

Climate change adaptation and livelihood restoration in Tana River Delta: Embracing innovative approaches and technology



Project dates:
October 2021 - September 2022

Location:
Tana River County, Kenya

Lead Partner:
World Vision Kenya (WVK) is a Christian relief, advocacy and development organisation that works to improve the well-being of children, families and communities in Kenya.

Funding:
 The Tana River Climate Change and Livelihoods Restoration Project project was funded by World Vision Korea.

Climate change and land degradation is a growing problem for rural farming communities who rely on agriculture and livestock across Tana River Delta. Unsustainable fuelwood harvesting and farming practices have been weakening the already stretched ecosystems and threatening livelihoods and food security. In response, WVK have embraced strategic partnerships and innovative approaches to strengthen their climate change adaptation and livelihood restoration activities in the region.

Tana River Climate Change and Livelihoods Restoration Project (T-CLIRP) is part of WVK's larger integrated emergency response programme providing lifesaving water, sanitation and hygiene, nutrition, livelihood and economic recovery interventions to drought affected communities across Kenya. T-CLIRP is focused on supporting sustainable natural resource management, farmland restoration and overall ecosystem strengthening activities to improve the long-term resilience of nine pastoral and farming communities that inhabit the Delta.

Key project partners

WVK partnered with several organisations to ensure their response was utilising the most efficient and effective technology and project practices available. This case study is structured around two specific partnerships, Ushahidi and Kenya Flying Labs, highlighting the innovation that they enabled.

- **Ushahidi** is a non-profit technology company that provides software and tools to help mobilize communities to create meaningful change. Their platform uses a mapping tool to collect, analyse and visualize crowdsourced data that empowers individuals and groups to generate, and act on, reliable insights and data.
- **Kenya Flying Labs** is a technology company that provides innovative drone, data analysis, and AI solutions to Kenya's humanitarian and development actors. They promote the use of drone technology to provide socially beneficial insights for rapid response, situational awareness, mapping and surveying.

WVK also worked with **Seedballs Kenya**, a Kenyan based organisation that has pioneered the mass production of 'biochar seedballs' to support the reintroduction of indigenous tree and grass species across Africa. GSMA Mobile for Humanitarian Innovation provided technical guidance and funding to help document and showcase the various ways innovative technologies can help strengthen climate resilience and response activities.



Key statistics from project reporting



9 villages

across Tana River County

Kizuliani, Tosi, Kaloleni,
Shauri Moyo, Kenze, Luvu,
Vumbwe, Mikameni & Sailoni



2,250 acres

of land mapped and
evaluated by Kenya
Flying Labs' drones



250 acres

of degraded land
cleared

through mobile money
enabled cash-for-work
initiative



1,000kg

of 'biochar seedballs'
distributed



2 natural resource
management
committees formed

and **33 members** trained on
natural resource management



200
households

encouraged to adopt
cleaner energy options

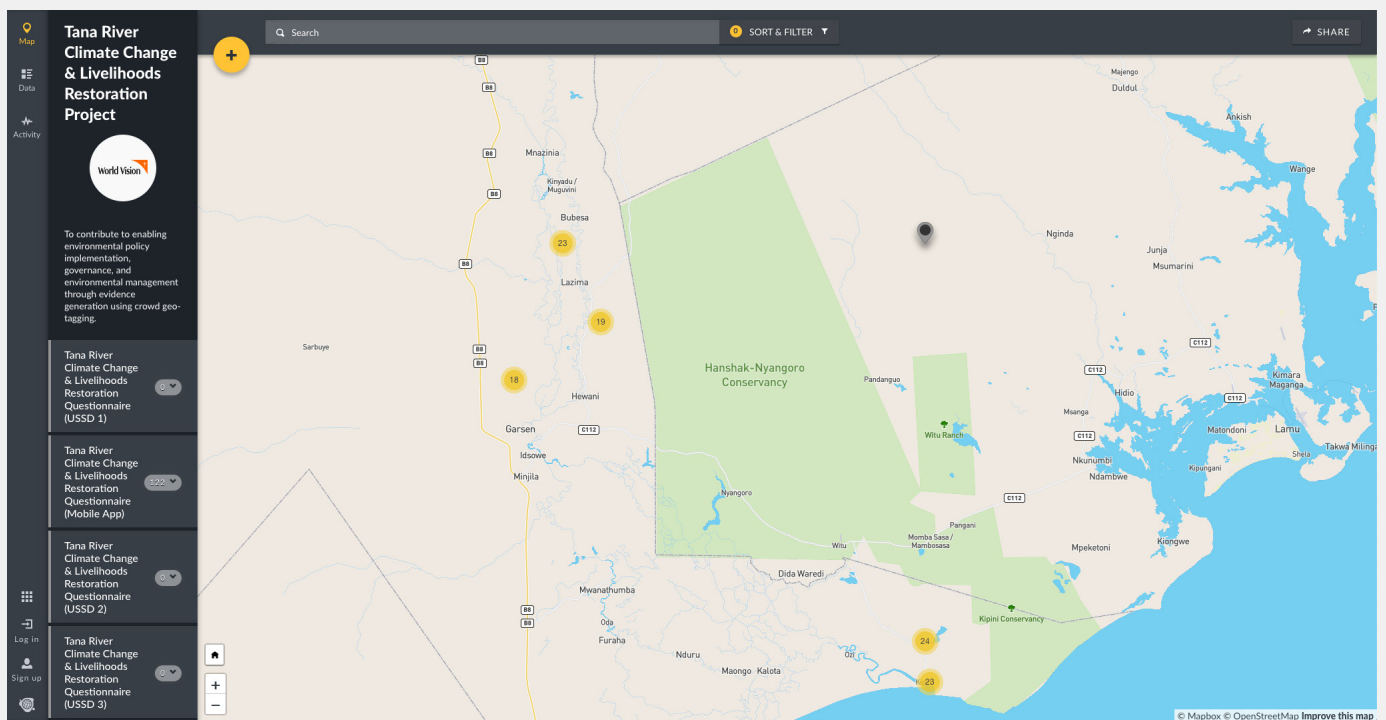
Project details

Using mobile technology to increase community empowerment

One of the longer-term aims of the T-CLIRP project is to empower communities to voice their concerns around climate change and pressures on natural resources. In addition to traditional Community Voice and Action training, WVK partnered with Ushahidi Kenya to use their innovative evidence-based approach to community empowerment. The Ushahidi mobile platform uses geo-tagged data to

create crowdsourced maps of community feedback (see Figure 1 below), generating location specific evidence of request and feedback on natural resource management activities and support. The platform also enables surveys to collect participant stories of how they have been affected by climate change and their experience of WVKs ongoing support.

Figure 1: Ushahidi's geo-tagged insight mapping



Using drone technology to inform project planning

One of the main objectives of the T-CLIRP project was to reverse land degradation and help develop healthier ecosystems through the clearing and reseeded of highly degraded areas. A key initial step in this process was deciding which areas around the nine villages most needed to be cleared and reseeded through mobile money enabled cash-for-work initiatives. WVK partnered with Kenya Flying Labs to use their drones to capture the high-resolution aerial images and location-based data needed to create 'Vegetation Maps' around the villages.

The drone's multispectral imaging system used indices such as Visible Atmospherically Resistant Index and Triangular Greenness Index to measure recent growth and vegetation health. By mapping and evaluating 2,250 acres of land they were able to identify which 250 acres would most benefit from restoration activities. The findings were then discussed with representatives from the communities, county government and Kenya Forest Services to collaboratively develop action plans for main clearing and reseeded activities.

Seedballs: A low-tech but highly specialised approach to reseedling

Seedballs Kenya's 'biochar seedballs' have been specifically developed to support the reintroduction of indigenous tree and grass species in harsh environments. Their low-tech innovation involves coating Kenya Forestry Research Institute certified seeds with charcoal dust and binders to protect them from predators and high temperature until rains arrive and trigger germination. The protective coating also contains organic material that encourages the seeds to sprout and provides nutrition to help the growth of sturdy seedlings. The seedballs do not need tilling into the ground and can be scattered across the project sites once cleared. This is usually done by hand but for this project WVK was also able to use Kenya Flying Labs' drones for 'aerial reseedling', using specially adapted equipment to distribute the seedballs from the air.



Project lessons

Leveraging familiar communication channels encourages community engagement

A key step for Ushahidi was identifying which communication channels would be most suitable for the target communities to share their experiences. SMS and USSD were chosen as they were already well known and widely used. Following guidance from the GSMA, Safaricom was able to provide prepaid four digit 'shortcodes', which did not charge users and were easier to remember than standard telephone numbers. The response from communities was better than expected, with one USSD survey sent to 250 preregistered participants receiving responses from nearly 900 individuals. Not only did the participants share their climate change stories but they

also actively encouraged other community members to share theirs too. By focusing on basic phones over smartphones, and providing prepaid shortcodes, the Ushahidi platform proved to be a reliable and accessible tool for increasing engagement and encouraging ongoing dialogue with the community.

"It's essential for humanitarian actors to reach marginalised communities wherever they are. Many of these communities exist in low bandwidth environments so we need to provide solutions that allow them to participate and raise their voices, no matter the technology constraints."

Daniel Odongo
Ushahidi Kenya

Project lessons



A secure integrated platform enables privacy-conscious data processing

Open datasets can help enable different project partners and stakeholders to work together collaboratively however data privacy can be a challenge when collecting and using community insights. Knowing that that all data collection, processing and storage was automatically being done in compliance with local data and privacy legislation meant that WVK were able to completely trust Ushahidi from a technical data security perspective. The platform not only provided the analysis and visualisation

“We always make sure that the privacy of every individual participating in our projects is well protected. The Ushahidi platform helped us to securely gather information from communities across the project area within a very short time, allowing us to work quickly and responsibly with partners to develop unified action plans”

Collins Obale
World Vision Kenya

tools that made the data more usable for implementing partners, but also kept a detailed record of all data processing and access. As well as ensuring confidential and compliant use this provided additional reassurance that even if a data breach had happened then the procedures were already in place to report and investigate it as necessary.

Geo-tagged feedback ‘maps’ provide integrity for data-driven decision making

The Kenyan government are keen to encourage community participation in policy making and planning, however in practice this can be a complicated process. For any data-driven decision making, there needs to be complete confidence in the integrity of the data and insights being used before engaging with external policymakers and influencers. Ushahidi’s geo-tagged data meant that any insights feeding into decision-making was location specific and could be followed up, verified and validated if needed. Using the

Ushahidi mobile platform meant that reliable insights could be used to guide initial policy and advocacy engagements, and consistent longer-term community feedback could also continue to steer ongoing project planning and implementation.

“When you are engaging with policy makers you need to be sure that you have concrete information. With Ushahidi we can be very sure of the data source, as we know it is coming directly from the participants and if needed can be checked and discussed with the local community”

Jedidah Ganira
World Vision Kenya

Project lessons

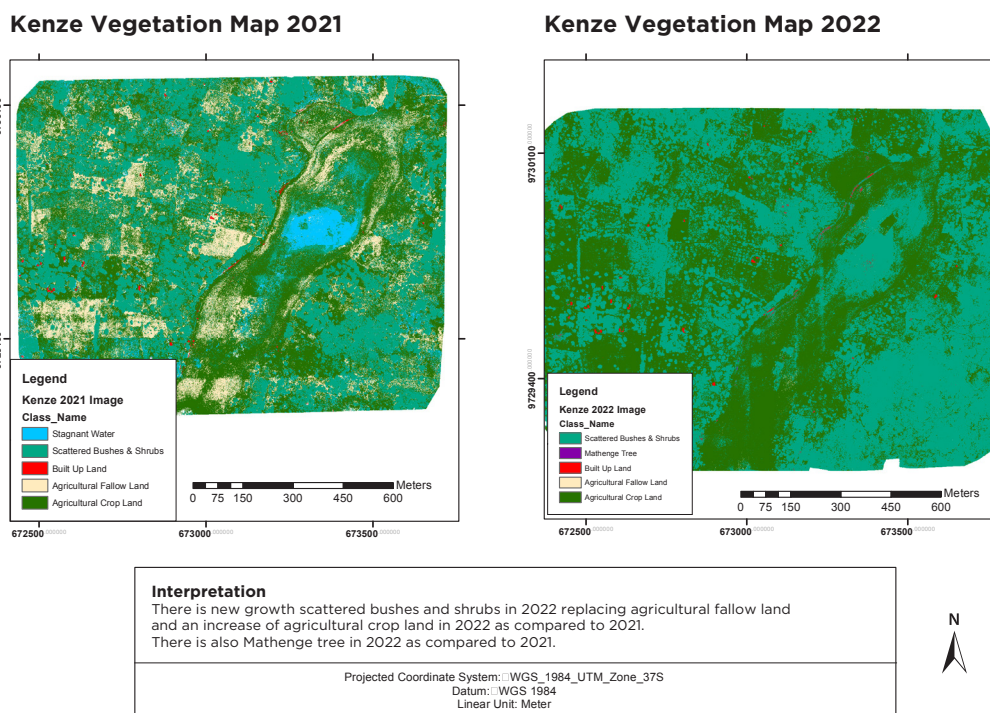
Innovative implementation approaches can improve overall project efficiencies

Traditional reseeding is a laborious process that relies on specific knowledge, skills and tools that can present many challenges, particularly when relying on a less experienced cash-for-work community members. As the seedballs do not need tilling the teams were able to distribute the seeds by hand following simple orientation sessions from the project leads. The drone enabled aerial reseeding also proved to be very efficient, with a single drone successfully covering a hectare of cleared land in only five minutes and capable of reseeding up to 100 hectares per day. Because the seedballs are also suited to harsh environments they could also be distributed at any time of year without relying on imminent rain to survive, which proved particularly useful with ongoing droughts and unexpected delays disrupting other conventional planting and reseeding activities.

Using Vegetation Maps to monitor land health and productivity

By re-mapping the chosen project sites after 12 months Kenya Flying Labs' drones were also able to help monitor and evaluate the overall progress of the T-CLIRP clearing and reseeding activities. The maps of the land around Kenze village for example (see Figure 2 below) show that the community had successfully increased their agricultural crop land and also encouraged the growth of new indigenous bushes and shrubs in the surrounding areas. The maps were also useful to help identify the project sites where progress had been slower and more specific activities were needed. The maps around Shaurimoyo village for example highlighted an increase in the invasive tree species Mathenge, so they were able to plan more focused clearing accordingly.

Figure 2: Kenya Flying Labs' Vegetation Maps around Kenze village showing changes in vegetation before and after T-CLIRP land restoration activities





Project outcome

A more collaborative and sustainable response

As well as formal partnerships with key implementing partners WVK focused on working closely with affected communities as well as other local public and private sector organisations with shared objectives. A key example of this was the inclusion of Kenya Forest Services and community and county government representatives in the planning, development and implementation of core project activities. By working together with a collective vision they were able to identify opportunities address shared barriers and

challenges. The value of this approach was evidenced when the collaboratively developed T-CLIRP site maps and project plans were incorporated into the official Tana River County Integrated Development Plan, the government plan confirming development activities at all administrative levels for next five years. Through embracing partnerships and collaboration WVK have been able to improve the coordination, effectiveness and sustainability of their overall climate change adaptation and livelihood restoration activities.

Next steps

By leveraging the expertise and resource of these partners WVK have been able to make use of their innovative, efficient and effective technology and project practices as well as showcase the various ways in which mobile technology can help build climate resilience. Thanks to the positive results of the project World Vision have not only agreed to extend the funding for an additional 12 months but have also expanded T-CLIRP Phase 2 to include the restoration of a further 100 acres of degraded land across six additional villages.

WVK are also now more prepared and informed to continue to seek, co-create and apply digital solutions to their operations, and thanks to the capacity and relationships already built the scale-up and replication of similar solutions in new areas or projects will be more straight forward. This was noted in WVK new organisational strategy which includes commitments to innovation with Information and Communications Technology highlighted as a key focus for greater impact.

Data sources

- World Vision Kenya project data and reporting documents
- Kenya Flying Labs project data and vegetation maps
- Ushahidi project reporting and monitoring data
- Mobile for Humanitarian Innovation stakeholder interviews and reflective workshops session with key project partners