POLICY BRIEF NO. 10

ASSESSING THE EFFECTIVENESS OF CLIMATE ADAPTATION INTERVENTIONS IN EAST AFRICA

Contributors:
Joanes Atela[1], Mary Nantongo[2], Humphrey Agevi[1], Washington Kanyangi[1], Florence Onyango[1]

[1] Africa Research and Impact Network
[2] Makerere University Business School

Acknowledgements
This report would not have been possible without the invaluable contributions of numerous individuals and organisations. We extend our sincere gratitude to the FCDO for their generous funding and support of this research, as well as to the EARIH for their guidance and expertise throughout the project. We commend the dedicated research team at ARIN for their hard work and insightful analysis. Our appreciation also goes to the policymakers, practitioners, and community members who participated in interviews and focus group discussions, as well as to the reviewers who provided valuable feedback on the report.

KEY MESSAGES

High levels of climate vulnerability in East Africa mean that effective adaptation is critical to protect livelihoods and sustain economic development – with key sectors affected including agriculture, health, water and sanitation, energy, infrastructure and biodiversity.

The distribution of adaptation interventions in East Africa is highly uneven across countries - some fragile states host significantly fewer interventions than relatively stable states. The distribution of interventions is further shaped by investors, political and donor interests.

I**ntegrated approaches like Nexus approaches Water, Energy, Food, and Ecosystems (WEFE) and Climate Smart Agriculture (CSA) build resilience across interconnected sectors** - these approaches effectively enhance resilience by combining multiple practices and sectors. However, their implementation is often hindered by institutional silos and inadequate technical support.

Adaptation interventions are often measured against livelihoods, with economic and ecological impacts remaining unclear - economic impacts are not fully understood due to limited investments in value chains and market linkages. Ecological benefits, such as improved soil health and biodiversity, are frequently overlooked due to the absence of appropriate tools and indicators to capture these benefits.

Institutional and funding challenges hinder the long-term effectiveness of adaptation efforts - key challenges include institutional misalignment, limited domestic financing, and reliance on short-term grants, all of which reduce the sustainability and impact of adaptation initiatives.

To cite this Policy Brief, use the following format: Africa Research and Impact Network (2024). *Assessing the effectiveness of climate adaptation interventions in East Africa (*Policy Brief No.10)

BACKGROUND

East Africa faces severe climate change impacts due to its reliance on climate-sensitive sectors and limited adaptation capacity. While predictions remain uncertain, East Africa will likely experience increased wetness (with more intense and unpredictable rainfall) and rising temperatures, amplifying flood and drought risks.

The region's adaptive capacity, as measured by the Climate Resilience Index (CRI)[1], is relatively low compared to that of other African regions (AfDB, 2022). The region's CRI score is 25.0, which is significantly lower than Southern Africa's score of 43.6 and Northern Africa's score of 63.5 (see **Figure 1**). The CRI varies between East African countries—from 18.3 to 28.9, with Djibouti, Kenya and Tanzania scoring highest, and South Sudan achieving the lowest CRI[2].

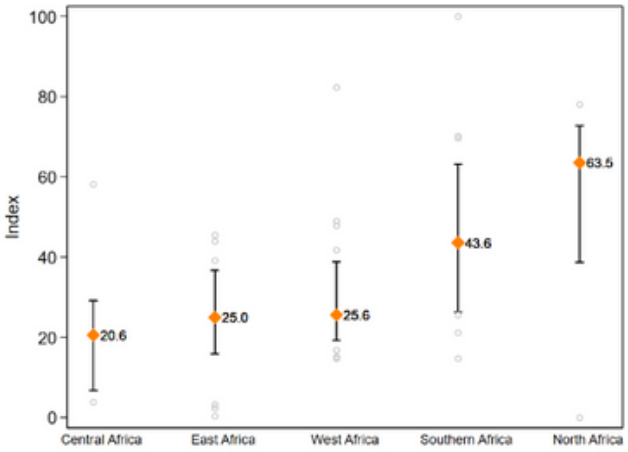

Figure 1: Climate Resilience Index scores across regions. Source: AfDB (2022).

Investing in impactful climate adaptation and resilience is critical to minimising future losses and fostering positive economic, social, and environmental outcomes. The adaptation investments must be hinged on effective adaptation actions in key sectors such as: food and agriculture, disaster risk reduction, water security, climate resilience infrastructure, resilient land management and nature-based solutions.

Despite some progress in integrating adaptation into national policies, such as nationally determined contributions (NDCs) and national adaptation plans (NAPs), critical gaps remain in policy implementation and investment in climate adaptation. Specifically, there is a lack of robust evidence on what interventions are more effective in addressing vulnerabilities and what opportunities exist for scaling up investments. Specific questions require attention, notably: whether initiatives are making a positive difference for vulnerable communities; and whether they are achieving their desired impact, i.e., promoting equity and providing good value for money.

This Policy Brief highlights key policy insights and recommendations synthesised from a broader study *'Assessment of the effectiveness of climate adaptation interventions in East Africa'*. The study aims to inform FCDO's future adaptation programming by generating robust evidence on the effectiveness of adaptation interventions across nine countries of East Africa countries: Kenya, Tanzania, Uganda, Rwanda, Burundi, Ethiopia, Eritrea, Somalia, and South Sudan.

METHODOLOGY

Adopting a two-phase approach, the study conducted an initial scoping exercise to understand East Africa's climate adaptation landscape. Specifically, adaptation interventions were mapped from various databases across the region and key sectors, including agriculture and food security, water security and management, nature-based solutions, climate-resilience infrastructure, and disaster risk reduction. Project documents were retrieved and reviewed, and websites were scanned to characterise the interventions in terms of their activities, technologies/innovations being applied, community engagements, and reported impacts.

To further understand the evidence base of interventions, a systematic literature review of both published and relevant policy documents was conducted to identify the state of evidence on the effectiveness of different practices and existing gaps needing research attention. Building on Phase One (1), an empirical investigation was conducted in Phase Two (2) across Kenya, Rwanda, Tanzania, and Uganda. Case study analyses were carried out on seven selected adaptation projects using country focus group discussions and key informant interviews (KIIs) with project implementers, policymakers, beneficiaries, and funders.

RESULTS

1.Overview of practices prioritised in policy (NDCs and NAPs)

The NAPs and NDCs of countries in East Africa were reviewed to identify prioritised sectors and activities outlined in these policies and to determine whether these priorities were aligned with current risks and existing interventions. Agriculture, food security, and water security and management were the most common sectors identified in the policy documents (Figure 2). The previous sections highlight that agriculture and water security are among the sectors most affected by climate change thus, the policy priorities seem to be aligned with the critical risks. However, the NAP and NDC lack adequate evidence, detailed data and implementation plans for the relevant technologies and practices.

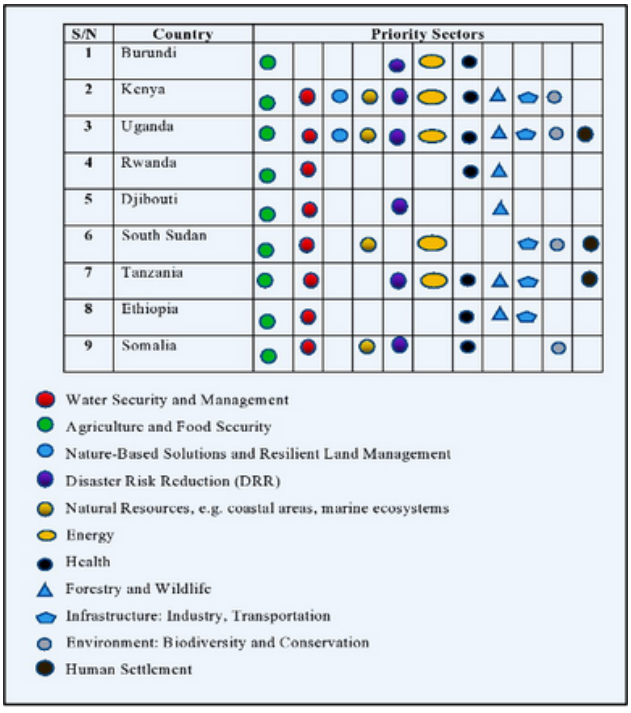

Figure 2: Priority sectors in the NDC and NAP per country (Source: Illustration by ARIN)

[1]The Climate Resilience Index is calculated as **RI = (ACI*TCI)/(EI*SI)**; where RI: climate resilience index, ACI: adaptive capacity index, TCI: transformative capacity index, EI: exposure index and SI: sensitivity index. The index is derived by considering GDP as well as readiness and vulnerability to climate change.

[2] Climate Resilient Index

2. Uneven distribution of climate adaptation interventions

A total of 242 interventions were mapped across East Africa. The majority of these interventions were concentrated in Kenya, with a focus on agriculture and food security (35.9%) and water security and management (21.1%) (Figure 2). This uneven distribution might have been influenced by various factors including; donor interests, political stability, and governance issues, which determine how projects are mobilised, designed, and implemented across East African countries.

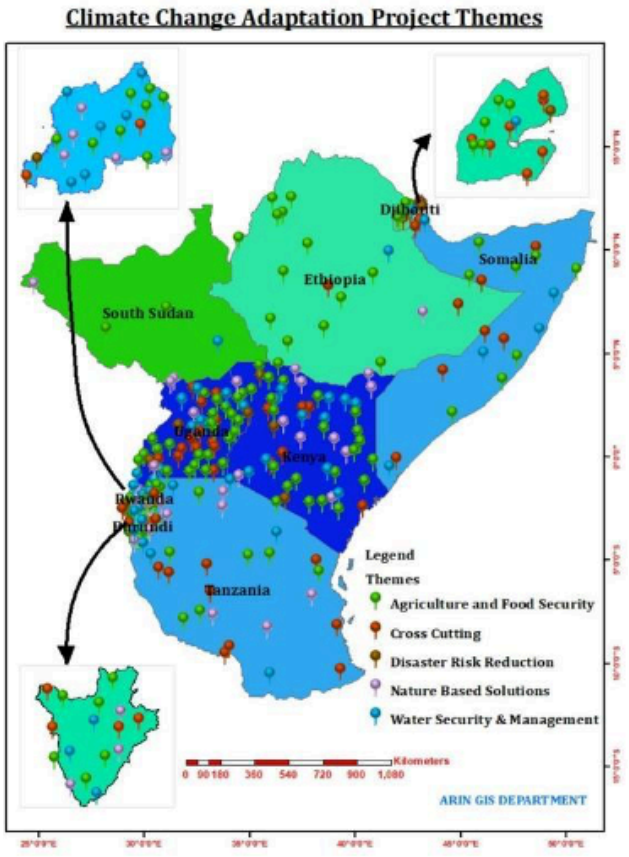

Figure 3: Spatial distribution of the a) total identified adaptation interventions and b) per thematic areas (n = 242)

3. Nexus approaches and sectoral synergies

The analysis revealed the importance of interventions that adopt a "nexus" approach, connecting sectors like Water, Energy, Food, and Ecosystems (WEFE), Nature-based Solutions (NbS), and Climate Smart Agricultural (CSA) practices, as well as climate-resilient infrastructure (CRI). These approaches present opportunities for leveraging synergies across sectors. Empirical case studies demonstrated that WEFE interventions enhance resource efficiency while maximising impacts while NbS interventions enhance communities' adaptation capacity by linking ecosystem services with livelihoods. For CRI, building resilience into infrastructure ensures that it remains functional amid varying climate conditions, further enhancing the effectiveness of adaptation interventions.

4.Knowledge gaps in integrated approaches

Despite the promise of integrated approaches such as CSA, there is limited evidence of their scalability and impact. Research gaps include the need for cost-benefit analyses, socio-technical feasibility studies, and the integration of indigenous knowledge with modern technologies like intensification and mechanisation. Harmonising competing national strategies, such as those promoting agricultural intensification with CSA practices, requires further evidence to inform policy.

5.Impact of climate adaptation interventions

The impact of adaptation interventions is highly valued by beneficiaries, particularly in terms of livelihood improvements. Targeting interventions at key vulnerabilities enhances their impact, as demonstrated by projects like the solar-powered water supply in Kajiado under the Kenya Climate Change Adaptation Project. Intersectional vulnerabilities (e.g., women and children) also play a crucial role in determining the impact of interventions, as shown in the Ololunga Primary School adaptation village, which improved pupil nutrition and supported women's participation in water management. While the social impacts of interventions are visible, the economic impacts are less developed. Transforming social impacts into economic benefits requires time and additional investment in value chains and technologies to enhance productivity. For instance, food-insecure communities like those in Gicumbi (Rwanda) and Kajiado (Kenya) need stabilised food systems before being linked to markets.

6.Ecological outcomes of adaptation

Ecological impacts, although important, are often overlooked. For instance, the upscale push-pull technology project in Vihiga County, Kenya, demonstrated ecological benefits like reduced pesticide use, improved soil health, and controlled erosion. However, limited awareness and prioritisation of ecological impacts by communities and policymakers reduce the focus on these outcomes. There is also a lack of tools designed to assess ecological impacts within adaptation projects.

7.Institutional and policy alignment

Institutional alignment with national policy priorities (e.g., NDCs, adaptation plans) offers opportunities for political buy-in, but tensions arise when global narratives like carbon credits overshadow local needs such as livelihoods. Institutional disintegration and sectoral silos impede the effectiveness of integrated interventions, highlighting the need for multi-sectoral coordination, local leadership, and the incorporation of indigenous knowledge into decision-making processes.

8.Challenges in financing adaptation interventions

The reliance on grant funding, typically implemented by non-profits, limits the flexibility and sustainability of adaptation interventions. Transitioning from short-term project-based funding to sustainable business models is a major challenge. Additionally, domestic financing for adaptation is scarce, and international funding remains uncertain. However, efforts to mobilise private sector financing through multilateral development banks, such as the African Development Bank's Adaptation Accelerator Programme, show promise. Institutional preparedness and capacity building are essential for the successful adoption of private financing.

9.Capacity building, community engagement, and policy coherence as enablers

Capacity building, community engagement, and policy coherence are key enablers of effective adaptation interventions. Building local ownership through targeted community engagement and co-creation approaches helps institutionalise, sustain, and scale up interventions. For example, capacity-building initiatives for farmers on new technologies facilitate peer learning, while stakeholder collaborations linked to policy processes enhance the sustainability of projects.

Most adaptation interventions among fragile states integrate peace-building initiatives. This fosters community engagement for harmony and cohesion. Integrating peace-building initiatives stems from the realization that impactful adaptation outcomes in such jurisdictions hinge on stable social systems.

RECOMMENDATIONS

1.Promote balanced distribution of interventions: To address regional disparities, donors, governments, and development partners should invest in adaptation projects in highly vulnerable and underfunded countries such as South Sudan, Djibouti, Somalia and to some extent, Rwanda. This will help avoid climate-induced migration and improve adaptation outcomes across the region. Special attention should be paid to balancing sectoral funding, ensuring that underfunded areas like Nature-based Solutions (NbS), disaster risk reduction (DRR), and climate-resilient infrastructure receive adequate support to prevent amplifying risks in well-funded sectors like agriculture and water security.

2.Mainstream climate adaptation into national policies: Countries should integrate climate adaptation across all vulnerable sectors, such as NbS, DRR, and resilient infrastructure, to close policy gaps and enhance the effectiveness of interventions. Aligning these efforts with national development strategies and adaptation priorities will ensure a coherent approach to building resilience and create opportunities for greater political buy-in. Institutional alignment and coordination among government agencies, local leadership, and sectoral stakeholders will be critical for implementing integrated policies.

3.Leverage nexus approaches for greater impact: Adopting Water-Energy-Food-Ecosystem (WEFE) nexus approaches and linking sectors like NbS and Climate-Smart Agriculture (CSA) practices can optimise resource use and improve overall adaptation outcomes. Policymakers and project designers should promote cross-sectoral synergies to enhance resilience, reduce operational costs, and maximise social and ecological benefits. These approaches should be tailored to local contexts, combining modern technologies with indigenous knowledge to ensure sustainability and relevance.

4.Enhance targeting of vulnerabilities: Climate adaptation interventions should be tailored to address key vulnerabilities, especially those faced by women, children, and other marginalised groups. Projects like the solar-powered water supply in Kajiado and the adaptation village at Ololunga Primary School demonstrate that well-targeted interventions improve livelihoods and foster community ownership. Scaling up such interventions while engaging vulnerable groups in project design will ensure that climate adaptation efforts meet the needs of the most affected populations.

5.Foster economic impact of interventions: Transforming social impacts into economic benefits requires long-term investment in value chains and innovative business models. Strengthening value chains in food-insecure regions like Gicumbi (Rwanda) and Kajiado (Kenya) will enhance productivity and market integration. Moreover, private sector engagement is crucial for developing sustainable business models that move beyond grant-based funding and attract long-term investment for adaptation projects. Innovative financing models such as weather-indexed crop insurance, cooperatives, and devolved financing systems should be explored to build climate resilience.

6. Increase awareness and monitoring of ecological impacts: Ecological outcomes of climate adaptation interventions, though critical, are often overlooked. Tools to monitor and assess ecological impacts, such as soil health, biodiversity conservation, and erosion control, should be incorporated into project designs. Raising awareness among communities and policymakers about the importance of ecological benefits, as seen in the push-pull technology project in Vihiga, Kenya, will ensure that ecological outcomes are prioritised alongside social and economic impacts.

7.Expand evidence base and address research gaps: Rigorous, process-based research is needed to provide evidence on the scalability and impact of integrated approaches like CSA and NbS. Governments and donors should invest in research that goes beyond agricultural outputs, focusing on governance, community participation, inclusiveness, and equity. Particular emphasis should be placed on less-studied areas like climate-resilient infrastructure and underfunded countries such as Burundi and Somalia, ensuring that interventions are informed by a robust evidence base.

8.Strengthen institutional and policy coherence: Effective climate adaptation requires strong institutional frameworks and coherent policies that align with national development strategies and adaptation priorities. Multi-sectoral coordination is essential for breaking down silos and ensuring that interventions are integrated and responsive to local needs. Moreover, harmonising global narratives like carbon credits with local priorities such as livelihoods will ensure that adaptation efforts are both relevant and effective.

9.Develop sustainable financing models: Transitioning from short-term grant-based funding to sustainable financing models is a major challenge for adaptation interventions. Private sector engagement should be encouraged through the development of innovative business models and financing mechanisms such as the African Development Bank's Adaptation Accelerator Programme. Additionally, institutional capacity building is essential for enabling countries to mobilise domestic and international finance for long-term adaptation projects.

10.Prioritise Capacity Building and Community Engagement: Capacity building and community engagement are vital for the success and sustainability of adaptation interventions. Sustained support, local leadership, and long-term investments in training and technology dissemination will ensure that acquired skills are effectively implemented. For example, farmer training programs that promote peer learning and the co-creation of solutions will help institutionalise adaptation practices at the local level. Strengthening collaborations between stakeholders and linking them to policy processes will further enhance project sustainability and scalability. In addition, in fragile jurisdictions, peace-building initiatives can be embedded in community engagement initiatives to foster stability and cohesion. This will provide an opportunity for adaptation actions to take root among the vulnerable communities against climate risks.

CONCLUSION

The assessment of climate adaptation interventions in East Africa reveals both significant progress and critical gaps in addressing the region's vulnerability to climate change. Adaptation efforts, particularly in agriculture and water security, have positively impacted livelihoods, though their uneven distribution highlights the need for more inclusive and balanced approaches. Integrated and nexus-based interventions, like WEFE and CSA, offer great potential but require enhanced coordination, local leadership, and capacity building to scale effectively. To ensure long-term sustainability, it is essential to mobilise domestic financing, increase private sector involvement, and prioritise ecological benefits. Moving forward, a more cohesive, community-driven, and well-targeted strategy that addresses both social and economic vulnerabilities will be crucial for fostering resilience across East Africa.

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About ARIN
The Africa Research and Impact Network (ARIN) is a leading organisation dedicated to addressing Africa's key development challenges, including climate change, sustainable agriculture, and inclusive economic growth. ARIN conducts rigorous research to assess the impacts of climate change and adaptation interventions, working closely with policymakers to turn evidence into actionable strategies(ARIN empowers researchers, policymakers, and communities to tackle climate challenges through capacity building and knowledge sharing. ARIN drives real-world impact and contributes to a more resilient and sustainable future for East Africa. More about ARIN can be found **here**

About FCDO
The Foreign, Commonwealth & Development Office (FCDO) is a leading UK government department dedicated to promoting international relations and supporting sustainable development. As a key partner in this study, the FCDO's invaluable funding and expertise have been instrumental in advancing research and policy initiatives focused on addressing climate change and fostering resilience in East Africa. Their support has enabled collaborations that enhance the effectiveness of adaptation strategies, ultimately contributing to the well-being of communities in the region. More information about the FCDO and its work can be found **here**.

About EARIH
The East Africa Research and Innovation Hub (EARIH) is an initiative funded by the FCDO aimed at promoting research and innovation across East Africa. EARIH focuses on critical areas such as climate change, health, and agriculture, supporting both research and start-up ecosystems to drive sustainable development. Through this initiative, the FCDO seeks to strengthen regional research capacities, support innovators, and address local challenges with global impacts, including food security and environmental resilience. More about EARIH **here**.