



## Integrating climate risk into resilience planning: the case of Isiolo, Kenya

Our SUED team works to integrate climate resilience into urban planning in Kenya.

Kenya's Isiolo county lies around 285 kilometers north of the capital Nairobi. A largely arid area, long periods without rain are often followed by seasons of intense rainfall and floods.

Due to dry soil with a high clay content and limited vegetation, the water cannot run off into the ground, which is worsened by poorly maintained stormwater drainage systems. Isiolo's urban centre – located on a low-lying floodplain and surrounded by steep gradients – is especially vulnerable to heavy flooding through stormwater and flood water overflowing from a shared basin with neighbouring counties.

Over the past three decades, Isiolo has seen an increase in these extreme weather events, causing damage to land, agriculture, economy, infrastructure and people living in the county's urban region. [Isiolo's government](#) registered 1,320 households that have been displaced between 2009 and 2019 due to flooding, while Japan's International Cooperation Agency estimates a total of about £5.3 million in property damage during 2015's flood events.

### Climate resilience for economic development

In this context, efficient urban planning, water management and infrastructure are essential to meeting the needs and ensuring the wellbeing of the county's rapidly growing and vulnerable urban population, having almost to 80,500 between 2009 and 2019.

Kenya's devolution has brought forward economic priorities of previously marginalised areas. Transformative projects to advance economic potential – such as the Lamu Port-South Sudan-Ethiopia Transport Corridor (LAPPSET) – require the county government to scale up urban development, including the setting up of water drainage systems that are multi-functional and fit-for-purpose. However, the funding for new storm water drainage systems due to the pressures of supporting a large vulnerable population remains scarce. It is due to these competing needs and limited financial opportunities that the climate resilience of Isiolo's urban expansion continues to be hampered.





## What we do

The UK Government, through the SUEd programme, is working with Isiolo and eleven other municipalities to improve the climate resilience of their urban environments and drive sustainable economic development. The programme is working closely with the county and municipal leadership to develop climate-smart [Urban Economic Plans](#) (UEPs) that outline how municipalities will build their infrastructure to better service the population, develop decongested urban centers that enable residents to live and work sustainably in well-planned towns as well as absorb direct and indirect impacts of climate change. Our SUEd team's approach puts strong emphasis on climate resilience within the UEP development process, helping municipalities to identify how to better adapt to climate change and reduce the risks posed by climate events.

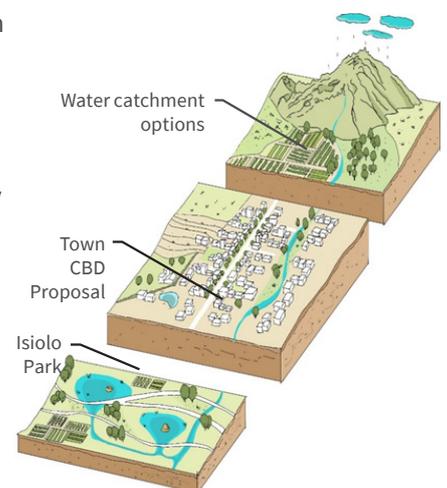
This will ensure that urban centres, the primary location for economic growth, are only minimally affected by hazards. SUEd does this in the following ways:

- Understanding how climate change affects people:** The programme works with municipalities and other stakeholders to learn about economic priorities and their obstacles to economic growth. By understanding how climate change might affect the population, the municipalities were able to make significant decisions in planning, utilisation of land within their territories and what climate-resilient infrastructure projects need to be prioritised.
- In-Depth Assessments and Analysis:** We have incorporated a multi-faceted approach in the assessment of a municipality's demographics, economy, infrastructure, environment, and climatic conditions in Isiolo through its UEP development process. In its assessment of Isiolo municipality, SUEd was able to see how rainwater continually drains into the surrounding hillsides and converges in the urban centre, where floodings of up to 500mm regularly cause damage to livelihoods and properties which in turn lead to displacement and considerable economic losses. The urban centre – with its limited green infrastructure and lack of surface water management in place – continues to be at risk of flooding.
- Development of a Responsive Framework:** SUEd works closely with the municipal and county leadership to develop local solutions. This involves an iterative process that helps the municipality and county key decision makers seek solutions that impact beyond their current challenges. This is critical as climate change remains unpredictable: by establishing a culture that uses existing issues to enable understanding for how a locality's climate may change in the future, it is possible to integrate future solutions into current planning. Working with Isiolo's county and municipal leadership, we have put together a development framework that determines the support needed to improve the municipality's capability to foster urban growth whilst building climate resilience.
- Informed Climate Visioning:** During the final stages of the UEP, our SUEd team supported the county and municipal leadership to set their vision for the future – “develop Isiolo as a centre of Excellence and a Major Economic Hub in Kenya with Resilient and Inclusive Growth through the Responsible Use of its Natural Resources” – and identify key economic priorities.

**Example:** SUEd proposed a Sustainable Urban Drainage System (SuDs) to protect both the population and infrastructure from flooding in the Central Business District (CBD) of Isiolo municipality. Through this local solution, the municipality was able to plan how the SuDs would re-direct overflows through a bio-park into a natural reedbed system, forming a nature-based solution. The bio-park will revegetate the banks of River Marire – thereby enhancing adaptation to water stress – and ensure water supply for farmlands and livestock watering points.

This measure will directly counter the effects of droughts and enable safe water flow through the urban center. The initiative brought Isiolo one step closer to its goal of ensuring an holistic approach to its economic priorities in terms of storm water management, and addresses the challenges around the unpredictable nature of flooding.

**Result:** With a development framework in place that is based on climate resilient urban development, Isiolo municipality now has an effective urban economic plan that clearly articulates how it can utilise river flow management and build SuDs to reduce the risks of urban flooding and droughts. Our support plays substantial role in attracting investment and providing sustainable long-term solutions to Isiolo's stormwater management.



## A strong partner, every step of the way

Our SUED team was key in the planning process of a SuDs project that enhances Isiolo's climate resilience, following a four-step approach.

The implementation of this SuDs project enables the county of Isiolo to appropriately mitigate flooding within its urban area. A multi-faceted drainage system, designed to provide the fastest and most effective transport of stormwater runoff into River Marire, will effectively address water scarcity and make a strong case for using biodiversity and ecosystem services as part of an overall adaptation strategy to climate change.

**1** **First**, the municipality would need to prioritise the construction of drainage channels around its airport and feeder roads within the municipality as well as rehabilitate drainage channels. By doing so the channels will redirect stormwater away from residential, commercial, and academic spaces to the River Marire. 

**2** **Second**, River Marire needs to be expanded and individuals living on its riparian land resettled. This will enable it to safely channel stormwater at peak discharge. 

**3** **Third**, a semi-natural bio-park will enable the utilisation of 25% of the stormwater flowing into the municipality. The captured water will be used to create a green space for the population and generate income for the municipality by charging access fees to the park. 

**4** And **fourth**, the construction of four check dams in catchment areas in the neighbouring Meru County reduces the volume and velocity of floodwater flowing to Isiolo Municipality. 

Climate resilience is key to Isiolo's future and economic development. Due to SUED's strong partnership with the Isiolo county and municipality as well as Tetra Tech's global network of development cooperation partners, the programme is well placed to drive investments into the proposed urban system, ensure the safety of the public and minimise the environmental impact of urban stormwater.



### About SUED

Tetra Tech International Development is implementing SUED for the UK Government from 2018 to 2024.

Our work with the 12 municipalities aims to better address demographic, security, and economic development challenges. The aim of this work is to contribute to Kenya's President's Big Four priorities — manufacturing, universal healthcare, affordable housing, and food security — and

strengthening the United Kingdom's modern partnership with Kenya.

To do this, SUED provides technical expertise across thematic areas, in urban economic planning, investment attraction and capacity building.



107 Gray's Inn Road, London WC1X 8TZ, UK  
+44 (0) 20 7837 2881 | [intdev.tetratecheurope.com](http://intdev.tetratecheurope.com)

Tetra Tech International Development has regional offices in  
United Kingdom | Poland | Kenya | Nigeria | The Netherlands | Turkey | Croatia

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