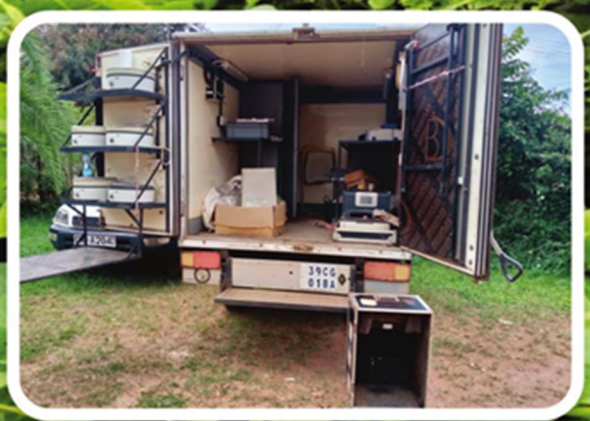
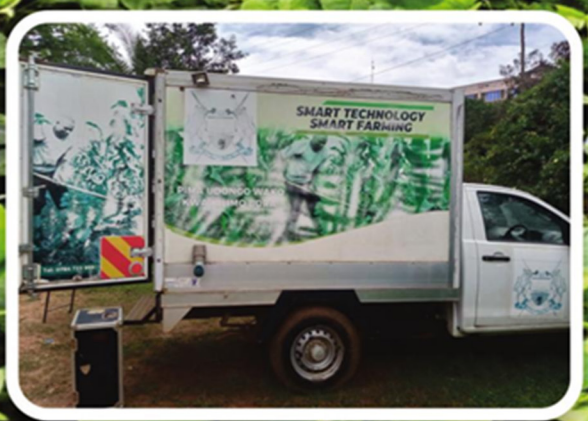
COUNTY GOVERNMENT OF BUNGOMA

DEPARTMENT OF AGRICULTURE, LIVESTOCK, FISHERIES, IRRIGATION AND CO-OPERATIVES

BUNGOMA COUNTY AGRICULTURAL SOIL MANAGEMENT POLICY 2023





COUNTY GOVERNMENT OF BUNGOMA

DEPARTMENT OF AGRICULTURE, LIVESTOCK, FISHERIES, IRRIGATION AND CO-OPERATIVES

BUNGOMA COUNTY AGRICULTURAL SOIL MANAGEMENT POLICY 2023

TABLE OF CONTENTS

FOREWORD

The Bungoma County Agricultural Soil Policy 2023 was prepared in conformity to National and County Agriculture Sector aspirations of an Innovative, Sustainable and Commercially Oriented Sector. The agricultural sector is a key contributor to Kenya's and the county's economy and the means of livelihood for most of the rural population. In 2021 Agriculture contributed 21.2% to the national GDP. The agriculture sector contributed 43% of the total Gross County product in 2022. The sector contributes significantly to other economic activities in the county such as manufacturing, wholesale and retail trade, transport and storage. Sustained agricultural growth is critical to uplifting the living standards of Kenyans as well as generating rapid economic growth.

Kenya Vision 2030 identified agriculture as one of the six key economic sectors expected to drive the economy to aprojected10 percent annual economic growth. The Constitution of Kenya, Article 43(1) (c), Article 53 (l) (c), Article 21 and Article 27 and the National Food and Nutrition Security Policy 2011 recognizes food security as a basic human right. However, in spite of the importance of the agricultural sector, challenges persist including declining agricultural productivity, environmental degradation, under-utilization of land resources and inadequate application of appropriate technologies.

To transform agriculture into a modern, innovative and commercially oriented sector as envisioned in Kenya Vision 2030, it is imperative that land productivity is improved and sustained through proper management of agricultural soils. Soils perform a large number of economic and environmental functions. Many industries, including farming and food production, forestry and tourism, depend on the sustainable use of soils.

Soil is the most important resource in agricultural production. It constitutes the foundation of agricultural development and ecological sustainability and the basis for food production. It is also the world's largest terrestrial pool of carbon and approximately 95% of global food is produced in soil. Most of the agricultural soils in Bungoma County are affected by key issues such as; declining fertility, soil erosion, deforestation, climate change and inappropriate land use that hinder potential productivity of agricultural value chains. Soil sampling conducted by Kenya Agriculture Research Institute (KARI), now Kenya Agriculture Livestock Research Organization (KALRO) under National Accelerated Agricultural Input Program National Agriculture Accelerated Input Programme (NAAIP) soil survey in 2013 showed that the county soil status was acidic (pH less than 5.5) and therefore recommended application of non-acidifying fertilizer

and liming. Continuous testing using county mobile testing labs confirmed that soil is chemically degraded across the county and thus recommended improvement through liming and other sustainable land management practices.

This policy aims to promote agricultural development through sustainable soil management practices. It proposes a wide range of measures and actions responding to key agricultural soil issues and challenges. Soil management requires partnership and coordination with key stakeholders. It is against this background, that this county Agricultural Soil Management Policy has been developed.

The County Government of Bungoma is committed to fully implement this policy and shall therefore strengthen the respective institutions and provide the needed resources.

H.E. Rt. Hon. Kenneth Makelo Lusaka EGH, CBS
GOVERNOR, BUNGOMA COUNTY

PREFACE

The Bungoma County Agricultural Soil Policy domesticates the National Agricultural Soil Policy, 2023. Recognizing the significance of agricultural soils to food and nutrition security, this policy was developed to promote sustainable management of soil in the county. The policy was formulated through a consultative and participatory process. The input was achieved through wide consultations in a series of workshops, meetings and professional fora involving development partners, private sector groups, communities and research institutions. The process of preparing this policy was spearheaded by a dedicated technical working group that comprised of staff from the County Departments of Agriculture, Livestock, Fisheries and Cooperatives; Environment, Water, Natural Resources and Climate Change; County Attorney; and a representative from National Environment Management Authority (NEMA).

This policy highlights priority areas in agricultural soil management and incorporates interventions that will be employed by the County in order to achieve sustainable soil management practices. Priority areas highlighted are: declining soil fertility, soil erosion, deforestation, inappropriate land use, climate change impacts on agriculture soils and inadequate knowledge and skills. The policy aims to promote programs on integrated soil fertility management systems, protect soils and conserve biodiversity, support programs on afforestation and reforestation, promote and enhance climate change mitigation and adaptation measures and enhance knowledge and skills on sustainable land management.

The successful implementation of this policy will depend on the partnership between the County Government of Bungoma and all relevant stakeholders. All stakeholders should therefore, embrace the recommendations contained in this policy towards ensuring effective soil quality management for improved agricultural productivity.

Eng. Herbert Kibunguchy
COUNTY EXECUTIVE COMMITTEE MEMBER
DEPARTMENT OF AGRICULTURE, LIVESTOCK, FISHERIES, IRRIGATION AND COOPERATIVES

ACKNOWLEDGEMENT

The drafting of the Agricultural Soil Management policy is an outcome of tireless efforts and participation by various individuals and institutions. Firstly, I wish to acknowledge our development partner, GIZ, which through the Soil Protection and Rehabilitation of Degraded Soils in Western Kenya Project (Pro-Soil), provided resources to support formulation of this policy.

I wish to thank the County Executive Committee with the Leadership of H.E the Governor for adopting and approving this strategy for implementation. Special appreciation goes to the County Executive Committee Member (CECM) for Agriculture, Livestock, Fisheries, Irrigation and Cooperatives for his invaluable guidance in the preparation of this Policy.

I wish to thank the County Assembly for playing its legislative role and ensuring that this policy is passed. Specifically, we extend our gratitude to the Sectoral Committee on Agriculture, Livestock, Fisheries, Irrigation and Co-operatives.

Special appreciation also goes to the technical working group (TWG) for their dedication in drafting and facilitating stakeholder participation fora in the formulation process. The TWG comprised of staff from the County Departments of Agriculture, Livestock, Fisheries and Cooperatives; Environment, Water, Natural Resources and Climate Change; County Attorney; and a representative from NEMA.

Finally, we are especially indebted to research institutions, universities, Civil Society Organizations (CSOs), Non-Governmental Organizations (NGOs), and Community Based Organizations (CBOs) who sent representatives to participate in the formulation and validation of this policy.

Dinah Makokha
COUNTY CHIEF OFFICER-AGRICULTURE AND IRRIGATION
DEPARTMENT OF AGRICULTURE, LIVESTOCK, FISHERIES, IRRIGATION AND COOPERATIVES

ABBREVIATIONS AND ACRONYMS

AEZ	Agro-ecological Zone
ALDEB	African Land Development Board
ATVET	Agriculture Technical Vocational Education Training
ASDS	Agriculture Sector Development Strategy
ASM	Agricultural Soil Management
AU	African Union
CAADP	Comprehensive African Agricultural Development Programme
CBOs	Community-based organizations
CIAT	International Centre for Tropical Agriculture
CoK	Constitution of Kenya
COMESA	Common Market for Eastern and Southern Africa EAC East Africa Community
EU	European Union
FABP	Food and Agriculture Business Principles
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GMOs	Genetically Modified Organisms
ICRAF	International Centre for Research in Agro-Forestry(World Agro-Forestry Centre)
IGAD	Inter-Governmental Authority on Development
KALRO	Kenya Agricultural and Livestock Research Organization
KEBS	Kenya Bureau of Standards
KEFRI	Kenya Forest Research Institute
KEPHIS	Kenya Plant Health Inspectorate Services
KFA	Kenya Farmers Association
KGGCU	Kenya Grain Growers Cooperative Union
KNBS	Kenya National Bureau of Statistics
MENR	Ministry of Environment and Natural Resources

MoALF	Ministry of Agriculture, Livestock and Fisheries
NAAIP	National Accelerated Agriculture Input Programme
NAEP	National Agriculture Extension Policy
NALEP	National Agricultural and Livestock Extension Programme
NASEP	National Agricultural Sector Extension Policy
NASM	National Agricultural Soil Management
NASMP	National Agricultural Soil Management Policy
NEMA	National Environmental Management Organization
NFP	National Forest Policy
NGOs	Non-Governmental Organizations
NIP	National Irrigation Policy
NLC	National Land Commission
NLRP	National Land Reclamation Policy
NOADP	National Organic Agricultural Development Policy
NRM	Natural resources management
TWG	Technical Working Group
SIDA	Swedish Development Cooperation
NSS	National Soil Service
NSWCP	National Soil and Water Conservation Programme
PRSP	Poverty Reduction Strategy Paper
SDG	Sustainable Development Goals
SIDA	Swedish International Development Agency
SOPs	Standard Operating Procedures
SRA	Strategy for Revitalizing Agriculture
SSA	Sub-Saharan Africa
UNCCD	United Nations Convention on Combating Desertification
UNEP	United Nation Environment Programme
UNGC	United Nations Governing Council
VAT	Value Added Tax
VCR	Value Cost Ratio
WTO	World Trade Organization

CHAPTER 1: POLICY CONTEXT AND RATIONALE

1.0 Introduction

The chapter presents the context within which the County's agriculture soil management policy is developed. It outlines existing policy and legal framework context at both National and County levels. It also summarizes the rationale for the policy and provides insights into the process of developing the policy.

1.1 Background

The agricultural sector is a key contributor to Kenya's and the county's economy and the means of livelihood for most of the rural population. In 2021 Agriculture contributed 21.2% to the national GDP. The agriculture sector contributed 43 percent of the total Gross County product in 2022 (KNBS, 2023). The sector contributes significantly to other economic activities in the county such as manufacturing, wholesale and retail trade, transport and storage. Sustained agricultural growth is critical to uplifting the living standards of Kenyans as well as generating rapid economic growth. However, in spite of the importance of the agricultural sector, challenges persist including declining agricultural productivity, environmental degradation, under-utilization of land resources, and ineffective value-addition of agricultural produce, weak market linkages and inadequate application of appropriate technologies.

Kenya Vision 2030 identified agriculture as one of the six key economic sectors expected to drive the economy to a projected 10 percent annual economic growth. The sector is therefore central to the achievement of Vision 2030 goal of "a globally competitive and prosperous country with a high quality of life by 2030". This goal will be realized through promotion of an innovative, commercially oriented and modern agriculture as envisioned in the Agriculture Sector Transformation and Growth Strategy (ASTGS), 2019-2029. Agriculture is therefore expected to lead the growth and transformation of the economy and maximize the benefits of an accelerated growth of minimum 7 percent per annum. The Constitution of Kenya, Article 43 (1) (c), Article 53 (l) (c), Article 21 and Article 27 and the National Food and Nutrition Security Policy 2011 recognizes food security as a basic human right.

Soil is the most important resource in agricultural production. It constitutes the foundation of agricultural development and ecological sustainability and the basis for

food production. It is also the world's largest terrestrial pool of carbon and approximately 95 percent of global food is produced in soil. However, evidence provided in the Status of the World's Soil Resources (SWSR; 2015) report and other studies shows that about 33 percent of global soils are moderately or highly degraded due to unsustainable management practices. This loss also significantly reduces the soil's ability to store and cycle carbon, nutrients and water. Kenya must therefore strive to bring the issue of sustainable soil management to the forefront of public attention in order for her population to recognize and appreciate the importance that soil has with food, water, climate, biodiversity and life.

Soil and water conservation (SWC) was introduced in Kenya in the 1930s due to serious erosion problems in both the settlers and the African farms and was made compulsory by the African Land Development Board (ALDEV) and the Swynnerton Plan (1953-1957). Colonial authorities addressed the problem of soil erosion by implementing district level by-laws specific to the 'African held land' which focused on coffee and cotton. Local administration and Agricultural Technicians rigorously enforced these stipulations and stiff penalties were imposed on farmers who failed to comply. SWC measures that were enforced included contour farming, tree planting, terrace strip cropping and destocking.

However, there was a lost decade (1963 -1972) where there was no clear cut SWC approach. This was a period of laxity by the people towards coerced soil conservation. This was because soil conservation had become both politically and socially untenable. During this period, more terraces disappeared through destruction, and neglect than were being constructed coupled with few initiatives towards soil conservation.

Land degradation was considered to be a serious problem in Kenya during the United Nation Conference on Human Environment in Stockholm in 1972, hence the revival of soil conservation (1972-1988). The National Soil and Water Conservation Program (NSWCP) was launched in 1974 with support from the Swedish International Development Agency (SIDA). This programme aimed at increasing and sustaining agricultural production through simple, cheap and effective soil conservation measures. This was an individual farm-based approach with a package of tools given out to farmers.

The catchment approach (1988-1998) strategy was later introduced and addressed all conservation measures in clearly delineated catchments. The benefit was viewed in terms of high visibility of conservation efforts, continuous treatment of farms, safe conveyance of excess runoff in the high rainfall areas, water harvesting in the arid and semi-arid lands and development of a cadre of highly specialized staff.

In 2000 the National Agriculture and Livestock Extension Programme (NALEP) was launched. NALEP had the basic elements of Catchment Approach (Focal Area Extension Approach -2000 -2010). The approach was more demand driven and holistic in all technical areas. It took over from the catchment approach. However, the focal area approach concentrated on all aspects of farm management but was not focused entirely on soil management. After the closure of National Agriculture Livestock Extension Programme (NALEP) a gap has existed in the area of coordination of soil and water conservation programs in the country.

Most of the agricultural soils in Bungoma County are affected by key issues such as; declining fertility, soil erosion, deforestation, climate change and inappropriate land use that hinder potential productivity of agricultural produce. The first soil survey in Bungoma County done between 2010 and 2011 by KARI (now KALRO) under National Accelerated Agricultural Input Program (NAAIP) whose results released in 2013 showed that most of the farms had acidic soils (pH less than 5.5) and therefore recommended use of non-acidifying fertilizer and liming. The second soil survey in 2015, indicated that 67 percent of the sampled soils from all the wards were acidic. Continuous testing using county mobile lab confirms that our soils are chemically degraded across the county and thus recommended improvement through liming and other sustainable land management practices.

1.2 Policy and Legal Framework

This policy will complement several national and county legal instruments in providing a framework for management of sustainable soil management as outlined below;

The Constitution of Kenya, 2010 is the overarching law that governs natural resources in Kenya. Chapter 5 of the constitution deals with land use and land tenure and in it are various articles that are relevant to soil management.

Kenya Vision 2030 emphasizes sustainable agricultural growth as a critical element in poverty reduction and addressing inequalities. It recognizes the importance of soil fertility in enhancing agricultural productivity for driving economic growth.

Environment Management and Coordination Act (EMCA), 1999 (amended 2015) - This Act establishes the National Environmental Management Authority (NEMA) whose mandate is to coordinate all environmental activities in Kenya.

Climate Change Act, 2016- The Act provides for a regulatory framework for enhanced response to climate change; to provide for mechanisms and measures to achieve low carbon climate development, and for connected purposes.

Forest Conservation and Management Act, 2016 - The Act contextualizes establishment and development of sustainable management of forestry resources. It further provides for farm forestry which will take pressure off existing forests and act as income generation. This ensures that ecosystem services associated with forested ecosystems continue to be provided.

Land Act, 2012 - The Act provides guidelines for the management of public land, conservation of ecologically sensitive public land, and conservation of land based natural resources.

Crops Act, 2013 - The Act has provisions for development of regulations on measures of maintaining soil fertility including soil testing and regulation of soil salinization, chemical degradation and toxic levels in plants and promotion of fertilizer cost-reduction investment projects through provision of incentives and facilities to relevant investors.

Sessional Paper 1 of 2017 on National Land Use Policy (NLUP) -aims at guiding Kenya towards a sustainable and equitable use of land. The policy calls for immediate actions to address environmental problems that affect land such as degradation, soil erosion and pollution.

Agricultural Soil Management Policy,2023-The policy gives direction on how agricultural soils will be managed for increased crop productivity and production while at the same time conserving the environment. The policy encompasses sustainable agricultural soil and environmental management with regard to soil and water conservation, soil fertility management, agroforestry, soil restoration and rehabilitation, technology development, dissemination and utilization of soil management technologies and investments.

National Agriculture Policy, 2021 - The Policy provides a framework for sustainable development of the agricultural sector based on the requirements of the Constitution, the Kenya Vision 2030, Millennium Development Goals and other national, regional and international development goals in agriculture.

National Environmental Policy, 2013- The Policy sets out important provisions relating to the management of ecosystems, ecosystem services and sustainable use of natural resources.

National Agricultural Sector Extension Policy (NASEP), 2012 - The instrument sets policy for agricultural extension, and promotion and diffusion of technologies for land management. The policy recognizes that land is an important resource

in agricultural development, thus soil and water conservation and support for environmental conservation in all agricultural projects and programmes are prioritized.

National Forest Management Policy, 2014 – The Policy provides a framework for improved forest governance, resource allocation, partnerships and collaboration with the state and non- state actors to enable the sector to contribute to meeting the country's growth and poverty alleviation goals within a sustainable environment.

Agricultural Sector Transformation and Growth Strategy, (ASTGS) 2019 - 2029 The ASTGS takes an evidence-based approach, and a sharp focus on implementation and delivery with the counties at the Centre. This approach is the foundation for addressing the challenges that constrain agricultural output, productivity, natural resource management, and the effects of climate and environmental change.

Kenya Climate Smart Agriculture Strategy, 2017 – 2026 - The broad objective of the Kenya CSA Strategy is to adapt to climate change, build resilience of agricultural systems while minimizing emissions for enhanced food and nutritional security and improved livelihoods

Bungoma County Environment Policy, 2021 - The policy is guided by specific objectives such as providing financial resources for sustainable management of the County environment and natural resources; providing a framework for an integrated approach to planning and sustainable management of environment and natural resources; promoting and enhancing partnership and public participation in the protection and conservation of the County environment and natural resources among others.

Bungoma County Climate Change Policy, 2020- The policy's objectives is; to appropriately address County climate change challenges for sustainable development; promote conservation of natural resources for posterity; and integrate climate change into all County development projects and programmes among others.

Bungoma County Climate Change Action 2023-2027- The Plan was developed to provide a roadmap in building resilience to the impacts of climate change.

1.3 Rationale

Soil is the most important resource in agricultural production. It constitutes the foundation of agricultural development and ecological sustainability and the basis for food production. The current rate of soil fertility decline and degradation in Bungoma is not conducive for the projected 7% national growth of the agriculture sector. Despite this scenario, there has been little effort towards the development of policies to address declining soil fertility, soil erosion, deforestation, inappropriate land use and climate change.

The Kenya Agricultural Soil Management Policy 2023, the National Agriculture Policy 2021 and the Agriculture Sector Transformation Growth Strategy 2019-2029 have been the main documents guiding soil management in the sector which do not adequately address key thematic issues for the Bungoma situation regarding agricultural soil management. Furthermore, weak coordination, implementation and enforcement of existing strategies, policies and legislation is evident. As such policy gaps in the management of agricultural soils have been identified in this policy that requires a comprehensive sector-wide approach that is multi- sectoral and multi-stakeholder.

1.4 Policy Development Process

The formulation of the Bungoma County Agricultural Soil Policy was through a consultative and participatory approach. The Technical Working Group undertook desk top research for secondary information and drafted the policy through focused group discussions. The draft policy was subjected to internal validation and review through presentations to key stakeholders and later public participation. The draft policy was then presented to the county executive committee for approval and subsequent transmission to the County Assembly for input and approval.

CHAPTER 2: THE POLICY FRAMEWORK

2.0 Introduction

This chapter covers the vision, mission, goals, objectives and guiding principles that govern the policy.

2.1 Vision

Sustainably managed agricultural soils for enhanced productivity and environmental protection for improved livelihoods.

2.2 Mission

To promote sustainable agriculture soil management practices through appropriate technologies and stakeholder engagement.

2.3 Policy Objectives

2.3.1 Broad Objective

The main objective of this policy is to promote agriculture development through sustainable soil management practices.

2.3.2 Specific Objectives

1. To promote programs on integrated soil fertility management systems.
2. To protect soils and conserve biodiversity.
3. To support programs on afforestation and reforestation.
4. To promote and enhance climate change mitigation and adaptation measures
5. To enhance knowledge and skills on sustainable land management.

2.4 Guiding Principles

The implementation of this Policy will be guided by the following principles;

a. **Right to a clean and healthy environment** for sustainable development.

b. **Equity and social inclusion**: fair and equitable distribution of resources and benefits to all communities including marginalized and vulnerable communities.

c. **Partnership**: prioritize building partnerships, collaborations and synergy from the public, government, public benefits organization, civil society, private sector as well as vulnerable communities including women, youth and Persons with Disability.

d. **Accountability**: the mobilization and utilization of financial resources shall be undertaken with integrity and transparency, in order to achieve optimal results in the implementation of the policy interventions.

e. **Stakeholder Engagement and Public Participation**: consultations, negotiations and consensus building shall be key.

CHAPTER 3: POLICY ISSUES AND POLICY INTERVENTIONS

3.0 Introduction

This chapter highlights priority areas in agricultural soil management and incorporates interventions that will be employed by the County in order to achieve sustainable soil management practices.

3.1 Policy Issues and Policy Interventions

Policy Issue1: Declining Soil Fertility

Soil fertility is the ability of the soil to provide appropriate plant nutrients for crop growth and a key factor that determines the quality and quantity of crop produce. Decline in soil fertility is the loss of vital nutrients that are important in growth of crops through leaching, soil erosion and mono-cropping among others. In Bungoma County, soil fertility decline has led to low productivity of agricultural produce.

Inappropriate cultivation practices such as; continuous cropping and cultivation across the contour lines has resulted into nutrient loss and soil erosion respectively. Mechanized systems affect the soil through compaction that limits water and air infiltration into the soil. The equipment for cultivation are inadequate and inaccessible leading to low adoption of soil management practices. In addition, the inappropriate use of both organic and inorganic fertilizers has resulted into fluctuation of soil pH levels that has led to a decline in soil fertility.

The County has three mobile soil laboratories that only offer dry analysis at subsidized price rates. The lack of supportive infrastructure, maintenance subscription and inadequate infrastructure for complete soil testing and analysis has hindered access to such services and adoption of corrective measures on soil fertility management.

High prices of fertilizer products and inadequate availability have hindered access by farmers leading to low utilization levels hence low yields. Nationally, there exists a fertilizer subsidy programme administered through the 4 existing NCPB stores however these stores are not adequately distributed across the county. The County has a free fertilizer input scheme for vulnerable farmers which is not sustainable. Further, adulteration of fertilizer blends in the market due to inadequate enforcement of quality

standards has hampered corrective efforts in addressing soil fertility levels. Farmers have not embraced the use of organic manure due to higher quantities required.

Policy Interventions:

To promote sustainable land management practices and integrated soil fertility management systems, the county government in collaboration with stakeholders shall:

1. Develop legislations on soil fertility management initiatives.
2. Enhance relevant infrastructure for soil sampling testing and analysis.
3. Promote programmes on capacity building of agricultural value chain actors on soil fertility management.
4. Promote compliance programmes to fertilizer safety and quality standards.
5. Promote innovative soil fertility management technologies.
6. Enhance access to soil fertility management inputs.
7. Facilitate production and use of organic fertilizer materials.

Policy Issue 2: Soil Erosion

Soil erosion is the detachment, movement and deposition of the field's soil by the natural forces of water and wind or other human activities. Soil erosion leads to loss of top soils that support agricultural production resulting in reduced agricultural productivity. The common soil erosion types in Bungoma County are rill and gully, which are the advanced forms of splash and sheet that are not easily observed. Mudslides occur along the slopes when the soil is saturated with rain water and moves down the slope.

In Bungoma County, there are inadequate structures to control water movement such as cover crops, grass strips, buffer strips, dead plant materials and physical structures such as terraces and cut off drains to reduce soil erosion.

The existing statutes are not adequately enforced to address issues of soil erosion on cultivated slopes, along riverbanks, around water bodies (riparian areas) and catchment areas.

Investment by the County government towards the development of soil erosion interventions for the agricultural sector is inadequate. Similarly, public and private actors' prioritization of soil erosion control and rehabilitation initiatives in resource allocation is often inadequate. There also exists limited dissemination and uptake of soil and water conservation technologies due to poor linkage between research and extension.

Increased land fragmentation within households due to increased population and urbanization towards rural areas is a major cause of soil erosion due to destruction of soil conservation structures and lack of roof catchment structures.

Policy Interventions:

To protect soils and conserve biodiversity, the county government in collaboration with stakeholders shall:

1. Promote soil cover.
2. Promote establishment of soil and water conservation and storage structures.
3. Promote compliance with existing soil erosion control laws and regulations.
4. Enhance Public Private Partnership in soil erosion control.
5. Enhance resource mobilization and financial prioritization of soil erosion control.
6. Promote capacity building and public awareness in soil erosion control.

Policy Issue 3: Deforestation

Deforestation is the conversion of forest to an alternative permanent non-forested land due to use such as agriculture, grazing or urban development. Deforestation is primarily a concern for developing countries due to shrinking areas of forests thus causing loss of biodiversity, disruption of ecosystem services and enhancement of greenhouse gas emissions.

The total forest cover in Bungoma County is 14.83 percent of the total land mass consisting of gazetted and non-gazetted forests which is below the county target of 18% by 2030.[1]. The most concentrated deforestation in the County occurs in Mt. Elgon sub-County due to increasing demand for agricultural land. Farm forest cover for Bungoma County is at 7.9 percent which is below 10 percent farm forest cover for the country. . The population in Bungoma County has been on the increase leading to shrinking of farm forest cover due to land subdivisions and urbanization.

Timber logging, firewood collection and charcoal burning are a menace in the Mt. Elgon region and other areas in the county. More than 72% of the county households use firewood as the main source of cooking energy. There is increasing demand for wood and wood products for construction and as raw material for industrial use. About 30 Ha of Mt. Elgon Forest is harvested yearly which has reduced the tree cover. This has exposed the soil to destruction.

Encroachment in forested areas has further been worsened by weak enforcement of relevant laws and regulations. Additionally, inadequate public awareness and actors' capacity for forest conservation has slowed down conservation efforts.

Policy Interventions:

To prioritize increase in forest/ tree cover and ensure conservation the county government in collaboration with stakeholders shall:

1. Promote afforestation and re-afforestation.
2. Promote compliance with existing forestry laws and regulations.
3. Promote use of clean sources of energy
4. Promote alternative sources of livelihoods to people residing near forest to reduce pressure on use of forest resources.
5. Enhance capacity building and public awareness on forest conservation.

Policy Issue 4: Inappropriate Land Use

''Land use" is the term used to describe the human use of land. It represents the economic and cultural activities (agricultural, residential, industrial, mining, and recreational uses) that are practiced at a given place. Different land use activities have varied effects on the environment and human health.

In Bungoma County it has been noted that poor land use practices such as cultivation along river banks, steep slopes, riparian areas, wetland and catchment areas are some of the key factors that have resulted in increased surface runoff, soil erosion and pollution of rivers. Additionally, inappropriate tillage practices including burning of plant residues further expose the soil to various agents of soil erosion. Fragmentation of agricultural land and unplanned urbanization has further led to soil degradation.

There is poor waste management and inappropriate use of pesticides resulting in soil and water contamination. Illegal quarrying, tree cutting (on-farm and forests), sand harvesting, brick making and charcoal burning are other causes of soil degradation. Brick-making removes the top fertile soil while charcoal burning results in destruction of vegetation and soil bio-health. There is weak capacity and low enforcement of land use and urbanization laws and regulations in the county.

Policy interventions:

To promote sustainable land use practices the county government in collaboration with stakeholders shall:

1. Promote sustainable land use programs.
2. Enhance enforcement of land use and urbanization laws and regulations
3. Promote development of affordable and appropriate technologies and innovations and establish incentives to facilitate adoption for sustainable land management.
4. Promote proper farm waste management strategies.

Policy Issue 5: Inadequate Knowledge and Skills.

Unsustainable land use practices among farmers can be largely attributed to lack of adequate knowledge and skills in agricultural production. This has led to a significant decline in productivity per unit area across various farming systems. Despite its critical importance, there is insufficient attention given to sustainable land management, which adversely affects land productivity on a broader scale.

Many farmers and stakeholders lack essential knowledge about sustainable land and soil management due to poorly coordinated systems for collecting and disseminating vital information at the county level. Moreover, there is a shortfall in support for on-farm research focused on sustainable land management. This is compounded by the scarcity of soil management extension service providers and weak connections between research initiatives and extension services regarding sustainable land management technologies. These limitations hinder the promotion and adoption of effective soil management practices.

The use of Information and Communication Technology (ICT) in promoting sustainable land and water management programs has also been limited, further affecting the farming community's acceptance of these technologies. Although there are 88 Vocational Training Centers (VTCs) and 8 Agricultural Technical and Vocational Education and Training (ATVET) institutions in the county, sustainable land management technologies are not sufficiently integrated into their curricula, and they often lack the capacity to incorporate sustainable soil management topics into their teaching programs.

Policy Interventions:

1. Promote capacity development and training programmes and projects on sustainable land management.
2. Enhance and support public soil management extension services
3. Support adaptive research on matters of sustainable land management.
4. Support Research-Extension linkage programmes on sustainable land management.
5. Promote ICT programmes in soil and water management
6. Support Competency-based training programs on sustainable land and water management in ATVETs and VTCs.

Policy Issue 6: Cross Cutting Issues

i. Climate Change impacts on agriculture soils.

Climate change refers to long-term shifts in temperatures and weather patterns due to natural and human activities like deforestation, improper waste management, unplanned urbanization, encroachment to forest land and emission of greenhouse gases.

A drastic increase in climate-induced disasters such as droughts, landslides and mud slides, rock falls and floods, has resulted in significant socio-economic damage and environmental degradation. Excess rainfall has led to change in soil physical, biological and chemical composition resulting in reduced agriculture productivity. Prolonged dry spell has led to low soil cover and reduced biomass exposing the soil to high temperature and agents of soil erosion. There are also incidences of emerging and recurring pests and diseases.

Some of the land management practices such as burning of plant residues and poor handling of organic farm waste has contributed to emission of greenhouse gasses. There exists weak Early warning system on climate change that has led to poor emergency preparedness and coordination. Despite the county having developed a Climate Change Action Plan its implementation remains a challenge. It is worth noting that agriculture plays an important role in greenhouse gas (GHG) emissions mitigation and removal of Carbon dioxide gas from the atmosphere by sequestering carbon, yet it lags behind other sectors in terms of climate commitments, such as carbon credits and other climate change mitigation measures.

Policy Interventions:

1. Support climate early warning system to enhance preparedness in managing climate variability and weather extremes.
2. Support the implementation of the Bungoma County Climate Change Action Plan 2023-2027.
3. Promote climate smart agriculture and associated technologies.
4. Promote carbon credit programmes.

ii. Gender and Social Inclusion

There is unequal access to and control over land with 75 percent of women not owning land compared to 66 percent of men owning land. In Bungoma land is predominantly owned by men thus control productive resources. Youths are only considered responsible when they are married, furthermore youths who are engaged in farming their farm produce is owned by the household.

In Kenya, women account for 70 percent for agriculture labour force, while in Bungoma County women account for 75 percent for agriculture labour force. As much as women contribute in labour force, men control most of the enterprises when it starts fetching money.

Participation of men and women in rural education and campaign programs is skewed against female. Most of the participants in trainings are men however, on farm activities are done by women and youth.

There exist gender policies however, there is inadequate funding, low enforcement and awareness to implement these policies.

Policy interventions:

1. Promote capacity building on gender mainstreaming in soil and water management.
2. Promote participatory approaches for men, women and vulnerable groups in designing and implementation of soil and water management programs.
3. Promote mechanisms of identification of vulnerable groups.
4. Promote gender affirmative policies and regulations in soil and water management.

CHAPTER 4: POLICY IMPLEMENTATION FRAMEWORK

4.0 Introduction

This chapter looks into the relevant institutions and their roles in coordination and implementation of this policy.

4.1 Institutional framework

The successful implementation of this policy will depend on the partnership between the County Government of Bungoma and particularly the Department of Agriculture, Livestock, Fisheries, Irrigation and Cooperatives with the various relevant stakeholders. These partners include, other County Government departments, the National Government and its institutions, development partners, non-state actors like International and local NGOs, and Private Sector among others.

Table 1: Institutions, Departments and Roles of Stakeholders

Institution	Departments	Role in Implementation of the Policy
County Government	Department of Agriculture, Livestock, Fisheries, Irrigation and Cooperatives.	Shall be responsible for coordination during the implementation of this policy.
	Department of Environment, Water, Natural resources, tourism and climate change.	Implementation of the County climate change action plan and management of solid waste.
	Department of ICT	Shall be responsible for development and maintenance of ICT systems on soil management.
	Department of Lands, Urban/Physical Planning, Housing & Municipalities	Advise on urban planning
	Department of Finance and economic planning	Responsible for coordination of development of budget and planning documents such as County Integrated Development Plan, Annual Development Plan, and Annual Financial Fiscal Strategy Paper among others.

Institution	Departments	Role in Implementation of the Policy
	Department of Health and Sanitation	Management of liquid and solid waste
National Government	Ministry of Interior and Coordination	Enforcement of the legislations
	Kenya Forest Service	Protection and conservation of forests.
	Meteorological Department	Develop and provide early warning systems of weather to farmers.
	National Land Commission (NLC)	Conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities
Development partners	Multilateral and bilateral organizations	Development partners will provide financing and technical support for the implementation of this policy.
Regulatory Bodies	KEPHIS	Oversee regulatory functions on organic and bio-fertilizers.
	KEBS	Establishment of quality standards of all products, developing fertilizer standards, quality control and certification of fertilizer materials.
	NEMA	Responsible for the overall environmental management including those related to agricultural soil management and specifically to monitor and enforce Environmental Quality Standards Regulation
	Radiation Board	Responsible for ensuring compliance to standards in respect to radioactive materials in soil fertility inputs
Non-State Actors	CSOs, Financial Institutions, NGOs	Collaborate with the County government in the implementation of the policy through financing, offering technical support, oversight and review of the policy.
Research Institutions and Institutions of Higher learning	Universities, TTIs, National Polytechnics and KALRO	Carry out research and develop appropriate technologies that address soil management.

CHAPTER 5: POLICY MONITORING, EVALUATION, REPORTING AND REVIEW

5.0 Introduction

Policy monitoring, evaluation, reporting and review (MERR) are key components in the implementation process. It provides decision makers, development partners and other stakeholders with better means of learning from past experience, improving service delivery, planning, and allocation of resources and demonstrating results as part of accountability to key stakeholders.

5.1 Monitoring and Evaluation

Monitoring of the Policy implementation is an ongoing process that will ensure focused realization of the objectives. It will be participatory, involving all the stakeholders and beneficiaries. The Department of Agriculture together with relevant stakeholders shall collect, compile and analyze information on the implementation of various soil management interventions.

For successful implementation of this soil policy, the department will develop a MERR framework within six months of the policy implementation. The MERR framework is expected to be consistent with the County Integrated Monitoring and Evaluation Systems (CIMES) and have clear terms of reference for relevant stakeholders in data collection, analysis, review storage and sharing.

To ensure effective monitoring, evaluation and learning, the county shall establish a soil management unit which will be multi-Sectoral in nature thus involving representatives from different sectors.

5.2 Reporting

The County Government through the Department of Agriculture, Livestock, Fisheries, Irrigation and co-operatives will develop soil management reports quarterly and annually, detailing the level of implementation of the policy and the challenges experienced. The report will outline options on how to subsequently address challenges and emerging issues.

5.3 Review of the policy

The policy will be reviewed as need arises to address the sector challenges and emerging issues.

Supported by:

Implemented by