



Photo: A storage tank at Kamuyuni Rock Catchment (Credit: ADA)

Assessing the effectiveness of locally-led public good climate investments in water infrastructure in Kitui County

Findings from a 2023 functionality and governance longitudinal study

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Key Messages

- Most public good climate investments in water infrastructure in Kitui only provided adequate water during the rainy season and shortly afterwards – infrastructure should serve communities even in the driest seasons. For example, sand dams can store water in the dry season and shallow wells can be dug to enable access to this water.
- Non-functional investments resulted from a lack of repairs and maintenance, both major repairs (e.g. damaged embankment walls) and minor repairs (e.g. damage to fences and gates). Minor repairs should be carried out efficiently to prevent them becoming major issues in the future.
- The majority of investments had insufficient funds to finance project management expenses, such as the purchasing of spare parts. It is important to develop a financing mechanism that supports operations and maintenance throughout the lifespan of an investment, and institutionalise project audits to monitor the investments' functionality and sustainability, making adjustments where needed.
- Local knowledge was integrated into the planning and execution of the investments through community forums, led by the Ward Climate Change Planning Teams. These included community consultations through public barazas, and the identification and prioritisation of the investments by the communities they would serve.
- It is essential to carry out capacity strengthening for Ward Climate Change Planning Committees and investment management committees in leadership, project management, operations and maintenance.

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Summary

Climate change poses significant challenges to water security in arid and semi-arid regions, necessitating innovative and sustainable approaches to water resource management. This technical brief outlines the key findings and recommendations derived from a longitudinal functionality and governance study that assessed 12 public good climate investments in water infrastructure implemented through the County Climate Change Fund (CCCF) mechanism between 2013 and 2018 in Kitui County, Kenya. The study was conducted in 2023, ten years after the investments were implemented, by the Adaptation Consortium (ADA), Anglican Development Services Eastern (ADSE) and the County Government of Kitui, supported by the Climate and Development Knowledge Network (CDKN) programme.

The brief provides valuable insights into the technical and governance factors influencing the success of locally-led adaptation (LLA) investments implemented through the CCCF mechanism in Kitui County. It offers recommendations to support the successful and sustainable implementation of locally-led projects to enhance their long-term impact.

Study Background

Kitui County is situated in the eastern region of Kenya. Its landscape is dominated by a semi-arid and arid environment, comprising rugged terrain, rocky hills, and vast plains. The plains and plateaus are suitable for rain-fed agriculture, with most of the county's agricultural activities taking place in these areas. Livestock rearing, particularly of goats, sheep and camels, is a major source of livelihood for many residents, as is rain-fed agriculture. However, the limited availability of water and fertile land means that these activities are often characterised by low productivity and high vulnerability to climatic shocks. The county's rivers and streams are seasonal, with most of them drying up during the dry season. However, they are important sources of water for the communities in the county, supporting irrigation and domestic use. Kitui County receives low, erratic and unreliable rainfall throughout the year. These climatic conditions have exacerbated water scarcity in the county, making it difficult for crops and vegetation to thrive, thus contributing to limited agricultural productivity and insufficient support for other human activities.⁵

With a population primarily dependent on agriculture and livestock farming for livelihoods, the limited availability of water resources poses a significant threat to the well-being and development of the communities in Kitui County. About 50% of Kitui's population does not have access to clean water, and about 57.6% of households, mostly women and children, spend over 30 minutes each day fetching drinking water.⁶

Water accessibility having been identified as the main challenge in the 2016/2017 financial year, the County Government of Kitui partnered with ADA and ADSE to support the implementation of 12 public good climate investments in water infrastructure: eight earth dams, two sand dams, one rock catchment and one pipeline extension. These 12 investment sites were locally identified by the communities in 10 wards as pilots for community driven adaptation initiatives.

⁵ Department of Economic Planning and Budgeting, County Government of Kitui. 2023. *Kitui County Integrated Development Plan 2023-2027*. Available from: <https://repository.kippira.or.ke/bitstream/handle/123456789/4333/CGOKTI-FINAL-KITUI-COUNTY-CIDP-2023-2027....submitted-to-CA.pdf?sequence=1&isAllowed=y> (last accessed on 7 August 2024).

⁶ Ministry of Agriculture and Livestock, County Government of Kitui. 2023. *Kitui County Agri-Nutrition Implementation Strategy (CANIS)*. Available from: https://www.advancingnutrition.org/sites/default/files/2023-10/kitui-canis-9-12-23_ada.pdf (last accessed on 7 August 2024).

In 2019, ADA conducted a comprehensive functionality and governance study assessing all 12 investments with the aim of evaluating the technical sustainability and governance of the investments, and with a specific focus on quality assurance, usability and sustainability. In October 2023, the County Government of Kitui, ADSE and ADA, supported by the CDKN programme, conducted a longitudinal functionality and governance study, a repeat study assessing the same investments as the 2019 study.

The lessons from the longitudinal study are intended to provide insights and guide the local, national and regional conversations on the facilitation of climate finance flows to the local levels, gender and social inclusion in decision-making, and the suitability, efficacy, sustainability and impact of locally-led public good climate investments.

Methodology

The primary objective of the longitudinal study was to identify and assess the factors (challenges and successes) that affect the functionality and governance of the investments. Specific objectives included investigating technical issues, assessing community engagement, examining governance challenges and analysing environmental factors that impact project sustainability. To achieve this, a mixed-methods approach was employed, combining focus group discussions and key informant interviews with videography, photography and observation checklists for technical assessments. Field data was gathered capturing the perspectives of communities, site committees and relevant stakeholders. These findings were collated and synthesised into a series of reports and videos to derive meaningful insights.⁷ The study took place in October 2023, during the peak of the dry spell in Kitui.

Study Findings

Definition of terms

Functional: A functional water point is one that is operating as expected and serving the community well on the day of the visit and within the last month.

Partially functional: A partially functional water point is one where some of the components are absent, broken or damaged, but there is still some water available to the community.

Non-functional: A non-functional water point is one where some or all of the components are absent, broken or collapsed, with the result that water is not accessible or available to the community.

Not-in-use: This term applies to those water points that may not be in use due to seasonality and low rainfall, but they are intact and functional during the wet season.

The longitudinal study considered the functionality status of the investments and found that four out of the 12 investments were functional, three were partially functional, two were non-functional, and three were not in use during the visit.

The main findings from the study include:

- The combined functional and partially functional investments formed 59% of the total investments, and were considered sustainable, providing water for domestic and livestock use.

⁷ For more information, see CDKN's project page: [Building water resilience in Kenya's arid and semi-arid lands](#).

- Local knowledge was integrated into the planning and execution of the investments through community forums led by the Ward Climate Change Planning Committees. Sites were identified and prioritised by their respective communities.
- Challenges included ensuring that the infrastructure design was appropriate, that there is ongoing functionality and maintenance, and that there is adequate technical expertise to maintain and repair the infrastructure. Repairs were noted as needed at many of the investments, including major repairs to dam embankment walls and minor repairs to additional infrastructure, such as solar pumps, fences, gates, tap stands, cattle troughs and VIP latrines.
- Non-functional investments formed 16% of the total investments and were the result of a lack of repairs and maintenance. The study suggested that to ensure the sustainability of the investments, minor repairs were carried out immediately to prevent them causing major breakages and the possible loss of water infrastructure. For example, the Mutethya Nzaini Earth Dam had been partially functional during the 2019 study, but was no longer functional in 2023 - the embankment wall had been breached and needed compaction, the fence had been vandalised and eroded by floods, and the spillway was not properly designed.
- Maintenance challenges, such as the unavailability of spare parts, the slow response time from the department responsible for major repairs and the need for the community to understand county public participation forums and influence county budget allocations for major repairs, have led to delays in carrying out necessary repairs and have impacted the operational status of the investments.
- Insufficient funding and inadequate cost-recovery mechanisms have hindered long-term operations and maintenance of the investments.

Recommendations

Based on the study findings and to enhance the efficacy and sustainability of the investments:

- **Establish investments that serve communities even in the driest seasons.** It was established that most of the investments had adequate water during the rainy season and shortly after, but most investments had inadequate/no water during the dry season. The majority of the investments assessed primarily catered to domestic and livestock needs, with other uses being relatively limited in scope. The community either accessed water directly from the source through scope holes, shallow wells and water troughs or through pipeline water kiosks that extend to the villages, with a few instances of individual household connections. At one site women would fetch water the whole day and sometimes late into the night, walking for more than 5km.
- **Make use of technical information at the design stage and integrate a landscape restoration approach.** Climate information and hydrogeological information are examples of technical information that could be included. Earth dam designs did not factor in the construction of check dams upstream of the dam to control siltation. Some earth dams, such as Kyandevu Earth Dam, were sited near another dam affecting the flow of water into the dam. Climate information was not used in some investments such that floods and long dry periods rendered the investments non-functional and not-in-use.
- **Develop a financing mechanism to cater for operations and maintenance throughout the lifespan of an investment.** Most investments did not have sufficient funds to finance project management expenses such as purchasing spare parts, paying for repair services and security services. In addition, there is a need to clearly define the roles for each actor in ensuring functionality and sustainability of the investment as it was noted that the project committees are

unable to influence county budgetary allocation to cater for major repairs. Unavailability of spare parts locally was also identified as a limiting factor for the functionality of the investments. Finally, the county government needs to institutionalise project audits to monitor their functionality and sustainability, and make adjustments where necessary. The information generated will be key in reporting progress and adaptation impacts in the county.

- **Carry out continuous capacity assessment.** At some sites, the membership of the management committees had changed over time and the new members had not been trained on leadership, financial management and operation and maintenance of the investments. The management committees' capacity to undertake repairs also needs strengthening.
- **Conduct community sensitisation on project ownership.** This is key to controlling vandalism as well as improving understanding of the rationale of paying for the water usage by all project beneficiaries, and ensuring functionality and sustainability of an investment.
- **Integrate landscape restoration activities during the investment design process.** This will promote rehabilitation of the water catchments to increase water recharge, reduce the speed of surface water flow and reduce siltation in the water reservoirs.

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