



**COUNTY GOVERNMENT OF KAKAMEGA**

**DEPARTMENT OF AGRICULTURE, LIVESTOCK, FISHERIES AND  
COOPERATIVES**

**THE KAKAMEGA COUNTY  
SUSTAINABLE LAND AND FOREST  
MANAGEMENT POLICY**

**JUNE 2022.**

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## ACRONYMS

ADSW	Anglican Development Service Western
AHADI	Agile Harmonized Assistance for Devolved Institutions
AGRA	Alliance for a Green Revolution in Africa
ASDSP	Agricultural Sector Development Support Programme
CBO	Community Based Organization
CEC	County Executive Committee
CFA	Community Forest Association
CIDP	County Integrated Development Plan
DVS	Director of Veterinary Services
EIA	Environmental Impact Assessment
ERA	Economic Review of Agriculture
FW	Fall Army Worm
GIZ	German Corporation for International Cooperation
GEF	Global Environmental Facility
KALRO	Kenya Agricultural and Livestock Research Organization
KFS	Kenya Forestry Service
LM1	Lower Midland zone 1
LM2	Lower Midland zone 2
LM3	Lower Midland zone 3
LM4	Lower Midland zone 4
M&E	Monitoring and Evaluation
MHH	Male Headed Households

MOALF	Ministry of Agriculture, Livestock and Fisheries
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
PELIS	Plantation Establishment for Livelihoods Improvement System
pH	Concentration of Hydrogen Ions
SFM	Sustainable Forest Management
SLM	Sustainable Land Management
SLFM	Sustainable land and Forest Management
UM0	Upper Midland zone 0
UM1	Upper Midland zone 1
UM2	Upper Midland zone 2
UM3	Upper Midland zone 1
UM4	Upper Midland zone 4
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States of America International Development

## INTERPRETATIONS

**Adaptation:** Adjustments in ecological, social or economic systems in response to actual or expected climatic stimuli and their effects or impacts.

**Adoption:** The action or fact of choosing to take up, follow, or use something.

**Agro-forestry:** Deliberate inclusion of trees and shrubs into the farming systems.

**Bio fertilizer:** Substances which contain living organisms which colonize the interior of the plant and promote the growth by increasing the supply or availability of primary nutrients

**Carbon sink:** A reservoir such as soils and forests that can absorb carbon dioxide from the atmosphere.

**Coping:** Are Short term responses that are utilized to face a sudden, unanticipated climatic risk.

**Ecosystem:** A dynamic complex of macro and microorganism communities interacting with their physical environment as a functional unit.

**Ecosystem service:** The benefits human populations derive, directly or indirectly, from ecosystem functions

**Fertilizer:** Any substance or material or mixture of substances added into the soil for the purpose of adding plant nutrients necessary for enhancing plant growth and development.

**Greenhouse gases:** Gases of the atmosphere, both natural and manmade, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere and clouds.

**Inorganic fertilizer:** A synthesized substance or material added into the soil for the purpose of adding plant nutrients necessary for enhancing plant growth and development.

**Integrated Nutrient Management (INM):** Combined use of inorganic and organic fertilizers

**Mitigation:** An intervention to reduce the sources or enhance the sinks of greenhouse gases.

**Organic Agriculture:** A holistic production management system which promotes and enhances agro eco system, health, including bio diversity, biological cycles and soil biological activity.

**Organic fertilizer:** is any substance or material of plant or animal origin that is added to the soil-plant system in its original form or naturally decomposed form to supply plant nutrients.

**Plant nutrients:** Essential life-giving plant elements.

**Sustainable Land Management (SLM):** practices and technologies that aim to integrate management of land, water, biodiversity and other environmental resources to meet human needs while ensuring long-term sustainability of ecosystem services and livelihoods.

**Sustainable Forest Management:** management of forests according to the principles of sustainable development.

**Soil:** The unconsolidated cover of the earth, made up of solid particles, water and air and capable of supporting plant growth.

**Soil conditioners:** Any substances or material added to the soil for the purpose of improving the medium for plant growth.

**Soil fertility:** The capacity of the soil to supply plants with nutrients, water and air.

**Soil health:** Capacity of a soil to meet performance standards relating to nutrient, air and water storage and supply.

**Soil quality indicators:** Measurable soil attributes that influence the inherent capacity of the soil to perform its production and environmental related functions.

**Soil restoration:** Returning degraded soils back to their original productivity.

**Soil rehabilitation:** Process of returning degraded soil to a functional state.

## **FOREWORD**

Kakamega County is characterized by high population, low agricultural productivity and inadequate off-farm income opportunities. Although it receives good amounts of rainfall all year round, yields of food crops have remained low and this could be attributed to poor agronomic practices and the use of low quality seeds. Population pressure coupled with low productivity in farms has compelled smallholders to encroach into the forest to seek alternative sources of income from timber, fuel wood, medicinal herbs, cultivation and fodder. Consequently, the forest is severely threatened despite its multiple socioeconomic and environmental benefits to the over 1.7 million inhabitants.

Sustainable land and forest management is critical in ensuring food security and rehabilitation of forests. Some of the identified challenges to sustainable land and forest management include poor land use, land degradation, decline in soil fertility, soil pollution and poor soil and water conservation practices. Other challenges are; planting of eucalyptus in water catchment areas, small farm land sizes, deforestation and inadequate extension services.

Although the county government has initiated a number of interventions such as; subsidized farm inputs and mechanization, smallholder irrigation and drainage, fish farming and support to cooperatives and other farmer organizations, sustainable land and forest management has not been adequately addressed. Therefore, there is need to develop a policy for this particular purpose given that review of the existing national policies indicated gaps.

The Kakamega County Sustainable Land and Forest Management policy, therefore, sets to provide a framework for integrated approach to sustainable land and forest management. The policy holds a living status and shall be reviewed and updated regularly to deal with overarching and emerging concepts and issues of the ever evolving science of Land and Forest Management. In its current form, it provides a comprehensive framework for the development of an Action Plan to guide the County to develop and deploy responsive Sustainable Land and Forest Management practices.

This policy is necessary for successful implementation of the sustainable land and forest management technologies. The policy will appropriately assist in implementation of sustainable land and forest management and agro-biodiversity conservation to reduce environmental degradation. The livelihoods of farmers around the forest will be improved through up scaling of existing sustainable land and forest management technologies to ease pressure on land and the forest.



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**County Government of Kakamega**



## ACKNOWLEDGEMENT

The Department of Agriculture, Livestock, Fisheries and Cooperatives (DALF&C) would like to extend its sincere gratitude to all individuals and institutions who shared their data, insights and experiences which informed and enriched the development of the Kakamega County Sustainable Land and Forest Management Policy.

In particular, we wish to thank the project donors; Global Environment Facility (GEF), United Nations Environmental Program (UNEP) and Alliance for a Green Revolution in Africa (AGRA) for funding the Sustainable Land and Forest Management project, whose broad objective was to contribute to food security and incomes of smallholders farmers and secure sustainable land and forest ecosystems in western Kenya.

We also want to appreciate the Director General of KALRO, Dr. Eliud Kireger, for his overall guidance and support. Special thanks go to Dr. George Ayaga, the Project Coordinator and Centre Director KALRO Alupe, the Project Coordination Unit consisting, Dr. John Achieng and Dr. David Mbakaya, and all the Project Consortium partners (ADS-W, ROP-Africa, MMUST, Nature Kenya, KFS, KEFRI, KWS, County Government of Kakamega, County Government of Nandi and the County Government of Vihiga).

Furthermore we acknowledge with much appreciation the crucial role of the Technical Working Group (TWG) consisting of Johnstone Imbira, Josephine Wanyama, Luke Marani, Albert .A. Ochenje, Sally Tirimba and Isaac Oindo, who put in a lot of effort to ensure that this Policy is completed on time.



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## **EXECUTIVE SUMMARY**

Agriculture is important in Kenya's national economy as it contributes to 27.3% of the Gross Domestic Product (GDP) and the survival of the Kenyan population is thus directly dependent almost entirely on land to derive goods and services. The Constitution of Kenya, 2010 assures Kenyans of the right to be free from hunger and to have adequate food of acceptable quality in accordance to Article 43(c) and to clean and safe water in adequate quantities (Article 43(d)).

Kakamega County is characterized by low agricultural productivity, and inadequate off-farm income opportunities which have contributed to food insecurity in the County. These challenges have compelled smallholder farmers to encroach into forest lands which are still fairly fertile, and also to seek alternative sources of income from timber, fuel wood, fodder and medicinal herbs. Consequently, the forest is severely threatened despite its multiple socioeconomic and environmental benefits to the over half a million inhabitants of the County.

Several policy issues were identified through a participatory approach which involved various stakeholders including agriculture sector institutions and community organizations. These issues have continued to constrain the development of the agriculture sector due to inappropriate use of land and forest management technologies to curb land degradation and encroachment into the forests. The policy issues included; land degradation through human activities, soil erosion, declining soil fertility, poor water management, drying up of water sources such as springs and streams, vulnerabilities due to changes in temperature and precipitation patterns among others. Earlier, the National and County governments had developed policies and strategies to promote appropriate sustainable land and forest management practices.

The policy proposes a broad range of measures and actions responding to key sustainable land and forest management issues and challenges. It also seeks to provide the framework for integrated approach to planning and mainstreaming sustainable land and forest management practices in all sectors.

The document has Six (5) chapters as follows:

Chapter one provides background information about the policy and its importance to the County of Kakamega. It also describes the County setting under which the policy will be implemented, and concludes by highlighting the scope, rationale, objectives and guiding principles of the policy.

Chapter two reviews the situational analysis of the County with regards to sustainable land and forest management.

Chapter three highlights the policy priority areas, the specific challenges and policy interventions that the County Government intends to adopt.

Chapter four identifies the legal and institutional framework upon which the policy will be operationalized.

Chapter five outlines the financial arrangements under which the policy will be implemented, while Chapter six highlights the implementation mechanisms, monitoring and evaluation.

It is hoped that this policy will achieve the desired goal and objectives.

# CHAPTER ONE – INTRODUCTION AND BACKGROUND

## 1.1 INTRODUCTION

The Kenya Land Policy (2012) provides for key principles of managing land issues, one of them being sustainable and productive management of land resources. Land is an integral part of the Environment. The Kenya Vision 2030 has placed the environment at the top of its agenda, stipulating that Kenya aims to be a nation that has a clean, secure and sustainable environment by 2030. However, environmental degradation is escalating in Kenya due to exploitative land use practices, deforestation, overgrazing, poorly planned and expanding human settlements, industrialization and pollution. Poverty is another major cause and consequence of land degradation and resource depletion. The poor rely heavily on natural resources for their livelihoods, and are unable to put land to rest or add inputs. Land degradation affects almost all spheres of national and county development and thus has a bearing on sustainable land and forest management.

The importance of providing for measures and mechanisms to address land degradation is widely recognized. Sustainable land and forest management is fundamental to human and animal life, livelihood systems, food security and sustainable development. Yet from time to time, Kakamega County is visited by vagaries of dry spells. The County also exhibits varied geological, climatic, infrastructural and socio-economic conditions.

The County experiences high vulnerability to adverse effects of land degradation and is characterized by high population pressure, low agricultural productivity, and inadequate off-farm income opportunities. The population pressure coupled with low productivity in their farms has compelled smallholder farmers to encroach into forests to seek alternative sources of income from timber, fuel wood, fodder and medicinal herbs. Consequently, arable land and forests are severely threatened despite their multiple socio-economic and environmental benefits to the over half a million inhabitants of the County. Due to poor understanding of the hydrological cycle and improper land use, there is mismanagement of water and land among the various users. With climate change manifestation the land and water crisis is set to heighten.

## **1.2 BACKGROUND INFORMATION**

### **1.2.1 POSITION AND SIZE OF THE COUNTY**

The county has a total area of 3033 km<sup>2</sup> and borders Trans Nzoia to the north, Bungoma to the North West, Busia to the west, Vihiga to the south, Nandi to the east, Uasin Gishu to the north east and Siaya to the South West. The county forest land cover stands at 9.98%.

### **1.2.2 KAKAMEGA FOREST AREA**

Kakamega forest is in Kakamega County, to the East of Kakamega town. The forest station is in Kakamega East Sub-County, about 2 km from Shinyalu town. The forest currently covers an area of 27,075 ha including 3,985 of National Reserve.

### **1.2.3 PHYSICAL AND TOPOGRAPHIC FEATURES**

The altitudes of the county ranges from 1,240 metres to 2,000 metres above sea level, The southern part of the county is hilly and is made up of rugged granites rising in places to 1,950 metres above sea level. The Nandi Escarpment forms a prominent feature on the county's eastern border, with its main scarp rising from the general elevation of 1,700 metres to 2,000 metres. There are also several hills in the county such as Misango, Imanga, Eregi, Butieri, Sikhokhochole, Mawe Tatu, Lirhanda, Kiming'ini among others.

### **1.2.4 AGRO ECOLOGICAL ZONES**

There are two main ecological zones in the county namely; the Upper Medium (UM) and the Lower Medium (LM). The Upper Medium covers the Central and Northern parts of the county such as Ikolomani, Lurambi, Malava, Navakholo and Shinyalu that practise intensive maize, tea, beans and horticultural production mainly on small scale; and Lugari and Likuyani where large scale farming is practised. The second ecological zone, the Lower Medium (LM), covers a major portion of the southern part of the county which includes Butere, Khwisero, Mumias East, Mumias West and Matungu. In this zone, the main economic activity is sugarcane production with some farmers practising maize, sweet potatoes, tea, ground nuts and cassava production.

### **1.2.5 CLIMATIC CONDITIONS**

The rainfall ranges from 1280.1mm to 2214.1 mm per year. The rainfall pattern is evenly distributed all year round with March to July receiving heavy rains while December to February receives light rains. The temperatures range from 18<sup>0</sup> C to 29<sup>0</sup>C. January, February and March are the hottest months except for July and August which are relatively colder.

### **1.2.6 POPULATION SIZE AND COMPOSITION**

According to the 2009 National Population and Housing Census, the county population was 1,660, 651 consisting of 797,112 males and 863,539 females giving the population distribution of 48 per cent male and 52 per cent female. The county population is projected to reach 2,028,325 by 2020.

### **1.3 Importance of Sustainable Land and Forest Management in the Conservation of forest ecosystems**

Kakamega County has a total area of 3,051.30 km<sup>2</sup> and a total population of 1.8675 million people with annual growth of 2.5% (2019 National Population and Housing Census). The high population has led to continuous sub division of land to uneconomical units ranging from 0.5 to 2 ha. Yields of staple food crops such as maize and beans are less than 1.5 tons per hectare for maize and less than 0.5 tons per hectare compared to a potential yield of over 5 t/ha and about 1 ton/ha for maize and beans, respectively. This is partly due to poor agricultural practices such as continuous cultivation of farmlands without adding soil-enriching inputs, inadequate use of soil and water conservation structures. Livestock production is characterized by low productivity due to low quality breeds and poor feeding and overall management practices.

The population pressure, coupled with low farm productivity, has compelled the smallholder farmers to encroach into the forest to seek alternative sources of income from timber, fuel wood and medicinal herbs. There is also massive destruction of Kakamega forest by licensed saw millers, illegal loggers and charcoal burning. Consequently, the forest is severely threatened despite its multiple socioeconomic and environmental benefits to the over 1.7 million inhabitants of the county. The rivers and springs have started drying up as a result of wanton destruction of the forest.

### **1.4 SCOPE OF THE POLICY**

The scope of this policy applies to the use, conservation and management of land and forest resources within the areas in Kakamega County. This includes soil and water management/conservation, agricultural practices, land use practices, forestry and agro-forestry practices, and conservation of biodiversity.

The policy is applicable to the entire Kakamega County; all its riparian areas, Kakamega Forest ecosystem (Kakamega forest) and other forested areas within the county and all water catchment areas, farmlands and riverine environment.

This policy applies to all Kakamega County Government Departments and other National Government Agencies implementing environment-related functions, all sustainable land and forest management stakeholders including saw millers and development partners, all associations

dealing with land and forest resources, contractors and the communities living around the Kakamega forest ecosystem. All individuals and community members have individual responsibilities to conserve land and forest resources within their locality for their own benefits and those of future generations.

For purposes of this policy, sustainable land and forest management encompasses established approaches such as soil and water conservation, biodiversity, forest restoration, natural resource management and integrated landscape management and is based on the following principles:

- a) Targeted policy and institutional support, including the development of incentive mechanisms for SLM adoption and income generation at the local level;
- b) Land-user-driven and participatory approaches;
- c) The integrated use of natural resources on farms and at the ecosystem scale; and
- d) Multi-level, multi-stakeholder involvement and partnerships at all levels – land users, technical experts and policy-makers.

This policy will guide the County in achieving its objectives as envisaged in the Constitution of Kenya 2010, Vision 2030, and the County Integrated Development Plan (CIDP 2018-2022). In addressing the rehabilitation, use and management of land and forest resources, the policy gives direction on how land and forest resources will be managed sustainably.

## **1.5 RATIONALE OF THE POLICY**

The County's land and forests resources which are critical to its economy continue to face persistent challenges with regard to poor soil and water management practices, planting of eucalyptus in water catchment areas and poor siting on farms, subdivision of land to uneconomical units, high costs of inputs coupled with poor market linkages, and inadequate extension support services. Other challenges include human encroachment to forests, and inadequate stakeholder awareness on forest plantation establishment and management. These have led to declining crop production and productivity resulting in food and nutrition insecurity; rampant deforestation has impacted negatively as a result of reduced rainfall amounts being received leading to drying up of streams and rivers, and increased loss of biodiversity. To address these challenges, policy reviews were done to identify the strengths and gaps therein. The identified gaps then formed the policy issues focusing on sustainable land and forest management.

The Kakamega County Sustainable Land and Forest Management Policy, therefore, aims at providing and guiding the management of the stated resources within the County. It will also ensure that the linkage between environmental conservation and food security is realized hence enhancing social inclusion, improved human welfare, employment creation, and maintaining a healthy, functioning ecosystem for the community.

## 1.6 GOAL, OBJECTIVES AND GUIDING PRINCIPLES

### 1.6.1 THE POLICY GOAL

The goal of this Policy is to:

Provide a framework to enhance sustainable use and management of land and forest resources in Kakamega County for a better quality of life for the present and future generations.

### 1.6.2 OBJECTIVES OF THE POLICY

- i) to provide a framework for an integrated approach to mainstreaming sustainable land and forest management in county planning;
- ii) to provide the legal and institutional framework for sustainable use and management of the county's land and forest resources;
- iii) to provide a framework to build the capacity of the communities within kakamega county and to promote their participation in sustainable management of land and forest resources; and

### 1.6.3 GUIDING PRINCIPLES

The following principles will guide the implementation of this policy:

- (i) **Right to food security:** The right to food security will be exercised taking into consideration sustainable land use and the social and environmental needs.
- (ii) **Environmental Right:** Every person in the county has a right to a clean and healthy environment and a duty to safeguard and enhance the environment.
- (iii) **Eco-system Approach:** An integrated ecosystem approach will be employed in the use and management of the natural resources to ensure that all ecosystem services are managed in an integrated manner while also providing a range of benefits to the citizenry.
- (iv) **Total Economic Value:** Benefits generated from the ecosystem will be integrated into the county accounting system, programs and projects.
- (v) **Public Participation:** In exercise of the Total Economic Value Principle, a coordinated and participatory approach to forest protection and management will be enhanced to ensure that the relevant county departments, private sector, civil society and communities are involved in planning, implementation and decision making processes.
- (vi) **Sustainable Natural Resource Use:** Natural resources will be utilized in a manner that does not compromise the quality and value of the resource or decrease the carrying capacity of supporting ecosystems.



- (vii) **Equity:** The management of the natural resources will ensure equitable access and use of the resources both for present and future generations.
- (viii) **Subsidiarity:** The management of the natural resources will be through decentralization and devolution of authority and responsibilities by the relevant government agencies to the grass root organizations such as the Community Forest Association (CFAs), Water Users Association etc.
- (ix) **Good Governance:** Rule of law, effective institutions, transparency and accountability, respect for human rights and the meaningful participation of communities will be integrated in environmental management.
- (x) **Benefit sharing:** Access to, derivation from natural resources, and equitable apportionment of accruing entitlements and rights in the utilization, exploitation, use, conservation, development and management of natural resources.
- (xi) **Regional Cooperation:** For shared resources, regional and county instruments will be cooperatively implemented for better natural resource management

## **CHAPTER TWO – SITUATION ANALYSIS**

### **2.0 INTRODUCTION**

Kakamega County receives good amount of rainfall throughout the year in most parts. The annual county rainfall ranges from 1280.1mm to 2214.1 mm per year. The rainfall pattern is evenly distributed all year round with March and July receiving heavy rains while December and February receives light rains. The temperatures range from 18 °C to 29 °C. January, February and March are the hottest months with other months having relatively similar temperatures except for July and August which have relatively cold spells. The county has an average humidity of 67 percent.

The County, over the recent past, has witnessed a number of challenges resulting in land and forest degradation. They include; high population growths, shrinking productive land, urbanization are some of the significant challenges that have caused pressure on existing land and forest resources. Other human activities contributing to degradation in the county include; poor soil and water conservation and management practices, deforestation, overgrazing and pollution. These activities undermine the sink function of the forests which operates through such processes as nutrient recycling, decomposition and the natural purification and filtering of air and water.

This backdrop provides the justification for this Sustainable land and forest Policy. It gives the framework to guide the county's efforts in addressing the ever-growing land and forest management issues and challenges such as:

### **2.1 LAND AND LAND USE**

#### **2.1.1 Land Size**

The total county land acreage is 305,130Ha of which 27,075Ha is under forest cover, 255,483Ha is under crops and 22,572Ha under infrastructure.

This category of land is purely used for agriculture i.e. for crop production and livestock production and it measure's approximately 218,322.6Ha. The northern part of the county i.e. Likuyani and Lugari Sub Counties has large farm sizes with an average of 4 ha used for large scale farming. The southern region has small land parcels with an average of 0.6 ha used for small scale farming and this being inadequate, the aspect of encroachment becomes a big issue in these areas.

The County has 27,075Ha of land under forest. This is mostly in Lugari, Malava, Likuyani, Navakholo, Lurambi, Khwisero and Shinyalu sub-counties. The land is owned by the government and it's gazetted for forest use.

### **2.1.2 CROP, LIVESTOCK AND FISH PRODUCTION**

The main land use types include livestock rearing, crop farming, tree planting, fish farming and settlements.

Crop production is the mainstream of the County's economy and contributes about 65 per cent to the County's income. Agriculture employs the majority of people in rural areas as well as those in the urban areas indirectly. The two main categories of crops grown in the county are food crops, industrial crops depending on the use of the harvested produce and a third category is horticulture crops (multipurpose).

Food crops-are cereals (maize, sorghum, finger millet, and rice), pulses (beans, peas and grams) or roots/tubers (cassava, s/potato, arrow roots). But some pulses have declined due to some factors e.g. diseases. There's need for research and adoption of crop varieties that are high value and disease resistant.

The county is endowed with good climate for livestock husbandry. The following livestock are reared: cattle (dairy, zebu), poultry (indigenous chicken, layers, broilers, ducks, turkeys, geese and pigeons), bee keeping, pigs, goats (local goats, dairy goat), hair sheep and rabbits. According to (census 2009) Livestock population in the County is as follows Cattle - 377,910, Sheep – 88,790, Goats – 74,405, Pigs – 24,604, Donkeys – 691, Indigenous chicken - 959,746, Commercial chicken – 73,876. About 68% of the cattle are the zebus.

The county has potential for Fish farming which is one of the eight flag ship projects implemented by the County Government of Kakamega. The Department of Fisheries is currently implementing the Kakamega County Fish Farming Programme in which pond construction and renovation and provision of fish fingerlings is subsidized. The main fish species are Nile Tilapia and Catfish. The main production unit is the earthen fish ponds which if proper land and forest conservation measures are not put in place contribute immensely to land and forest degradation.

Overreliance on convectional crop production and livestock rearing has immensely contributed to land and forest degradation.

## **2.2 Environmental Governance**

Many sectoral policies and laws in the county are not harmonized with each other and with the Constitution. These include policies and laws concerning agriculture, land, water, forests, trade and industry, which have significant implications on the environment.

Different sectors in the county are characterized by ineffective regulatory mechanisms and inadequate enforcement on related policies and laws. The promulgation of the Constitution brought new requirements for natural resource management such as public participation,

community and gender rights, and equity in benefit sharing, devolution and the need to achieve 10% forest cover among others. These challenges are compounded by dwindling public land meaning that forestry development has to expand into private and community land, which need incentives and clear methods of engagement to encourage investments in commercial forestry on private land.

The need to enact supporting legislation following the promulgation of the constitution is required to minimize conflicts between industry, communities and governments at both national and county levels over resource management and benefit sharing. In addition, forest governance needs to take into account emerging issues and best practices at global, regional, national and county level.

### **2.3 Loss of biodiversity**

The County continues to lose her biodiversity due to habitat destruction, overgrazing, deforestation, pollution, unsustainable harvesting of natural resources, bio-piracy and introduction of invasive and alien species, among others. Invasive and alien species are a major threat to the environment. They threaten indigenous species through the effects of predation, alteration of habitat or disruption of ecosystem processes. The challenge of dealing with loss of biodiversity becomes even more complicated when one is dealing with shared resources where sustainable land and forest management laws and policies of neighboring counties are not harmonized.

### **2.4 ENVIRONMENTAL EDUCATION AND AWARENESS**

The agricultural sector faces challenges in building capacity for sustainable land and forest utilization and management in the county. Forestry curricula have not adequately responded to emerging issues and technologies in the sector while practitioners require continuous professional development to take advantage of these technologies to further forestry development. The role of professional bodies in advancing professionalism in forestry practice and standards has not been stipulated well in the county frameworks

### **2.5 ENVIRONMENTAL DEGRADATION**

High poverty levels in the county have impacted negatively on the environment. Poverty is a major cause and consequence of land and forest degradation and resources depletion because of lack of alternative source of livelihoods.

**2.5.1 Poor Pasture Management:** There is little to no pasture management in the County as a result of overstocking and heavy reliance on rainfall to regenerate the pasture. This has led to high levels of soil erosion and degradation within the county.

**2.5.2 Unsustainable Sand Harvesting:** This practice is not regulated within the County. This leads to destructive and unsustainable practices such as harvesting along river banks without proper guidelines.

**2.5.3 High Levels of Deforestation:** There is poor co-ordination between Kenya Forest Service and the county government of Kakamega. There is an unsustainable rate of logging and charcoal burning as this practice is conducted in an unregulated manner. Due to this there are no reforestation plans and/or activities by those engaged in these economic activities. This state of affairs is as a result of lack of enforcement of the statutory regulations.

## **2.6 Decreasing and low quality water flows**

Poor water quality has been registered in the county over the times. One of the main benefits which forests bestow to the environment is the regulation of water flows, and in improving the quality of water. There is therefore great need to intensify management of water catchments to enhance the conservation of water, regulation of river flows, and to reduce siltation and sedimentation of water reservoirs.

## **2.7 High levels of erosion, siltation and land degradation**

Soil erosion is a major challenge in the county. It degrades the land, with the eroded soils silting rivers. Trees prevent soil erosion, and assists in creating conditions for restoring fertility therefore sustainable land and forest management will enhance soil and water conservation.

## **2.8 Climate change**

Climate is changing in the county, and this is having a direct impact on land and forest resources through; flooding, health, landslides, and drought. Forestry is playing an important role in both mitigation and adaptation to climate change, and towards green growth. The continuous loss of biological resources translates into loss of economic potential and options for commercial development.

## **2.9 Conservation of Shared Natural Resources**

An ecosystem approach that considers the totality of impacts, even when the ecosystem crosses county boundaries, Conflicts over control and management of resources shared with neighboring Counties is very common. This state of affairs calls for a framework for a harmonized and common approach to the conservation and management of such shared natural resources among the neighboring Counties.

### 2.30 Legal framework

The Constitution of Kenya, 2010 under Article 43 provides that every person has the right to be free from hunger, have adequate food of acceptable quality and to clean and safe water in adequate quantities. Article 60 further provides that land shall be held, used and managed in a manner that is equitable, efficient, productive and sustainable and in accordance with the following principles— (a) equitable access to land; (b) security of land rights; (c) sustainable and productive management of land resources; (d) transparent and cost effective administration of land; and (e) sound conservation and protection of ecologically sensitive areas;

Article 69.(1) provides that “the State shall - (a) ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits; (b) work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya; (c) protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities; (d) encourage public participation in the management, protection and conservation of the environment; (e) protect genetic resources and biological diversity; (f) establish systems of environmental impact assessment, environmental audit and monitoring of the environment; (g) eliminate processes and activities that are likely to endanger the environment; and (h) utilize the environment and natural resources for the benefit of the people of Kenya. Article 69 (2) provides that every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.”

# CHAPTER THREE: SUSTAINABLE LAND AND FOREST MANAGEMENT POLICY ISSUES

## 3.1 SUSTAINABLE LAND MANAGEMENT

### 3.1.1 Poor Land Use

Poor land use is a major cause of soil degradation, depletion of essential plant nutrients, loss of soil organic matter, compaction and development of hardpan, accumulation of salts and acidification leading to poor physical, chemical and biological state of the agricultural soils. These challenges spell a gloomy future for the county unless the status quo is changed.

Poor land use in Kakamega has led to decline in production of the major cereals, namely: maize, sorghum, finger millet and rice. For instance, maize yields have declined from the optimal five tonnes per hectare, under proper land management, to 1.5tonnes per hectare. Such declines are particularly significant given that maize is the staple food for the county.

For sugarcane, the main cash crop in the county, production has declined from 120 tonnes per hectare to 30 tonnes per hectare over a period of 30 years. The low production and productivity of food crops and cash crops is attributed to suboptimal land management practices which include: poor tillage and land preparation practices, poor cropping, land fragmentation and encroachment of riverbanks and water catchment sources.

### Challenges

- (i) Poor tillage practises;
- (ii) Low adoption of soil conservation practices ;
- (iii) Low enforcement of sustainable land management related laws;
- (iv) Poor coordination amongst land management stakeholders;
- (v) Planting of Eucalyptus on riverbanks and water catchment sources.

### Policy statement:

To this end the county government shall-

- (i) promote and support soil conservation practices;
- (ii) legislate on conservation of land including the riparian areas;
- (iii) support the planting of environmentally friendly tree species on riverbanks and water catchment sources; and

- (iv) Support development of land use packages, and disseminate appropriate technologies on sustainable land management.

### **3.1.2 Land Degradation**

Land degradation is the change in soil health status resulting in diminished capacity of the ecosystem to provide goods and services for its beneficiaries. It can also be defined as the decline in soil quality caused by improper land use which can be physical, biological or chemical. It is estimated that 2 billion ha of soil resources in the world have been degraded, namely 22 percent of cropland, pasture, forest and woodland. The result of soil degradation is such that the original use is no longer possible and the land has become practically unproductive. This leads to low yields, displacement of people, spread of air and water borne diseases that are harmful to flora and fauna.

In Kenya about 2.2 percent of land area is bare and 69.7 percent is under shrubs. The implication for this is that 71.9 percent of the land area in Kenya being at the risk of degradation due to poor natural cover.

Kakamega County population density has increased from 544 persons/km<sup>2</sup> from 2009 to 665 persons/km<sup>2</sup> 2017. This has led to sub-division of land to uneconomical sizes, and pressure on the available infrastructural and social facilities. The increasing trend in population has led to increased demand for food, energy and housing, thus encouraging soil degradation. The main components of soil degradation are soil pollution, soil erosion and loss of soil fertility.

#### **Challenges**

- (i) poor farm management practices;
- (ii) improper disposal of road runoff;
- (iii) deforestation;
- (iv) poor soil cover; and
- (v) unregulated sand harvesting, mining and brick making;

#### **Policy statement:**

To this end the county government shall-

- (i) strengthen and provide extension services to offer sustainable land management practices ;
- (ii) promote proper building of rural roads and safe disposal of road runoff into farms;
- (iii) provide incentives for land and forest conservation to reduce pressure on forest and farmland through afforestation and agroforestry;
- (iv) promote conservation agriculture; and



- (v) provide guidelines for sand harvesting, mineral mining, brick making and rehabilitation of used land;

### **3.1.3 Decline in soil fertility**

Soil fertility is important in agricultural production. It is the ability of the soil to support growth of plants.

Kakamega county soils have, over the years, been losing essential nutrients, organic matter and increasing in soil acidity. Years of continuous cultivation and exportation of nutrients from the farm without proper handling and replenishment of soils may have led to loss of soil fertility. This has resulted in decreased crop yield per unit area for example maize yields have declined from the optimal five tonnes per hectare, under proper land management, to 1.5tonnes per hectare.

The major factors affecting soil fertility and hence crop production in Kakamega are: the following: declining of soil pH; injudicious use of fertilizers; leaching of plant nutrients; and soil erosion.

#### **Challenges**

- (i) high cost of soil testing services;
- (ii) low awareness by farmers on the need for soil testing;
- (iii) overuse of acidifying fertilizers;
- (iv) low use of organic manures;
- (v) inadequate knowledge on preparation and use of organic manure;
- (vi) low adoption of conservation agriculture practices;
- (vii) low awareness and implementation of 10% tree cover policy; and
- (viii) inadequate agriculture extension services.

#### **Policy statement:**

To this end the county government shall-

- (i) promote and create awareness on the need for soil sampling and testing;
- (ii) promote subsidized soil testing services;
- (iii) promote the 10% tree cover on farm and off farm;
- (iv) support organic farming and conservation agriculture ;
- (v) strengthen and facilitate agriculture extension services; and
- (vi) promote the use of non-acidifying fertilizers, and soil amendments;

### 3.1.4 SOIL POLLUTION

Soil pollution is defined as the presence of toxic chemicals (pollutants or contaminants) in soil, in high concentrations to pose a risk to human health and the ecosystem. Such contaminants include heavy metals, toxic gases, inorganic ions and salts (e.g. Phosphates, Carbonates, Nitrates and Sulphates). Bio-accumulation occurs when plants accumulate small molecules of the pollutants which build up causing high levels to occur in the plant than in the soil. Animals and humans who feed on these crops can be poisoned by the pollutants.

Soil pollution is a major environmental challenge in Kakamega County. However, there is inadequate information on its causes and effects. Soil pollution reduces soil fertility thus decreasing yields due to change in soil structure, soil pH and death of soil microorganisms such as earth worms, beneficial fungi and rhizobia. Direct discharge of waste water by industries e.g. sugar industries and jaggeries, uncontrolled burning of waste; leakage of sewage system, underground storage tanks and leaching of soluble substances from landfills and dumpsites also contaminate soils.

#### **Challenges**

- (i) poor industrial and solid waste disposal;
- (ii) poor effluent discharge;
- (iii) improper use of agricultural and industrial chemicals; and
- (iv) poor land planning.

#### **Policy statement:**

To this end the County Government shall-

- (i) put in place legislation to ensure all industrial waste and agrochemicals are treated to best standards before discharge into the ecosystem;
- (ii) enforce execution of industrial actions as recommended in environmental impact assessment and social environmental assessment reports;
- (iii) establish appropriate disposal facilities;
- (iv) support and promote best practices in waste management 6R's (reduce, recycle, reuse, refuse, refill and return) and carry out public education on how industrial waste is to be handled.

### 3.1.5 POOR SOIL AND WATER CONSERVATION PRACTICES

Soil management has a direct and significant impact on water availability to crops. Some soil conservation practices increase the amount of water available to crops, while others degrade soil

and decrease available soil water. A good soil structure improves water infiltration and decreases runoff and erosion.

### **Challenges-**

- (i) lack of incentives for good land conservation practices in landscape management; and
- (ii) existing statutes are not adequately enforced to address all issues of sustainable land management.

### **Policy statements**

#### **To this end the County Government shall-**

- (i) promote soil and water conservation interventions including adoption of conservation agriculture principles to enhance sustainable land management;
- (ii) provide incentives to facilitate access to affordable, appropriate technologies and equipment for soil and water conservation;
- (iii) establish a comprehensive land use guidelines and regulations;
- (iv) prioritize and mainstream soil and water conservation agenda in county governments' programmes and projects; and
- (v) Develop and implement a regulatory framework for sustainable land management practices.

### **3.1.6 SMALL FARM LAND SIZES**

Declining agricultural land due to a combination of factors including uncontrolled subdivision and inappropriate land use is a major hindrance to enhancing agricultural productivity and optimal use of land as a resource. The pattern of human settlements in the county is influenced by natural resource endowments, which include availability, accessibility and control.

Sustainable human settlement involves creating the conditions under which people in both rural and urban settings can enjoy healthy, productive and well integrated lifestyles. This should ensure that people live in safe, healthy and dignified conditions with relatively easy access to amenities. However, rapid urbanization in the county caused by population growth and rural-urban migration has hindered the capacity of urban centres to provide housing, infrastructure, services and job opportunities.

### **Challenges:**

- (i) land fragmentation;
- (ii) poor land planning;

## **Policy statements**

### **To this end the County Government shall-**

- (i) Encourage appropriate minimum land sizes suitable for various agricultural ecological zones based on suitable enterprises and their economic potential;
- (ii) Develop and enforce integrated land use planning at all levels.
- (iii) create arboreta and parks within the county;
- (iv) support preservation of lands for indigenous and cultural activities;
- (v) integrate demographic issues into environmental management and natural resources conservation;
- (vi) develop and implement an integrated housing policy and housing master plan that takes into account environmental considerations; and

## **3.2 CLIMATE CHANGE**

Climate change is significant change in global temperatures and precipitation over time due to natural variability or to human activity. Climate change affects agriculture in a number of ways, including through changes in average temperatures, rainfall, and climate extremes (e.g., heat waves); changes in pests and diseases; changes in atmospheric carbon dioxide and ground-level ozone concentrations; changes in the nutritional quality of some foods; and changes in the sea level. Climate is one of the most important factors affecting the formation of soil with important implications for their development, use and management perspective with reference to soil structure, stability, and topsoil water holding capacity, nutrient availability and erosion.

In Kakamega the expected onset of rainfall used to be mid-February and March; farmers could dry plant with certainty unlike in the recent years; however Change in frequency and intensity of floods, dry spells, and increased levels of pests and diseases, such as aphids has changed this. The county needs to focus on relevant interventions and strategies.

### **3.2.1 FLOODS**

During enhanced rainfall seasons in Kakamega County, flooding occurs along river banks and low-lying areas. Lowland soils are often under water for days or weeks causing oxygen depletion or reducing conditions which in turn affect the chemistry of the soil water system and consequently soil aggregation which impacts agricultural production and productivity. Water logged soils expose crops to susceptibility of attacks by root rot organisms while growth is minimized.

### **Challenges-**

- (i) encroaching on riparian land;

- (ii) lack of soil conservation structures;
- (iii) deforestation; and
- (iv) Destruction of wet lands.

**Policy statement:**

To this end the county government shall-

- (i) promote appropriate flood reduction technologies;
- (ii) support water harvesting technologies; and
- (iii) Support protection of catchment areas such as tree planting, soil and water conservation.

**3.2.2 INVASIVE PESTS AND DISEASES**

Climate change causes a threat to the control of pests and diseases. These pests and diseases include insects (fall army worm), plant diseases (Maize Lethal Necrosis Disease and bacteria wilts) and invasive weeds such as striga weeds. As climate variables continue to change in Kakamega county, new pests and diseases invade previously uninhabited areas, minor pests become major pests. Climatic factors that aid in pests and diseases invasion are mostly temperature related and include increasing average temperatures, changes in precipitation patterns and water shortage. Most pests pupate and lay eggs in the soil and soil drench is usually done using a lot of pesticides which destroy important soil microorganisms, at the same time result in buildup toxins in the soil.

**Challenges:**

- (i) prevalence of invasive pests and diseases;
- (ii) inadequate knowledge on integrated pest management techniques; and
- (iii) Inadequate research and dissemination on control technologies of invasive pests and diseases.

**Policy statement:**

To this end the county government shall-

- (i) establish a crop protection unit;
- (ii) promote integrated pest management;
- (iii) support and strengthen an agricultural research extension linkage on pest control technologies; and
- (iv) Set aside funds for control of invasive pests and diseases.

### **3.2.3 EUCALYPTUS AND OTHER WATER SAPPING PLANTS IN WATER CATCHMENT AREAS AND FARMS**

Eucalyptus trees are a fast growing, early maturing tree species that farmers plant in water catchment areas and farmlands not for environmental conservation but for fuel wood, income generation, and construction. The use of eucalyptus for wood fuel is important in bio-diversity conservation in that it replaces indigenous species, thereby preventing further degradation of natural forests. Furthermore, certain Eucalyptus species, by quickly producing firewood, have aided in eliminating the causes which frequently have led to land degradation and desertification. When eucalyptus is grown as a short rotation crop for high biomass production and removal, soil nutrients are depleted rapidly and which conforms to conventional scientific argument.

#### **Challenges**

- (i) Eucalyptus and other water sapping plants being planted on riparian land, wetlands and marshy areas;
- (ii) Conflicts arise from shading and harm to the neighbouring farms from eucalyptus and other water sapping plants grown on farm edges; and
- (iii) Planting of inappropriate tree species that are late maturing, with extend shading effect making large portions of land unproductive.

#### **Policy statements:**

##### **To this end the County Government shall-**

- (i) Promote and support cultivation of suitable eucalyptus and other water sapping plants species without compromising environmental conservation;
- (ii) Actively assist farmers in making informed decisions in planting, managing and utilizing eucalyptus and other water sapping plants and alternative tree species;
- (iii) Promote conflict resolution arising from planting of eucalyptus and other water sapping trees; and
- (iv) Enforce laws that prohibit planting of eucalyptus and other water sapping trees on riparian land, wet lands and water catchment areas.

## **3.3 SUSTAINABLE FOREST MANAGEMENT**

### **3.2.1 Indigenous forests**

Kakamega forest is one of the indigenous forests found in the county. It supplies important economic, environmental, recreational, scientific, social, cultural and spiritual benefits. However, the forest has been subjected to land use changes such as conversion to farmlands, settlements,

reducing its ability to supply forest products and serve as a water catchment, biodiversity conservation reservoirs, wildlife habitats and carbon sinks.

**Challenges:**

- (i) Deforestation;
- (ii) Destruction of water catchment areas; and
- (iii) Overexploitation of non-wood forest product.

**Policy statement:**

**To this end the County Government shall:-**

- (i) sustainably conserve and manage all reserved forests for multiple uses in accordance to approved management plans with communities and other stakeholders;
- (ii) promote and support the rehabilitation and management of water catchment areas; and
- (iii) Support and promote ex-situ and in-situ conservation of forest genetic resources.

**3.2.2 Farm forestry**

Trees are essential part of diversified farm production, providing both subsistence products and incomes while contributing to soil fertility and soil and water conservation. Products such as fuel wood, timber, fodder trees, shrubs or grass contribute significantly to the economies of the rural population. Given the growing population, it is not possible to meet all the demands of forest products from state forests and the main alternative source of these products is private lands. Planting of trees on the farms has several positive environmental effects, which include watershed protection, enhancement of the microclimate and carbon sequestration. To achieve the national forest cover target of 10% of land area, the major afforestation effort will have to be in community and private lands.

**Challenges:**

- (i) Deforestation of farmlands with minimal replacement;
- (ii) Competition for land between crops and trees; and
- (iii) Inadequate forestry extension services.

**Policy statement:**

**To this end the County Government shall:**

- (i) reduce pressure on reserved forests by promoting partnerships with land owners to increase on-farm tree cover;

- (ii) create incentives (economic and non-economic) to promote implementation of sustainable forest management practices; and
- (iii) Promote production, processing and marketing of farm forestry products.

### **3.2.3 Plantation Forests**

Forest plantations supply industrial wood and also play a crucial role in conserving biodiversity, providing habitat for wildlife, conserving soils and regulating water supplies and sequestering carbon dioxide. Apart from supplying wood products, forest plantations play an important role in reducing pressure on the indigenous forests.

All forest plantations on public lands are managed with the primary objective of production of high quality wood for industrial purposes.

Recognizing fewer species in forest plantations today, there is need to diversify the species and genetic base to improve ecological resilience and product diversification.

#### **Challenges**

- (i) lack of awareness on forest plantation establishment and management amongst stakeholders;
- (ii) inadequate funding towards establishment of forest plantation; and
- (iii) Inadequate land for establishment.

#### **Policy Statements**

**To this end the County Government shall:**

- (i) Promote private sector participation in establishment and management of plantations.
- (ii) Support and promote private sector and community participation in the establishment and management of commercial forests on public, private and community land.

### **3.2.4 Urban Forests and Roadside Tree Planting**

Establishment of arboreta, roadside tree planting, botanical gardens, urban forests, recreational parks and mini-forests enhances environmental, social, and economic values. Trees provide a cool and serene environment, act as natural filters and contribute to the general wellbeing of society besides improving the microclimate of cities and towns.

Trees planted along the boundaries of road reserves are important for aesthetic and shade effects to travelers along the highways and other public roads. A belt of amenity trees planted at the interface of road and private lands will improve the scenery on road reserves contribute to carbon



sequestration, mark the boundaries between the road reserves and private lands to avoid encroachment into the road reserves.

### **Challenges**

- (i) lack of guidelines on urban forestry and planting of trees along road reserves;
- (ii) encroachment of road reserves; and
- (iii) poor of urban planning

### **Policy Statements**

**To this end the County Government shall: -**

- (i) promote the establishment and management of urban forestry and amenity belts of appropriate tree species along road reserves;
- (ii) establish and maintain arboreta, green zones, botanical gardens, recreational parks and urban forests for aesthetic and recreational values; and
- (iii) Support and promote planning of urban forest and road side tree planting.

## **3.2.5 Forest products and industries**

### **3.2.5.1 Wood products**

The forest products sub-sector plays an important role in supporting the subsistence needs of many households. The major subsistence product is fuel wood on which over 80% of Kakamega households and institutions depend. Although 30% of all wood fuel is consumed as charcoal, its production and marketing is not adequately regulated. Most of the wood fuel is obtained from plantations, woodlands and shrub lands on community and private land.

### **Challenges:**

- (i) unsustainable extraction, which exceeds production;
- (ii) no proper regulations on wood products harvest and replanting of the trees; and
- (iii) Illegal trade in wood and wood products.

### **Policy statement:**

**To this end the County Government shall:**

- (i) promote investment in wood industry to enhance efficiency in wood conversion and value-addition;
- (ii) establish a chain-of-custody and certification system for trade in wood and wood products;

- (iii) promote efficient production and utilization of wood fuel, and adoption of alternative forms of renewable energy; and
- (iv) Establish regulations on harvesting of wood products and tree planting.

### **Non wood forest products**

Non-wood forest products are important to the livelihoods of the rural communities and account for a significant share of household incomes and expenditures. Some of the non-wood forest products that contribute to sustainable livelihoods include gums and resins, honey, essential oils, frankincense, myrrh, fibres, medicinal and aromatic plants, dying and tanning materials. In addition, many of these products have high potential for export. In times of food scarcity, some non-wood products are the main source of nutrition for many communities.

### **Challenges:**

- (i) overexploitation of non-wood products; and
- (ii) Inadequate knowledge in production and processing of non-wood forest products.

### **Policy statement:**

#### **To this end the County Government shall:**

- (i) promote the sustainable production and utilization of non-wood forest products; and
- (ii) Support and build capacity in establishment and processing of non-wood forest product enterprises.

### **3.2.3 Forestry Education and Training**

The forestry sector faces challenges in building capacity for sustainable utilization and management. Forestry curricula have not adequately responded to emerging issues and technologies in the sector while practitioners require continuous professional development to take advantage of these technologies to further forestry development. The effective participation of communities and other stakeholders in forestry conservation and management requires awareness and information technologies, potentials, opportunities and management techniques.

### **Challenges:**

- (i) inadequately developed forestry curricula;
- (ii) professionals in forestry are not adequately trained in emerging forestry issues; and
- (iii) Weak forest extension network to disseminate information on forestry across the county.

**Policy statement:**

**To this end the County Government shall:**

- (i) support formal forest sector education programmes at different skill levels which are regularly reviewed to encompass emerging issues and challenges;
- (ii) support forestry education and training institutions to offer responsive curricula and training to build capacity for development of the sector;
- (iii) strengthen the capacity of the forestry education and training institutions to offer diverse vocational forestry training in the sector;
- (iv) establish linkages between forestry education and training institutions and forestry industry to enhance practical skills of forestry graduates; and
- (v) Establish a strong forest extension network to disseminate information on forestry across the county.

**3.2.4 Forestry Research and Development**

Forestry in Kenya currently suffers from low productivity of crops, low conversion efficiency and poor value addition. There is a need for Mechanisms for engaging county governments in forestry research and development to be developed. A vibrant and proactive forest sector requires a strong forestry research strategy for technology development and transfer.

**Challenges:**

- i. climate change leading to emerging pests and diseases;
- ii. small genetic base of crops; and
- iii. low investments in technology development.

**Policy statement:**

**To this end the County Government shall:**

- (i) support forestry research in critical areas to ensure generation of appropriate technologies for forestry development;
- (ii) promote research and training to improve uptake of wood processing technologies;
- (iii) develop the capacity of research institutions to disseminate information and forest technologies; and
- (iv) Promote investment in research and innovation in order to attain high productivity and meet county, national and international standards.

### **3.3CROSS-CUTTING ISSUES ON SUSTAINABLE LAND MANAGEMENT/SUSTAINABLE FOREST MANAGEMENT**

#### **3.3.1 Governance**

Political goodwill is essential in the implementation of this policy. A clear position on this aspect is already incorporated in the County Vision statements and the leadership manifesto.

Collaboration between the Kakamega county government and the national government and other county governments should be strengthened so as to strengthen SLM /SFM.

#### **Challenges:**

- (i) no clear guidelines on distribution of revenues accrued from exploitation of natural resources;
- (ii) weak coordination of institutions responsible for SLM/SFM; and
- (iii) Little or no funding of projects targeting SLM/SFM.

#### **Policy interventions**

**To this end the County Government shall:**

- (i) ensure equitable distribution of revenues accrued from exploitation of natural resources to all citizens in the county, for example from granite products; forestry products; distribution of water harvested and stored, carbon trading, among others;
- (ii) protect pristine biodiversity sites, especially those used in cultural rights and other traditional practices like the crying stone;
- (iii) protect water resources in the county, including springs, streams, rivers, natural wetlands and constructed wetlands such as water pans, small dams, medium-sized dams and large-scale reservoirs;
- (iv) create mechanisms to strengthen collaboration between the county government and national agencies such as NEMA, WRA, KWS, KFS, KEFRI, especially on matters of enforcement of regulations;
- (v) support good governance in SLM programmes, projects and activities by ensuring issue-based, people-centered, and result-oriented engagement; and accountable and transparent utilization of funds sourced under this policy; and
- (vi) Promote community cohesion and support mechanisms for conflict resolution on environmental matters.

### **3.3.2 Women, Youth, Vulnerable and Marginalized Groups**

Effects of Land degradation is likely to impact negatively poor and underprivileged regions, communities and people who depend solely on Agriculture as source of income. Kakamega County, women and youth are likely to be strongly affected as most of them participate in the highly susceptible agricultural activities. The high risk of land degradation as a result of climate change increase workload for these vulnerable groups, more so in agriculture production. The situation is worse during extreme climatic conditions and disasters.

The County Government of Kakamega fully recognizes that women and youth are powerful agents of change in development, because of this; it promotes their participation in policy formulation and decision-making. To further address gender aspects of vulnerability, the County Government of Kakamega in collaboration with other relevant entities shall take the following policy measures:

#### **Challenges:**

- i. no regulations on role of women in land tenure systems;
- ii. discrimination of women in land inheritance; and
- iii. Access to land use and sharing of accrued resources.

#### **Policy interventions**

**To this end the County Government shall:**

- i. strengthen women and youth participation in sustainable land and forest management programs;
- ii. ensure reduction in the vulnerability of women and youth to the effects land degradation as a result of climate change impacts, particularly in relation to their critical roles in rural areas in provision of water, food and energy;
- iii. involve women and youth decision making in use and management of natural resources and related activities; and
- iv. Develop and implement vulnerability-reduction measures that focus particularly on the needs of women and youth.

### **3.1.5 Biodiversity Conservation**

Biodiversity describes the organisms in the natural environment, which provide the ecosystem services that form our natural capital: fresh water, clean air, soil fertility and biological pest control. Biodiversity is fundamental to the future sustainability of the world's natural resources. These ecosystem services are under threat, globally and nationally, because the world is facing a wave of extinctions at a scale not seen before in human history.

## **Challenges:**

- (i) overexploitation of natural resources leading to loss of biodiversity;
- (ii) inadequate information on ecosystem conservation amongst the communities;
- (iii) environmental pollution as a result of overuse and misuse of agrochemicals; and
- (iv) Alien and invasive species.

## **Policy interventions**

### **To this end the County Government shall:**

- (i) develop mechanisms to ensure that the benefits arising from access to genetic resources;
- (ii) develop and implement a county strategy to contain, control and mitigate alien and invasive species;
- (iii) protect and restore native vegetation and terrestrial ecosystems;
- (iv) improve scientific knowledge and access to information; and
- (v) Improve the sustainability of protected area systems.

## **3.1.6 Marketing**

The major actors involved in trade are producers, traders, middlemen, transporters and local authorities. The margins between farm gate prices and consumer prices are wide and indicative of suppressed profitability for the producer. Many markets have inadequate physical facilities and do not therefore provide facilities like storage and cold rooms, weighing equipment, loading/unloading and social amenities.

## **Challenges**

- (i) information asymmetry among market players distorts market prices, reduces producer margins, skews trade benefits toward middlemen and traders, and blocks entry of new market players while increasing the wide gap between the farm gate and market price;
- (ii) lack of access to physical markets for new entrants due to presence of cartels and brokers;
- (iii) failure to honour contractual obligations between buyers and producers;
- (iv) prevalence of produce of substandard hygiene and quality arising from lack of enforcement of standards, and poor consumer awareness; and
- (v) Lack of organized and hygienic fresh produce markets for supplies to ship chandlers.

## **Policy interventions**

### **To this end the County Government shall:**

- (i) promote gathering and exchanging market information through appropriate avenues;
- (ii) promote contract farming and formation of farmer organizations or groups which will be encouraged to increase farmer bargaining power and benefits from economies of scale as well as cushioning them from price fluctuations;

- (iii) through relevant ministries and institutions enforce laws and regulations that ensure adherence to safety, hygiene and other standards; and
- (iv) Facilitate training in recommended best practices in pre- and post-harvest handling, packaging and transportation.

## **CHAPTER FOUR-IMPLEMENTATION FRAMEWORK**

### **4.1 Implementation Framework**

The Department of Agriculture, Livestock, Fisheries and Cooperatives Development shall develop an Implementation Framework for the Policy, with the participation of land and natural resource management sub sector. The Implementation Framework will designate the roles and responsibilities of all parties. Further, the Framework will provide for institutional strengthening and capacity building for effective delivery of land and forest management services, including mechanisms for financing the implementation of the policy and communication. The implementation Framework will incorporate an integrated approach, joint planning and participation of stakeholders. The focus will be addressed through coordinated programmes and projects which: institutional reforms, operations and maintenance, research and technology development, information gathering and management, monitoring and evaluation, capacity building and training, and infrastructural development. This Policy underscores the county government's commitment to increase the Public-Private Partnerships (PPP) to strengthen sustainability of the sectors.

### **4.2 Financing**

Financing of the Kakamega County Sustainable land and Forest Management Policy implementation will come from the National and County governments, financial institutions, development partners, Non-governmental organizations, the private sector, Civil Society Organizations, Community Based Organizations and Faith Based Organizations.

#### **4.2.1 The County Government**

It is recognized that there is massive deficit in financing of land and forest management programs in the County. The Financing of sustainable land and forest management policy implementation will largely come from the County government of Kakamega. Thus it shall prioritize funding for sustainable land and forest management.

#### **4.2.2 Financial Institutions and Development Partners**

Kakamega County has several financial institutions and development partners; however their contribution to sustainable land and forest management is very limited. The County Government shall partner with the financial institutions and development partners to offer increased services to agriculture and more specifically to sustainable land and forest management.

The financial institutions that exist in the agricultural and forestry sectors include commercial banks, Agricultural Finance Corporation, Kenya Women Finance Trust, Agricultural Savings and Credit Societies, Women Fund , Youth Fund, and Constituency Development Fund (CDF).



The role of these financial institutions includes providing access to credit, banking services, financial advice, and investment services.

The development partners to collaborate with the County Government for sustainable land and forest management policy implementation include GIZ, IFAD, UNEP, SIDA, FAO, GEF, WORLD BANK, EU, DFIDROP Africa, faith based organizations like ADSW and One Acre Fund

- a) soil improvement activities
- b) Advocate for proper soil management systems in the County.

### **4.3 Monitoring and evaluation**

Monitoring on the implementation of the policy is an ongoing process. This will ensure focused sustainable land and forest management for the realization of the set objectives. Monitoring will be participatory involving all the stakeholders and beneficiaries. The Department of Agriculture, Livestock, Fisheries and Cooperatives Development together with relevant County Departments and National Government agencies will collect, compile and analyze information on the implementation of various land and forest management interventions from other implementers of the policy. The information will be processed so as to compare the various benchmarks with actual implementation of the interventions.

The M&E Framework shall be clearly linked to the planned outcomes and outputs of the Framework adopted by all concerned stakeholders. The Framework shall specify performance indicators and targets for each policy priority and strategic action, and will propose accountabilities for the actors that are tasked to implement them. Each County Department and Agencies for which specific accountabilities shall be identified, to ensure enforcement of the relevant policy priorities and measures, using means and mechanisms at its disposal or to be identified as part of the process of development of cost for sustainable land management.

In addition to monitoring and enforcement against the Framework, the implementation of the policy shall undergo an independent external evaluation in 5 years' time. Recommendations made thereof shall feed into the revision process for this policy and the amendment of the resulting legislation instruments. Such revisions shall be carried out based on thorough public participation consultation processes and reviews of the results at that point in time.