA's technical support to improve the climate resilience of the TIRP 2 railway project is highly relevant. By combining engineering solutions ('grey infrastructure') with Nature based Solutions ('green infrastructure'), the project aims to strengthen a transport system that is critical for economic activity and rural connectivity – aligning with Tanzania's broader national strategies for climate adaptation.



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Nature Based Solutions Offer Strong Value for Money (VfM) - But VfM Estimates could be strengthened

Analysis comparing project designs with and without Nature based Solutions shows promising results:

- NbS can generate strong financial returns.
- For TIRP 2, GCA estimate that the proposed climate resilient options could generate an estimated net benefit of around USD 125 million, a benefit cost ratio of 5:1, and an internal rate of return of about 24%.

This suggests that NbS can offer excellent VfM. However, the study identified additional costs which were not included in the analysis. In particular:

- Supporting farmers to adopt conservation agriculture, one of the recommended NbS, would require additional investment.
- The costs of GCA's technical assistance were not fully accounted for.

Including these costs would reduce the estimated benefits – but the overall economic case for adding NbS remains strong.

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A More Strategic Approach Would Maximise Nbs Opportunities

a) NbS should be further embedded in a broader development pathway

Some NbS, such as conservation agriculture, are already widely used in development programmes. To increase the chances that these solutions will be implemented effectively within the transport sector, GCA and partners should:

- Identify from the start who will be responsible for implementing and supporting them.
- Clarify what additional activities or partnerships are needed.
- Promote the use of expertise in community-based development, in addition to technical engineers or climate specialists.

This would help ensure the capacity is available to effectively implement the NBS solutions.

b) Stronger institutional anchoring would increase long-term impact

GCA brings strong technical skills and a solid understanding of policy environments. However, its current model – in this case, 18 months technical support focused on project design – makes it hard to influence what happens later, during implementation.

Adding NbS to a project document is a significant innovation, but effective implementation will require strategic engagement with additional partners who are not normally part of transport sector programmes:

- Government bodies across different sectors.
- Local NGOs.
- Community based organisations (CBOs).
- Other partners who are essential for on the ground action.

A more strategic, partnership oriented, and longer-term approach would improve the likelihood that recommended NbS are actually delivered.

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The Africa Regional Climate and Nature Programme (ARCAN) has supported a range of existing multi-partner initiatives in sectors most affected by climate change since 2022. With International Climate Finance (ICF) funding of over £100 million, ARCAN has been a key vehicle to meet the UK's Foreign, Commonwealth and Development Office (FCDO) ICF commitments in Africa. Ecorys (with support from Altai and IIED) has been contracted as ARCAN's independent MEL Unit.

RECOMMENDATIONS

For GCA (and others undertaking similar interventions)

- **Include all relevant costs** – such as behaviour change support and technical assistance – in cost benefit analyses of Nature based Solutions.
- **Integrate NbS within a broader development pathway**, identifying early which partners and supporting interventions are needed for uptake.
- **Adopt a more strategic, long-term approach** to secure the partnerships and engagement required for NbS to be implemented, especially through early collaboration with government bodies, NGOs, and community organisations.



“Adding NbS to rail infrastructure in Tanzania will only be transformational if carried through to implementation.”

Key Informant Interview

The Midline Evaluation Summary Report and full case studies will be available at: [DevTracker Programme GB-GOV-1-300808 Documents](#) and the Ecorys website at: [World-class research-based consultancy | Ecorys](#)