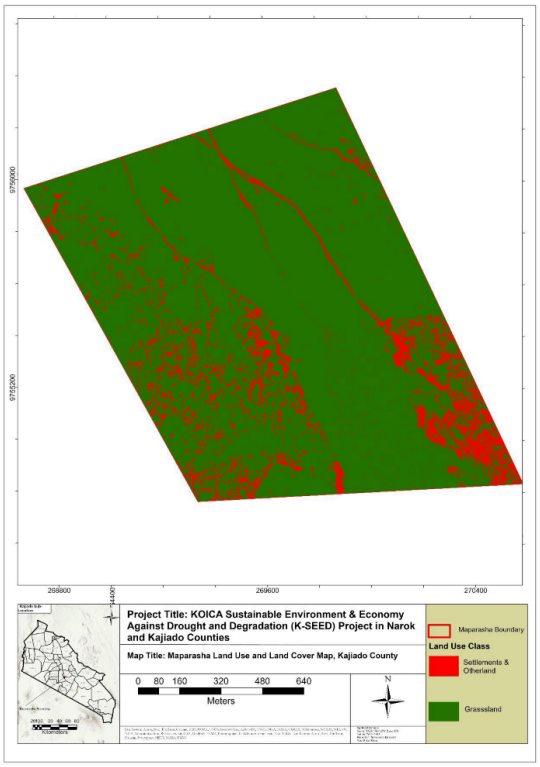
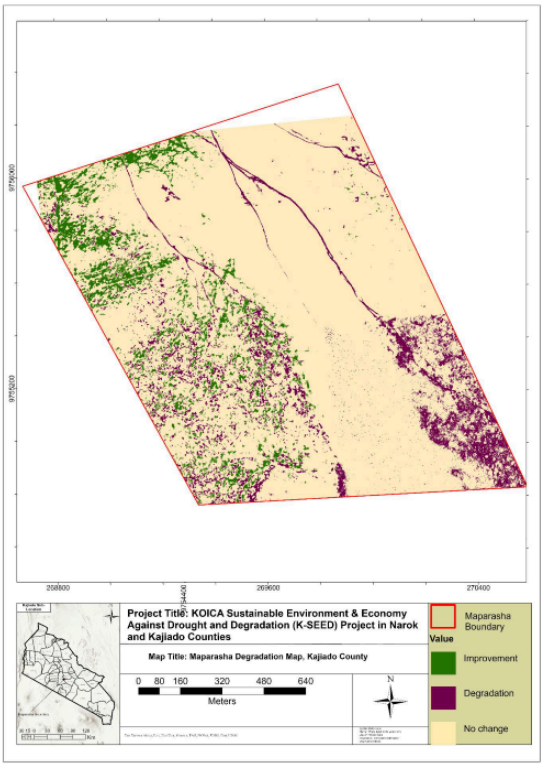
KOICA Sustainable Environment & Economy Against Drought and Degradation (K-SEED) Project in Narok and Kajiado Counties





OVERVIEW	
Flying Labs	Kenya Flying Labs
Geographic area	Kajiado and Narok Counties, Kenya
Date range	January - October 2024
Sector program	EcoRobotics
Main SDGs	GOAL 2: Zero Hunger GOAL 13: Climate Action

SCOPE	
Project stakeholders	Project Owner and Client - World Vision Kenya Project Partners - Kajiado County Government and Narok County Government
People impacted	Communities living in the two counties
Number of people impacted	5,000 people
Problem statement	World Vision is promoting integrated climate change (mitigation-adaptation-response) project for Narok and Kajiado

	counties, which are environmentally and economically important in the Tsavo Ecosystem and Dispersal Area (TEDA) based on the 'Enhancement of Sustainable Climate Change Responsiveness' program of the KOICA Kenya Country Plan (2022-2025).
Project objectives	• **Conduct Remote Sensing for Landscape Restoration:** Partner with a local drone operator to perform remote sensing using multispectral sensors, evaluating restoration progress across Narok and Kajiado counties. • **Utilize Long-Range UAS Platform for Data Collection:** Employ a long-range Unmanned Aerial System (UAS) equipped with specialized sensors and software to collect, process, and analyze landscape data over the target areas. • **Produce Geospatial Products for Restoration Assessment:** Generate detailed products, including Normalized Difference Vegetation Index (NDVI), Digital Surface Model (DSM), and Digital Terrain Model (DTM), to provide insights into vegetation health and terrain characteristics. • **Survey and Monitor Specific Land Types:** Cover a total project area of 1,400 hectares, with dedicated assessments of 100 hectares of forestland, 1,000 hectares of grassland, and 300 hectares of cropland, to evaluate the effectiveness of restoration efforts. • **Support Reforestation through Seedball Dispersal:** Facilitate the dispersal of seedballs over 15 hectares in Namanga Hills, as per client guidance, to promote reforestation and biodiversity enhancement.
Scope	This is a 3 year project that will study the area of interest using drone data to track changes across the project period and to validate the interventions done by the community through World Vision's support. The main objective is to reclaim land and use it for productive purposes.
Outcome	The immediate outcomes of the project were: • Creation of NDVI maps of the areas of interest • Printed copy of the orthomosaics • Vegetation analysis to identify invasive species
Impact	• Improved ecosystem restoration and management through community actors and technological innovation

	• Strengthened farmer/pastoralist-led inclusive and climate resilient livelihoods • Strengthened policy, knowledge and reporting instruments for locally-led county level integrated landscapes restoration
Challenges	The area was mainly of hilly terrain and remote hence access was an issue.
Next steps	Multiyear scanning and analysis of the areas of interest to identify and monitor change during the project period.

COMMUNITY ENGAGEMENT AND STAKEHOLDER SUPPORT	
Consent for data acquisition	We had letters of no objection from the client and community leaders for us to fly drones in the regions. We also had clearance from the Kenya Civil Aviation Authority to fly drones in the areas of interest.
Community engagement activities	Community engagement was done jointly by the Kenya Flying Labs team and World Vision teams through community leadership. We held “Barazas” community meetings, church gatherings and schools as channels of reaching out to communities. The county governments also shared information through their channels.
Community groups engaged with	Churches and Schools
Community attendance	Averagely 30-50 people per session.
Community feedback	We received positive feedback and a show of support for the program.
Stakeholder support	n/a

DATA ACQUISITION	
Size of area	2800 Hectares or 28 km2
Drone	Ebee X RTK
Sensor(s)	RGB / Soda and Multispectral / Sequoia)
Flight plan software	eMotion

Flight height	120 meters above ground
GSD (Accuracy)	3 cm/pix
Number of images acquired	15,000
Number of flights	13
Time invested in data acquisition	6 days
Georeferencing	n/a

DATA PROCESSING & ANALYSIS	
Processing software	PIX4Dfields
Processing time	Total of 10 days
Data products	Orthomosaic, DTM, NDVI
Analysis tools	ArcGIS Pro, ArcGIS Online, QGIS
Analysis outputs	NDVI
Final outputs shared with stakeholders	Raw data, flight logs, maps
Data sharing	Hard disk