



MAKUENI COUNTY FOREST AND LANDSCAPE RESTORATION IMPLEMENTATION PLAN (FOLAREP)

2024–2033





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2024 – 2033



Food and Agriculture
Organization of the
United Nations

Makueni County Forest and Landscape Restoration Implementation Action Plan (FOLAREP) 2024-2033

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For further information, please contact:

Chief Officer
Environment, Natural Resources, Mining and Climate Change
Department of Lands, Urban Planning & Development, Environment and Climate Change
Email: co.environment@makueni.go.ke
Website: www.makueni.go.ke

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DEFINITION OF TERMS

Afforestation: Planting of new forests on lands that historically have not contained forests.

Carbon sequestration: The uptake of carbon containing substances, in particular carbon dioxide (CO_2), in terrestrial or marine reservoirs.

Climate change adaptation: A human intervention to reduce the sources or enhance the sinks of greenhouse gasses (GHGs).

Climate change: A long-term change in the average weather patterns that have come to define Earth's local, regional and global climates.

Deforestation: Conversion of forest to non-forest use.

Degraded landscapes: Are ecosystems that have lost their natural functions, biodiversity, and services due to human or natural disturbances.

Drought: A period of abnormally dry weather long enough to cause a serious hydrological imbalance.

Ecosystem services: Ecological processes or functions having monetary or non-monetary value to individuals or society at large.

Forest and Landscape Restoration: An active long-term process to regain ecological integrity and enhance human wellbeing across deforested, degraded forests and landscapes

Forest: Land spanning more than 0.5 hectares with trees of at least 2 metres and a minimum canopy cover of 15%, and include natural and planted plantation forests on state, community and private land.

Forest Cover: Refers to a land area of more than 0.5ha with a canopy cover of at least 15%, a minimum tree height of 2 meters which is not primarily under agricultural or other specific non- forest land use.

Rangelands: Vast undisturbed natural resources and landscapes in the form of grasslands, bushland, woodlands, wetlands and deserts.

Restoration: Any intentional activity that initiates or accelerates the recovery of an ecosystem from a degraded state.

Reforestation: The natural or intentional restocking of existing forests and woodlands (forestation) that have been depleted, usually through deforestation but also after clear cutting.

Tree Cover: Area covered by tree patches of less than 0.5 hectares outside recorded forest areas

Watershed: An area of high ground which divides two or more river systems, so that all streams on one side flow into one river and those on the other side flow into a different river

Wetland: A distinct ecosystem that is flooded or saturated by water, either permanently (for years or decades) or seasonally (for weeks or months).

FOREWORD



In commitment to my campaign manifesto christened “*Wauni wa Kwika Nesa na Ulungalu*” (Passion to serve with Integrity) which has extensively been entrenched in the County Integrated Development Plan (CIDP), I am delighted to introduce the Makueni County Forest and Landscape Restoration Implementation Action Plan (FOLAREP). This document represents a significant milestone in our commitment to sustainable environmental management and community well-being. Makueni County, endowed with diverse ecosystems, recognizes the critical role that our forests and the associated landscapes play in supporting biodiversity, regulating climate, and sustaining livelihoods.

The Forest and Landscape Restoration Implementation Action Plan (FOLAREP) for Makueni County 2024-2033, UK Partnering for Accelerated Climate Transition (UKPACT) is a programme funded by the UK Government. UKPACT supports countries that strive to overcome barriers to clean growth and have high emissions reduction potential to accelerate their Climate Change mitigation efforts. FOLAREP promotes sustainable land use practices and fosters harmony between communities and natural resources, in line with the Forest Conservation and Management Act (2016) and Kenya Vision 2030.

FOLAREP is a testament to our collective dedication to the responsible stewardship of our natural resources. It encapsulates a comprehensive strategy that harmonizes environmental conservation with community development, fostering a holistic approach to sustainable practices and livelihood improvement. By engaging with local communities, stakeholders, and leveraging the best available knowledge, skills and technologies this plan aims to strike a balance between ecological integrity and human needs.

As we navigate the challenges of the 21st century where environmental degradation and climate change pose formidable threats, the FOLAREP serves as our road-map to a resilient and vibrant future. It is a call to action, an invitation to collaborate, and a blueprint for a greener and more sustainable Makueni County.

I extend my sincere appreciation to all those who have contributed to the development of this plan. Your dedication reflects our shared commitment to leaving a lasting legacy for generations to come. Together, let us embark on this journey towards a healthier and more sustainable Makueni County.

**Mutula Kilonzo Junior, CBS
Governor, Makueni County**

PREFACE



Forest and Landscape Restoration Implementation Action Plan (FOLAREP) - 2024-2033 is a ten-year cross-sectoral and multi-stakeholder coordination framework to accelerate actions to restore deforested and degraded landscapes in Makueni County. This is a domestication of the National FOLAREP and geared towards implementing the National Landscape and Ecosystem Restoration Strategy 2023-2032. The plan seeks to enhance resilient socio-economic development, improve ecological functioning and contribute to achieving the County's, national and international aspirations and obligations.

Forest and landscape restoration is of high priority to the National and County Governments, as outlined in various national policies, legislation and strategies. They include Vision 2030, Forest Conservation and Management Act (2016), Climate Change (Amendment) Act (2023), National and Climate Change Action Plan (2018-2022), Updated Nationally Determined Contributions (2020), the National Landscape and Ecosystem Restoration Strategy 2023-2032 and several County Commitments and policies.

Implementing FOLAREP will contribute to achieving 30% national tree cover by 2050, up from the current 12.38% nationally and from 12.47% to 28.14% at the Makueni County level. Further, it will contribute to the fulfillment of international obligations, including the United Nations Convention on Biological Diversity (UNCBD), the United Nations Framework Convention for Climate Change (UNFCCC), the United Nations Forum on Forests (UNFF), the Bonn Challenge, and the African Forest Landscape Restoration Initiative (AFR100). It will also be a critical instrument in supporting the aspirations of the UN Decade for Ecosystem Restoration, 2021-2030.

The Makueni County Departments of Land, Urban Planning and Development and Environment and Climate Change will be expected to set up the requisite County structures to address the gaps in Forest and Landscape Restoration (FLR), FLR legislation, regulation, research, incentives, and capacity building as stipulated in this plan. The action plan will ensure sustainable restoration of targeted forests and landscapes for improved ecological functionality and livelihoods in the County. The FOLAREP 2024-2033 has outlined the required resources and provided sustainable financing approaches for its implementation. A robust monitoring and evaluation framework has also been incorporated to promote an effective, efficient and inclusive FLR programme in the County.

I, therefore invite all stakeholders, including the national government, development partners, the private sector, civil society organizations, faith-based organizations and local communities to collaborate with our County Government to support the implementation of this plan.

Japheth M. Mang'oka
County Executive Committee Member, Lands, Urban Planning & Development,
Environment and Climate Change

ACKNOWLEDGEMENTS



Makueni County has a number of ecosystems, including forests, rangelands, wetlands, and agroecosystems. Unfortunately, these ecosystems have continued to be degraded due to various drivers associated with unsustainable land management and the utilization of land resources. This Forest and Landscape Restoration Implementation Action Plan (FOLAREP) will go a long way in the restoration of these degraded landscapes.

The successful preparation of the Makueni County FOLAREP owes its accomplishment to the collaborative efforts of various stakeholders from Government, Non-governmental Organisations, and the private sector. Special thanks go to Dr. Leigh Winowiecki, Robin Chacha, Christine Magaju from CIFOR-ICRAF and Meshack Muga from FAO for their relentless efforts to make the production of this document a reality. I would also like to thank World Resources Institute (WRI) for helping the County in identification of priority legal frameworks in the forest sector through the policy accelerator program. The contribution made by Resource Conflict Institute (RECONCILE) during public consultations of this plan is also highly appreciated.

Secondly, my gratitude goes to the multi-stakeholder Technical Working Group (TWG) who played a critical role in delivery of an excellent Restoration Plan for Makueni County. Members of the TWG were drawn from the following institutions working within our county: Staff from the County government, Kenya Forest Service (KFS), Kenya Forestry Research Institute (KEFRI), Water Resources Authority (WRA), National Environment Management Authority (NEMA), Kenya Agriculture and livestock Research Organisation (KALRO), Kenya Meteorological Department (KMD), National Drought Management Authority (NDMA) and Mbooni Community Forest Association (MBOCOFOA).

The Department also recognizes and appreciates the numerous support provided by the Governor and County Executive Committee Member, Lands, Urban Planning & Development, Environment and Climate Change for their immense support and policy guidance throughout the development of this implementation plan. Further appreciation goes to the local community and individuals for contributing by providing information, their insights and review.

Much appreciation also goes to the County Environment Committee (CEC) for their contribution from the onset to the validation of the Plan.

Lastly, our appreciation goes to the County Assembly Committee responsible for matter environment and climate change for their support and presentation of the plan to the entire house for adoption.

Dr. Geoffrey Muthoka
Chief Officer, Environment, Natural Resources, Mining and
Climate Change

ACRONYMS AND ABBREVIATIONS

ADP	Annual Development Plan
ASALs	Arid and Semi Arid Lands
CBO	Community Based Organization
CEC	County Environment Committee
CECM	County Environment Committee Member
CFAs	Community Forest Associations
CIFOR	Center for International Forestry Research
CSA	County Statistical Abstract
EMCA	Environmental Management and Coordination Act
FAO	Food and Agriculture Organization of the United Nations
FCDO	Foreign and Commonwealth Development Office
FFS	Farm Forestry Schools
FLR	Forest and Landscape Restoration
FMNR	Farmer Managed Natural Regeneration
FMPs	Forest Management Plans
FOLAREP	Forest and landscape Restoration Action Plan
GCF	Green Climate Fund
GEF	Global Environment Facility
GoK	Government of Kenya
ICRAF	World Agroforestry Centre
ICRISAT	International Crops Research Institute of the Semi-Arid Tropics
KALRO	Kenya Agricultural and Livestock Research Organization
KEFRI	Kenya Forestry Research Institute
KENHA	Kenya National Highways Authority
KEPHIS	Kenya Plant Health Inspectorate Service
KeRRA	Kenya Rural Roads Authority
KFS	Kenya Forest Service
KMD	Kenya Meteorological Department
KNBS	Kenya National Bureau of Statistics
Kshs	Kenya Shillings
KWS	Kenya Wildlife Service
M&E	Monitoring and Evaluation
MBOCOFOA	Mbooni Community Forest Associations
MDAs	Ministries, Departments and Agencies
MEAs	Multilateral Environmental Agreements
MENR	Ministry of Environment and Natural Resources
MERL	Monitoring, Evaluation, Reporting and Learning
MOA	Memorandum of Association

MOU	Memorandum of Understanding
NbS	Nature-based Solution
NDMA	National Drought Management Authority
NEMA	National Environment Management Authority
NFRA	National Forest Resource Assessment
NGAO	National Government Administration Officers
NGOs	Non-Governmental Organizations
NTFPs	Non-Timber Forest Products
PESTLEG	Political, Economic, Social, Technological, Legal, Environment and Governance
PFMPS	Participatory Forests Management Plans
RCMRD	Regional Centre for Mapping of Resources for Development
REDD+	Reduction of Emissions through Deforestation and Degradation
ROAM	Restoration Opportunities Assessment Methodology
SDL	State Department of Livestock
SLM	Sustainable Land Management
SWOT	Strengths Weaknesses Opportunities and Threats
TWENDE	Towards Ending Drought Emergencies
TWG	Technical Working Group
UK-PACT	United Kingdom-Partnering for Accelerated Climate Transitions
UNCBD	United Nations Convention on Biological Diversity
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
WRA	Water Resources Authority
WRI	World Resources Institute

EXECUTIVE SUMMARY

Makueni County is one of the 47 counties in Kenya. It borders Machakos County to the North, Kitui County to the East, Kajiado County to the West and Taita Taveta County to the South. It is also one of the 29 Arid and Semi-arid lands (ASALs) of counties in Kenya. The forest cover in Makueni County is 5.38% while the tree cover is 12.47% according to the National Forest Resources Assessment (NFRA) Report 2021. The county has a population of 987,653 with an annual growth rate of 5.1% and poverty rate of 34.8%. Forests and landscapes in Makueni are under immense pressure both from natural and anthropogenic factors resulting in slightly more than 13% of the total county area being degraded (NFRA, 2021). There is illegal and unsustainable logging for charcoal production, wood fuel and timber that has contributed largely to loss of forest ecosystem goods and services. Whereas Kenya committed herself to the Bonn Challenge and AFR100 in 2016 to restore 5.1 million hectares of deforested and degraded lands in order to address the associated challenges identified in the Country, there are no joint or coordinated efforts in carrying out restoration in the County by different actors.

To address these issues and expedite restoration efforts within the county, Makueni has rejoined the national restoration agenda and strategy of degraded landscapes in Kenya by crafting a Forest and Landscape Restoration Implementation Action Plan (FOLAREP). This is aligned to the National Landscape and Ecosystem Restoration Strategy 2023-32 and the national FOLAREP. This plan is in line with the County Integrated Development Plan (CIDP III, 2022-2027), the Makueni Vision 2025 and targets on restoration and environmental conservation. It envisions restoring 200,000 hectares of degraded forests and landscapes including

croplands, rangelands and urban spaces. The plan aims to address deforestation and habitat loss, soil degradation, climate change, biodiversity decline and economic and social challenges due to degraded natural resources through a cross-sectoral and multi-stakeholder coordination framework. The Makueni FOLAREP is expected to significantly contribute to accelerating the achievement of the national and the county tree cover as envisioned in the National Landscape and Ecosystem Restoration Strategy 2023-32 and the national FOLAREP. The Makueni FOLAREP is designed to operationalize Forest and Landscape Restoration (FLR) within the county, with a primary focus on structured stakeholder engagement and coordination.

The development of the plan involved a comprehensive process led by a Technical Working Group (TWG) put in place by the County Government and places significant emphasis on community involvement, innovative financing mechanisms, and the integration of FLR into county development plans. The development of the plan involved several TWG meetings and consultations. The draft FOLAREP was subjected to public participation, a stakeholder's validation forum before being reviewed by the County Executive Committee and the County Assembly. After the final reviews, the draft FOLAREP was edited, printed, signed and launched.

Historical analysis of land cover changes revealed levels of degradation with maps indicating several FLR hotspots across the County with Agroforestry (44%), Silvo-pastoral and Rangeland rehabilitation (32%) and Plantation forests (19%), collectively accounting for 95% of the restoration options in the County. A number of ongoing initiatives in collaboration with various stake-

holders in various areas were identified that include supporting small scale farmers who will be transitioning or have potential to transition from subsistence farming to commercial farming, restoration of landscapes for enhancing the climate change resilience.

The goal of FOLAREP is to accelerate county actions on restoration as a contribution to the achievement of the national Bonn Challenge and AFR100 target (2016) of restoring 5.1 million hectares of deforested and degraded landscapes by 2030 and contribute to the achievement of County, national aspirations and international obligations. The overall objective of the FOLAREP is to restore 200,000 hectares of degraded forests and landscapes in Makueni County through integrated restoration approaches for improved ecological functionality and social economic benefits by 2033. FOLAREP has 5 specific objectives:

1. To develop and strengthen policies, regulatory frameworks and institutional coordination for enhanced FLR implementation.
2. To enhance the capacity of stakeholders to undertake forest and landscape restoration.
3. To restore 200,000 ha of degraded forests and landscapes in prioritized areas in the county.
4. To mobilize resources locally, nationally and internationally from public and private partnerships for FLR implementation.
5. To promote inclusive nature-based value chains and adoption of alternative sources of livelihoods for the improved well-being of communities.
6. To enhance the adoption of FLR monitoring, evaluation, research & learning (MERL), knowledge management and information sharing.

Makueni FOLAREP will leverage on the existing structures and institutional frameworks with the Makueni County Forest Management and Landscape Restoration Authority

being the focal point. The County Government will liaise with the National Government and other stakeholders to facilitate FLR action planning and implementation and has already prepared a Restoration Opportunities Assessment Methodology (ROAM) report that will guide restoration activities. The FLR activities will be integrated and mainstreamed into the county planning processes, including the County Integrated Development Plans (CIDPs), County Environment Action Plan, County Spatial plan, Wetland Management Plans, Catchment Management Plans and Annual Developments Plans and Budgets. The County Government will collaborate with National Government Ministries, Departments and Agencies with mandates on forests and landscape restoration, as well as non-state actors implementing FLR actions. Further, the County Government will formulate, enact, and implement requisite legislations and policies to create a conducive environment for FLR interventions.

A detailed work plan for the ten years has been developed. The overall financial requirements to implement this plan is estimated to cost the County government and partners approximately Kshs. 30.128 billion. This is against the National budget of Kshs. 1.9 trillion as per the FOLAREP 2023-2027. These resources will be mobilized from the County government's budgetary allocations, bilateral donors, public-private-partnership, local and international NGOs. An opportunity for prioritization of FOLAREP funding from key global financing mechanisms such as GCF and GEF will be pursued by the government in collaboration with other stakeholders.

A monitoring and evaluation plan is established leveraging on planned frequency following matrices of selected indicators including policies, gender inclusive green value chains promoted and developed, infrastructure among others and by responsible departments and institutions and by adapting to an implementation matrix developed herein.

1 | INTRODUCTION

Makueni County is one of the 47 counties in Kenya. It is situated in the South Eastern part of the Country and borders Machakos County to the North, Kitui County to the East, Kajiado County to the West and Taita Taveta County to the South (Figure 1). The County is located between Latitudes $1^{\circ} 31'42.3912''$ and $2^{\circ} 59'47.1552''$ South and Longitudes $37^{\circ}8'34.1844''$ and $38^{\circ}31'4.4616''$ East. It covers an area of

8,176.7 Km². According to the national census of 2019, the County has a population of 987,653 and is predominantly inhabited by the Akamba community who form approximately 97% of the total number of the inhabitants.

The County falls under the Arid and Semi-arid lands (ASALs) of Kenya, with relatively low rainfall and prolonged dry periods hence a water scarce county. Majority

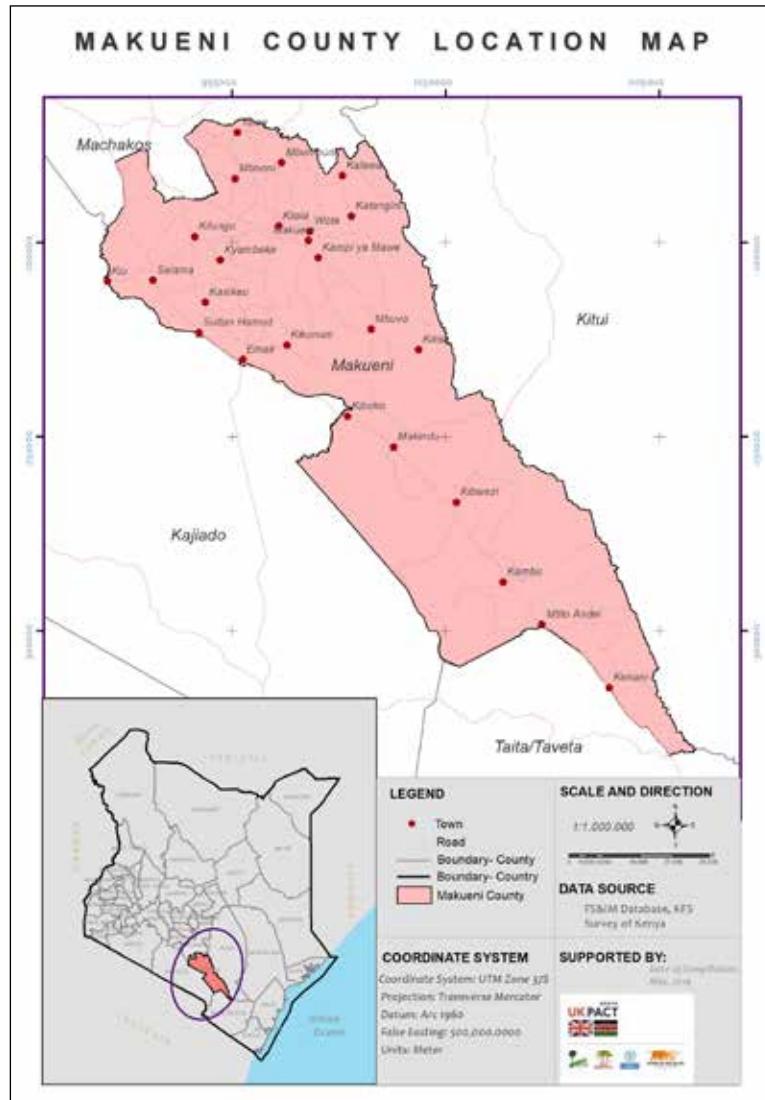


Figure 1: Makueni County Location Map (Source: KFS and Survey of Kenya)

of the population depend on subsistence agriculture as the main economic activity and natural resources to meet their daily livelihoods. This has led to competition in resource use mainly land and water which exacerbates degradation. Most agricultural practices are unsustainable and inappropriate, and combined with other anthropogenic activities, they significantly contribute to land degradation in settlement areas. These activities significantly contribute to soil erosion and reduction of soil moisture and water quality. In addition, soil erosion has led to deterioration of soil fertility consequently leading to low production per unit area.

Degradation of forests and other landscapes (farmland, riparian and rangeland etc) in Makueni is primarily linked to high population pressure as the majority of the poor significantly depend on natural resources to make ends meet. With a population density of 120 persons per Square Km and annual growth rate of 5.1% and poverty rate of 34.8%, a significant part of the pressure is placed on land and water resources. Illegal and unsustainable logging for charcoal production, wood fuel and timber has contributed largely to loss of forest ecosystem goods and services.

Holistic landscape restoration approaches that balance both socio-economic, environmental goals and diverse needs of various sectors and players are needed. The concept of forest and landscape restoration (FLR) is an integrated approach that may provide nature-based solutions aimed at improving the biodiversity, ecosystem services, productivity and well-being of communities.

There have been restoration efforts being undertaken in the County by different actors that have not been harmonized to one common County plan. FOLAREP for Makueni County will provide an opportunity for an amalgamated implementation of interventions that collectively address those challenges.

1.1 Justification and rationale for Makueni County FOLAREP

The forest cover in Makueni County is 5.38 % while the tree cover is 12.47% according to the National Forest Resources Assessment (NFRA) Report 2021. Forests and landscapes in Makueni are under immense pressure both from natural and anthropogenic factors resulting in slightly more than 13% of the total county area being degraded (NFRA, 2021). Kenya committed herself to the Bonn Challenge and AFR100 in 2016 to restore 5.1 million hectares of deforested and degraded lands in order to address the associated challenges identified in the Country.

Further, the plan will contribute to the fulfillment of international obligations, including the Convention on Biological Diversity (CBD), the United Nations Framework Convention for Climate Change (UNFCCC), the United Nations Forum on Forests (UNFF), the Paris Agreement (32 per cent reduction in Greenhouse Gas Emissions (GHG) by the year 2030). It is also a critical instrument that will support the aspirations of the UN Decade for Ecosystem restoration, 2021-2030.

The plan is in line with various national policies, legislation, and strategies. These include the Vision 2030, the Bottom-Up Economic Transformation Agenda (BETA), Forest Conservation and Management Act (2016), Climate Change Act (2016), the National Forest Programme (2016-2030), National Climate Change Action Plan (2018-2022), and Updated Nationally Determined Contributions (2020), Forest and Landscape Restoration Action Plan (FOLAREP), National Landscape and Ecosystem Restoration Strategy 2023-2032, which supports 15 billion tree growing strategy. Implementing the plan will contribute to achieving 30% national tree cover by 2032, up from the current 12.38%.

Whereas the National FOLAREP 2023-2027 targets to restore 2.55 million hectares of degraded forests and landscape in

the country, it is necessary to cascade the draft National FOLAREP to the counties to guide the implementation towards restoring ecological functionality of forests and landscapes so as to achieve local, national and international restoration targets. This plan is in line with the Makueni Vision 2025 and the County Integrated Development Plan (CIDP III) targets on restoration and environmental conservation.

1.2 The FOLAREP formulation process

This plan was developed in line with the National FOLAREP (2023-2027), a process that was driven by a nominated County

Secretariat and a Technical Working Group (TWG). The formulation process was initiated in October 2023 and is as outlined in Figure 2.

1.3 Amendment of the Plan

A mid-term review for the plan is recommended to measure the progress and impacts for possible review. It is envisaged that the review may take place five years after the commencement of the implementation process. The amendment process will be guided or advised by future policy demands, new commitments on the subject matter, the County Government or National Government.

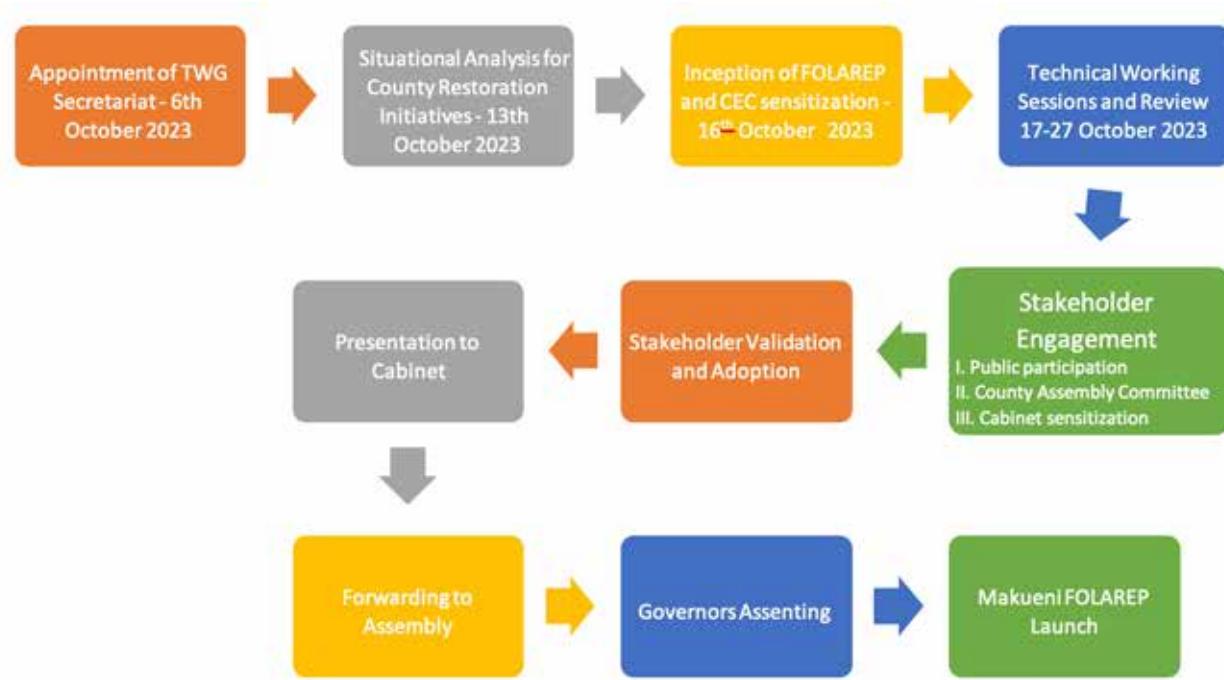


Figure 2: Makueni County FOLAREP development process

2 | SITUATIONAL ANALYSIS

A situational analysis was carried out through literature review and mapping. The analysis included review of the enabling legal frameworks and strategic underpinnings for FLR implementation, assessment of priority landscapes in Makueni (Forest lands, croplands, rangelands, wetlands, urban lands, bare lands and watersheds), the restoration opportunities in Kenya (ROAM Assessment, 2016) and restoration opportunities in Makueni (ROAM Makueni, 2018). Analysis of land cover and land use changes was also done using remote sensing and GIS tools. Mapping and comprehensive data analyses that informed targeted and sustainable restoration strategies in alignment with the unique ecological contexts of Makueni County was carried out. Further, the analysis reviewed the economics for scaling up FLR in Makueni County, barriers to Forest and Landscape Restoration,

Political, Economic, Social, Technological, Legal, Environmental and Governance (PESTLEG) and Strengths Weaknesses Opportunities and Threats (SWOT) for FLR, Risk and stakeholder analysis. A public participation exercise at the ward level was later conducted where community members identified and confirmed potential environmental restoration hotspots, which were incorporated into the plan.

2.1 Enabling legal frameworks policies and strategic underpinnings for FLR implementation

The implementation of the proposed FOLAREP is guided and supported by global, regional, national and sub-national legal and policy frameworks as summarized in Tables 1,2 & 3.

Table 1: Multilateral Environmental Agreements

Multilateral Environmental Agreements (MEAs)	Multilateral Environmental Agreements (MEAs) Details
Paris Agreement, 2015	Sets out a global framework to avoid dangerous climate change effects by limiting global warming to below 2°C and pursuing efforts to limit it to 15°C
Sustainable Development Goals (SDG) also known as the 2030 agenda	Provides for targets to end poverty and inequality, protect the planet, and ensure that all people enjoy health, justice and prosperity It is critical that no one is left behind
The African Forest Landscape Restoration Initiative (AFR100)	An African Countries commitment to restore 100 million hectares in Africa as part of the Bonn challenge
Africa Agenda 2063 under the African Union	This is Africa's development blueprint to achieve inclusive and sustainable socio-economic development over a 50-year period from 2013-2063
United Nations Framework on Climate Change (UNFCCC), 1992	Aims to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system
United Nations Conventions to Combat Desertification, 1994	Provides actions to manage land degradation and drought promptly and effectively

Table 2: National laws and policies

National Laws and policies	National Laws and policies details
The Constitution of Kenya, 2010	Promotes Sustainable utilization of natural resources and the need to maintain a national tree cover of 10%
Forest Conservation and Management Act (FCMA), 2016	Provides for management and conservation of gazetted forests and associated resources under the KFS
Water Act, 2016	Provides for the regulation and management of water supply and protection of water catchments
The Environment Management and Coordination Act, 1999 (Amended in 2015)	Provides for conservation of forests and natural resources, including conservation easements, restoration orders, and environmental impact assessment
Irrigation Act, 2019	Provides advisory and guidelines on irrigated landscapes
Climate Change Act, 2016	Guiding Kenya's climate change response through mainstreaming climate change into sector functions
Land Act, 2012,2016	Provides for management of land and land-based resources, and for connected purpose
Physical and Land-use Planning Act, 2019	Provides for the planning, use, regulation and development of land
Wildlife (Conservation and Management) Act, 2013	Provides for conservation and management of wildlife protected areas
Community Land Act, 2016	To provide for the recognition, protection and registration of community land rights, management and administration of community land Provide for the role of county governments in relation to unregistered community land
Forest (Sustainable Forest Management) Rules, 2009	Rules provide for sustainable forest harvest and community management of forest resources with respect to granting of a permit and licenses
Forest (charcoal) Rules, 2009	Regulate charcoal production and transportation
Forest Harvesting Rules, 2009	Provide rules for the commercial harvesting of timber in state forests, provisional forests, registered private forests, and local authority forests
Agriculture (Farm Forestry) Rules, 2009	Provides for sustainable land management practices and agroforestry
The Energy Act, 2019	Provides for development and use of renewable energy technologies, including biomass
County Government Act, 2012	Provides for implementation of national policies on forest management and conservation
Agriculture Policy, 2021	Sustainable use of natural resources, particularly land and water, which are expected to boost agricultural production and productivity establishment of farm forestry where every person who owns or occupies agricultural land shall establish and maintain a minimum of 10% of the land under farm forestry
Kenya Agricultural and Livestock Research Act No 17 of 2013	Promotes soil and water conservation and prevents the destruction of vegetation

National Laws and policies	National Laws and policies details
Public-Private Partnerships (PPP) Act, 2013	Provides for regulatory framework for public private partnerships
The Timber Act, Cap 386, 1972	Provides for the more effective control of the sale and export of timber
Mining Act, 2015	Provide for regulations on mining and any dealings in minerals and reclamation of degraded land
Intergovernmental Relations (Amendment) Act, 2021	Framework for consultation and cooperation between the national and county governments
Climate Change Fund Regulations, 2020	Public fund designed to finance local adaptation and managed at the discretion of the county government
Forest Policy, 2014	Seeks to ensure sustainable management of protection and proper management of all public, private and community-forests
National Environmental Policy, 2013	Provide a framework for an integrated approach to sustainable management of Kenya's environment and natural resources
National Land Policy, 2009	To guide Kenya towards efficient, sustainable, and equitable use of land for prosperity and posterity Provide for rights of communities to access resources upon which they depend
National Land Use Policy, 2017	Provide legal, administrative, institutional and technological framework for optimal utilization and productivity of land related resources in a sustainable and desirable manner at National, County and community levels
National Climate Change Framework Policy, 2016	Committed towards ensuring and strengthening the adaptation of our natural ecosystems and human communities to climate change
National Wildlife Conservation and Management Policy, 2017	Provides for sustainable management of Kenya's wildlife resources
National Energy Policy, 2018	Provides for efficient utilization of green energy sources
National Food and Nutrition Security Policy, 2011	Promoting sustainable food production systems with particular attention to increasing soil fertility, agro-biodiversity, organic methods and proper range and livestock management practices, support sustainable irrigation and water management systems
National Policy on Gender and Development, 2000	Achieve gender equality and women's empowerment in national development so as to enhance participation of women and men, boys and girls, vulnerable and marginalized groups for the attainment of sustainable development
The FLR Implementation Action Plan 2022-2027 (FOLAREP)	Provides for rehabilitation of 255 million hectares

National Laws and policies	National Laws and policies details
National Climate Change Action Plan (2023-2027)	Sets out the path towards low carbon climate resilient development in a manner that prioritizes adaptation
National REDD+ Strategy, 2021	Identified the key drivers of deforestation and forest degradation
Kenya Strategic Investment Framework for Sustainable Land Management, 2017- 2027	Promotes appropriate management practices, enables land users to maximize the economic and social benefits from the land while maintaining or enhancing the ecological support functions of the land resources
National Disaster Risk Management Policy, 2017	Build a safe and disaster-resilient nation through the establishment of a robust Disaster Risk Management system
National Land Reclamation Policy 2013	Provide for the protection, management and restoration of marginal and degraded lands
National Climate Change Framework Policy, 2016	Committed towards ensuring and strengthening the adaptation of our natural ecosystems and human communities to climate change
National Wildlife Conservation and Management Policy, 2012	Provides for sustainable management of Kenya's wildlife resources
National Energy Policy, 2018	Provides for efficient use of green energy sources
National Food and Nutrition Security Policy, 2011	Promoting sustainable food production systems with particular attention to increasing soil fertility, agro-biodiversity, organic methods and proper range and livestock management practices, support sustainable irrigation and water management systems
National Policy on Gender and Development, 2000	Achieve gender equality and women's empowerment in national development so as to enhance participation of women and men, boys and girls, vulnerable and marginalized groups for the attainment of sustainable development
Bamboo National Policy, 2019	Increasing area grown with bamboo enabling commercialization and value-addition
Kenya Vision 2030	Provides for social, political and economic transformation by 2030
National Climate Change Action Plan, 2013	Sets out the path towards low carbon climate resilient development in a manner that prioritizes adaptation
National Landscape and Ecosystem Restoration Strategy 2023-2032	Aims to increase tree cover to 30% by 2032 through planting 106 hectares trees

The Forest Conservation and Management Act is crucial in legislating public forests. It seeks to ensure sustainable management and conservation of forest resources while recognizing the crucial role these

ecosystems play in balancing environmental health and community livelihoods. Overall, the Act serves as a framework for protecting forests while fostering sustainable development (*Figure 3*).

The national forest protection have limited impact on communities' access to resources within community forest parcels.

National forest protection are developed by the national Ministry of Environment and implemented by government agencies such as the Kenya Forest Service

These measures focus on, and are implemented more strictly for, public forests which have been delineated and gazetted. However, due to the legal status of forests that are owned, used, managed and administered by communities, there are limitations to the extent to which government agencies can implement forest protection directives.



Adapted from Kazungu et al 2023

Figure 3: The Forest Conservation and Management Act serves as a framework for protecting forests while fostering sustainable development.

2.2 Priority landscapes in Makueni

2.2.1 Forest lands

The gazetted forests account for 150.2 km² while non gazetted (County) forests account for 177.88 km². There are six Community Forest Associations (Figure 4) in the county (Tables 4-6).



Figure 4: Community Forest Association

Table 3: County laws and policies

County Laws, Policies and Plans		County Laws, Policies and Plans
Makueni County Vision 2025		Provides for actions to address socio-economic development challenges
Makueni County Spatial Plan 2019-2029		Provides framework for spatial development
Makueni County Environment Action Plan 2018-2022		Gives framework on Environmental Management and Conservation within the County
Makueni County Water Policy, 2020		Proposes a framework for an integrated approach to planning, sustainable development & management of water resources, and progressive realization of the human right to water, sanitation and environment
Makueni County Integrated Development Plan 2023-2027 CIDP III		A five year plan to facilitate development and environmental management
Makueni Environment and Climate Change Policy, 2020		Aims to provide a holistic framework to guide the coordination and management of climate change
Makueni County Water Act, 2020		Provides for establishment of structures to enhance water development and management
Makueni County Sand Conservation and Utilization Act, 2015		Provides for conservation and utilization of sand resources
Makueni County Climate Change Act, 2022		Provides for structure to mainstream climate change and enhance community resilience to climate shocks
Makueni County Climate Change Action Plan (2023-2027)		Provides framework for enhancing climate resilience
Makueni County Forest and Landscape Restoration Bill, 2024		Provides for management and conservation of community forests and associated resources under the county government
The Makueni County Agriculture and Livestock Policy, 2020		Provides for integrating Agroforestry in all Agro ecological zones to enhance productivity

Table 4: KFS Gazetted forests

Forest Name	Size (ha)	Status
Kilungu	615.10	Fairly conserved
Makuli	3845.20	Partly degraded
Nthangu	2701.90	Partly degraded
Mbooni	1992.70	Partly degraded
Kibwezi	5849.6	Fairly conserved
Total	15,004.5	

Source: Kenya Forests Service, Makueni County

Table 5: Makueni County Gazetted Forests CFAs

CFA Name	Forest
MBOCOFOA	Mbooni Forests
UKIKA	Kibwezi Forest
Kilungu	Kilungu Forest
Kenze	Kilungu Forest
Nzaui	Makuli Forest
Makuli	Makuli Forest

Source: Kenya Forests Service, Makueni County

Recognizing the community tenure rights of forests is requisite for sustainable management and conservation of vital forest resources (Figure 5). Through the acknowledgment and protection of these rights, the communities living in the peripherals can actively contribute to decision-making processes, ensuring that their livelihoods are considered. This also fosters better stewardship of forest ecosystems, leading to improved environmental health and resilience.



Figure 5: Forest community tenure rights

Table 6: Makueni County Forests

S/NO.	Forest name	Division/Ward	Area (ha)	Status
1.	Kiou, Ndulume, Kenze	Kasikeu	188	Partly degraded
2.	Yekanga	Mavindini	100	Partly degraded
3.	Mavindini (Katumbua)	Mavindini	100	Partly degraded
4.	Mutungu Hill	Kilungu	8	Partly degraded
5.	Mbuinzau, Kai A+B, Kilema	Nguumo, Kikumbulyu South	16,800	Degraded
6.	Kalumbi and Mwambwani Hills	Mbitini	109	Partly degraded
7.	Kitundu A+B, Kyangoma, Nduuni, Salamala, Mukatini	Mbooni	47	Partly degraded
8.	Kathekani, Ititi, Kalimakoi, Muli-luni	Mtito Andei	125	Partly degraded
9.	Ithumba	Nguu	5	Partly degraded
10.	Nzaini Tree Nursery	Tulimani	2	
11.	Nzueni, Muvau, Unoa	Wote	304	Partly degraded
Total			17,788	

2.2.2 Agricultural landscapes

The County has a total of 5,042.7 km² and 1,762.71 km² arable and non-arable land, which accounts for 74% and 21.9% of the total County surface, respectively. Most of the arable land or 6% (480.9 km²) is used for crop cultivation purposes, down from 9% in 2000.

The County has potential in horticulture and dairy farming especially the hilly parts of Kilungu and Mbooni. The lowlands, including Kathonzweni, Mbooni East, Nzai and Makueni are used for livestock rearing, cotton and fruit production.

The County has three major livelihood zones (LZ) namely: marginal mixed farming

livelihood zone occupied by 40 percent of the total county population while mixed farming-coffee, dairy and irrigation and mixed farming - food crops, cotton, and livestock are each occupied by 30 percent of the total county population. The main industrial crops grown are cotton, coffee and sisal while the main cereal food crops grown are maize, sorghum and millet. The main pulses grown are green grams, cowpeas, pigeon peas, *Dolichos lablab* and beans. The root crops are sweet potatoes, cassava and arrowroot. Horticulture is a major enterprise in the region producing vegetables and fruits for both the local and the export markets. The key vegetables grown are kales, capsicum, baby corn, cabbages, tomato, and Asian vegetables while the main fruit crops are citrus, mango, pawpaw, avocado, banana and watermelon.

Agriculture contributes 78% of the total household income in Makueni County and is the driver of the Country's economy. Additionally, the sector contributes 53.2 % of the total Gross County Product (GCP). However, the sector contribution towards the National gross value added is 1.68%. (KNBS Gross County Product Report, 2019).

The agriculture sector suffers from adverse effects of climate change, forest degradation, deforestation, desertification, unpredictable weather conditions such as drought due to climate change, pollution, soil erosion, human-wildlife conflict and salinity. This underscores the importance of establishing agro-ecological zones and land use zones to curb the adverse effects of climate change.

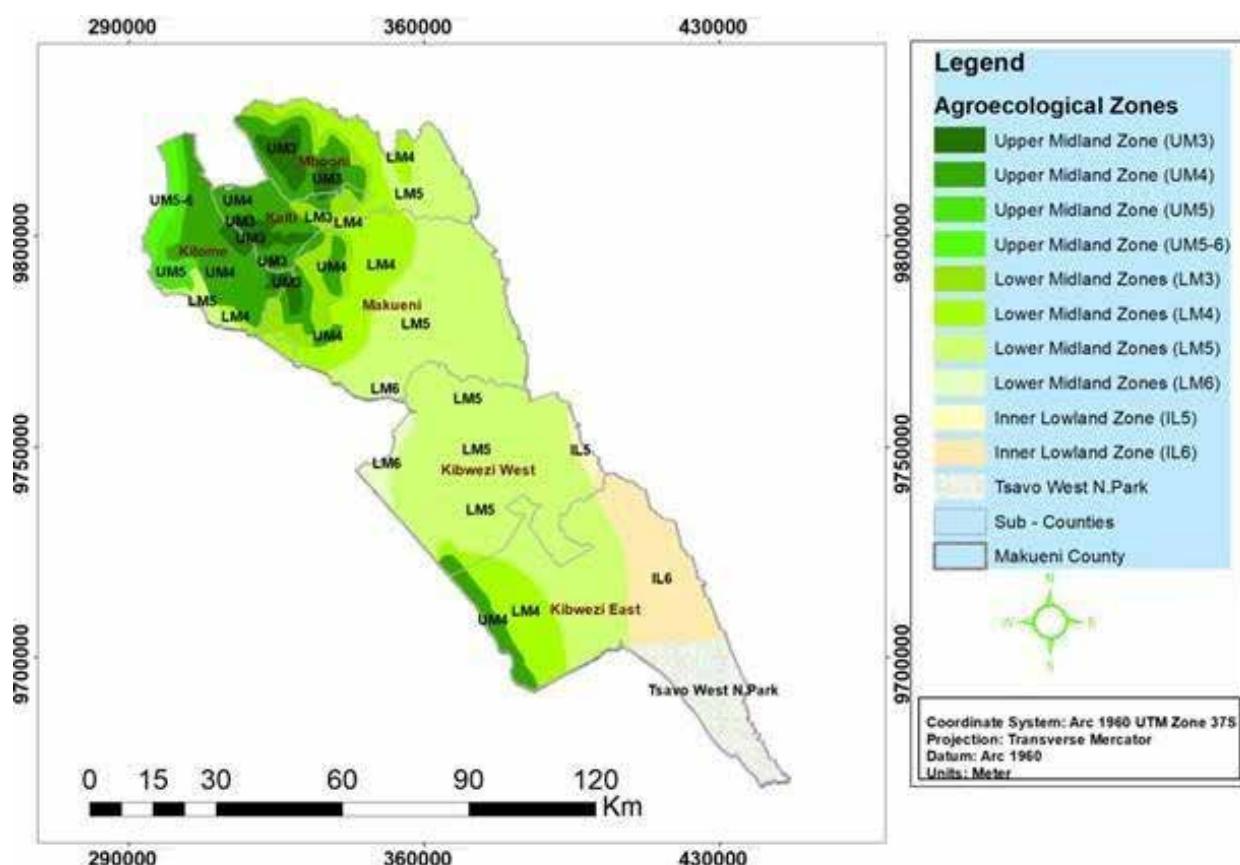


Figure 6: Agroecological Zones

Source: Farm Management Handbook

Table 7: Agro ecological zones and their description

Zones	Area in km ²	Areas	Description
Inner Lowland Zones	670		
IL5	39	Parts of Kibwezi East/ Kibwezi West	Inner Lowland Livestock-Millet Zone
IL6	631	Parts of Kibwezi East/ Kibwezi West	Inner Lowland Ranching Zone
Lower Midland Zones	5352		
LM3	389	Parts of Kibwezi East/ Kibwezi West/Makueni	Cotton Zone
LM4	1094	Parts of Kibwezi East/ Kibwezi West/Makueni	Marginal Cotton Zone
LM5	3757	Parts of Kibwezi East/ Kibwezi West/Makueni/ Kilome	Livestock - Millet Zone
LM6	112	Parts of Kibwezi East/ Kibwezi West/Makueni/ Kilome	Midland Ranching Zone
Upper Midland Zones	1691		
UM3	311	Parts of Kilungu Upper Makueni and Mbooni west/Kilome.	Marginal Coffee Zone, Avocado, Macadamia
UM4	1150	Some parts of Kibwezi, Kilungu, UpperMakueni, Mbooni west & East/ Kibwezi East Chyulu)	Maize - Sunflower ZoneCotton
UM5	138	Some parts of Kilome	Livestock - Sorghum Zone. Cotton
UM5-6	93	Some parts of Kilome	Livestock/SorghumUpper Midland Ranching Zone

Source; Makueni County Statistical Abstract 2022

2.2.3 Rangelands

In 2016, bushland accounted for 48% (3893 km²) of the total land cover, up from 27% in 2000. Within the same period, grasslands accounted for 5% (393.4 Km²) of land cover in Makueni, down from 7% in 2000. The major livestock species kept in the County are cattle, sheep and goats. (Makueni County Spatial Plan 2019-2029). Livestock sales account for between 37-87% of household incomes in the rangeland parts of the county. Cattle rearing in the County faces serious food shortages in the dry

season as pasture gets depleted in the lower parts of Kibwezi West (Kathekani), Makindu (Nguumo), Makueni (Kitise) and Kaiti (Kee).

2.2.4 Wetlands and riparian areas and watersheds

There are no lakes in Makueni County although marshlands account for 0.01% (5.7 km²) of the total county surface area, down from 1.1% in 2000. Athi River is the main seasonal river traversing the County. However, there are significant wetlands in the County as per Table 8.

Table 8: Wetlands in Makueni County

S/ No	Name	Locality	Area	Vegetation type	Uses	Ownership status	Threats	Remarks
1	Mtito Andei	Mtito Andei	820.5 ha	Indigenous trees water lily	Irrigation-Livestock	Community	Not fenced Encroachment	Demarcation needed
2	Simba	Masimba		Indigenous trees water lily	Irrigation Livestock	Community	Not fenced Encroachment	Demarcation needed
3	Makindu	Makindu	980 ha	Indigenous trees water lily	Irrigation-Livestock	Community	Not fenced Encroachment	Demarcation needed
4	Kibwezi Springs	Kibwezi		Indigenous trees	Now restricted	Community	Partly fenced	Need to extend the fence to Kitui bridge near Kibwezi town
5	Mutala			Grass	School use part as play grounds	School	Not fenced, encroached	Demarcation needed
6	Kikoo	Kibwezi	18 ha	Water lilly	Restricted	Community	None	Demar- tation need Gazettement
7	Kivale			Swampy Indigenous trees	Not used	Community		Demarcation need Gazettement
8	Ndungu-tuni			Pond indicator trees	Irrigation Livestock	Public	Not fenced	Demar- tation need Gazettement
9	Kyaumb-wa			Earth dam Grass	Irrigation-Livestock	Community	Not fenced	Demarcation need Gazettement
10	Isyukoni			Water lilly Natural vegetation	Irrigation Livestock	Community	Not fenced	Demar- tation need Gazettement
11	Wetaa	Mbooni		Water lilly	Arrow roots planted close to wa- ter pointDo- mestic	Public	Encroachment Catchment degraded	Demarcation Gazettement
12	Wathi	Kikima		Nappier grass	Domestic Water use	Community	Not fenced	Demarcation Gazettement
13	Kilui	Kibwezi		Indigenous trees Water Lilly	Livestock Irrigation	Community	Not fenced Encroachment	Demarcation- Gazettement
14	Kiboko	Kiboko		Indigenous trees Water Lilly	Livestock Irrigation	Public	Partly fenced Encroachment	Demarcation- Gazettement
15	Mbui Nzau	Makindu		Natural vegetation	Livestock	Community	Encroachment Not fenced	Demarcation- Gazettement

S/ No	Name	Locality	Area	Vegetation type	Uses	Ownership status	Threats	Remarks
16	Ndituni	Tawa				Community		Demarcation-Gazetttement
17	Umani	Kibwezi				KFS protected area	Not fenced	Demarcation Gazetttement
18	Kiangini	Makindu		Natural vegetation	Livestock	Community	Encroachment	Demarcation Gazetttement
19	Kyuu	Mbooni		Water lily	Irrigation	Community	Not fenced	Demarcation Gazetttement
20	Kwa Musy- esya	Mbooni		Water lily	Livestock Irrigation	Public	Fencing not done	Demarcation Gazetttement
21	Muoni	Kathiani		Water lilyGrass	Farming	Public	Not fenced Encroachment	Demarcation Gazetttement
22	Mulima	Mbooni		Water lily Natural vegetation	Farming	Community	Not fenced Encroachment	Demarcation Gazetttement

Source: WRA Lower Athi Sub-catchment

Note: Where the area has not been indicated can be determined by ground truthing.

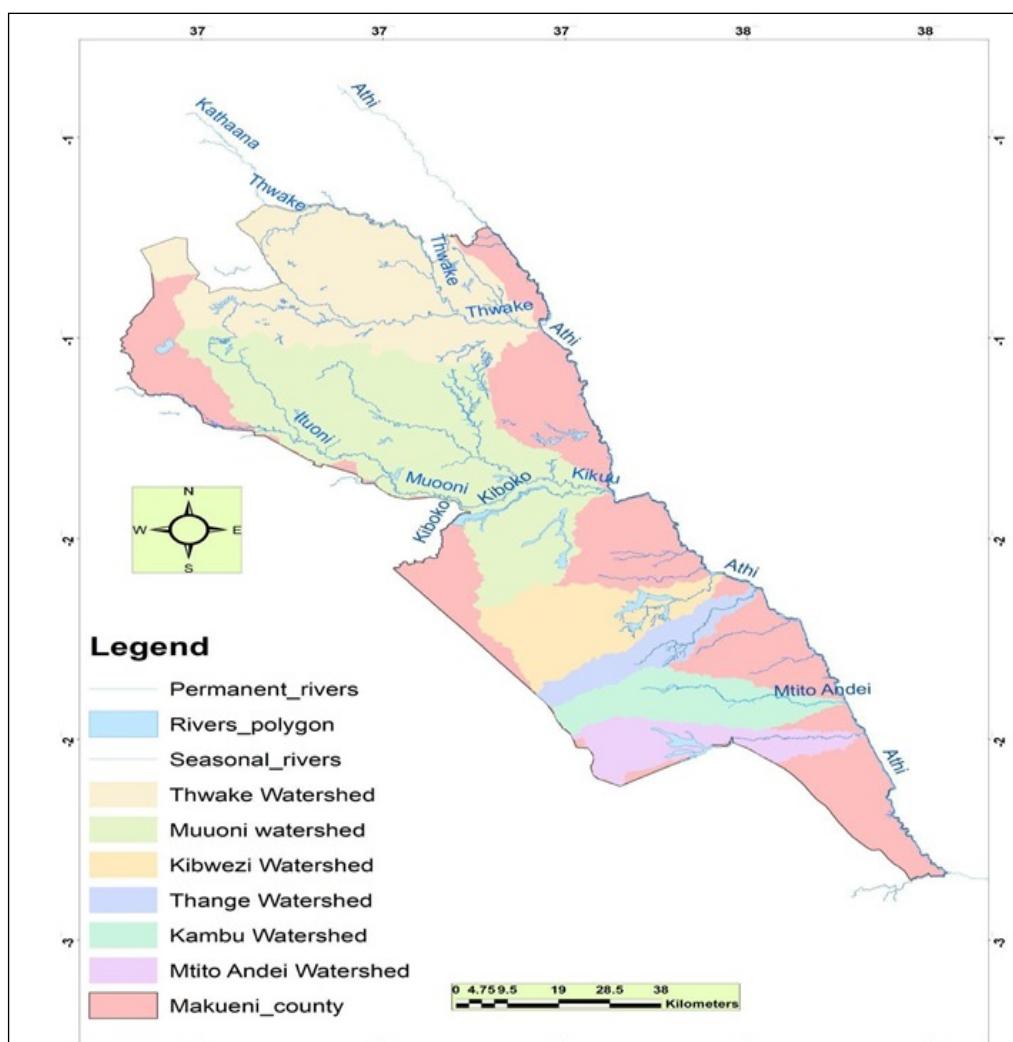


Figure 7: Main watersheds in Makueni County

Source: Makueni County Spatial Plan and Digital Elevation Model from Earth Explorer

Summary of Makueni County Landscapes

1. Total Land Area

8,008.9 km² (Makueni is the 9th largest county in Kenya by land size).

2. Land Use Distribution

- *Agriculture (Crops & Livestock)* – ~75%
- *Major Crops:* Maize, beans, green grams, mangoes, sorghum.
- *Livestock:* Cattle, goats, poultry (key for dairy and meat).
- *Arid & Semi-Arid Lands (ASALs)* – ~20%
- *Low-rainfall zones*, mainly used for pastoralism.

- *Forests & Conservation Areas* – ~3% (includes Kibwezi Forest, Chyulu Hills, and scattered woodland).

- *Urban & Settlement Areas* – ~2%

- *Major towns:* Wote (county HQ), Makindu, Sultan Hamud.

3. Key Agricultural Zones

High-Potential Areas: Around Kilungu Hills (maize, beans, horticulture).

Irrigation Schemes: Kathonzweni, Kibwezi, Thange (mangoes, vegetables).

Lowland Drylands: Livestock (cattle, goats) and drought-resistant crops.

4. Water Sources & Irrigation

Rivers: Athi, Muoni, Kaiti.

Dams: Thange, Kimutwa, Kwa Kathoka.

Irrigated Land: ~5,000 hectares (growing due to county projects).

5. Environmental Challenges

- *Desertification:* 30% of land at risk.
- *Deforestation:* 1.2% annual tree cover loss (KNBS 2022).

Figure 8: Summary of Makueni Landscapes

Source: Makueni County Statistical Abstract 2022

The County has six main watersheds; Thwake, Kikuu, Makindu/Kiboko/Muoni, Kibwezi, Thange, Kambu and Mtito Andei that drain into River Athi.

2.2.5 Other landscapes (urban, infrastructure, settlement areas)

Built-up areas and artisanal mining sites account for 8% (644.5 km²) of the total county area, representing a 6% increase between 2000 and 2016. Denuded land is approximately 16 % (1247.1 km²) of the total land surface in Makueni and is of very marginal nature (Makueni County Spatial Plan 2019-2029).

2.3 Historical analysis of land cover changes/level of degradation in Makueni County

Before considering restoration efforts, it is crucial to analyse historical forest and landscape trends to understand the extent and causes of environmental degradation. This perspective reveals patterns of deforestation, land use changes, and ecosystem degradation, highlighting the underlying factors driving these changes.

To gain a comprehensive understanding of historical trends and changes in land cover and land use within Makueni County, National Land Use and Land Cover data from four distinct epochs was utilized. By narrowing this national data down to the county level, a comparative analysis of changes between 1990 and 2018 was conducted. This enables us to effectively assess and analyse the transformations in LULC patterns over time, which is crucial for guiding our forest and landscape restoration activities and initiatives in the county.

Figure 9 illustrates the various land use and land cover (LULC) types across Makueni County. The different colors represent distinct categories of land cover, allowing for a visual understanding of how land is utilized and what types of vegetation or surface types are present. Here is a detailed breakdown:

Table 9 illustrates the quantitative changes in land use and land cover between the years 1990 and 2018.

Negative changes imply a decline, while positive changes denote improvements in these land cover categories over time.

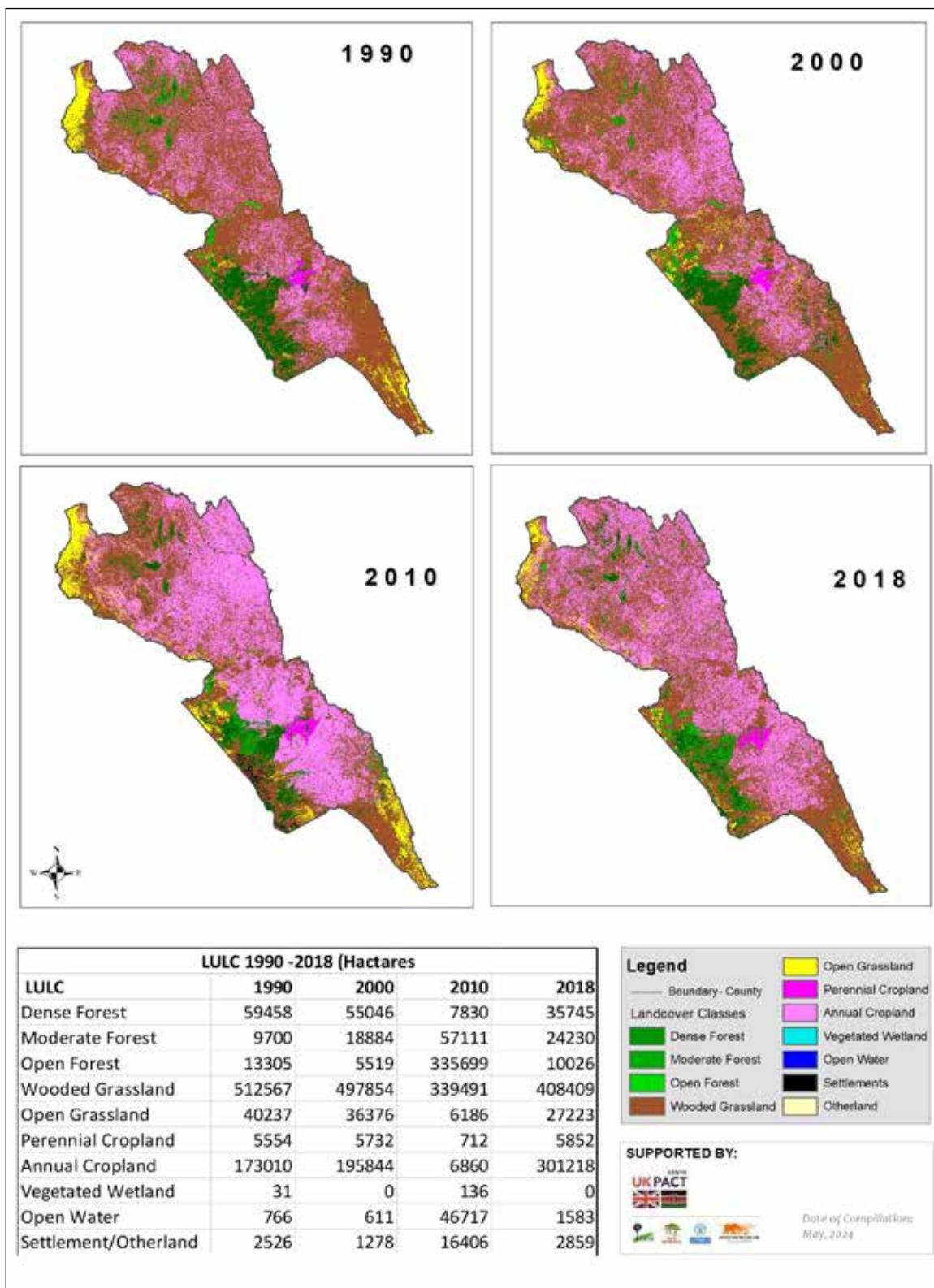


Figure 9: Land use land cover map 1990-2018 (KFS, 2021)

Each column represents the change in land use and land cover (LULC) categories over the specified periods. The overall change column shows the net change from 1990 to 2018.

Table 9 summarizes changes in land use and land cover (LULC) categories from 1990 to 2018.

By comparing historical land use and land cover (LULC) data over the 28-year period, across different time periods (1990, 2000, 2010, and 2018), significant changes in LULC patterns in Makueni County can be observed. Table 9 also highlights the major shifts in land use and land cover which is crucial for formulating effective restoration and land management plans for Makueni County.

Dense Forest: There was a significant decline in dense forest area from 1990 (59,458 hectares) to 2010 (7,830 hectares). However, there was some recovery by 2018, with dense forest covering 35,745 hectares.

Moderate Forest: Moderate forest area increased notably from 1990 (9,700 hectares) to 2010 (57,111 hectares). By 2018, the area decreased to 24,230 hectares, indicating a reduction in moderate forest cover.

Open Forest: Open forest saw a massive expansion by 2010 (335,699 hectares) from a low of 5,519 hectares in 2000. By 2018, this had decreased significantly to 10,026 hectares.

Wooded Grassland: Wooded grassland decreased from 512,567 hectares in 1990 to 339,491 hectares in 2010. It then increased to 408,409 hectares by 2018, showing some recovery.

Open Grassland: Open grassland consistently declined from 40,237 hectares in 1990 to 6,186 hectares in 2010. By 2018, it increased to 27,223 hectares, suggesting some regrowth.

Perennial Cropland: Perennial cropland fluctuated slightly but remained relatively stable, from 5,554 hectares in 1990 to 5,852 hectares in 2018.

Annual Cropland: Annual cropland increased significantly from 173,010 hectares in 1990 to 301,218 hectares in 2018.

Vegetated Wetland: There was minimal presence of vegetated wetland, peaking briefly at 136 hectares in 2010 and then disappearing by 2018.

Open Water: Open water increased significantly to 46,717 hectares in 2010 but then dropped to 1,583 hectares by 2018.

Table 9: Quantitative changes in land use and land cover between the years 1990 and 2018.

LULC 1990-2018 (Hectares)					Change from 1990-2018			
LULC	1990	2000	2010	2018	1990-2000	2000-2010	2010-2018	1990-2018
Dense forest	59,458	55,046	7,830	35,745	-4,402	-47,216	27,915	-23,713
Moderate forest	9,700	18,884	57,111	24,230	9,184	38,227	-32,881	14,530
Open forest	13,305	5,519	335,699	10,026	-7,786	330,180	-325,673	-3,279
Wooded grassland	512,567	497,854	339,491	408,409	-14,713	-158,363	68,918	-104,158
Open grassland	40,237	36,376	6,186	27,223	-3,851	-30,190	21,037	-13,014
Perennial cropland	5,554	5,732	712	5,852	178	-5,020	5,140	298
Annual cropland	173,010	195,844	6860	301,218	22,834	-188,984	294,358	128,208
Vegetated wetland	31	0	136	0	-31	136	-136	-31
Open water	766	611	46,717	1,583	-155	46,106	-45,134	817
Settlement/ otherland	2,526	1,278	16,046	2,859	-1,248	15,128	-13,547	333

Settlement and other land areas significantly increased from 1,278 hectares in the year 2000 to 16,406 hectares in 2010 and then decreased to 2,859 hectares in 2018.

The analysis of LULC changes from 1990 to 2018 highlights significant shifts in land use in Makueni County, with notable declines and recoveries in forested and grassland areas. A restoration plan should focus on reforestation of degraded areas, management of grasslands, optimization of agricultural lands, conservation of water bodies, and planning sustainable settlements to ensure a balanced and resilient landscape.

One of the most notable trends is Agricultural land which has seen considerable changes over the years. Annual cropland, marked in pink, has expanded, reflecting the intensification of agricultural activities to support the growing population. Perennial cropland, shown in dark yellow, has also changed, though these areas tend to be more stable compared to annual crops.

Deforestation is another critical issue observed in Makueni County. Dense forests, indicated by green areas, have decreased, most likely due to logging, agricultural expansion, and settlement growth. Moderate and open forests, shown in lighter shades of green, have also changed, transitioning towards a more open or degraded state due to human activities.

Grasslands and shrublands have undergone noticeable transformations as well. Wooded grassland and open grassland, depicted in yellowish and yellow areas, have been affected by grazing pressures and land conversion for agriculture. These changes highlight the dynamic nature of land cover in response to human activities and environmental factors.

Water bodies and wetlands in Makueni County have also experienced fluctuations. Open water, marked in blue, and vegetated wetlands, shown in light blue, show changes in size and health due to climatic variations and water management practices. These fluctuations are crucial for understanding

the availability of water resources and the health of wetland ecosystems in the County.

In summary, the most notable trends are the substantial decline and partial recovery of forest areas, significant variability in annual cropland, and an overall reduction in wooded and open grasslands.

Figure 10 illustrates the various land use and land cover (LULC) types across Makueni County. The different colors represent distinct categories of land cover, allowing for a visual understanding of how land is utilized and what types of vegetation or surface types are present. This map provides a snapshot of the current land use and land cover in Makueni County, with distinct areas marked for different uses such as agriculture, forestry, and settlements.

Agricultural Land: Approximately 75% of Makueni County is used for agriculture. This includes both subsistence and commercial farming. The dominant crops include maize, beans, and various fruits such as mangoes. According to the Makueni County Integrated Development Plan (CIDP) 2018-2022, a significant portion of the county's land is devoted to crop production and livestock grazing.

Urban and Built-Up Areas: Urbanization is steadily increasing, especially in towns like Wote, the county headquarters. This urban expansion often leads to the conversion of agricultural or natural land to residential, commercial, and infrastructural uses. The Kenya National Bureau of Statistics (KNBS) reports a steady increase in urban areas within the county.

Forests and Woodlands: There are patches of forests and woodlands, particularly in protected areas. However, these regions face challenges such as deforestation due to logging and charcoal production. Conservation efforts are in place but need strengthening to prevent further degradation, as noted in the Kenya Forest Service report on Makueni County.

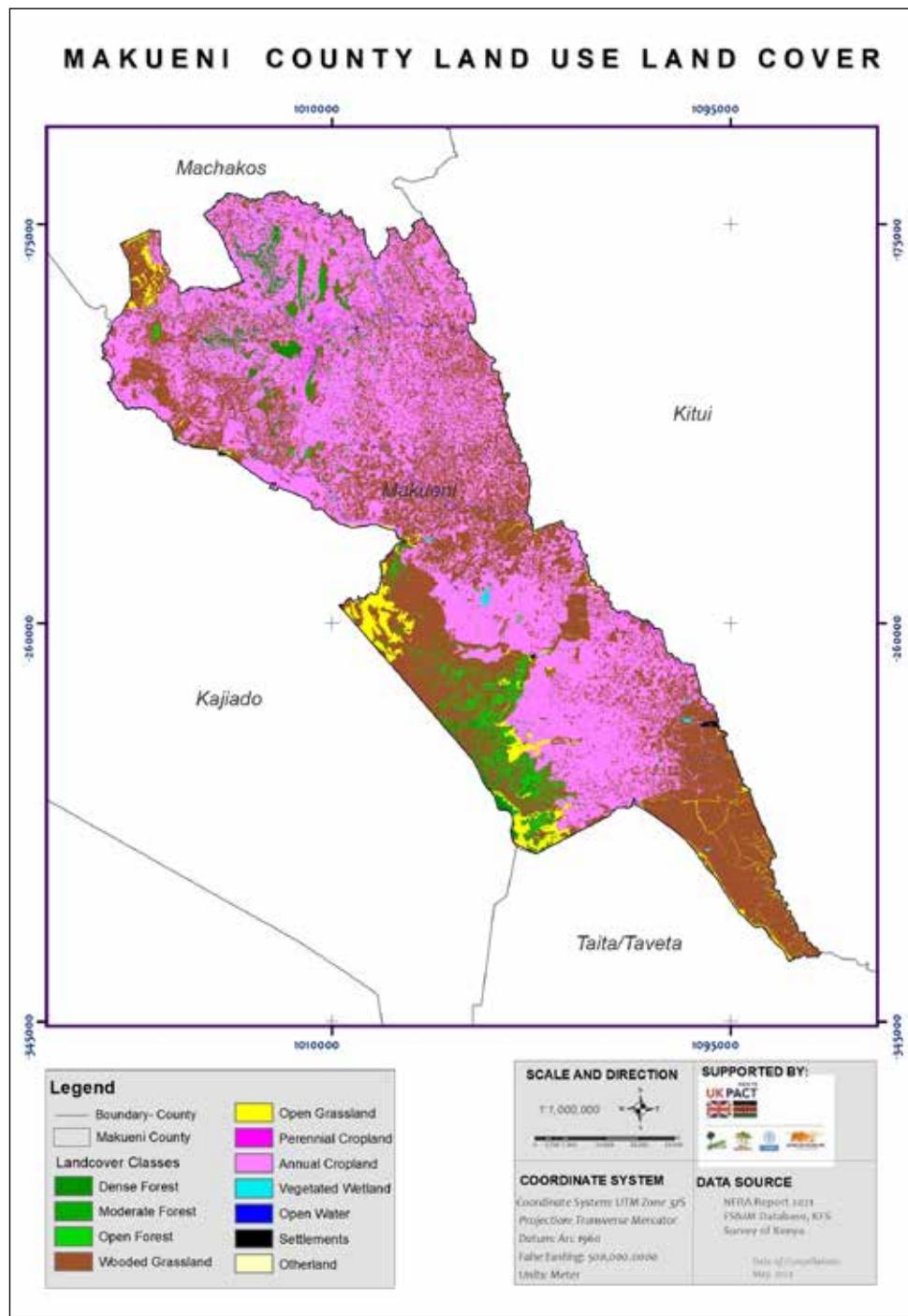


Figure 10: Various land use and land cover (LULC) types across Makueni County

Water Bodies: The County has several rivers and seasonal streams, which are crucial for irrigation and domestic use. However, these water bodies are often subjected to seasonal fluctuations and are impacted by overuse and pollution. The Water Resources Authority (WRA) highlights the challenges of maintaining water quality and availability in the county.

Grasslands and Shrublands: These areas are prevalent and are used for grazing livestock. Overgrazing and land degradation are common issues affecting these regions. This issue is discussed in the land degradation assessment by the Food and Agriculture Organization (FAO).

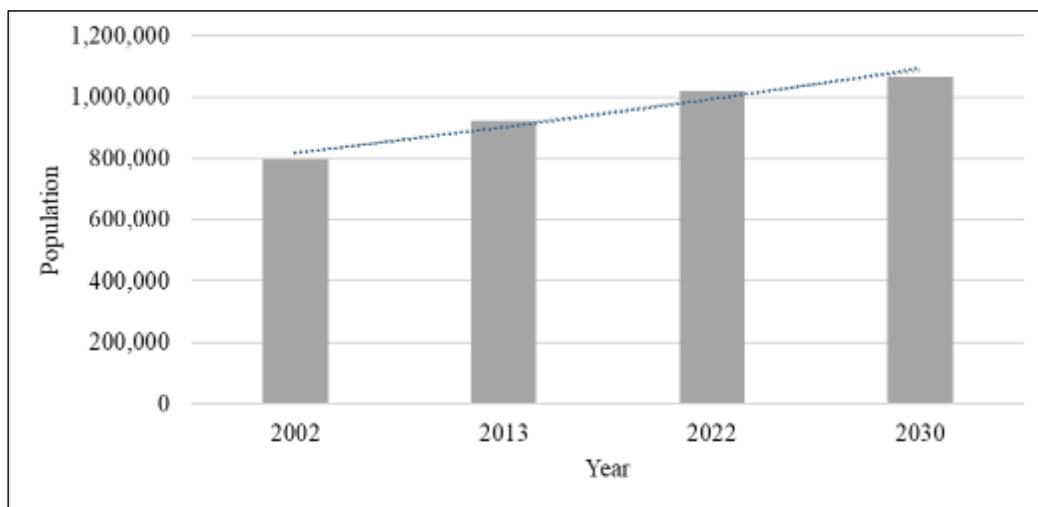


Figure 11: Makueni County Population Projections Trend

Source: KNBS, 2019

Figure 11 shows an increasing trend in population which has an impact on natural resources. The plan should put into consideration the expected population increase and put strategies for sustainable utilization of the forests and landscapes.

2.4 Forest and Landscape Restoration opportunities in Makueni County

Based on the Makueni County ROAM, 2018 data, the largest opportunity for landscape restoration in the County lies in Agroforestry (44%), Silvo-pastoral and Rangeland rehabilitation (32%) and Plantation forests (19%), collectively this accounts for 95%

of the restoration options in the County. Although all the Sub-Counties have opportunities in Agroforestry, those in the lower zones (Kibwezi East and West) have greater opportunities for Rangeland restoration compared to the ones in the middle and upper zones, the latter which have more opportunities for plantation forests.

The potential areas for restoration in Makueni County are illustrated in Figure 12 and Table 10. This data was obtained from a mapping and comprehensive data analyses that identified and informed potential restoration hotspots and strategies in alignment with the unique ecological contexts of Makueni County.

Table 10: Potential restoration per sub-county in Makueni County (in hectares).

Restoration option	Makueni	Kaiti	Mbooni	Kibwezi East	Kibwezi West	Kilome	Total
Roads	1,220	661	867	883	1,294	2,135	7,060
Wetlands	1,705	335	1,298	766	1,838	465	6,407
Degraded	1,078	5,401	563	24,157	12,568	2,967	46,734
Afforestation	1,226	2,301	2,034	424	707	1,840	8,532
Farm	13,821	2,962	7,872	10,852	12,913	5,549	53,969
Commercial	225	601	1,392	194	22	389	2,832
Rangelands	15	45	10	53,775	12,172	9,774	75,791

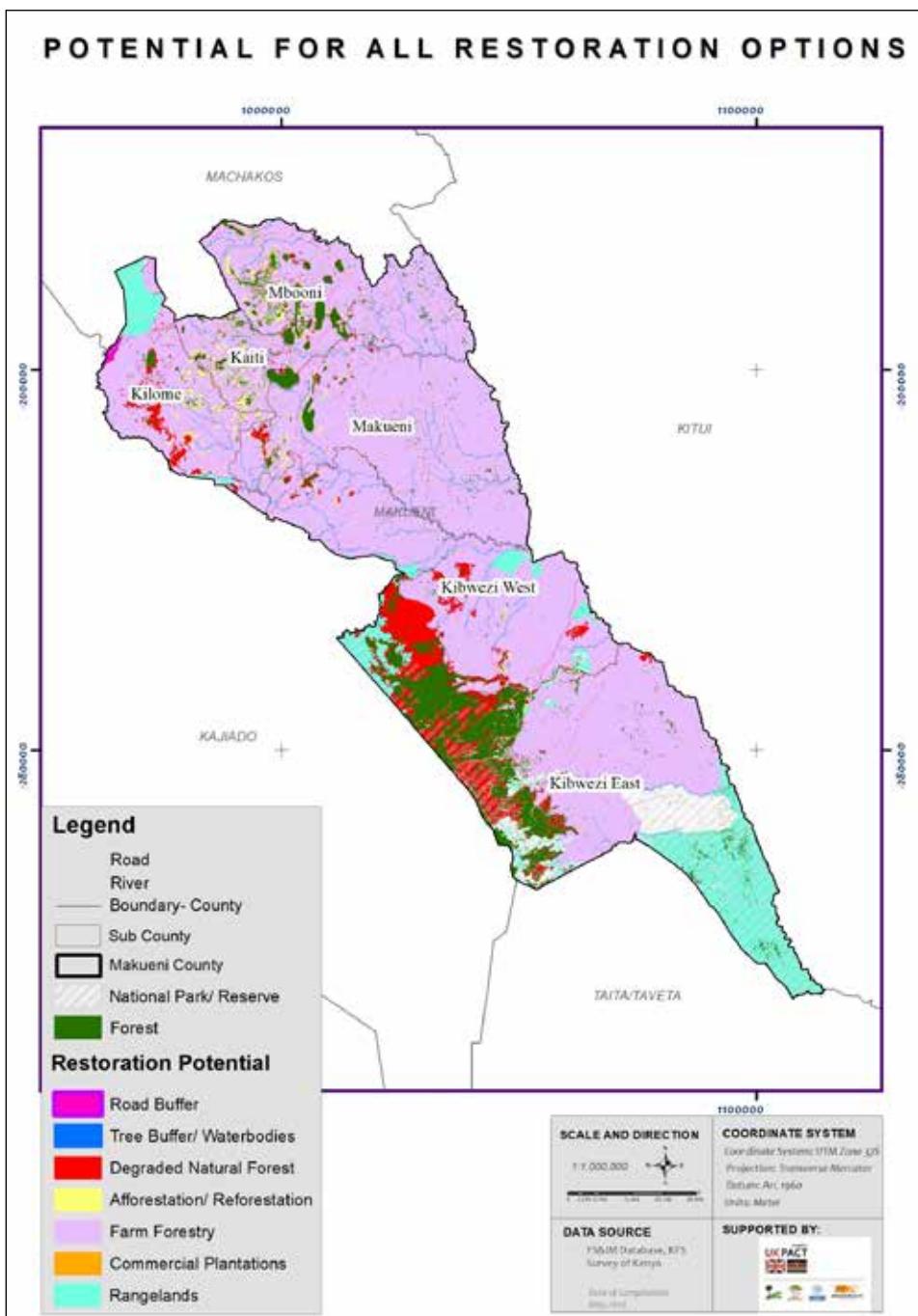


Figure 12: Restoration potential for Makueni County

Source: KFS, 2021

The above analysis gives a total of 201,325 ha of combined potential area of restoration in Makueni County. For purposes of this plan, 200,000 ha has been used for computation of costs and seedlings with different restoration options having different spacing and planting configurations.

The choice of tree and grass species used in restoration is determined by agro ecological zones as shown (Figure 13) and a list of suitable species for restoration shown in Annex 2.

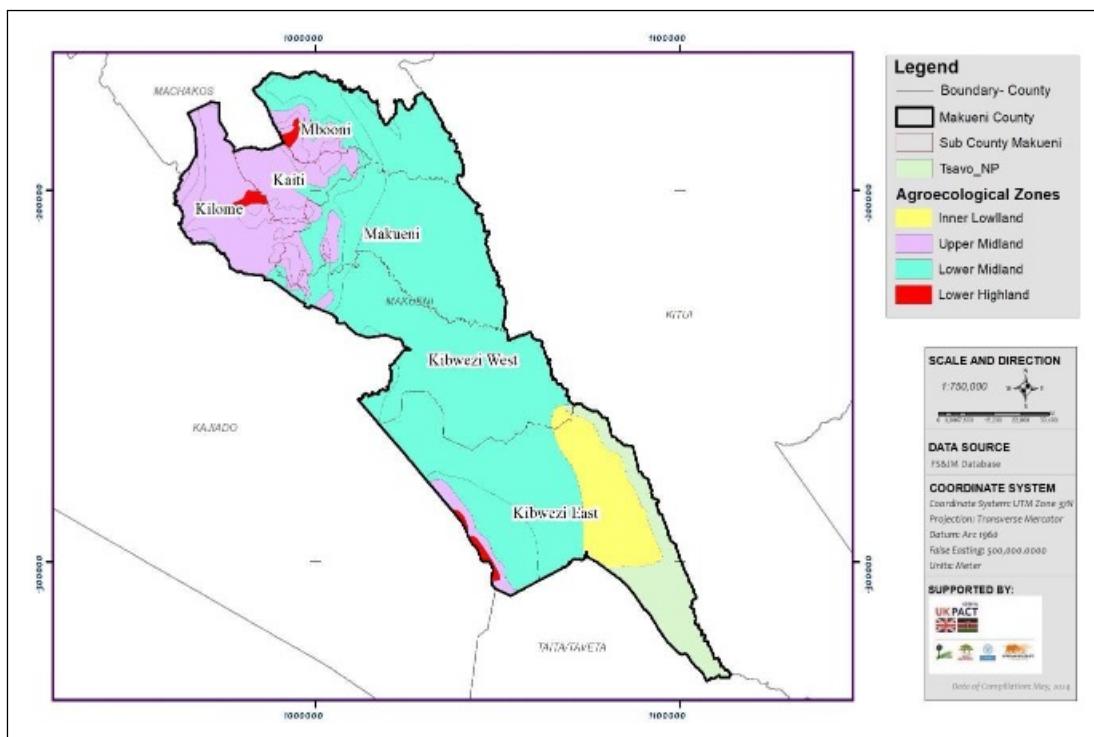


Figure 13: Tree Species and Grass Suitability Data Map (2022)

Source: KFS, 2021

2.5 Land Degradation Analysis

Degradation in Makueni County is rampant due to unsustainable land use, deforestation, and erosion. As highlighted in the Kenya Forest Service report, "Assessment of Environmental Degradation in Makueni County," rapid population growth and inadequate waste management worsen the situation, threatening both ecosystems and local livelihoods.

In this County, the extent of land degradation was assessed through a color-coded system that ranges from high to low levels of degradation. This system employs different color shades to visually represent the varying degrees of land degradation across the county. The deep red shades signify areas with high levels of land degradation, while the lighter green shades indicate areas with lower levels of degradation. This color-coded approach helps to effectively communicate the diverse and changing landscape conditions in Makueni County.

The inclusion of the sub-counties on the map is invaluable for stakeholders and policymakers. It allows for a more granular understanding of the distribution of land degradation throughout Makueni County.

Each Sub-County has its unique environmental challenges and degradation patterns based on factors like terrain, vegetation cover, and human activities.

From Figure 14, regions like Kibwezi East, despite being a national reserve, show the highest degree of land degradation. Kaiti, Mbooni, and parts of Kilome also face severe degradation and urgently need conservation and restoration efforts. Sub-counties like Makueni and Kibwezi West, shaded in orange and green, exhibit lower levels of degradation but still show moderate stress. These areas are in relatively better condition and offer potential for rehabilitation and sustainable land management.

2.6 Potential Restoration Options for Makueni County

In Kenya, forest restoration is a high priority on the government's agenda, and is reflected in a number of different legislations and policies. The Government of Kenya has put in place several high-level initiatives and laws that are strongly linked to restoring lands and their associated ecosystem services. These include:

- The 2010 Constitution calls for reforesting and maintaining a tree cover of at least 10% of the country (GoK, 2010a);
- The National Climate Change Response Strategy calls for growing 7.6 billion trees on 4.1 million hectares of land during the next 20 years (GoK, 2010b);
- Kenya's Vision 2030 has a flagship project underway for rehabilitating and protecting indigenous forests in the five watertowers (Mount Kenya, the Aberdare Range, the Mau Forest Complex, Mount Elgon and the Cherangani Hills), with the goal to increase forest cover and volume

of water flowing from the catchment areas (GoK, 2007);

- The National Landscape and Ecosystem Restoration Strategy, 2023 championed by the President's targets to restore and conserve 10.6 million hectares of degraded landscapes and ecosystems towards achieving 30% tree cover in Kenya by the year 2032 for biodiversity conservation, environmental sustainability, sustainable livelihoods, climate resilience and social economic development.

It is clear from the initiatives mentioned above that Kenya has a strong commitment to landscape restoration and has been putting in place the building blocks for improving its tree cover and restoring its landscapes and associated ecosystem services. Landscape restoration will be an important tool in helping the country meet its economic, development, and environmental goals. Scaling up these restoration initiatives requires a proper assessment of the existing opportunities, planning and resources to support implementation on

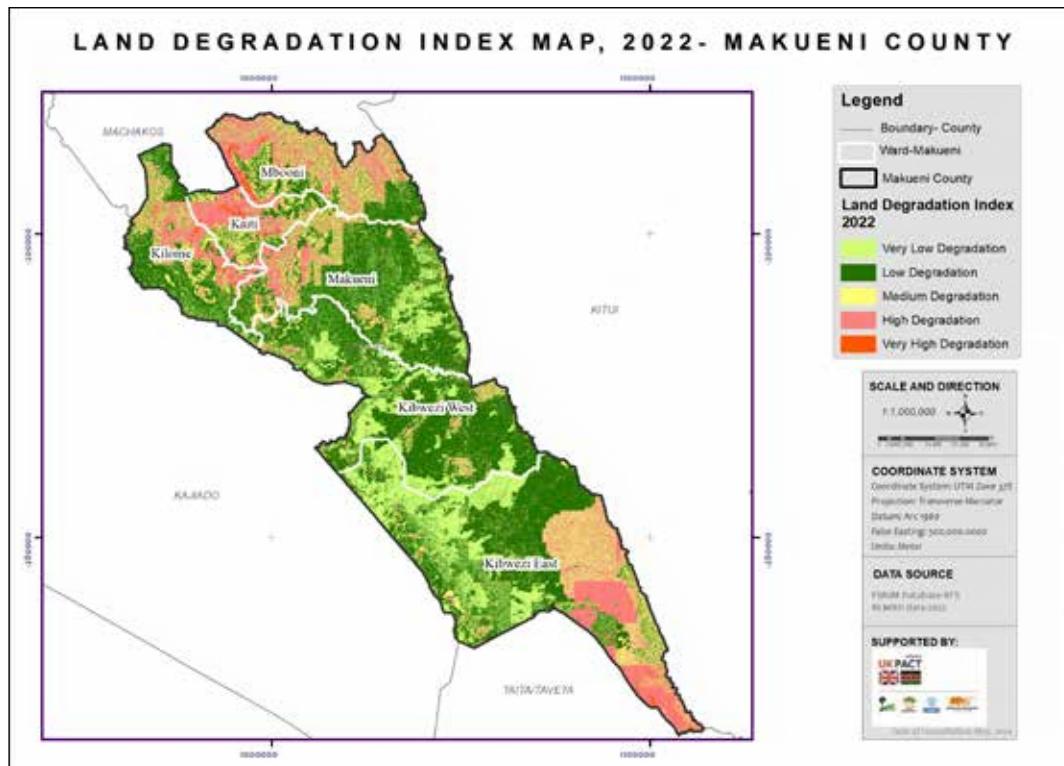


Figure 14: Land Degradation Index Map (2022)

Source RCMRD

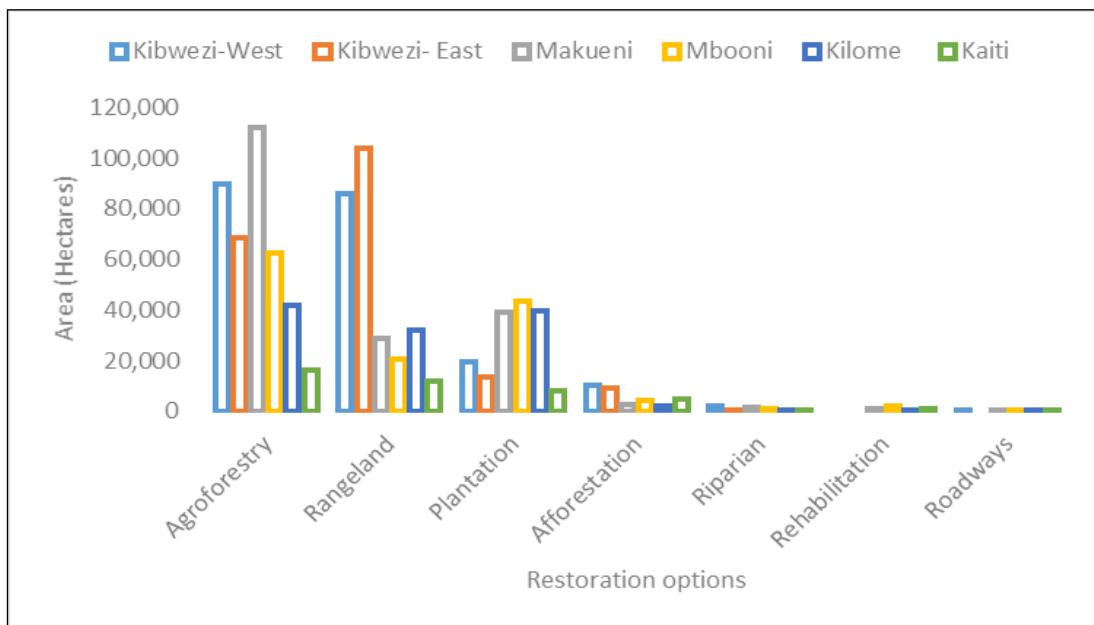


Figure 15: Forests and Landscape Restoration options Infograph

Source: Makueni ROAM, 2018

the ground. In September 2014, the Government of Kenya established a multi-stakeholder Technical Working Group led by the Kenya Forest Service (KFS) to carry out the assessment of potential restoration opportunities – a critical first step towards forging a coordinated strategy for scaling up landscape restoration in Kenya. The group identified the most pressing land use challenges currently affecting Kenya, as well as a list of restoration options that could help address these challenges and restore the ecosystem services that are currently lacking.

The various landscape restoration options identified included 7 options namely:-

- Option 1: Restoration Opportunities for Afforestation or Reforestation of Natural Forests
- Option 2: Restoration Opportunities for Rehabilitation of Degraded Natural Forests
- Option 3: Restoration Opportunities for Agroforestry on Cropland
- Option 4: Restoration Opportunities for Commercial Tree and Bamboo Plantations on Potentially Marginal Cropland and Un-stocked Plantation Forests
- Option 5: Restoration Opportunities for Tree-based Buffer Zones along Water Bodies, Wetlands
- Option 6: Roadways
- Option 7: Restoration Opportunities for Rangelands

Narrowing our focus to Makueni County, the options for restoration remain consistent with the seven restoration initiatives implemented at the national level (Figure 15).

2.7 On-going FLR initiatives in Makueni

The County Government of Makueni in partnership with various stakeholders has and is implementing various Forest and Landscape initiatives in various areas that include:

2.7.1 Environment Directorate forest and landscape restoration initiatives

The Government in 2018 partnered with World Resources Institute (WRI) to conduct a Restoration Opportunities Assessment Methodology study (ROAM) in 2018. The Assessment was aimed at identifying the land use challenges and opportunities

for restoration in the county. This report formed the basis for forest and landscape restoration in the county. Seven restoration options were identified, agroforestry; riparian land restoration; road buffer zone restoration; rangeland rehabilitation; plantation forests and rehabilitation of natural forests (Figure 15). The County Government has implemented the ROAM report through the following:

i. **Makuli- Nzaui landscape restoration:**

In collaboration with WRI a Restoration Action Plan 2021-2026 was prepared. WRI through the MasterCard Foundation is financing the planting and growing of 1,200,000 seedlings in five (5) years. So far more than 200,000 seedlings have been planted in both forestland and farmland.

ii. **Afforestation:** The County Government in partnership with Kenya Forest Service (KFS) rehabilitated degraded natural forest through, enrichment planting of 100 ha in Makuli, Nthangu, Mbooni and Kilungu Forests; production of four

million seedlings in KFS tree nurseries in Makuli, Kibwezi, Mbooni, Kilungu, Nthangu, and Makueni central nursery; establishment of 100 ha woodlots on farms; restocking of 50 ha of industrial forest plantations; rehabilitation of 10 ha in riverine areas and establishment of 10 km firebreaks. 130,800 seedlings were also planted in institutions, market areas, water projects sites and established additional 58 tree nurseries.

iii. **Devolution forest:** This was established at Kwa Kathoka Agricultural Training College during the 7th and final devolution conference from 23 - 26 November 2021 where 1,000 indigenous tree species were planted in collaboration with the Council of Governors.

iv. **Degraded land rehabilitation:** The County Government rehabilitated Matwikani watershed by planting 3,000 tree seedlings, 200 stalks of Napier grass, 400 giant bamboo seedlings and 100 stalks of live materials (Sisal). Nine farm ponds were excavated, one

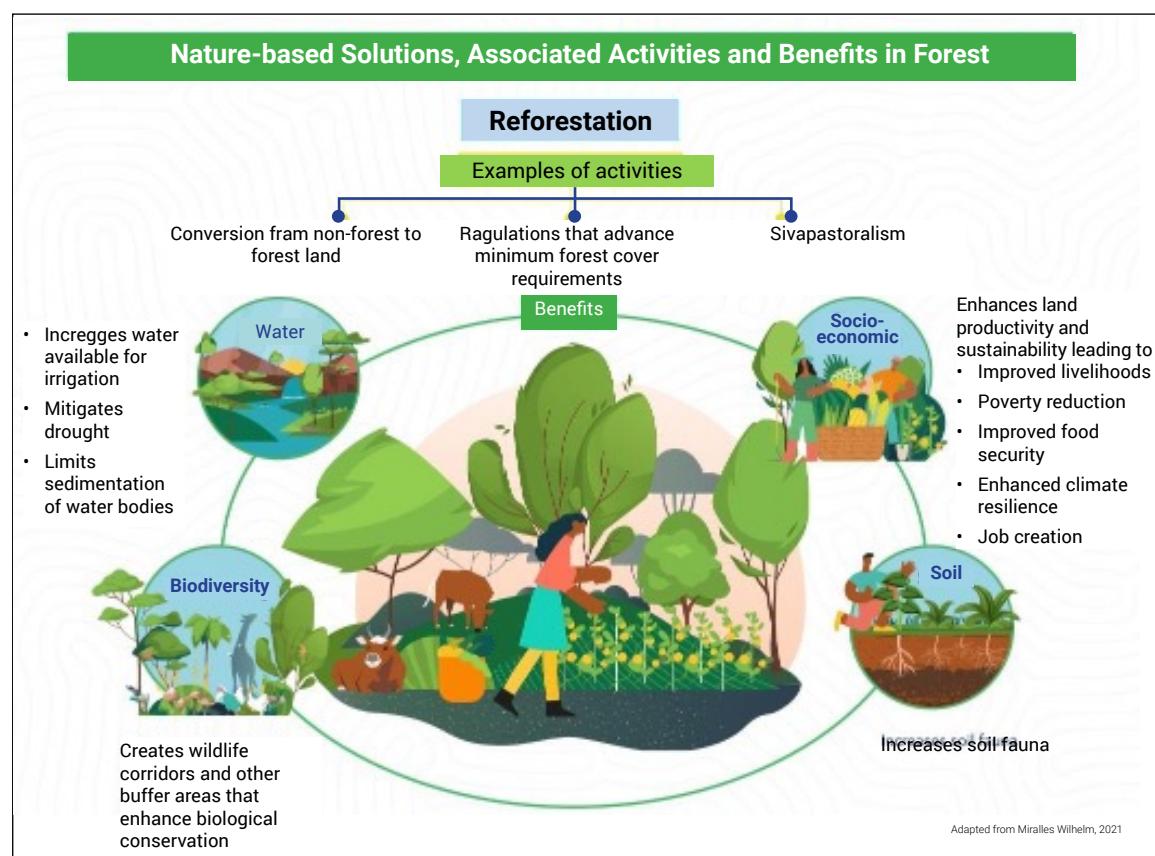


Figure 16. Benefits of reforestation

water pan de-silted, 59 household farms were provided with 1 kg. of grass for grass reseeding and they were also trained on water harvesting technologies. Additionally, 9 gully sites were rehabilitated across the county.

- v. **Water catchment protection:** 17 km of terraces were excavated as soil-water conservation structures in Muuni-Maatha hill, Mbui Nzau hills and Yekanga forest to enhance the hydro-ecological function of county forests.
- vi. **Riparian land Restoration:** The county government rehabilitated Kiboko and Kiu in Kibwezi west, Mangelete, Kwa Mukonza and Umani in Kibwezi East, Kithue and Kinyongo wetlands in Mbooni sub-county by planting seedlings in 40 hectares of land, constructing and rehabilitating weirs, sand dams, and grass reseeding. 1,500 tree seedlings were also planted along the river banks of Kanyonga and Kambu rivers.
- vii. **Protection of gazetted forests:** Kenya Forest Service (KFS) protected and conserved a total of 15,004.5 Ha of gazetted forest against all forms of threats and degradation activities on forest conservation.
- viii. **TWENDE Project:** The County Government, Department of Environment and Climate Change in collaboration with NDMA, Anglican Development Services Eastern (ADSE), (International Union for Conservation of Nature (IUCN), Conservation International (CI) and SDL are implementing an Ecosystem Based Adaptation (EBA) initiative dubbed; Towards Ending Drought Emergencies Project (TWENDE) aims at reducing the cost of climate change induced drought on the national economy by increasing resilience of the livestock and other land use sectors in restored and effectively governed rangeland ecosystems. The project Wards in Makueni are: Nguumo, Makindu, Thange, Ivingoni/Nzambani, Nguu/Masumba.

2.7.2 FLR Activities by the Department of Agriculture

Forest Landscape Restoration (FLR) incorporates a range of initiatives for ecosystem revitalization including agricultural productivity and sustainability. These activities contribute to social resilience by engaging local communities in the restoration process, empowering them to manage and protect their natural resources while sustaining livelihoods. This integrated approach advances a beneficial balance between productive croplands and forest conservation, ultimately leading to healthy ecosystems and sustainable livelihoods (Figure 16 & 17).

National Agricultural Value Chain Development Project (NAVCDP) aims at supporting small scale farmers who will be transitioning or have potential to transition from subsistence farmers to commercial farmers, restoration of landscapes for enhancing the climate resilience.

Kenya Cereal Enhancement Programme Climate Resilient Agricultural Livelihoods (KCEP-CRAL) in collaboration with NDMA has excavated two water pans; Mitundu water pan with a capacity of 8,260 cubic meters, benefiting 773 HH in Kikumbulyu South Ward) and; Kataa water pan with a capacity of 8,103 cubic meters, benefiting 406 HH) in Masongaleni Ward. In Kathonzweni Ward, KCEP-CRAL and NDMA implemented Kwa Kilui Earth dam with a capacity of 40,000 m³ and benefitting 7,500 households and over 3,000 Livestock (Cattle, Goats/ Sheep & Donkeys). Distance for accessing Water has been reduced from 10 - 8 Km to 4 km thus saving time for searching for water from 5 hours to 1 hour.

Under the Smallholder Irrigation and Value Addition Project (SIVAP) several activities have been carried out. They have been geared towards;

- Preventing and mitigating land degradation and restoration of degraded lands.
- Control of soil erosion.

The Forest and Landscape Restoration Implementation Plan (FOLAREP) Monitoring Framework

The Forest and Landscape Restoration Implementation Plan 2023-2027 (FOLAREP) is a five year cross-sectoral and multi-stakeholder coordination framework, which aims to accelerate the restoration of deforested and degraded landscapes in Kenya for resilient socioeconomic development and improved ecological functioning.

The restoration monitoring framework was developed as a flexible and adaptable framework, which acknowledges and accounts for differences in capacity to monitor restoration changes over time and space.

PROCESS INDICATOR CATEGORIES



Area of land under restoration



Restoration project data



Investment



Policy and advocacy



Value chains



Communication and knowledge

OUTCOME INDICATOR CATEGORIES



Land health



Tree cover and type



Socio-economic



Capacity



Biodiversity



Climate change

Figure 17 Relationship between FLR and agriculture

- Improvement of soil water storage.
- Management of soil organic matter for soil carbon sequestration.
- Management and enhancement of soil fertility.

The specific activities include:

- Excavation of land management practices including; Fanya Juu – 29,655m, Cut off drains (CoD) – 12,452m, Grass strips 5,870m, Pasture establishment – 5ha and Agro forestry - 6,500 fruit trees.
- Under National Agricultural and Rural Inclusive Growth Project (NARIGP), over 700 groups were funded and put 6,827Ha of land under sustainable land management practices which included conservation agriculture, manuring, and water harvesting: Producer organizations were funded and ripped over 3,190 acres of land under promotion of conservation agriculture. NARIGP also carried out capacity needs assessment on Sustainable Land Management practices and acquired equipment such as Handheld GPS devices, Mobile mappers, clinometers, Geodetic RTK and Soil testing equipment for use in

the SLM practices. Additionally, seven Multi-Community Investments (MCIs) have been implemented. These are Rehabilitation of Kilombo Earth Dam and the SLM/ Catchment protection, Kwa Nguni, Ngosini, Muangini, Muuni, Kya Kivandi and Mukuyuni. In each, 40 farm ponds were excavated, installed with irrigation components and lined.

In summary, the immediate outcomes include:

- 301,250m³ of water harvested in Kilombo Earth dam and 7 Sand dams;
- Soil water conservation- 35,522m terraces excavated;
- Tree seedlings planted – 17,353;
- 440 farmers have received soil testing services and 1,421 terrace leveling services.

In addition, The County in collaboration with ICRAF and FAO is delivering on nature based solution outcomes. The project aimed at Capacity strengthening and scaling gender-responsive, context-appropriate water management options, tree growing and sustainable wood-fuel systems in Makueni; Co-development, implementation, and

capacity building on Nature Based Solution (NbS) and FLR monitoring and reporting frameworks; Strengthening coordination of community forest associations (CFAs) and their contribution to county forest conservation and management policies; Gender, Equity and Social Inclusion (GESI); Building institutional capacity for equitable and inclusion (Figure 18).

2.7.3 KEFRI Forest and Landscape Restoration (FLR) Activities

KEFRI Kibwezi-Sub-Regional Research Centre in Makueni and supports the County in its service provision FLR through:

- Production high quality germplasm for increased farm productivity and expansion of forestry programmes.
- Diversification of trees and bamboo for soil erosion control and increased crop production.
- High quality forest products for construction, furniture, biochemicals, medicinal and herbal products and biomass energy.
- Innovative digital products such as JAZA MITI to track progress of ten percent

(30%) tree cover by 2032 and the Re-greening App by CIFOR-ICRAF.

- Conduct research in forestry and allied natural resources.
- Disseminate research findings to stakeholders.
- Build capacity of stakeholders.
- JICA/KEFRI Project on Development of Drought Tolerant tree species.
- Rehabilitation of degraded forests with bamboo and other species.
- Demonstrations of various indigenous tree species.

2.8 Economics of Upscaling FLR

The upscaling will involve the decentralization of forests and landscape restoration (FLR) activities to community level. Restoration materials will be sourced at the landscape level where available on condition they meet specified requirements. At this level, direct socio-economic impacts will be felt. This will translate into enormous social, economic and environmental benefits. The economics of upscaling restoration therefore will be achieved by restoring 200,000 ha of Forest and Landscape.

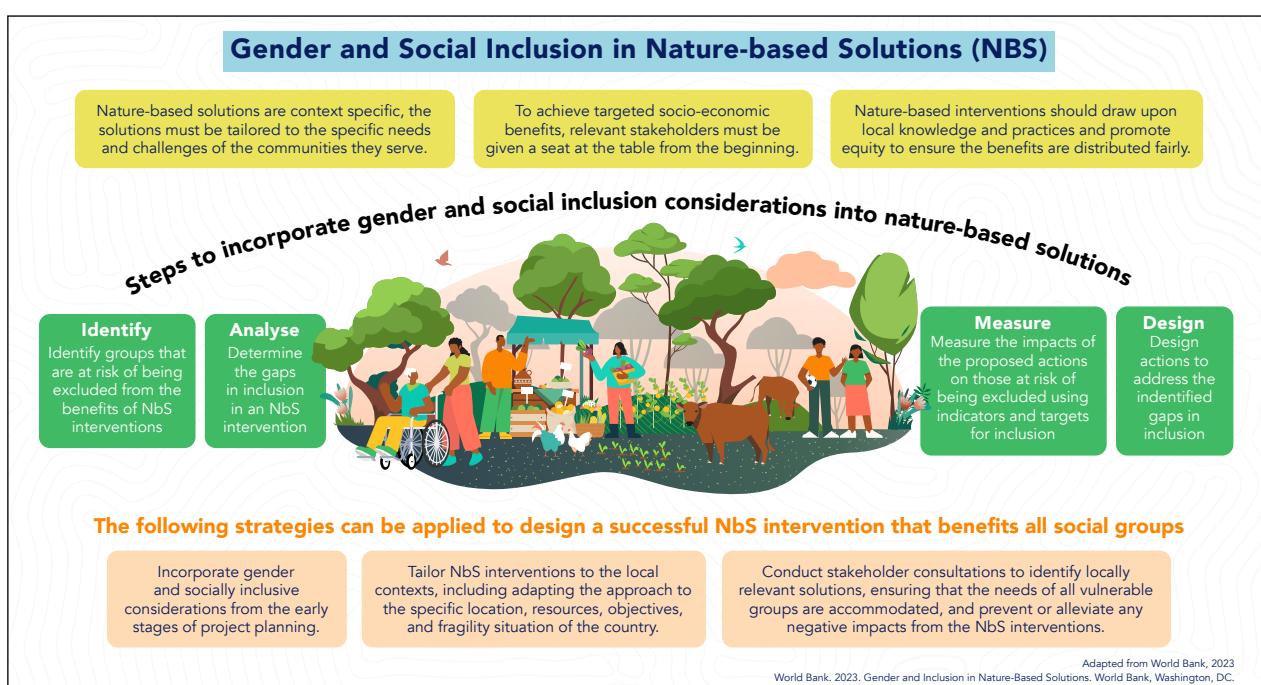


Figure 18: Gender equity and solution inclusion in nature-based solutions



In Kenya, the goal of FLR is to improve ecological functionality and socio-economic benefits. Priority landscape restoration options for Kenya include:

- Afforestation and reforestation of natural forests;
- Rehabilitation of degraded natural forests;
- Agroforestry;
- Commercial plantations (including bamboo);
- Silvopastoral and rangeland restoration;
- Tree-based buffer zones along water bodies and wetlands;
- Tree-based buffer zones along roadways;
- Public education, awareness and sensitisation on tree growing;
- National tree planting campaigns; and Greening of schools and other learning Institutions.



Figure 19: Goals for Forest and Landscape Restoration in Kenya

Restoration of the 200,000 ha will be two fold with five initiatives;

- 1) Identifying and costing initiatives that fix carbon as biomass (in tree or wood state). These are by tree planting and grass planting.
- 2) Identifying and costing initiatives that fix carbon in the soil through soil fertility management, basically the Sustainable Land Management (SLM) practices.

The first initiative which in the case will target an area covering 63,700 ha. This area will be planted and restored with tree based components in the plantations, farmlands and roadways.

The second component will be restored using Farmer Managed Natural Regeneration (FMNR) covering an area of 56,300 ha in the degraded natural forests and enrichment planting in the natural forests translating to 56 million tree species being planted and grown to a tune of Ksh. 8.4 Billion where the cost of planting and growing a single seedling to mature tree is estimated to be Kshs. 150.

The third restoration method will involve a combination of FMNR, grass reseeding and tree seed broadcasting using seed balls covering an area of 74,700 ha.

The fourth initiative will be used to restore denuded barelands and roadways through mechanical and biological interventions (gabion boxes, scour check, check walls, sand dam) covering an area of 7,000 ha. An extra intervention through SLM (terracing, zai pits, trapezoidal bands, retention ditches), and lastly, natural regeneration and FMNR will be applied then the tree restoration component introduced.

Lastly, the wetlands and waterways covering an estimated area of 6,400 ha will be restored using vegetative planting materials, water friendly trees, grasses and bamboo to minimize siltation from run-off and flash floods.

In summary, upscaling FLR activities will cost the County Government and partners approximately Ksh. 30.128 Billion. This is against the National budget of Ksh. 1.9 trillion as per the National FOLAREP 2023 - 2027.

2.9 Barriers to Forest and Landscape Restoration

There are several barriers to the implementation and upscaling of FLR in Makueni as detailed in Table 11.

Table 11: Forests and Landscape Restoration Barriers

Key area	Barriers
Policy Related Issues	<ul style="list-style-type: none"> Conflicting government policies, laws and related strategies and initiatives Slow uptake of devolved functions Absence of County level legal frameworks Weak structures to implement and enforce relevant policies, laws and regulations Inadequate personnel to implement relevant policies, laws and regulations
Information Barriers	<ul style="list-style-type: none"> Inadequate information on FLR technologies Ineffective knowledge management systems and information sharing mechanism on FLR associated benefits Limited access to data Inadequate information on site species matching
Land Tenure Issues	<ul style="list-style-type: none"> Encroachment into public land Expensive and tedious succession process. Ineffective land use planning. Land fragmentation. Competing land uses .
Social Barriers	<ul style="list-style-type: none"> Demographic pressures on land. Resource use conflicts among families and communities.
	<ul style="list-style-type: none"> Negative cultural norms and practices (malpractice) on succession and tree growing Gender inequalities and norms. Negative political interest Poverty
Economic Barriers	<ul style="list-style-type: none"> Inadequate financing. Expensive FLR technologies Inadequate benefit sharing mechanisms. Inflexible programming for public and donor funded projects. Inadequate prioritization and allocations of FLR budgets
Biophysical barriers	<ul style="list-style-type: none"> Frequent and prolonged droughts Water scarcity Water salinity Invasive and parasitic species explosion Extreme land degradation Infertile soils Wildfires

2.10 PESTLEG and SWOT Analysis for FLR

PESTLEG and SWOT Analysis was carried out and reported in Table 12.

Table 12: PESTLEG AND SWOT analysis

	Strengths	Weaknesses	Opportunities	Threats
Political	<ul style="list-style-type: none"> • Structural and institutional frameworks in place to support forest and landscape restoration initiatives • Clearly outlined planning documents mainstreaming FLR initiatives (CIDP, ADP, ROAM, Spatial Plan and Governor's manifesto) • Transition Implementation Plans (TIPS) approved by the executive • Enabling policy and legislative instruments (Makueni Environment Policy/ Bill, 2023 and Makueni County Sustainable Forest Management and Landscape Restoration Act, 2024; • Strong linkages and synergies from development partners at Sub-National, National and International Platforms supporting forest and landscape restoration 	<ul style="list-style-type: none"> • Low prioritization and inadequate budget allocation for FLR activities • Limited awareness on FLR and its benefits that can influence accurate decision making • Political inclination of most leaders towards prioritization of FLR projects in hotspots 	<ul style="list-style-type: none"> • Funding for GoK, private sector and development partners • Favorable national, regional global political agenda on FLR • Political good will eg President directive on 15 B trees drive 	<ul style="list-style-type: none"> • Bureaucracy in governance • Slowed project • Implementation during political transition • Negative political incitement towards conservation initiatives

	Strengths	Weaknesses	Opportunities	Threats
Economic	<ul style="list-style-type: none"> • Elaborate restoration financing opportunities at national, regional and international level for FLR (climate, agriculture, environment, water sectors) • Expanding nature-based enterprises • Increased awareness of ecosystem benefit sharing models • Resource mobilization by local communities and non-state actors geared towards FLR 	<ul style="list-style-type: none"> • Unstable Global and local economic performance cycles • Inadequate financial resources for restoration of degraded lands • Competition for forest and land resources for development • Weak linkages of forest and land-based products to markets and industries to spur development in sustainably managed environments; • High cost of FLR activities implementation 	<ul style="list-style-type: none"> • Increasing global demand of forest products from sustainably managed landscapes • Existence of employment opportunities in nature-based enterprises • Opportunities of green, blue and circular economies to incentivize stakeholders on environmental activities • Opportunities in carbon offsetting programmes eg REDD+ program 	<ul style="list-style-type: none"> • Unpredictable exchange rates • Inflation • Uncertain monetary and scale policies (ie reduction of budget allocations to restoration programs) • Corruption • High demand of forest goods and services • Global recession • Market fluctuation and failure – unclear valuation for ecosystem services and nature-based products • Poorly developed value addition chains of NTFPs • Lack of clear structures in benefit sharing thus hindering investment in FLR
Social	<ul style="list-style-type: none"> • Availability of youthful population to undertake FLR • Availability of indigenous knowledge in conservation and management of natural resources • Community engagement in participatory forest management • Willingness of stakeholders to participate in FLR programmes and projects • Positive cultural norms supporting conservation (shrines or groves) 	<ul style="list-style-type: none"> • High poverty levels leading to high dependency on land-based sector • Insufficient information on degradation status and value of forest resources to support proper planning • High rates of unemployment • Minimal inclusivity in FLR approach limiting ownership of the process at the community level • Inadequate knowledge on the importance and impacts of FLR among the communities • Rigidity to accepting new information and modern FLR technologies 	<ul style="list-style-type: none"> • Presence of many stakeholders in FLR • Improved uptake of nature-based interventions • Availability of land for FLR amongst the community members especially in the lower zones of the County • Positive change of attitudes towards FLR 	<ul style="list-style-type: none"> • Population growth exerting pressure on conservation areas • High poverty levels • Competing land-use practices • Inequalities in benefit sharing from proceeds of FLR • Some negative cultural norms, beliefs and practices • Gender inequality and limited inclusivity in decision making • Low rates of land succession hindering investment in FLR

	Strengths	Weaknesses	Opportunities	Threats
Techno-logical	<ul style="list-style-type: none"> Availability of science, technology and indigenous (ITK) technologies for FLR Existence of research and higher learning institutions Availability of trained workforce in the market for FOLAREP Existence of restoration related infrastructure for mapping, monitoring, reporting forecasting etc(Jaza miti App, regreening App) availability of useful open source information (Media) and softwares 	<ul style="list-style-type: none"> Inadequate information dissemination on best practices for FLR Limited access to technology and data in marketing of forest and other land-based products Limited access to information, technology and connectivity Limited profiling of empirical evidence and most recent information to influence policy on landscape restoration Lack of ICT equipment and tools for FLR Expensive monitoring 	<ul style="list-style-type: none"> Existence of an Executive Order that promotes automation of government services for improved efficiency and effectiveness Availability of open source FLR tools for research, planning, implementation and monitoring Expanded use of smartphones may be used to improve monitoring FLR 	<ul style="list-style-type: none"> Lack of agreed FLR common monitoring tools/platforms at National level to guide the County FLR Low uptake on ICT technologies Cybercrime and data insecurity (fraud, hacking misuse and abuse of data)
Legisla-tive	<ul style="list-style-type: none"> Existence of some supportive policy and legislative instruments; Availability of gazetted forests and protected areas 	<ul style="list-style-type: none"> Conflicting policies and laws both at county, national and sectoral levels Weak policy formulation and implementation framework Inadequate policies and legal frameworks Weak linkages between science and policy development on natural resources management; Low understanding of legislative frameworks and their interpretation; Unpackaged devolved functions 	<ul style="list-style-type: none"> Existence of government blue prints such as Vision 2030, National landscape and ecosystem restoration strategy Favorable constitutional dispensation; Effective County Assembly 	<ul style="list-style-type: none"> Lengthy process on formulation and legislation of laws and policies governing the sustainable use of forest resources and other land-based sector goods and services Undefined roles and duplication of roles

	Strengths	Weaknesses	Opportunities	Threats
Environment	<ul style="list-style-type: none"> • Availability of diverse landscapes that requires restoration • Availability different players supporting FLR • Availability of inputs for restoration (diverse tree species, technologies, skills and knowledge); • Existing information and baseline data for FLR 	<ul style="list-style-type: none"> • Weaknesses in implementation of environmental Laws and policies • Low level of awareness on carbon credit; Limited/low uptake of information on FLR • Low implementation rates of existing plans and recommendations on restoration 	<ul style="list-style-type: none"> • Potential for commercialization of native tree species value chains • Advancing development of payment for ecosystem services (PES) • Availability of funding opportunities and enabling environment • Kenyan commitment to the UN Decade of Ecosystem Restoration 	<ul style="list-style-type: none"> • Prolonged droughts; • Uncontrolled land-use changes and settlement on sloppy areas disturbing the soil structure (Infrastructure that interfere with the hydrology) • Pollution • Inadequate disaster recovery plans and conflict resolution mechanisms on environmental issues • Extremely denuded landscapes • Emergence of alien invasive and parasitic species • Encroachment
Governance	<ul style="list-style-type: none"> • Two-tier level of governance at national and county for coordination and strengthening implementation of FOLAREP • Existence of national Institutions responsible for forest management, conservation and research • Existence of Acts and regulations that guides participation of community in restoration activities; • Availability of community-based structures to support FLR (CFA, WRUAs, CBOs, Self-help groups) 	<ul style="list-style-type: none"> • Lengthy bureaucratic layering of governance • Low capacities of the county governments to implement devolved forestry and agriculture functions • Inadequate enforcement and compelling laws to support FLR • Conflicting and overlapping Institutional mandates • Uncoordinated efforts towards FLR; • Limited capacity to strengthen enforcement of County and community managed protected areas • Lack of public private partnership framework on FLR • Unrealistic restoration targets • Conflicting directives and executive orders eg charcoal ban, logging ban; • Unscientifically supported activism by civil society • Ignorance by user groups 	<ul style="list-style-type: none"> • Restructuring/ changes in land governance/ Government reforms • Increased funding from Government and development partners • Existence of County multi-stakeholder platforms for coordination (CEC, CCFB) • Existence of a national and County FLR framework 	<ul style="list-style-type: none"> • Uncontrolled use of forest products by user groups; • Limited access for funding FLR activities for government agencies • Lack of frameworks for monitoring and evaluation for FLR

2.11 Risk Analysis

The following are risks associated with the implementation of the Makueni County Forest and Landscape Restoration Action Plan, Table 13.

Table 13: Risk Analysis

Risk	Level	Mitigation	Actors
Drought	High	<ul style="list-style-type: none"> Species site matching, early planting/preparedness and underground water provision to supplement Research on drought resistant species Deployment of innovative technologies to address erratic weather patterns Early warning systems 	NDMA, KMD, KEFRI, KFS, County Governments,
Wild/forest fires	Low	<ul style="list-style-type: none"> Establishment and maintenance of firebreaks and fire lines for forest protection Awareness creation on fire management and control 	NGAOs, KFS, County Governments, Communities, KWS, NDMA
Insecurity	Moderate	<ul style="list-style-type: none"> Security enhanced by already established organs 	NGAOs, KFS, KWS
Invasive Species	Moderate	<ul style="list-style-type: none"> Carryout surveillance and control of invasive species by monitoring and inspecting all planting materials Promote use of quality seedlings from known sources 	KEFRI, KEPHIS, KALRO
Pest and diseases	Low	<ul style="list-style-type: none"> Pest and disease control measures Capacity building on pest and diseases tolerant species Promotion of biological control of pests Supporting research and dissemination of pest and diseases tolerant species 	KEFRI, KEPHIS, MOA, KALRO, KFS, KWS, County governments, NDMA

2.12 Stakeholder Analysis

The key stakeholders and their mandates on FLR are summarised in Table 14.

Table 14: Makueni County FLR Stakeholders

S/No	Stakeholder	Relevant FLR Mandate/Activities
1.	Action Aid	Community capacity building on Agroforestry Restoration of degraded lands and management
2.	Anglican Development Services-Eastern (ADSE)	Makueni Agro-forestry Carbon Project (MACP) Building resilience through Agro-forestry in Makueni County
3.	African Wildlife Foundation (AWF)	Sensitizing and strengthening CFAs
4.	African Sand Dam Foundation (ASDF)	Addressing access to water in the ASAL regions (support construction of sand dams)
5.	Bilal Muslim Mission Kenya	Provision of water structures, education support/sponsor, provision of food aid to the community
6.	CARITAS	Training on: Environmental conservation, Climate Smart Agriculture, Promotion of apiculture and poultry rearing
7.	Cereal Growers Association (CGA)	Capacity building on Climate Smart Agriculture
8.	Community Forest Associations (CFAs)	Advocacy for forest conservation and protection, support for nature based enterprises and co-management of forests

S/No	Stakeholder	Relevant FLR Mandate/Activities
9.	Community Forest Organization (CFOs)	Support in conservation and protection of County Forests
10.	Compassionate Aid (Faith based)	Capacity building to trainers education support
11.	David Sheldrick	Environmental conservation and Human-Wildlife conflict Management – electric fencing of the parks
12.	Desert Oasis Residents Empowerment Programme (DOREP)	Training on table banking and training on smart farming
13.	FAO/ MasterCard Foundation	Pasture establishment (SFERA Emergency project)
14.	Financial Services Association (FSA)	Training and advocacy for financing services
15.	Government of Kenya	Formulation of FLR legal frameworks and other relevant policies, their implementation and enforcement
16.	Government of Makueni County	Domestication of FLR legal frameworks, Implementation of devolved functions and Building synergies with partners on FLR
17.	Government of Makueni County; KCEP- CRAL	Training on Conservation Agriculture and Smart Agriculture, Provision of farming inputs to farmers
18.	Government of Makueni County; NARIGP	Training farmer groups on value chain approach for priority value chains and funding them on value chain addition
19.	Government of Makueni County; Agriculture department	promotion of Agro-forestry, Pasture production and soil & water conservation Improved breeds for goats, tractors and certified seeds
20.	ICRAF	Advocacy and training on smart agriculture, Promotion of Gender Environment and Social Inclusion in FLR and Support on development of FLR legal frameworks aiding domestication of National legal frameworks
21.	ICRISAT	Research on crops
22.	KALRO	Research on crops, Livestock genetic resources and biotechnology, Dissemination of research findings to stakeholders
23.	KEFRI	Research on forestry and allied Natural resources, Dissemination of research findings to stakeholders, Capacity building of stakeholders and Partnering with different institutions and stakeholders
24.	Kenya Forest Service (KFS)	Production of high quality forestry seedlings; Environmental conservation (Agroforestry) and Provision of casual employment to the community
25.	KFS REDD+ project	Sustainable management of forest and the conservation and enhancement of forest carbon stock, Advocating and training on environment conservation of Chyulu ecosystem
26.	KENHA, KeRRA, County department in-charge of Roads	Road construction and maintenance
27.	Kenya Water Towers Agency (KWTA)	Protection, rehabilitation, conservation and sustainable management of water towers
28.	Kenya Wildlife Service (KWS)	To sustainably manage Kenya's wildlife and its habitats for the benefit of nature and humanity Education support (sponsorship); corporate social responsibility
29.	NEMA	Supervising and coordinating all matters relating to the environment The main national body in the implementation of Government policies relating to the environment

S/No	Stakeholder	Relevant FLR Mandate/Activities
30.	National Drought Management Authority (NDMA)	Disseminate drought information Drought preparedness, management and coordination through the CSG Ending Drought Emergencies (water projects; rehabilitation & construction eg earth dams and boreholes) Capacity building and sensitization Chyulu Landscape Restoration (TWENDE) in 5 Wards
31.	One Acre Fund	Capacity building on smart agriculture and market linkage to farmers' produce
32.	Rea Vipingo Sisal Plantation (DWA)	Training on sisal growing and market linkage to farmers
33.	Resource Conflict Institute (RECONCILE)	Training on Environmental conservation Climate Smart Agriculture Promotion of apiculture, poultry Natural Resource Policy analysis and reforms
34.	RedCross	Agriculture support, Health sensitization and risk response and Education support
35.	State Department of Livestock (SDL)	Rangeland development
36.	Water mission	Building safe water, sanitation and hygiene solutions in developing countries
37.	Water Regulatory Authority (WRA)	Responsible for the governance on the use and management of water resources
38.	Water Service Providers (WSP)	Water provision (distribution and management of water infrastructure)
39.	WRUA	Training on water resources management and protection , Tree planting, Awareness creating, water allocation quotas
40.	Welthungerhilfe (WHH)/ GAA	Water Sanitation and Hygiene (WASH) interventions Integrated Food Security interventions (Smart Agriculture) Infrastructure Development Support in Public Primary Schools Climate Change mitigation and adaptation (Borehole/ River Catchment conservation, Soil and water conservation and Environmental conservation through Tree planting drives)
41.	World Vision	Supporting vulnerable groups; cash transfers; promotion of Farmer Managed Natural Regeneration (FMNR)
42.	Drylands Natural Resources Centre (DNRC)	Promotion of Sustainable Agriculture and agroforestry solutions for improved natural resources management.

3

GOAL, OBJECTIVES, PROPOSED STRATEGIC RESTORATION INTERVENTIONS AND ACTIONS

3.1 Goal

To accelerate County actions on restoration as a contribution to the achievement of the national Bonn Challenge and AFR 100 target of restoring 5.1 million hectares of deforested and degraded landscapes by 2030 as per the Bonn Challenge and 10.6 million hectares in the Country's Landscape and ecosystem strategy by 2033.

3.2 Overall Objective

To restore 200,000 hectares of degraded forests and landscapes in Makueni County through integrated restoration approaches for improved ecological functionality and social economic benefits by 2033.

Specific Objectives

1. To develop and strengthen policies, regulatory frameworks and institutional coordination for enhanced FLR implementation in the county.

2. To enhance the capacity of stakeholders to undertake forest and landscape restoration in the county
3. To restore 200,000 ha of degraded forests and landscapes in prioritized areas in the county by 2033.
4. To mobilize resources locally, nationally and internationally from public and private partnerships for FLR implementation in the county.
5. To promote inclusive nature-based value chains and adoption of alternative sources of livelihoods for improved wellbeing of communities.
6. To enhance adoption of FLR monitoring, evaluation, research & learning (MERL), knowledge management and information sharing.

3.3 The Key Interventions Areas and Actions as per Objective

The Key Interventions Areas and Actions as per Objective are detailed in Table 15.

Table 15: Specific Objectives, Interventions and Actions

Key Interventions Area	Actions
Objective 1: To develop and strengthen policies, regulatory frameworks and institutional coordination for enhanced FLR implementation in the county	
1.1 Review existing policy and regulatory frameworks.	<ol style="list-style-type: none">1.1.1 Review and identify the gaps in the existing FLR related policies and regulations in the county in view of global, regional, national initiatives, treaties, conventions, protocols and agreements1.1.2 Harmonize the gaps in existing FLR related policies and regulations frameworks in the county and validate the reviewed policies with stakeholders1.1.3 Prepare a cabinet memo outlining key recommendations on policy review for harmonization by the County Executive and if need be forward to the County Assembly for approval1.1.4 Recommend development of new policies and/or regulations as advised by legal review outcome

Key Interventions Area	Actions
1.2 Support implementation and development of FLR- related policy and regulatory frameworks in the county	1.2.1 Create awareness on FLR-related policies and regulations at the county and ward levels 1.2.2 Support development of recommended policies in activity 1.2.3 Develop County FLR related policies and legislations, framework 1.2.4 Integrate FLR policies and strategies in County Integrated Development Plans (CIDPs)
1.3 Support institutional coordination to enhance implementation of FLR in the county	1.3.1 Strengthen existing FLR related coordination units at County, Sub-County and Ward levels 1.3.2 Establish technical secretariat for coordination of FLR efforts at County level 1.3.3 Establish and strengthen County multi-stakeholder engagement platform on FLR 1.3.4 Develop and strengthen fora for stakeholders' engagement in FLR implementation and monitoring 1.3.5 Develop and strengthen trans-ward and inter-county frameworks for FLR implementation 1.3.6 Strengthen cross-sectoral and interdepartmental efforts on FLR related activities 1.3.7 Create and strengthen linkages and synergies with existing FLR related programmes
Objective 2. To enhance the capacity of stakeholders to undertake forest and landscape restoration in the county	
2.1 Develop supportive and protective FLR infrastructure and enablers (Water Resource Development,	2.1.1 Build capacity of key FLR stakeholders on identification and profiling of supportive and protective infrastructure 2.1.2 Development and maintenance of supportive and protective infrastructure (Water points, fire breaks etc) 2.1.3 Maintain inventory of both supportive and protective FLR infrastructure Access Roads, fire breaks, etc)
Objective 3. To restore 200,000 ha of degraded forests and landscapes in prioritized areas in the county by 2033	
3.1 Update and scale down the County level forest landscape restoration assessment to the landscape and ward level.	3.1.1 Access and review the Technical Report on the National Assessment of FLR Opportunities in Kenya (MENR, 2016) and the Makueni ROAM Report, 2018 3.1.2 Strengthen capacity of stakeholders to implement recommendations of the County ROAM report 3.1.3 Carry out landscape and ward level ROAM 3.1.4 Sensitize communities on ward level ROAM

Key Interventions Area	Actions
3.2 Restore and protect 11,300 ha of de-graded forest land/ plantations	<p>3.2.1 Survey, map, beacon and gazette non gazetted forests</p> <p>3.2.2 Identify and prepare sites for plantation establishment</p> <p>3.2.3 Strengthen capacity of stakeholders to produce 113 million seedlings of preferred plantation species</p> <p>3.2.4 Establish 11,300 hectares of plantations and carry out necessary silvicultural practices</p> <p>3.2.5 Develop five Forest Management Plans (FMPs)</p>
3.3 Restore 46,700 ha natural forests	<p>3.3.1 Undertake enrichment planting, silvicultural practices in 46,700 hectares of natural forests by planting 4 million of assorted indigenous tree seedlings</p> <p>3.3.2 Promote and enhance natural regeneration in specific identified natural forests including protected areas</p> <p>3.3.3 Identify and manage invasive species in plantations and natural forests</p> <p>3.3.4 Identify and promote conservation and protection of endemic and endangered species</p> <p>3.3.5 Develop one Participatory Forest Management Plans (PFMPs) in collaboration with CFAs and CFOs to support result-based financing for the PFMPs</p> <p>3.3.6 Create awareness and sensitization to government agencies, non-state actors, private entities and Community Forest Associations on FLR actions</p> <p>3.3.7 Promote innovative community-based and cost-efficient approaches for protection of restored and/ or areas under restoration (such as use of surveillance technologies, adopt a forest, social fencing, solar fencing among others)</p> <p>3.3.8 Promote and incentivize restoration approaches by private entities</p>
3.4 Restore 53,900 ha of degraded crop-land /Agroforestry	<p>3.4.1 Map and promote protection of ecologically sensitive niches within croplands from degradation</p> <p>3.4.2 Identify and promote the adoption of agroforestry best practices {eg setting up demo sites, Farm Forestry Schools (FFS)}</p> <p>3.4.3 Promote soil and water conservation measures in degraded croplands</p> <p>3.4.4 Support mass production and access to 333 million quality prioritized fruit trees (eg Avocado, macadamia, mangoes, citrus etc) and 206 million high value tree seedlings (eg <i>Grevillea robusta</i>, <i>Tamarindus indica</i>, <i>Moringa oleifera</i>, <i>Sclerocarya birrea</i> (<i>amarula</i>), <i>Terminalia brownii</i>, <i>Sesbania sesban</i>, <i>Melia volkensii</i> etc) totaling to 539 million tree seedlings</p> <p>3.4.5 Strengthen the capacity of County Government Forest Unit to establish seedlings production centers</p> <p>3.4.6 Promote Sustainable Land Management Practices (SLM) such as conservation agriculture, Climate Smart Agriculture, farmer managed natural regeneration etc</p>

Key Interventions Area	Actions
3.5 Restore 74,700 ha of degraded range-lands and wood-lands	<p>3.5.1 Promote pasture seed production, range reseeding and natural regeneration initiatives through community involvement</p> <p>3.5.2 Improve access to 8 million drought-tolerant tree seedlings (250 seedlings per hectare)</p> <p>3.5.3 Sensitization of communities on best practices on range-land management</p> <p>3.5.4 Promote soil and water conservation technologies and water harvesting measures in rangelands</p> <p>3.5.5 Identify, map and manage key invasive species within Makueni County</p> <p>3.5.6 Promote livelihood diversification programmes and green Income Generating Activities (IGAs) – (Commercial pasture development, feed lotting, hay etc)</p> <p>3.5.7 Promote sustainable utilization and value addition wood and Non-Timber Forest Products (NTFPs)</p>
3.6 Restore 6,400 ha of degraded buffer zones along water bodies and wet-lands	<p>3.6.1 Map, survey, peg, gazette and secure water bodies, wetlands and riparian buffer zones</p> <p>3.6.2 Build capacity of local communities and affiliated user groups on best technologies and practices to undertake restoration and management of water bodies, wetlands and riparian zones</p> <p>3.6.3 Promote, incentivize and upscale best water harvesting, soil conservation, riverine restoration techniques and adoption of indigenous knowledge approaches along rivers, wetlands and water bodies</p> <p>3.6.4 Support development and implementation of specific water catchment management plans</p> <p>3.6.5 Enhance enforcement of existing laws and regulations on riparian conservation to safeguard the gains made on restoration</p>
3.7 Restore 7,000 ha of degraded land/bare land/urban areas/ public utilities and of roadways in the county	<p>3.7.1 Map and promote protection of prioritized degraded and bare land</p> <p>3.7.2 Identify and promote the adoption of best restoration practices for degraded, denuded and bare land (Trapezoidal and half-moons bands etc) in prioritized areas</p> <p>3.7.3 Support mass production of planting live materials/germplasms (sisal, euphorbia, grass, bamboo, aloe etc) to restore 7,000 ha of degraded/bare land and urban areas</p> <p>3.7.4 Identify and promote adoption of mechanical and biological interventions (gabion boxes, check walls, score checks etc) to restore 50 ha denuded land affected by soil erosion in both private, community and public areas</p> <p>3.7.5 Identify and promote roads for water technologies (farm ponds, mitred drains, road beautification program etc) to restore 200 ha of roadways surface run off</p> <p>3.7.6 Develop and maintain 10 public recreational centres (arboreta, green parks, people's parks, gardens, sand parks)</p> <p>3.7.7 Identify and promote adoption of natural regeneration and farmer managed restoration technologies in restoration of 150 ha denuded and bare lands</p>

Key Interventions Area	Actions
Objective 4: To mobilize resources locally, nationally and internationally from public and private partnerships for FLR implementation in the county	
4.1 Support financial Resource mobilization Initiatives for FLR Implementation.	4.1.1 Conduct County capacity needs assessment on resource mobilization for FLR 4.1.2 Enhance the County capacity on resource mobilization and proposal development by training stakeholders and actors to implement FLR 4.1.3 Support stakeholders to develop bankable FLR investment projects and business plans 4.1.4 Promote community-based innovative financing mechanisms to support FLR 4.1.5 Develop a County public-private partnership (PPP) framework or a platform to finance FLR 4.1.6 Advocate for additional FLR budgetary allocations by the County Executive and Assembly 4.1.7 Develop a strategy for enhancing access to financial resources for FLR from private sector and other stakeholders 4.1.8 Promote linkages to optimize bilateral and multilateral funding opportunities for restoration
4.2 Strengthen restoration fund schemes (County climate change fund, Reclamation fund etc)	4.2.1 Strengthen existing governance structures for FLR resource mobilization and disbursement 4.2.2 Advocate and champion for the use of existing funding schemes such as County climate change fund, Reclamation fund 4.2.3 Develop and strengthen funding structure and governance procedures
Objective 5: To promote inclusive nature-based value chains and adoption of alternative sources of livelihoods for improved well-being of communities	
5.1 Promote and develop gender inclusive green value chains.	5.1.1 Map out existing green value chains and technologies in the County for improved livelihoods 5.1.2 Identify structural barriers to equitable access to restoration benefits (gender, youth and vulnerable groups) 5.1.3 Develop measures that enhance equitable access and sharing of the FLR benefits 5.1.4 Develop appropriate value chains for the identified products 5.1.5 Disseminate and upscale green value products
Objective 6: To enhance adoption of FLR monitoring, evaluation, research & learning (MERL), knowledge management and information sharing	
6.1 Enhance adoption of FLR monitoring, evaluation, research & learning (MERL).	6.1.1 Intensify adoption and customization of the nationally harmonized FLR monitoring, evaluation, research & learning (MERL) methodology/tool 6.1.2 Sensitize participating stakeholders on the harmonized M&E framework for common reporting and learning 6.1.3 Build capacity of technical officers on FLR monitoring, evaluation, research & learning (MERL) methodology/tool

3.4 Implementation of the proposed restoration interventions

The County Government will liaise with the National Government and other stakeholders to facilitate FLR action planning and implementation. The County has already prepared a ROAM report and preparation of this plan will help in guiding restoration activities.

The FLR activities will be integrated and mainstreamed into the county planning processes, including the County Integrated Development Plans (CIDPs), County Environment Action Plan, County Spatial plan, Wetland Management Plans, Catchment Management Plans and Annual Developments Plans and Budgets. The County Government will collaborate with National Government Ministries,

Departments and Agencies with mandates on forests and landscape restoration, as well as non-state actors implementing FLR actions. Further, the County Government will formulate, enact and implement requisite legislations and policies to create a conducive environment for FLR interventions.

The County Environment Committee (CEC), that is already gazetted, will offer leadership and oversight in environmental issues in the County. The County Government will prioritize budgetary allocation to the environment sector to support the operations of the Committee

To undertake activities and achieve the objectives of the FOLAREP, a 10-year implementation plan, Annex 1 and a budget budget is proposed (Table 16).

4

COORDINATION AND INSTITUTIONAL FRAMEWORK

4.1 Introduction

FOLAREP will leverage on the existing structures and institutional frameworks both at the local, county and national levels. The County FOLAREP shall be coordinated by the body/department responsible for the County Forest and Landscape Restoration. The successful implementation of this plan will require commitment and interaction of top management at the County, technical experts and all stakeholders. The County will consolidate FLR interventions and link them up with the National FLR interventions geared towards achievement of the national target. Figure 20 provides a clear link and feedback mechanism within the county in the planning, resource allocation, implementation, monitoring, evaluation and reporting of FLR activities. Membership of the various committees will be informed by the mandates of various MDAs, and key stakeholders involved in FLR activities in Makueni County.

The County FLR coordination structures shall address any arising grievances received from FLR activities through the Grievance Redress Mechanism (GRM) at the Ward FLR planning committee and escalate them through GRM focal persons.

4.2 Institutional arrangement for Makueni FOLAREP Implementation

4.2.1 County FLR Advisory Committee

This Committee is anchored under the Disaster Risk Management (DRM) Policy domiciled in National Drought Management Authority (NDMA). The Committee is co-chaired by H.E the Governor and the County Commissioner, and draws its members from County Departments, National Government ministries and agencies together with representation from Implementing Partners relevant to FLR activities. This Committee will provide

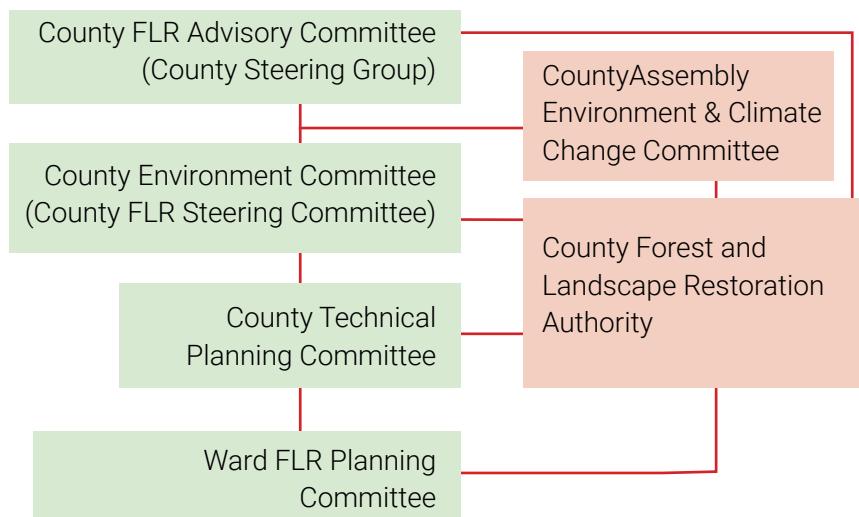


Figure 20: FOLAREP Institutional Framework

overall oversight and policy direction, set the agenda and top priorities for FOLAREP and promote financial and technical resource mobilization for the governance and implementation of FOLAREP. It will work along with Sector working groups. Further, the Committee shall ensure incorporation and implementation of recommendations from the National FLR Advisory Committee, monitor and evaluate FOLAREP's implementation, and address any associated risks.

4.2.2 County FLR Steering Committee (County Environment Committee)

This is the Committee bestowed with general Coordination of FLR activities in the County as per EMCA, 1999 (Revised, 2015). It is chaired by CECM responsible for Environment and Climate Change and the secretary is the County Director of Environment (NEMA). The County Environment Committee's composition is provided for in EMCA Cap 387 of the Laws of Kenya.

The main mandate of the CEC is to provide oversight, coordination and implementation of environmental conservation initiatives and to advise the Governor over the subject matter. The same will apply when discharging their FOLAREP coordination, oversight and resource mobilization at the county level and beyond.

4.2.3 The County Assembly Committee on Environment & Climate Change

This is a nine-member committee that will be overseeing the FLR steering committee commonly known as County Environment Committee and also the decisions arrived at the Advisory Committee.

4.2.4 County FLR Technical Planning Committee

This Committee is anchored on Makueni County Climate Change Act, 2022. It has a maximum of 31 members nominated by the Accounting Officers of the following organizations i.e KFS, NEMA, KEFRI, KALRO, KWS, WRA, Departments of Agriculture, Departments of Livestock production, Water Department Lands and Physical Planning, Department of Finance and Social Economic Planning, NDMA, and representatives from Public Benefits Organisations.

The committee shall provide technical support to the Steering Committee on the implementation of FOLAREP promoting synergies and complementarities on FLR amongst key actors. It shall also review and recommend the annual FLR Work Plans and Budgets for approval by the County FLR, prepare quarterly and annual progress reports. It shall further ensure that recommendations from the Steering Group are implemented. The committee will constitute sub-committees to provide technical support in the various thematic areas of FOLAREP including capacity building of Ward Structures together with other stakeholders.

Specific Duties of the County Technical FLR Committee will be to give technical guidance on:

- i. Implementation of specific FLR activities of the national Government and Partners;
- ii. Prepare common annual reports on FLR activities of the County government and Partners, for approval by the County Assembly where and when required;
- iii. Promote value addition and commercialization of forest products (wood and Non-Timber Forest Products (NTFPs) for program on FLR;

- iv. Promote Planning and implementation of cross sectoral Climate change adaptation and mitigation in the County.

4.2.5 Ward FLR Planning and Coordination Committee

This committee is adopted from the Ward Climate Change Planning Committee as per the Makueni County Climate Act, 2022 that consists of nine members representing diverse interests in the community namely one person from each gender representing elders, youths, persons living with disability, a representative in sectors relevant to FLR, one person representing Community Based Organizations in the Ward and Ward Administrator who is the Secretary.

The roles of this committee include:

- a) to coordinate and mobilize communities and other stakeholders in the Ward to design and implement FLR activities;
- b) to facilitate research and knowledge management at the Ward level on FLR, its impacts and strategies for implementation of restoration activities;
- c) to facilitate public education, awareness creation and capacity building at the ward level on FLR, its impacts and strategies for restoration;

- d) to coordinate, facilitate and manage community consultations on priority FLR activities;
- e) participate in county planning and budgeting process with a view of ensuring mainstreaming FLR and prioritization of restoration in county development plans;
- f) facilitate public participation in FLR governance, implementation of agreed restoration response activities and monitoring;
- g) coordinate and facilitate provision of technical support to communities in the Ward in developing proposals on FLR response projects for funding;
- h) Oversee implementation of FLR projects and report progress to the County FLR Technical Planning Committee.

4.1.6 County Forest and Landscape Restoration Authority

The functions of the Authority shall be to be secretariat of the above committees to ensure their smooth functioning in addition to their other duties as per the County Sustainable Forest Management and Landscape Restoration Authority Act, 2024.

5 | RESOURCE MOBILIZATION

5.1 Introduction

The Makueni Forest and Landscape Restoration Implementation Plan (FOLAREP) 2023-2033 is a cross-sectoral and multi-stakeholder coordination framework to accelerate actions to restore deforested and degraded landscapes in Makueni. The plan seeks to enhance resilient socio-economic development, improve ecological functioning and contribute to achieving County, National and International landscapes restoration aspirations and obligations respectively. Implementing

the Makueni FOLAREP will contribute to achieving 30% National tree cover by 2032, up from the current 12.38%. It will also be a critical instrument in supporting the aspirations of the UN Decade for Ecosystem restoration, 2021-2030.

5.2 Budget and financing mechanisms for FLR

The overall financial requirements to implement this plan is estimated to cost the County government and partners approximately KShs. 30.128 Billion.

Table 16: Financial resources required for Makueni FOLAREP

Expected Outputs	Amt. (Kshs)	Amt. (USD)
1.1 Existing policy and regulatory frameworks reviewed.	10,000,000	66,667
1.2 Implementation and development of FLR- related policy and regulatory frameworks supported	30,000,000	200,000
1.3 FLR institutional coordination to enhance implementation supported	15,000,000	100,000
2.1 Supportive and protective FLR infrastructure and enablers developed (water resource development, access roads, fire breaks, etc.)	6,000,000	40,000
3.1 The County level forest landscape restoration assessment updated and scaled down to the Ward level.	9,000,000	60,000
3.2 11,300 ha of degraded forest land/plantations restored and protected	1,695,000,000	11,300,000
3.3 46,700 ha of degraded natural forests restored	7,005,000,000	46,700,000
3.4 53,900 ha of degraded cropland/Agroforestry in the county restored	8,085,000,000	53,900,000
3.5 74,700 ha of degraded rangelands and woodlands restored	11,205,000,000	74,700,000
3.6 6,400 ha of degraded buffer zones along water bodies and wetlands restored	960,000,000	6,400,000
3.7 7,000 ha of degraded land/bare land and roadways in the County restored	1,050,000,000	7,000,000
4.1 Financial resource mobilization initiatives for FLR implementation supported	9,000,000	60,000
4.2 Restoration fund schemes (County climate change fund, Reclamation fund etc) strengthened	10,000,000	66,667
5.1 Gender inclusive green value chains promoted and developed	30,000,000	200,000
6.1 Adoption of FLR monitoring, evaluation, research & learning (MERL) enhanced	9,000,000	60,000
	30,128,000,000	200,853,333

The exchange rate used was 1 USD=KES 150 as at November, 2023

These resources will be mobilized from the County government's budgetary allocations, bilateral donors, public-private-partnership, local and international NGOs. The Makueni FOLAREP can be an opportunity for resource mobilization through global financing mechanisms such as GCF and GEF by the government in collaboration with other stakeholders.

5.3 Status of Makueni FLR financing

Currently, most of the funds for restoration are project based and sourced through different avenues.

Key financial sources available for FLR include:

- National and County government.
- Bilateral and multilateral funds such as Global Environment Facility (GEF); Green Climate Fund (GCF); World Bank.
- Local and International Non-Governmental Organizations.
- Public Private Partnership (PPP).

6

MONITORING, EVALUATION AND REPORTING FRAMEWORK

The monitoring and evaluation (M&E) framework will provide information on key milestones, challenges, and lessons learned in implementing the Makueni FOLAREP programmes. It will be essential in identifying implementation gaps, providing information on programmes and projects to key stakeholders, and assessing the achievements and impact of the restoration targets set in the plan.

Monitoring the Forest and Landscape Restoration progress will be undertaken through indicators (Figure 21) to serve as essential benchmarks that measure progress and assess the outcomes towards climate adaptation. Vegetation cover and species and biodiversity levels improved by this plan will be tracked to ensure that both

flora and fauna are thriving in the restored areas. The monitoring plan also aims at taking stock of developed soil health and stability that will maintain nutrient-rich and erosion-resistant environments. Community involvement is another key indicator, with metrics focusing on County government presence on the ground and local stakeholders engaged in restoration activities. Lastly, the FOLAREP monitoring plan can track economic benefits such as job creation through increased access to forest products that provide sustainable livelihoods for local communities. Collectively, these indicators will help gauge the effectiveness of restoration initiatives, guiding future actions and ensuring long-term ecological and social benefits.

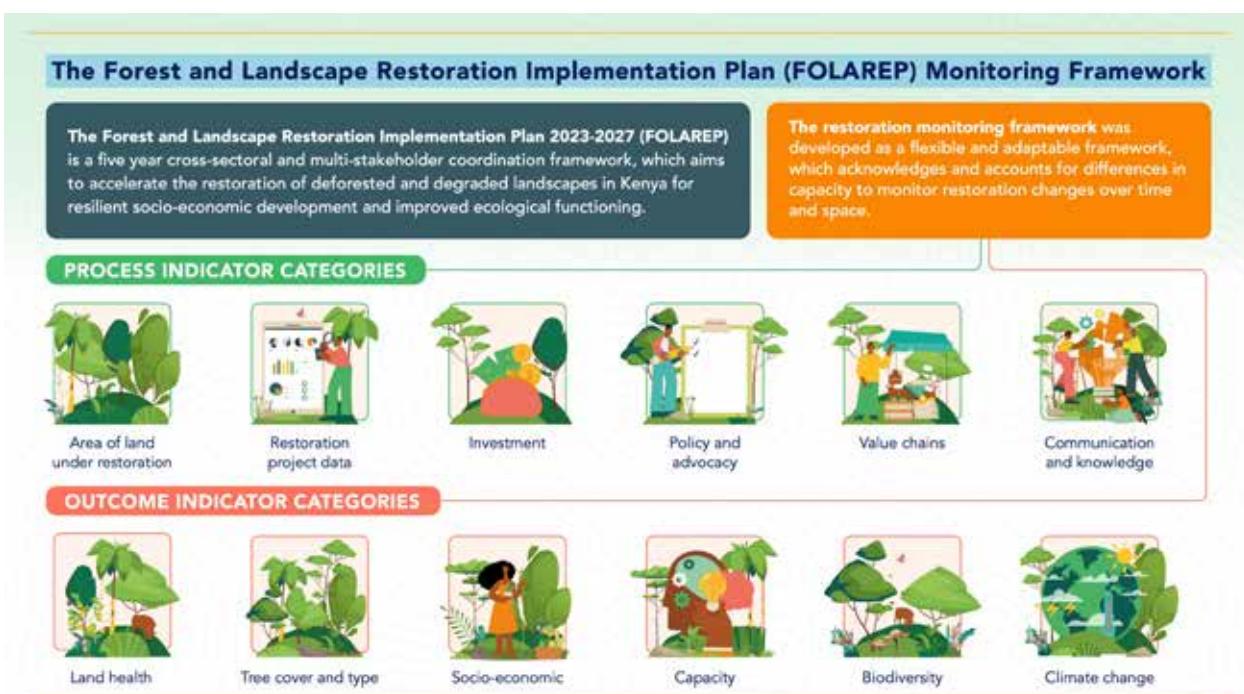


Figure 21: Indicators for FOLAREP monitoring

Table 17: Makueni County FOLAREP Monitoring and Evaluation Plan

Result Area	Indicator	Metrics	Source of Data	Frequency	Responsibility
County Legal, Regulatory and Coordination Framework	Number of legal frameworks and policies related to FLR reviewed, gaps identified and validated with stakeholders	Numbers, Types and description	Cabinet Memos, Policy briefs, CA/CE websites	Quarterly & Annually	CECM environment and climate change, County ECMs', County Assembly, County FLR secretariat
	Number of FLR policies developed and adopted by cabinet and approved by County Assembly	Numbers, Types and description	Cabinet Memos, Policy briefs, CA/CE websites	Quarterly & Annually	CECM environment and climate change, County ECMs', County Assembly
	Number of institutional coordination frameworks developed and strengthened in the County in relation to FLR	Numbers, Types and description	Cabinet Memos, Policy briefs, County Assembly & County Executive websites	Quarterly & Annually	CECM environment and climate change, County ECMs', County Assembly,
Supportive, Protective and Enabling Infrastructure Development	Number and type of infrastructure developed	Number	M&E reports and Annual Progress reports (APR)	Quarterly & Annually	CECM environment and climate change, County ECMs' County Assembly, County FLR secretariat
County Area under Forest landscape restoration	Number of FLR assessments updated and scaled down to sub county and ward levels	Numbers and Types and description	Cabinet Memos, Policy briefs, County FLR assessment reports, FLR M&E reports	Quarterly & Annually	CECM environment and climate change, County FLR secretariat, NEMA, KFS
	Hectares of degraded land restored and protected	Hectares of degraded land, natural forests, cropland, agroforestry, rangelands, woodlands, buffer zones along water bodies and wetlands and bare lands restored and protected	Cabinet Memos, Policy briefs, County FLR assessment reports, FLR M&E reports, County Statistical Abstracts, Ward Profiles	Progress, quarterly and Annually	CECM environment and climate change, KWS, KFS, County Forest Authority, Ministry of lands/ survey, County Survey Division

Result Area	Indicator	Metrics	Source of Data	Frequency	Responsibility
County Resource Mobilization	Amount of financial resources mobilized toward FLR	Kshs, USD, Stakeholders' inventory (grants and donors)	County Annual Budgets, County Fiscal Strategy Papers, County Investment Profiles, County Stakeholders'/ Liaison reports	Quarterly	CECM environment and climate change, County Treasury,
	Number of FLR fund schemes strengthened	FLR fund schemes (CCCF and Restoration fund)	County Annual Budgets, County Fiscal Strategy Papers, County Investment Profiles	Quarterly	CECM environment and climate change, County Treasury,
Nature-based value chains and adoption of alternative sources of livelihoods for improved wellbeing of communities	Number of gender inclusive green value chains promoted and developed	Numbers of gender groups	FLR secretariat reports, CSA Gender assessment and mapping reports	Biennial & Annually	CECM environment and climate change and gender
	Number of bankable projects on nature based value chains invested with restoration benefits	Investment amount	County Investment Profiles, County Annual Budgets	Annually	CECM environment and climate change, County Treasury, County Forest Authority, KFS
	Percentage change in community livelihoods/income levels	Income levels, jobs created	KNBS CSA/ Ward Profiles Kenya Household Survey	Annually	CECM environment and climate change, County Treasury

Result Area	Indicator	Metrics	Source of Data	Frequency	Responsibility
Research, Innovation and Knowledge management	Baseline survey & Evaluation	Current FLR practices	Ward Profiles, Kenya Household Survey	Thrice in the project period (At the start, midway & end)	CECM environment and climate change County Treasury
	Percentage adoption of FLR best practices	Percentage, Number and description	County FLR secretariat reports, Policy briefs	Annually	CECM environment and climate change, KWS, KFS County Forest Authority
	Number of knowledge management products produced on FLR	Number and description	County FLR secretariat Reports, Policy briefs	Annually	CECM environment and climate change, County Treasury
	Number of technologies on FLR researched, innovated and promoted in the county	Number and description	County FLR secretariat Reports, Policy briefs	Annually & Biennial	CECM environment and climate change KWS, KFS County Forest Authority
	Number of integrated M&E management system developed and adapted in the county	Number and description	County FLR secretariat Reports, Policy briefs	Annually	CECM environment and climate change, KWS, KFS County Forest Authority

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ANNEXES

Annex 1: Implementation Matrix

Activity	Output	Means of Verification	Responsible Institutions	Time frame				
				2024 - 2028	2029-2033			
Strategic Intervention Area 1: Review existing policy and regulatory frameworks								
Objective 1: To develop and strengthen policies, regulatory frameworks and institutional coordination for enhanced FLR implementation								
Identify and review the gaps in the existing FLR related policies and regulations in view of global, regional, national initiatives, treaties, conventions, protocols and agreements	Existing FLR policies reviewed and gaps identified	Invitation letters, number of meetings conducted and minutes, Policies reviewed	FLR secretariat, Relevant National Government entities and Development partners	X	X			
Harmonize the gaps in existing FLR related policies and regulations, frameworks and validate the reviewed policies with stakeholders	Policy gaps harmonized in relation to FLR and validated by stakeholders	Reports and gaps identified and harmonized	Relevant County Government depts, Relevant National Government entities and Development partners	X	X			
Prepare a cabinet memo outlining key recommendations on policy review and harmonization by County Executive and if need be forward to County Assembly for approval	Cabinet Memo with recommendations on policy review and harmonization requirements	Cabinet memo	CECM responsible for Environment and Natural Resources	X	X			
Recommend development of new policies and/or regulations as advised by legal review outcome	Developed policies and legal frameworks on FLR	Reports, Policies recommended	County Executive Committee (CEC) Policies developed	X	X			

Activity	Output	Means of Verification	Responsible Institutions	Time frame	
				2024 - 2028	2029-2033
Strategic Intervention Area 2: Support implementation and development of FLR-related policy and regulatory frameworks					
Create awareness on FLR-related policies and regulations at the County and Ward levels	Awareness created on FLR related policies and regulations	Awareness report, Training materials developed	Relevant County Government depts, Relevant MDAs and Development partners	X	X X X X X X
Support development of recommended policies in activity / Strengthening the existing laws and policies	Finalized FLR Policies	Reports, Developed policies, Laws reviewed	Relevant County Government depts, Relevant MDAs and Development partners	X	X X X X X X
Develop County FLR related policies, legislations and framework	Finalized FLR Policies	Reports, Developed policies, Laws reviewed	Relevant County Government depts, Relevant MDAs and Development partners	X	X X X X X X
Integrate FLR policies and strategies in County Integrated Development Plans (CIDPs)	Linked FLR policies with county plans	Reports, CIDP with FLR activities	Relevant County Government depts	X	X X X X X X
Strategic Intervention Area 3: Support institutional coordination to enhance implementation of FLR					
Strengthen existing FLR related coordination units at County level, Sub County and at Ward level	Strengthened FLR related coordination units/structures	Trainings and progress reports,	Relevant County Government depts, Relevant MDAs	X	X X X X X X
Establish technical secretariat for continuous coordination of FLR efforts at County level	Established technical secretariat for FLR Coordination	Appointment letters, Progress reports	Relevant County Government dept, NEMA, NDMA	X	X X X X X X
Establish County multi-stakeholder engagement forum	Established and strengthened County multi-stakeholder engagement platform	Meeting minutes,	Relevant County Government depts, Relevant MDAs and Development partners	X	X X X X X X
Develop and strengthen forums for stakeholders' engagement in FLR implementation and monitoring	Developed and strengthened FLR implementation and monitoring forum	Implementation reports, Monitoring reports, Engagement reports	Relevant County Government depts, Relevant MDAs and Development partners	X	X X X X X X

Activity	Output	Means of Verification	Responsible Institutions	Time frame			
				2024 - 2028	2029-2033		
Develop and strengthen trans-ward and inter-county frameworks for FLR implementation	Developed and strengthened trans-ward and inter-county framework	Frameworks developed, Reports	Relevant County Government depts, Relevant MDAs and Development partners	X	X	X	X
Strengthen cross-sectoral and inter-departmental efforts on FLR related activities	FLR cross-sectoral linkages established	Cross-sectoral reports	Relevant County Government depts, Relevant MDAs and Development partners	X	X	X	X
Create and strengthen linkages and synergies with existing FLR related programmes	Linkages and synergies created and strengthened on related programmes	MOUs, MOAs and partnership reports	Relevant County Government depts, Relevant MDAs and Development partners	X	X	X	X
Objective 2: To enhance the capacity of stakeholders to undertake forest and landscape restoration							
Strategic Intervention Area 4: Develop supportive and protective FLR infrastructure and enablers (Water Resource Development, Access Roads, fire breaks, etc)							
Build capacity of key FLR stakeholders on identification and profiling of supportive and protective infrastructure	Number of stakeholders capacity built	Incident reports, meeting minutes, reports, Participants lists	Relevant County Government depts, Relevant MDAs and Development partners	X	X	X	X
Development and maintenance of supportive and protective infrastructure (Water points, fire breaks)	Length/Number of supportive and protective infrastructure developed	Inventory reports, Number and types of infrastructure developed	Relevant County government depts	X	X	X	X
Maintain inventory of both supportive and protective FLR Infrastructure	Frequency of inventory updating	Inventory audit reports	Relevant County Government depts, Relevant MDAs and Development partners	X	X	X	X

Activity	Output	Means of Verification	Responsible Institutions	Time frame	
				2024 - 2028	2029-2033
Objective 3: To restore 200,000 ha of degraded forests and landscapes in prioritized areas in the County					
Strategic Intervention Area 5: Update and scale down the County level forest landscape restoration assessment to the Landscape and Ward level					
Access and analyse the Technical Report on the National Assessment of FLR Opportunities in Kenya (MENR, 2016) and the Makueni ROAM Report, 2018	Reviewed technical reports on assessment of FLR opportunities	Analysis reports	Relevant County Government depts, Relevant MDAs and Development partners		
Strengthen capacity of stakeholders to implement recommendations of County Forest Landscape Restoration Plan (FOLAREP)	Capacity build stakeholders on FLR implementation	Training and progress reports	Relevant County Government depts, Relevant MDAs and Development partners		
Develop and implement specific Landscapes and Ward level Forest and Landscape Restoration (FLR) Plans	Developed and implemented Ward FLR Plans	Reports, Ward FLR plans	Relevant County Government depts, Relevant MDAs and Development partners		
Strategic Intervention Area 6: Restore and protect 11,300 ha of degraded forest land/plantations					
Mapping, surveying, beaconing and gazettlement of non gazetted forests	Mapped, surveyed, beaconed and gazetted county forests	Maps, Survey reports and gazetted forests	Relevant County government depts, National Land Commission		
Identification and preparation of sites for plantation establishment	Plantation sites identified and prepared	Site reports	Relevant County government depts, KFS		
Strengthen capacity of stakeholders to produce 19 million seedlings of preferred plantation species	Number of seedlings of preferred species produced	Stakeholder training reports, Seedling production reports	County Government, Relevant County Government Depts, Relevant MDAs, Development partners, private entities		

Activity	Output	Means of Verification	Responsible Institutions	Time frame	
				2024 - 2028	2029-2033
Establish 11,300 hectares of plantations and carry out necessary silvi-cultural practices	Number of hectares of forests established and maintained	Reports on plantation establishment, survival monitoring reports	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X	X X X X X X
Develop and review Forest Management Plans- FMPs	Developed and reviewed County Forest management plan	FMP Review Reports, FMPs developed	KFS, Relevant County Government Depts, CFAs	X X X X X X	X X X X X X
Strategic Intervention Area 7: Restore 46,700 ha of degraded natural forests					
Undertake enrichment planting, silvi-cultural practices in 46,700 hectares of natural forests	Area of degraded natural forests restored	Progress reports, survival monitoring reports	Relevant County Government depts, Relevant MDAs, private sector and Development partners	X X X X X X	X X X X X X
Promote and enhance natural regeneration in specific identified natural forests	Area under natural regeneration	Progress reports	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X	X X X X X X
Identify and manage invasive species in plantations and natural forests	Identified and managed invasive species	Progress reports	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X	X X X X X X
Identify and promote conservation and protection of endemic and endangered species	Identified, conserved and protected endemic and endangered species	Progress reports	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X	X X X X X X
Develop and review Participatory Forest Management Plans	Developed and reviewed PFMPS	Reports, PFMPS	Relevant County government depts, KFS, CFAs, Development partners	X X X X X X	X X X X X X

Activity	Output	Means of Verification	Responsible Institutions	Time frame	
				2024 - 2028	2029-2033
Create awareness and sensitization to government agencies, non-state actors, private entities and Community Forest Associations on FLR actions	Sensitized government agencies, non-state actors, private entities and Community Forest Associations	Training/progress reports,	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X	X X X X X X
Promote innovative community-based and cost-efficient approaches for protection of restored and/or areas under restoration (such as use of surveillance technologies, adopt a forest, social fencing, solar fencing among others)	Promoted innovative and cost efficient approaches for restoration	Progress reports,	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X	X X X X X X
Promote and incentivize restoration approaches by private entities	Incentivized restoration approaches	MOUs, MOAs Progress reports	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X	X X X X X X
Strategic Intervention Area 8: Restore 53,900 ha of degraded cropland/Agroforestry in the county		Maps and Survey reports, Progress reports	Relevant County Government depts,	X X X X X X	X X X X X X
Map and promote protection of ecologically sensitive niches within croplands from degradation	Mapped and protected niches within croplands	Demo farms, Progress reports	Relevant MDAs and Development partners	X X X X X X	X X X X X X
Identify and promote the adoption of agroforestry best practices (setting up demo sites, FFS)	Number of identified and promoted best practices on agroforestry	Promoted soil and water conservation measures	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X	X X X X X X
Promote soil and water conservation measures in degraded croplands	Progress reports				

Activity	Output	Means of Verification	Responsible Institutions	Time frame	
				2024 - 2028	2029-2033
Support and make accessible 333 million quality fruit trees (Avocado, macadamia, mangoes, citrus etc) and 206 million high value tree seedlings (<i>Grevillea</i> , <i>Tamarindus</i> , <i>Moringa</i> , <i>Sclerocarya birrea</i> (amarula), <i>Terminalia brownii</i> , <i>Sesbania</i> , <i>Melia</i> etc) totaling to 539 million tree seedlings	Accessibility to improved high value quality seedlings	Number of high quality seedlings produced and supplied, Seedling production and distribution reports, survival monitoring reports	Relevant County Government depts, Relevant MDAs and Development partners	X	X
Promote Sustainable Land Management Practices (SLM) such as conservation agriculture, Climate Smart Agriculture, farmer managed natural regeneration etc)	Adopted SLM practices Area under SLM	Progress reports	Relevant County Government depts, Relevant MDAs and Development partners	X	X
Strategic Intervention Area 9: Restore 74,700 ha of degraded rangelands and woodlands					
Promote pasture seed production, range reseeding and natural regeneration initiatives through community involvement	Quantities of pasture seed produced, rangeland areas reseeding and area under natural regeneration	Reports on quantities of seeds produced, Reports of areas restored through reseeding, monitoring reports	Relevant County Government depts, Relevant MDAs and Development partners	X	X
Improve access to 8 million drought tolerant seedlings (250 seedlings per hectare)	Improved access to seedlings and establishment of drought tolerant species	Seedlings production report, Progress reports, survival monitoring reports	Relevant County Government depts, Relevant MDAs and Development partners	X	X
Sensitization of communities on best practices on rangeland management	Number of community members sensitized	Training reports and minutes	Relevant County Government depts, Relevant MDAs and Development partners	X	X

Activity	Output	Means of Verification	Responsible Institutions	Time frame	
				2024 - 2028	2029-2033
Promote soil and water conservation technologies and water harvesting measures in rangelands	Adopted soil and water conservation technologies and measures	Progress reports	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X	X X X X X X
Identify, map and manage key invasive species	Identified, mapped and managed areas under invasive species	Maps, progress reports, monitoring reports	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X	X X X X X X
Promote livelihood diversification programmes and green IGAs (Income Generating Activities - Commercial pasture development, feed lotting, hay)	Promoted livelihood diversification programmes	Progress reports	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X	X X X X X X
Promote sustainable utilization and value addition of wood and Non-Timber Forest Products (NTFPs)	Adopted value addition practices and value chains for wood and NTFPs	Wood and NTFPS value chains reports and products, Progress reports	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X	X X X X X X
Strategic Intervention Area 10: Restore 6,400 ha of degraded buffer zones along water bodies and wetlands		Map, survey, pegging, gazette and secure water bodies, wetlands and riparian buffer zones	Maps, Survey reports, Gazetted water bodies, progress reports	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X
Strengthen the capacity of local communities and affiliated user groups through capacity building on best technologies to undertake restoration and management of water bodies, wetlands and riparian zones		Number of capacity build stakeholders on best restoration management practices	Training reports, minutes and progress reports	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X

Activity	Output	Means of Verification	Responsible Institutions			
			2024 - 2028	2029-2033	2024 - 2028	2029-2033
Promote, incentivise and upscale best water harvesting, soil conservation, riverine restoration and adoption of indigenous knowledge approaches along rivers, wetlands and water bodies	Promoted and incentivised best practices for restoration	Training reports, Progress reports, Indigenous technologies documented, MoUs/MOAs	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X X	X X X X X X X	X X X X X X X
Support development and implementation of specific water catchment management plans	Number of developed water catchment management plans	Water Catchment Management Plan Progress report, MoUs/MOAs	Relevant County government depts, WRA and Development partners	X X X X X X X	X X X X X X X	X X X X X X X
Enhance enforcement of existing laws and regulations on riparian conservation to safeguard the gains made on restoration	Improved compliance to existing laws and regulations on riparian conservation	Sensitization reports, Enforcement/ prosecution reports, Water abstraction and pollution survey reports	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X X	X X X X X X X	X X X X X X X
Strategic Intervention Area 11: Restore 7,000 ha of degraded land/bare land/urban areas and roadways in the county						
Map and promote protection of degraded and bare land	Mapped and protected degraded and bare land	Maps of protected sites, Progress reports, MoUs	Relevant County Government depts, Relevant MDAs and Development partners	X X X X X X X	X X X X X X X	X X X X X X X
Identify and promote the adoption of best restoration practices for degraded, denuded and bare land (Trapezoidal and half-moons bands etc)	Number of identified and adopted best practices for restoration	Progress reports	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X X	X X X X X X X	X X X X X X X
Support mass production of planting live materials/germplasms (sisal, euphorbia, grass, bamboo, aloe etc) to restore 7,000 ha of degraded land	Number of produced live planting materials, Area of land under restoration	Progress reports,	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X X	X X X X X X X	X X X X X X X

Activity	Output	Means of Verification	Responsible Institutions	Time frame	
				2024 - 2028	2029-2033
Identify and promote adoption of mechanical interventions (Gabion boxes, check walls, scour checks etc) to restore denuded lands by soil erosion	Number of Identified and adopted interventions for restoration	Progress reports, Approved design plans, BoQs, Technical reports	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Identify and promote roads for water harvesting technologies (farm ponds, mired drains, road beautification program etc) to restore roadways surface runoff	Number of identified and implemented road runoff harvesting technologies	Monitoring reports, Approved design plans, Technical reports	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Identify and promote adoption of farmer managed natural regeneration restoration technologies on denuded land	Area identified, restored through farmer managed natural regeneration	Monitoring reports, Progress reports	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Objective 4: To mobilize resources locally, nationally and internationally from public and private partnerships for FLR implementation					
Strategic Intervention Area 12: Support financial resource mobilization initiatives for FLR implementation					
Conduct the County capacity needs assessment on resource mobilization	Number of capacity needs assessments conducted	Capacity needs assessment report,	Relevant County Govt Depts, and Development partners	X X X X X X	X X X X X X
Enhance the County capacity on resource mobilization and proposal development by training stakeholders and actors to implement FLR	Capacity on resource mobilization enhanced	Training reports,	County government, MDAs, private entities and Development partners	X X X X X X	X X X X X X
Support stakeholders to develop a bankable FLR investment projects and business plans	Number of Developed bankable FLR investment projects and business plans	Concept notes, proposals, business plans, MoUs / MoAs	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Promote community-based innovative financing mechanisms to support restoration	Number of Promoted operating financing mechanisms	Concept notes, proposals, Access to finances, MoUs, MoAs	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X

Activity	Output	Means of Verification	Responsible Institutions	Time frame	
				2024 - 2028	2029-2033
Develop County public-private partnership (PPP) framework or platform to finance FLR	Number of developed public-private partnership (PPP) frameworks or platforms to finance FLR	MoUs, MoAS, Progress reports	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Advocate for additional FLR budgetary allocations by the County Executive and Assembly	Increased FLR budgetary allocations	Budget allocation report	Relevant County govt Depts	X X X X X X	X X X X X X
Develop a strategy for enhancing access to financial resources for FLR from private sector and other stakeholders	Developed strategy for enhance access to financial resources	Strategic plan, Progress report, MoUs / MoAs	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Promote linkages to optimize bilateral and multilateral funding opportunities for restoration	Number of Promoted linkages	Strategic plan, Progress report, MoUs/MoAs	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Strategic Intervention Area 13: Strengthening restoration fund schemes (County climate change fund, Reclamation fund, County Water Fund etc)					
Strengthen existing governance structures for FLR resources mobilization and disbursement	Strengthened governance structures	Progress reports	Relevant County govt depts, MDAs and Development Partners	X X X X X X	X X X X X X
Advocate and champion the use of existing climate funding schemes eg Carbon credit trading and offsets	Existing funding scheme in use	Carbon trading reports	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Develop and strengthen fund structure and governance procedures	Developed and strengthened procedures	Training reports and procedures	County government, and Development partners	X X X X X X	X X X X X X
Objective 5: To promote inclusive nature-based value chains and adoption of alternative sources of livelihoods for improved wellbeing of communities					
Strategic Intervention Area 14: Promote and develop gender inclusive green value chains					
Map out existing green value chains and technologies in the County for improved livelihoods	Number of mapped out existing green value chains and technologies	List of value chains and technologies identified, participation by vulnerable and marginalised groups	Relevant county government, Relevant MDAs, private entities and Development partners	X X	

Activity	Output	Means of Verification	Responsible Institutions	Time frame	
				2024 - 2028	2029-2033
Identify structural barriers to equitable access to restoration benefits (gender, youth and vulnerable groups)	Number of identified structural barriers to restoration	Assessment Report	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Develop measures that enhance equitable access and sharing of the FLR benefits	Enhanced equitable access and sharing of the FLR benefits	Inclusivity report	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Develop appropriate value chains for the identified products	Number and type of developed value chains	Reports	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Disseminate and upscale green value products	Disseminated and up-scaled nature-based enterprises and products	Reports	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Objective 6: To enhance adoption of FLR monitoring, evaluation, research & learning (MERL), knowledge management and information sharing					
Strategic Intervention Area 15: Enhance adoption of FLR monitoring, evaluation, research & learning (MERL)					
Enhance adoption and customization of the nationally harmonized FLR monitoring, evaluation, research & learning (MERL) methodology/tool	Enhanced adoption and customization of FLR monitoring, evaluation	Methodology tools	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Sensitize participating stakeholders on the harmonized MERL framework	Sensitized stakeholders on the harmonized M&E framework	MERL reports	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X
Build capacity of technical officers on FLR monitoring, evaluation, research & learning (MERL) methodology/tool	Number of trained technical officers, Number of trainings	Training Reports, Monitoring reports	Relevant County govt Depts, Relevant MDAs, Private entities and Development partners	X X X X X X	X X X X X X

Annex 2: Tree Species & Grass Suitability

The suitability of grass and tree species holds paramount importance in the context of restoration efforts. It significantly influences the success and effectiveness of the restoration process, impacting the ecological, environmental, and social aspects of the restored area. Proper selection of tree species and grass ensures not only the establishment of a resilient ecosystem but also contributes to biodiversity, soil health,

and the overall sustainability of the restored landscape.

Agro-ecological zones were utilized to illustrate tree and grass suitability. The data and map below effectively convey information about suitable tree species and where they are most suitable, enabling land managers, conservationists, and policymakers to make informed decisions and plan for sustainable land use and ecosystem restoration.

Tree, shrub and Grass Species Suitable for Makueni Sub Counties

S/No	Sub-County	Agroecological zones	Tree/shrub species	Grasses
1	Makueni	Upper midland zone Lower midland zone	<i>Acacia senegal, Albizia spp, Balanites aegyptica, Combretum schumanii, Cordia sinensis, Melia volkensii, Sclerocarya birrea, Tamarindus indica, Vitex payos, Terminalia prunoides, Terminalia brownii, Acacia tortilis, Acacia nilotica, Combretum schumanii, Lannea schweinfurthii, Lannea rivae, Combretum rotundifolium, Vitex payos, Croton megalocarpus, Maerua triphylla, Terminalia brownii, Terminalia spinosa, Warbugia ugandensis, Ocotea madascariensis, Ficus sycomorus, Croton dichogamus, Grewia bicolor, Grewia tembensis</i>	<i>Cenchrus ciliaris, Chloris roxburghiana, Enteropogon macrostachyus and Eragrostis superba.</i>
2	Mbooni	Upper midland zone Lower midland zone	<i>Dalbergia melanoxylon, Grevillea robusta, Markhamia lutea, Spathodea campanulata, Acacia senegal, Acacia polyacantha, Acacia tortilis, Acacia nilotica, Croton macrostachys, Casuarina equisetifolia, Acacia mearnsii, Osyris lanceolate, Senna siamea, Senna spectabilis, Albizia spp, Balanites aegyptica, Combretum schumanii, Combretum rotundifolium, Cordia sinensis, Melia volkensii, Sclerocarya birrea, Tamarindus indica, Vitex payos, Croton megalocarpus, Terminalia brownii, Terminalia spinosa, Warbugia ugandensis, Eucalyptus spp, Cypress, Lannea schweinfurthii, Lantana camara, Citrus spp, Mangifera indica</i>	For high altitude include Bracharia varieties are also suitable - <i>Bracharia Muluato II, Cayman, Cobra, Piata, Xaraes, MG-4 and Basilisk; Panicum variety Siambasa and Boma rhodes</i> -

S/No	Sub-County	Agroecological zones	Tree/shrub species	Grasses
3	Kibwezi (Kibwezi East & Kibwezi West)	Lower midland zone Inner Lower land zone	<i>Melia volkensii, Dalbergia melanoxylon, Maerua triphylla, Casuarina equisetifolia, Balanites aegyptica, Grevillea robusta, Markhamia lutea, Adansonia digitata, Spathodea campanulata, Acacia senegal, Acacia tortilis, Acacia, Acacia nilotica, Acacia mellifera, Senna siamea, Combretum schumanii, Grewia tembensis, Combretum rotundifolium, Cordia sinensis, Sclerocarya birrea, Tamarindus indica, Warbugia ugandanensis, Jatropha curcas, Diospyros scabra, Moringa oleifera, Moringa stenopetala, Berchemia discolor, Azadirachta indica, Melia azadirach, Terminalia brownii, Grewia bicolor, Lannea schweinfurthii, Commiphora africana, Commiphora baluensis, Lannea rivae, Croton dichogamus, Delonix elata, Cassia alata</i>	<i>Cenchrus ciliaris, Chloris roxburghiana, Enteropogon-macrostachyus and Eragrostis superba.</i>
4	Kaiti (Kilungu, Ilima, Kee & Uki)	Upper midland zone Lower midland zone	<i>Acacia polyacantha, Acacia senegal, Dalbergia melanoxylon, Grevillea robusta, Tectonia grandis, Casuarina equisetifolia, Gmelina arborea, Senna siamea, Osyris lanceolate, Markhamia lutea, Balanites aegyptica, Albizia spp, Combretum schumanii, Cordia sinensis, Melia volkensii, Sclerocarrya birrea, Tamarindus indica, Vitex payos, Croton megalocarpus, Warbugia ugandanensis, Moringa oleifera, Citrus spp, Mangifera indica, Eucalyptus spp, Cypress</i>	<i>Cenchrus ciliaris, Chloris roxburghiana, Enteropogon-macrostachyus and Eragrostis superba.</i>
5	Kilome	Upper midland zone Lower midland zone	<i>Grevillea robusta, Acacia Senegal, Acacia polyacantha, Casuarina cunninghamiana, Grewia tenax, Albizia gummifera, Osyris lanceolate, Senna siamea, Balanites aegyptica, Combretum schumanii, Melia volkensii, Sclerocarya birrea, Tamarindus indica, Vitex payos, Croton megalocarpus, Warbugia ugandanensis, Terminalia spinosa.</i>	For high altitude include Bracharia varieties such as; <i>Bracharia Mutato II, Cayman, Cobra, Piata, Xaraes, MG-4 and Basilisk;</i> <i>Panicum variety Siambasa and Boma rhodes -</i>

Annex 3: FLR Hotspots in the County

According to the National Drought Early Warning Bulletin 2023 by NDMA, the County was on alert drought phase. 15 Wards of the 30 Wards were frequently hard hit by drought. This trend has been somehow consistent in the last three decades. The Cover Change detection maps indicate several FLR hotspots across the County that can be summarized as below:

Sub County	Ward	Thematic Area	Environmental Issue	Location
Kaiti	Kilungu	Forestry	<ul style="list-style-type: none"> Illegal grazing Encroachment Deforestation 	Kyamakuu (Kivaku) Kandoto (Kikoko) Kilungu forest (Ithemboni Road)
		Landscape	<ul style="list-style-type: none"> Gullies Soil erosion Unregulated sand harvesting Landslides 	Kikoko Sub- Ward; Kwa Katinda (Kithangathini), Kwa Damion (Kitoini), Kiseki (kwa muindi), Kivotini (Kikoko), Kwa mama Rose (Kikoko), Kyanguo, Kitheuni, Kithetheni, Muthethe, Matua, Kyakathungu, Kwa Maithya (Kisekini) Kithembe Sub-Ward; Uini, Kwa Kakuu, Nyaani, Kwa Malutu, Kyangoi , Kwa Kithome, Kwa Kamusyi, Kyekoto, Kavingoni
		Wetlands/ water sector	<ul style="list-style-type: none"> Pollution Siltation Deforestation 	Kikoko sub-ward: Kanze (Kitheuni), Alani (kithangathini), Ilovoto, Valalya (Kiuva), Kansaa (Kituermwe), Kyanyangu (Kithetheni),
	Ilima	Forestry	<ul style="list-style-type: none"> Illegal grazing 	Kwa Charles Mbundo, Kyambeke
		Landscape	<ul style="list-style-type: none"> Gulleys 	Kwa Malia, Katikomu, Mutomboa
		Wetlands/ water sector	<ul style="list-style-type: none"> Pollution 	Along Ndolo Valley, Musuvi stream
	Kilala	Forestry	<ul style="list-style-type: none"> Illegal grazing Bush fire outbreaks Firewood/tree felling 	Katende, Mutula Forest, Kilala Forest, Kyai Forest, Nthangu Forest
		Landscape	<ul style="list-style-type: none"> Gulleys 	Kaumoni Gully
		Wetlands/ water sector	<ul style="list-style-type: none"> Pollution Siltation 	Ikangaani Wetland
Kee	Kee	Forestry	<ul style="list-style-type: none"> Charcoal burning Illegal grazing 	Makongo Forest, Ndauni, Kimwatuo, Kivau,
		Landscape	<ul style="list-style-type: none"> Gullies Silt Bareland Landslides 	Watema Sub -Location: Kwa Kivinda, Kyathuti Dam, Kwa Sesi, Kwa Masani, Kwa Kingoo, Kwa James , Kwa Mangao, Kwa Kimwatu, Kaiti Drift (Kitandi), Kwa Mwangu (Mutulani), Kwa Katheka (Kakikya) ,Mikaini Dam, Kasunguni Dam, Kwa Ngindu (Kasunguni), Kavete Village, Mutuoni Stream, Kwa Kasisi, Kwa Kavutu, Kwa Muia / Mbevi-Ikalyoni Area, Kwa Ngalia, Kya Mwalula, Kwa Mwinzi, Kwa Mutisya, Kwa Munyambala - Makongo Area Kwa Cleopha, Kwa Makanzu, Sangai
		Wetlands / water sector	<ul style="list-style-type: none"> Pollution 	Along Kaiti River Along Waswa River

Sub County	Ward	Thematic Area	Environmental Issue	Location
Kibwezi West	Emali/ Mulala	Forestry	<ul style="list-style-type: none"> • Encroachment, illegal grazing in hills, deforestation, • Charcoal burning 	Muuni hill, Maatha hill, Tutini hill, Across the ward
		Landscape	<ul style="list-style-type: none"> • Gullies 	Mwasangombe, Iteta, Maatha, Tutini
		Wetlands / water sector	<ul style="list-style-type: none"> • Water pollution from agro-chemicals • Sand harvesting, riverine vegetation destruction and encroachment 	Along Muooni river
	Nguu/ Msumba	Forestry	<ul style="list-style-type: none"> • Deforestation, grazing in hills, encroachment 	Ithumba hill, Nguu hill
		Landscape	<ul style="list-style-type: none"> • Gullies • Bare land 	Itaava- Ithumba cluster, Yikivumbu, Vololo, and Masamukye clusters Ndunguni, Katulani, Kitende and gulleys
		Wetlands / water sector	<ul style="list-style-type: none"> • Encroachment and destruction of riverine vegetation 	Along Muuoni river and Kikuu river
	Makindu	Forestry	<ul style="list-style-type: none"> • Deforestation and encroachment 	Twaandu, Mitendeu and Kaasuvi hill, Kai Hill
		Landscape	<ul style="list-style-type: none"> • Bare land and gullies 	Kyanda in Kalii, Kwa Maundu in Kalii, Kwa Manzala Ngaakaa, kalindiloni, Ndalani, Kandengya, Kilema/Wayona
		Wetlands / water sector	<ul style="list-style-type: none"> • Encroachment • Uncontrolled shallow wells, illegal grazing • Deforestation/ riverine destruction • Sand harvesting 	Kiu catchment, along Muooni river and Kiboko river, Kiu catchment and Kiboko springs/river, Kiboko river, Kiu catchment, Kiboko river-Nthia, Makindu river
Nguumo	Forestry		<ul style="list-style-type: none"> • Encroachment, deforestation and grazing in hills • Charcoal burning 	Mbuinzau hill, Kilema hill, Tunguni, Kituvu and Makusu, Ndovoini, Muuni, Kaunguni, Kwa Nguni, Ngoleni, Kwa Mungala, Kwa Masavu, Kwa Maitha, Kwa Ngila,
			<ul style="list-style-type: none"> • Grazing, illegal tree felling 	Kilema hill, Mbuinzau hill
	Landscape		<ul style="list-style-type: none"> • Gullies and bare land 	Makusu, Tuanga, Mukononi, Wiivia, Ivoleni villages, Mbui – Nzau hill, Ing'oleni Hill, Wiivia water way, Mukononi water way, kaunguni lava corridor, Kwa Masavu
	Wetlands / water sector		<ul style="list-style-type: none"> • Destruction of water towers 	Mbuinzau hill, Kwelaa, Kivovwe, Kalovoto, Kilema Hill, Ithayoni, Kivovwe Syongelema, Kwa Kitusa

Sub County	Ward	Thematic Area	Environmental Issue	Location
Kibwezi East	Kikumbulyu South	Forestry	<ul style="list-style-type: none"> • Encroachment, deforestation and grazing in hills 	Mbuinzau hill,
		Landscape	<ul style="list-style-type: none"> • Bare land and gullies 	Siembeni-KwaKyai road, Masalani, Katulani-Mitundu road, Kalamba – Kawala road
		Wetlands / water sector	<ul style="list-style-type: none"> • Deforestation/illegal tree felling • Riparian encroachment • Grazing in wetland • Sand harvesting 	Kwakyai wetland, yuu river riparian area,Kibwezi river,Kibwezi/ (mwisho wa lami area),Kalamba river, Yanda Malisyo
	Kikumbulyu North	Forestry	<ul style="list-style-type: none"> • Deforestation on farms and charcoal burning • Prolonged draught • Deforestation • Overgrazing 	Ngulu, Mukononi water catchment rock
		Landscape	<ul style="list-style-type: none"> • Bare land and gullies • Gullies 	Ndetani, Kisayani, Ithumula, Katilamuni, Kasekeleni, Yikivala, Nguuni, Kivati, Kinzuu, Makaani, ing'uutheni, Kisayani cluster, Musingini cluster, Ndetani cluster, Ithumula cluster
		Wetlands / water sector	<ul style="list-style-type: none"> • Water pollution • Riparian encroachment and riverine vegetation destruction 	Athi river, Yuu river, Kimuu, Mukononi
	Kilome	Land degradation	<ul style="list-style-type: none"> • Gullies • Landslides 	Kiongwani, Kakutha, Muvai, Itumini, Munakye, Mangani, Kiongwani, Kilome, Mwasang'ombe, Vumbu, Kwa Misi, Malili, Kiiwii, Uvou, Maiani, Mutiluni, Kwa Katinda, Kwa Professor, Kavila, Kitonguni, Kaketa
		Forests	<ul style="list-style-type: none"> • Illegal logging, illegal grazing, encroachment. 	Kiongwani hill and Kenze, Kitumbuni, Ndatai, Nzama Nguu, Kya Kitoo
		Riparian zones / wetlands	<ul style="list-style-type: none"> • Encroachment, pollution from agrochemicals and farm, siltation, poor sand harvesting. 	Kwa Muulu, Kwa Kasilia, Nzaini, Nganya, Kasyukoni, Kwa John, Kiungani, Kithiini (wetlands) Rivers: Usi Unene, Kitonguni, Kwa Longo, Kaketa, Katalani, Ithima, kwa Mbisi, Muthitha and Kyandue

Sub County	Ward	Thematic Area	Environmental Issue	Location
Kiima Kiu/ Kalanzoni	Kiima Kiu/ Kalanzoni	Forests	<ul style="list-style-type: none"> Illegal grazing and illegal logging 	Mawa, Malili and Ulu Conservancy hills, Kimakiu, Mwia, Nthaani, Kithea
		Land degra-dation	<ul style="list-style-type: none"> Gullies 	Kwakatili, Kavuko, Marwa, Kalembwani, Ivelko, Mithanga, Kiteini, Kwa Elijah, Mkanda, Maiti, Katingi, Musengoni, Kwa Jaji, Kisooni, Imboo, Kwa Mwikuyu, Kasunguni, Ikaasu, Kwa Kaveki, Katilini, Matwikani, Itumbule, Kilombo area, Kasalama, Kaluli, Kalanzoni, Kyanyongo, Ndeemiu, Mbondoni, Mavandani, Kwa DC, Kyenze, Petrocity, Ulu, Meenea, Kwa Imaa, Kwa Mbulwa, Kwa GR Malu, Kalumba, Wea, Ikolya, Mbuvoni, Makuuni, Kwa Loa, Kwa Yoma, Mavivye, Kwa Museu, Kwekuyu, Kwa Mbiviti, Kwekaa, Mwandoki, Malili rural, Kwa Kalelu, Pipeline, Kithata, Kyunguni, along the SGR
		Riparian zones / Wetlands	<ul style="list-style-type: none"> Encroachment, pollution from agrochemicals and farm tools, siltation, obstruction upstream. 	Ikolya river, Musengoni, Kaluli Kwakivukui, Kwa Mwanzui, Kwa mwekundu, Kwa Nyali, Kisooni wetlands
	Kasikeu	Land degra-dation	<ul style="list-style-type: none"> Gullies 	Kayata, Kandolo, Yale, Kwale, Kwothithu, Kima, Kalimbini, Icutani, Kathemboni, Kyakatoni, Kenze
		Riparian areas / Wet-lands	<ul style="list-style-type: none"> Pollution from agro-chemicals and farm tools, encroachment 	Muangini, Kaluku, Kima, Kawese and Enguli rivers Enguli wetland
		Forests	<ul style="list-style-type: none"> Deforestation and illegal grazing 	Kilia and Kiou hills
Mbooni	Tulimani	Forestry	<ul style="list-style-type: none"> Forest degradation Forest degradation 	Tulimani forest, Kithoo forest Wanzauni, Kimenye, Kayumba, Uvauni, Kivumbuni, Kauti, Kyunyu, Kakenea, Ivumbu and Tulimani villages
		Landscape	<ul style="list-style-type: none"> Gulley 	Nthangathini, Muthwani, Kwa mutaki earth dam Kinyuani, Kalawani (Utithini/ Kali), Mbanya, Utumoni, Uvilani/ Kyakalya, Nthangathini, Kituluku, Kwa novi
		Wetlands / water sector	<ul style="list-style-type: none"> Riparian degradation 	Ngunduni springs, Nzoweni, Mukilo weir, Kithimani weir

Sub County	Ward	Thematic Area	Environmental Issue	Location
Kako/ Waia	Forestry	Forest degradation	Nthangu, Katende, Waia and Kithendu hill	
		Landscape	Gullies, barelands	Nzuu nthei, Kwa Mutonga, Kithendu, King'eleti, Katitika, Kavingiliti and Ngilani (Kyaluma), Kwa Benson Kisavi, Kwa Mwangangi Kilundu, Kwa Noah, Kwa Ndunda Muombi, Kwa Musembi Muindi, Kwa David Kasimu, Kwa Mumila Kyambilo, Kwa Mwinzi Mbido, Kwa Kisavi Mbido, Kwa Mbangala Kanyele, Kwa Mutisya Mbuloi, Kwa Nyamai Maingi, Kwa Cosmas, Kwa Mwau, Kwa Kikengo, Kwa Samson, Kwa Kinyae, Kwa Samson Malinda, Kwa Muteti, Kwa Benson Kisavi, Kwa Mwangangi Muviku, Kwa Noah, Kwa Ndunda Muombi, Kwa Musembi Muindi, Kwa David Kasimu, Kwa Mumila Kyambilo, Kwa Mwinzi Mbido, Kwa Kisavi Mbido, Kwa Mbangala Kanyele
	Wetlands / water sector	Encroachment and pollution	Kwa Nzangi, Kwa Daudi Mutiso, Utili Swamp, Kwa Nduku Nzioka, MBA Primary, kwa Musyoki Kwa Wambua, Kwa Muuluka, Kwa Musau Kinyumu	
Kisau/ Kiteta	Forestry	Encroachment	Utuneni, Kwakatunga, Kalimani	
	Landscape	Gullies	Kalimani, Kyome gullies, Kwa Katunga, Tawa river, AIC Kiambwa	
	Wetlands / water sector	Pollution, Encroachment	Mukundi, Ndutuni, Maia, Mwivithwa	
Mbooni	Forestry	Forest degradation	Mukaatini, Nduni, Mbooni boys, Ithanga, Kalamani, Wimaanzi, Mutulu, Kakya, Mbooni forest-Ukanga, Uthiuni, Ukuuni, Kalamani, Kalonduni, Kithangathini, Ndunu ngu, Ngaa	
	Landscape	Gullies	Matondoni primary, kwa Musyimi along ndueni Uvaa Road, Kwa Mbisu, Kiinyuni ABC, Ndolo, Kiimani in Kikiini, Mbuvuni ECDE, Syiluni, Kyamunyae, Kwa Kiilu along Kikima Kyuu Road, Kangethukani Mutulu Road, Muthei AIC, Kyavua gulley, Mutwii primary gulley, Bare land near kaseve forest, Mudslides Matondoni Primary, Mang'olo Kinyee primary school, Ikangaani	
	Wetlands / water sector	Encroachment of wet-lands, pollution	Kwa Kithue, Wathi River, Kyambui, Kiliku, Kituluni, Nduni /Mukasi, Yoani, Wetaa, Mangolo river, Isyukoni, Uvi, Makuu, Kalamani to Nzaini, Kyanthundi, Ikaangani, Yambae, Kwa Mwau,	

Sub County	Ward	Thematic Area	Environmental Issue	Location
Makueni	Kithungo/ Kitundu	Forestry	• Encroachment	Kitundu Forest
		Landscape	• Gullies	Kinyeke along Mwenyeani –Utangwa road; along Kwa Mutula – Woyani road; Kwa Pascal along Kilala – kavutini road; Along Kyanzuki-Utangwa road; KwaMuasa – Uma village; Kwa Ndisya – Woyani village; Kwa Mutisya Kasuni – Kithoni village, Muvaa, Ngai, Kangaleni (Kwa Kioko Ndeto, Kwa Musinda and Kwa Musyoki), Mutooni
		Wetlands / water sector	• Encroachment of riparian areas	Kiuuma, Kwa Kyenze and Kwa Kavete
	Kalawa	Forestry	• No forests	☒ N/A
		Landscape	• Gullies and barelands	Kasooni gulleys and Bareland, Ngomeni Village - Gulleys and Denuded land, Kyeni and Kathiani village- Gulleys, Mililuni village gulleys, Kalima Village gulleys, Mutomo/ Mbusyani Village gulleys, Syotuvali Sub location along Athi River has gulleys, Athi Location, along Athi River Mutanda Kavumbu, Kwa malenge, Along Thwake River, Mweleli Sub Location Maluini, Malunda, Ngangani villages, Mbukoni Sub Loc- Ngangani, Ngamione, Kaseve, Thwake Sb location- Katulya, Kinyau, Thwake areas, Mwaniamboo, Ititu sb location
		Wetlands / water sector	• No wetlands	N/A
	Kitise/ Kithuki	Landscape / Land degradation	• Gullies	Miambani village, Waimu village, Kimundi village, Nthiiani village, Kalelo villageB , Kasoka village, Yi nganga village, Kanzokea Kwa David Mutinda, kwa WaitaWwinzeni, Mitheni, Ngokani, Matulani/Manza, Kwa Nyaa, Kasayani, Athiani, Ngunguuni, Kavutha, Eastleigh, Kyase kwa Muthembwa, Mwitsyano
			• Charcoal burning	At own farm
		Riparian zones /Wetlands/ water sector	• Illegal sand harvesting	Kimundi earth dam, Kimundi river (Nthiiani point and Kalelo point) Ksoka River in Matheani village
			• Riparian encroachment and riverine vegetation destruction	Kimundi earth dam
			• Destruction/encroachment of water towers	
		Pollution	• Siltation	Kimundi earthdam
			• Water pollution from agro-chemicals	Kwa mbila earth dam and along River Athi

Sub County	Ward	Thematic Area	Environmental Issue	Location
Nzaui/ Kilili/Kalamba	Forestry	Landscape / Land degradation	• Gullies	Mavyaume, Maatha village, mung'etheele village and kwa munyalii, Kawala, Kalina, Nthiani, Ngai, Kawala
		Riparian zones /Wetlands/ water sector	• Forests/bush fires	Nzau hill, Makuli
			• Illegal grazing • Deforestation /illegal logging/tree felling • Forests encroachment	Nzau hill, Makuli hill, Kalumbi and Martha hill
			• Charcoal burning	Nzau hill, Makuli hill, Kalumbi, Martha hill and own farm
	Pollution	Riparian zones /Wetlands/ water sector	• Illegal sand harvesting	Mwilu river, Kikui river, Manyenyoni river and Kyamela river
			• Destruction/encroachment of water towers	Nzaui and Makuli hill
			• Siltation	Kwa klanyonga, Njau earthdam, Kisowe, Uvileni, Malungu, Kanzili, Kalima, Katumati and Yiangini
	Kathonzweni	Landscape / Land degradation	• Water pollution from agro-chemicals	Kikuu river
			• Soil and water pollution	Matiliku market – open defication
			• Noise pollution	Matiliku – bars and live bands, Kalamba market, Katulye and Makutano market - bars
			• Gullies	Thavu, Kwa Kavisi, Maluvyu, Kwa Katoo, Kwa Kalani, kwa Kivondo, Kwa David Syolinda, Kwa Syeni, Kwa Mutua Mwalili, Kwa Nzenya, Kwa Katumo, Kwa Mwaka, Kwa Ngandua, Mathemba Secondary school, Karani, Kithayoni, Kwa Mbaita, Mwinza Village, and Kwa Tumba,
			• Illegal grazing	Syethe Mbula hill
			• Deforestation /illegal logging/tree felling	
			• Forests encroachment	
			• Charcoal burning	Own farm and Syethe Mbula hill
			• Riparian encroachment and riverine vegetation destruction	
			• Destruction/encroachment of water towers • Siltation	Londokwe earth dam, Matinga I, Matinga II (Kasambani), Kwa Luma, Kwa Mbila earth dam, Kiteei earth dam, Kwa Katiku, Kwa Kilungya
			• Flooding	Kathonzweni polytechnic, Kwa Kimilu, Kitei Junction

Sub County	Ward	Thematic Area	Environmental Issue	Location
Mavindini		Pollution	• Water pollution from agro-chemicals	Kikuu river, Londokwe earth dam, Matinga I, Matinga II (Kasambani), Kwa Luma, Kwa Mbila earth dam, Kiteei earth dam, Kwa Katiku, Kwa Kilungya
			• Noise pollution	Kathonzweni market – bars and marketing during market day, Mbubo market – bars
	Mavindini	Landscape / Land degradation	• Gullies	The entire Katithi location, Kamuithi, Kitumbai, Syelia, Thwake village, Nguumo village, Ngosini, Yekanga, Nzeveni, Kanthuni, Iiani, Kakusywi, Methovini and Irvinga nzia villages
			• Forests/bush fires	
		Forestry	• Illegal grazing • Forests encroachment	Yekanga hill, Kanthuni hill, Katumbua hill, Mavindini hill
			• Deforestation /illegal logging	
		Riparian zones /Wetlands/ water sector	• Charcoal burning	Yekanga hill, Kanthuni hill Katumbua hill, own farm
			• Illegal sand harvesting • Riparian encroachment and riverine vegetation destruction • Siltation	Kanyonga, kalinzi, kisanyanoi, ngosini river, Athi river and Thwake river, Kyanngwasi river, Syongo itomaa, Thavu river,
		Pollution	• Water pollution from agro-chemicals	Athi river
			• Noise pollution	Bars
Muvau Kikuminini	Muvau Kikuminini	Landscape/ Land degradation	• Gullies	Silanga, Kivani, Nguni
			• Landslides	Around Kwa Kathoka earthdam, Kwa Muasa earthdam, Kwa Mutea earthdam, dangerous ditches along Wote-Kathonzweni roads ie opposite Pamoja mortuary and opposite Nuclear mortuary
		Forestry	• Forests/bush fires	None
			• Illegal grazing	Nzueni hill
			• Charcoal burning	Nzueni hill and Own farm
		Riparian zones /Wetlands/ water sector	• Illegal sand harvesting	Thwake river,
			• Riparian encroachment and riverine vegetation destruction	Ngosini river, Kwa Kathoka earth dam, Kambi mawe earth dam
			• Water pollution from agro-chemicals	
			• Destruction/encroachment of water towers	
			• Siltation	Kwa kathoka and Kambi mawe earth dams Muambani earthdam, Muvea earthdam

Sub County	Ward	Thematic Area	Environmental Issue	Location
Mbitini Ward	Landscape/ Land degradation		• Gullies	Mutiswa, Mutyambua and Masue hill zones and slopes (Mutyambua sub ward)
			• Landslides	Mungyani- and Muambwani hills (Kyemundu sub ward)
	Forestry		• Forests/bush fires	Muambwani, Kalumbi, Kyemundu and Masue forests
			• Illegal grazing	Masue and Muambwani forests, Kyemulu, Kalamusi
			• Deforestation /illegal logging/tree felling	Muambwani, Kalumbi, Kyemundu and Masue forests
			• Forests encroachment	Muambwani forest
			• Charcoal burning	Muambwani, Kalumbi, Kyemundu, Masue forests and own farm
	Riparian zones /Wetlands/ water sector		• Illegal sand harvesting	Suspected illegal sand smuggling by local dealers along Muooni river at Kavuthu drift site, Kwa Makove entry site, Ndituni river in Mutyambua location and from Mbulutini to Mbuthani along Muooni river
			• Riparian encroachment and riverine vegetation destruction	Along Muooni river
			• Destruction/encroachment of water towers	Kyemundu sub-ward different points; Muambwani hill, Kakutha area, Mutiswa Kanyoonyoo spring area in Katani cluster), Kwa Nzasi spring point in Kyumbuni cluster, Mangyaka spring area point in Mutyambua cluster
			• Siltation	Kwanzou E Dam, Mutyambua E Dam which was desilted halfway and Kwa Ngwili E Dam all in Mutyambua sub-ward
			• Flooding	Lower zones of Mutiswa location; (Mutiswa and Katani clusters) and Mutyambua location; (Mutyambua & Kyumbuni clusters)
	Pollution		• Water pollution from agro-chemicals	Muooni and Ndituni rivers
Wote/Nzui	Landscape/ Land degradation		• Gullies	Kitheini, Nganza
	Forestry		• Forests/bush fires	Makuli forest
			• Illegal grazing	Makuli forest
			• Deforestation /illegal logging/tree felling	Makuli forest
			• Forests encroachment	Makuli forest, Unoa, Makuli, Nthangu
			• Charcoal burning	Makuli forest (Kitheini cluster), Unoa, Nzueni, Nthangu

Sub County	Ward	Thematic Area	Environmental Issue	Location
		Riparian zones /Wetlands/ water sector	<ul style="list-style-type: none"> • Illegal sand harvesting • Riparian encroachment and riverine vegetation destruction. • Destruction/encroachment of water towers • Siltation 	Kilumwa, Wakyoo, Kanzoka, Kyambui and Mikwani streams Kilumwa, Wakyoo, Kanzoka, Kyambui and Mikwani streams Kwa-Kimani Yamuthinzi dam, Kwa Musila, Kaloki, Kamunyolo, Kauani, Kwa Ngwili, Kwa Nguli
	Thange	Forestry	<ul style="list-style-type: none"> • Illegal grazing • Illegal tree cutting • Forest fires • Encroachment 	Thange springs Chyullu hills
		Landscape	<ul style="list-style-type: none"> • Gulleys • Soil erosion • Bare land 	Kalulu, Along machinery- Thange highway, Nzavoni, Masonga
		Wetlands / water sector	<ul style="list-style-type: none"> • Water pollution from agrochemicals • Illegal tree felling • Illegal grazing • Encroachment 	Thange springs, Along Thange springs/river
	Mtito Andei	Forestry	<ul style="list-style-type: none"> • Illegal grazing • Illegal tree cutting • Encroachment • Human wildlife conflicts 	Kathekani, Ilikoni, Tsavo park Kyusiani, Kamunyuni, Ngiluni, Nzoila, Songea
		Landscape	<ul style="list-style-type: none"> • Gulleys • Soil erosion • Bare land • Solid and liquid waste pollution 	Along old Mombasa road, Along Daranjani-Kambu road Subati market, Mtito Andei market, Kambu market
		Wetlands / water sector	<ul style="list-style-type: none"> • Riparian encroachment • Deforestation • Illegal grazing • Illegal sand harvesting 	Along Kambu river

Sub County	Ward	Thematic Area	Environmental Issue	Location
Masongaleni	Masongaleni	Forestry	• Illegal grazing • Illegal tree cutting	Along Tsavo National park boundary
			• Human wildlife conflicts	Ngomano Athi Kamunyuni and Wandei
	Landscape		• Gulleys • Soil erosion • Bare land	Along Masonga- Kyumani road, Kyumani Miangeni, Tisya kwa Muluvi, Musingo
			• Illegal tree felling • Illegal grazing • Encroachment • Illegal sand harvesting	Athi River Kibwezi River
			• Human wildlife conflicts	Along Chyullu hills Nthongoni
	Ivingoni / Nzambani	Forestry	• Illegal grazing • Illegal tree cutting • Forest fires • Encroachment	Along Chyullu hills

Annex 4: Technical Working Group Members and Key Contributors

a) Technical Working Group

1. **Michael Okeyo Mairura (PhD)**
TWG Chairman, Assistant Regional Director – KEFRI
2. **Joseph M. Munyao**
TWG Team Leader. Deputy Director Environment; Makueni
3. **Rufo Gano Jillo**
TWG Rapporteur, Secretariat; Research Scientist – KEFRI
4. **Oloo Vincent Ochieng**
County Director of Environment - NEMA Makueni
5. **Gabriel Kiio**
County Warden
KWS, Makueni County
6. **Irene Kiprono**
Assistant County Forest Conservator – KFS, Makueni
7. **Bosco Kidake**
Senior Scientist, KARLO, Kiboko
8. **Christoper Mutunga**
Environment Officer/ Forester, Makueni
9. **Joshua Mutua**
Environment Officer/ GIS Expert, Makueni County
10. **Faith Mumo**
Climate Change Expert, NDMA, Makueni
11. **Richard Mwendwa**
Economist, Makueni County
12. **Samuel M. Mburu**
Assistant Director – Agriculture, Makueni

b) Key Contributors

1. **Dr Leigh Ann Winowiecki**
Global Research Leader: Soil and Land Health.
Co-lead: Coalition of Action 4 Soil Health (CA4SH)
<https://www.coalitionforsoilhealth.org/>
2. **Meshack Muga**
NPC, The Restoration Initiative FAO-Kenya
3. **Robin Chacha**
Research Associate /Project Officer, CIFOR-ICRAF
4. **Christine Magaju**
Research Associate - Systems, CIFOR-ICRAF
5. **Damaris Mwikali**
County Forester, Makueni
6. **Violet Oriwo**
Researcher, KEFRI
7. **Elizabeth Nguku**
Environment Officer, Makueni County
8. **Alice Mutemi**
Geospatial Specialist, KFS
9. **John Sila**
Devolution & County Administration
10. **Sabrina Trautman**
KANDS Collective



For further information, please contact:

Chief Officer
Environment, Natural Resources, Mining and Climate Change
Department of Lands, Urban Planning & Development, Environment
and Climate Change
Email: co.environment@makueni.go.ke
Website: www.makueni.go.ke

