Policy Review and Analysis for the Formulation of the Kenya Agroforestry Strategy (2020-2030)

March 2020

By Jane M. Mumina and Mieke Bourne

World Agroforestry

Table of contents

List of Acronyms and Abbreviations

AFC	Agricultural Finance Corporation
AFFA	Agriculture, Food and Fisheries Act
AFR100	African Forest Landscape Restoration Initiative
ASALs	Arid and Semi-Arid Lands
ASDS	Agricultural Sector Development Strategy
ASTGS	Agricultural Sector Transformation and Growth Strategy
CAACs	Catchment Area Advisory Committees
CAADP	Comprehensive Africa Agriculture Development Programme
CBD	Convention on Biological Diversity
CBO	Community Based Organizations
CCCFs	County Climate Change Funds
CIDPs	County Integrated Development Plans
DECs	District Environment Committees
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
GHG	Greenhouse Gas
KALRO	Kenya Agriculture and Livestock Research Organization
KAPSLMP	Kenya Agricultural Productivity and Sustainable Land Management Project
KSIF	Kenya Strategic Investment Framework (for SLM)
KFS	Kenya Forest Service's
LDN	Land Degradation Neutrality
MoEF	Ministry of Environment and Forestry
MTPs	Medium Term Plans
NAPs	National Adaptation Plans
NASEP	National Agricultural Sector Extension Policy
NBSAPs	National Biodiversity Strategies and Action Plans
NCCAP	National Climate Change Action Plan
NCCRS	National Climate Change Response Strategy

NDC	Nationally Determined Contribution
NEMA	National Environmental Management Authority
NFNP	National Food and Nutrition Security Policy
NWSS	National Water Services Strategy
PELUM	Participatory Ecological Land Use Management
UNFCCC	United Nations Framework Convention on Climate Change
UNCCD	United Nations Convention on Combating Desertification
UNCED	United Nations Conference on Environment and Development
SDGs	Sustainable Development Goals
SLM	Sustainable Land Management
TIPs	Transition Implementation Plans
WRUAs	Water Resources Users Association

Introduction

Agroforestry refers to a comprehensive set of practices that involve deliberate integration of trees into cropping and livestock systems in a temporal or spatial sequence (Sinclair 1999). Agroforestry is the practice of deliberately integrating woody vegetation (trees or shrubs) with crop and/or animal systems to benefit from the resulting ecological and economic interactions.

Farm forestry, includes any trees on farm land which are managed to produce saleable products such as timber, oil, tannin, charcoal or carbon credits has proved to be an important enterprise for small- and large-scale farmers worldwide (Otsieno *et al* 2014). It has the potential of improving forest/tree cover across the globe. In Kenya, the forest cover is less than 6.99% (KFS 2013). The country envisions achieving 10% forest cover over the next decade through promotion of agroforestry (Vision 2030).

Enabling government policies and regulations play an important role in facilitating agroforestry development in the country (Gérard 2013). Recognition of the importance of agroforestry appears to be growing, especially with increased attention paid to climate change adaptation and mitigation. It also remains an important component of sustainable land use and development in agricultural production and reduction of food insecurity. If integrated at the household level, agroforestry has the potential to provide economic, social and environmental benefits that are capable of addressing household income, livelihoods and food insecurity and environment related challenges (Agnes *et al* 2013).

Objective

This study was conducted to identify the policies, legislation, strategies and plans relevant to agroforestry, climate change and integration of the sustainable land management principles and practices at the national and county levels of Kenya. Gaps in the identified policies and legislation and in their implementation are highlighted and key findings and recommendations provided to guide the development of an agroforestry strategy for Kenya.

Scope of the Study

The study considered public policies and legislation in agriculture, environment, water, forest, wildlife and in the collaborating sectors at the national and county levels. The regional and international levels were also considered for treaties and commitments. The study sought to determine if agroforestry and climate change principles and practices are part of the public policies and legislations and if gaps or contradictions exist.

Methodology

A desk review of policies and legislation from the official government websites and government reports and empirical evidence from different authors was undertaken. The documents were studied, paying special attention on whether and how the policy have integrated agroforestry practices and identifying any gaps in that respect and how they could be bridged.

In total 91 documents, that is 8 national policies, 21 national legislations, 6 county laws, 7 strategies, 2 plans and 47 County Integrated Development Plans (CIDPs) for 2018-2022 were evaluated and a preliminary report made.

A Strengths, Weaknesses, Opportunities and Threats analysis was conducted on the national policies, legislations and strategies. An analysis of the counties reviewed their approach to agroforestry promotion and any related strategies and for climate change, including any strategies.

Key Findings

- Kenya has ratified and domesticated the relevant international conventions that address agroforestry, sustainable land management and appropriate utilization of natural resources.
- The Constitution of Kenya 2010 and Kenya Vision 2030 support sustainable utilization of natural resources and the need to maintain a national tree cover of 10 percent.
- While several national policies, strategies and plans address agroforestry, sustainable land management and climate change, most of them lack sufficient resources for implementation and lack monitoring systems.
- There is an emerging trend of recognizing agroforestry as a key strategy for achieving sustainable development outcomes in the exploitation of (land dependent) productive sectors of the Kenyan economy that is, agriculture, livestock and forestry. However, this recognition is more pronounced in programmatic documents and less or non-existent in legislative instruments. This implies that such commitments to promote agroforestry practices are not anchored in a coherent legislative framework (Gerald, 2020).
- In the review of 91 policy documents for this assessment only one document that is the Agriculture (Farm Forestry) Rules of 2009 was found to be highly relevant to agroforestry because that is its main objective. However, this document is a subsidiary legislation to the repealed Agriculture Act Cap 318 and therefore stands revoked following the enactment of Agriculture, Fisheries and Food Authority Act of 2013.
- There are early signs of effects of claw back (eroding gains) in the on-going reforms (e.g. Agriculture Fisheries and Food Act of 2013 has not been supplemented with subsidiary regulation to replace the revoked farm forestry rules of 2009), comparison of: forest Act of 2005 and Forest conservation and management Act of 2016; Environment Management Coordination Act of 1999 as revised in 2015 and from Agricultural Sector Development Strategy (ASDS) 2010-2020 to Agricultural Sector Transformation and Growth Strategy (ASTGS) 2019-2029), (Gerald 2020).
- Equity and issues of gender disparities and youth inclusivity were weakly represented in a number of policies in terms of ownership, control and access to productive assets, financial resources, livestock, land and credit.
- Fragmentation of institutions dealing with agroforestry exists. There is need to have the institutional mandates between the lead government ministries and agencies such as Ministry of Environment and Forestry, Ministry of Agriculture, Livestock and Fisheries, National Environment Management Authority, Kenya Forest Services and Kenya Wildlife Services fully clarified with urgency in order for the management plans to be well coordinated and supported by the said agencies.
- A number of Acts, policies and strategies were developed prior to devolution and are not aligned to newer government priorities and need to be updated. Many policies do not clearly indicate who should enforce what parts of the policy and with what resources.
- The Constitution under schedule 4 part 1 devolves some of the agricultural and environmental related mandate to the counties but there are no clear procedures of which policies they should enact to implement the obligation.

- All the 47 counties have enacted environmental policy plans to ensure proper utilization of the natural resources and avoid further land degradation.
- Kenya has recognized its vulnerability to climate change and has established a comprehensive policy framework to guide and help implement its response to climate change. But there remains significant need to strengthen the capacity of county governments to realize the benefits of devolution and fulfill their role in implementing adaptation actions.
- Financial rules and support from the national government affect the implementation of environmental and climate change projects in the counties, in that most of the counties are limited in revenue collection capacity and rely on the national government for the majority of their budget.
- Technical complexity of land information and management systems needs to be addressed as secure land tenure is critical for agroforestry development. The new land laws, enacted in 2012 to fulfill requirements of the land reforms stated in the constitution and Vision 2030 still have a number of loopholes that deny the common citizen their land rights. There is a legal framework for the recognition and protection of rights but the implementation; enforcement and compliance mechanisms are not fully effective. The rights of women are provided for, but their enjoyment is yet to be realized.
- The 2010 Constitution advocates for public participation to ensure involvement in all the steps that are adopted by the government to address ecological matters. There is a shortage of guidance for counties on how to conduct participation in the County Governments Act, in Guidelines produced by the Ministry of Devolution, and in counties own Public Participation Acts.

National restoration targets and International conventions

National restoration targets

2010 Kenyan government's Constitution: In 2009, responding to deforestation, and to increase sustainable management of agricultural land areas while motivating farmers to plant trees, the government enacted a farm forestry regulation that requires at least 10% of all farms to be under tree cover, and has introduced programs to encourage tree planting (Constitution of Kenya 2010).

African Forest Landscape Restoration Initiative (AFR100) aims to bring 100 million hectares of land in Africa into restoration by 2030. The commitments announced under AFR100 also support the Bonn Challenge adopted in 2011, whose overall objective is to restore 150 million hectares by 2020; the New York Declaration on Forests that stretches the goal to 350 million hectares by 2030; and the African Resilient Landscapes Initiative to promote integrated landscape management to promote adaptation to and mitigation of climate change. In 2016, Kenya committed to restoring 5.1 million hectares of land by 2030, which is nearly 9 percent of its total landmass (Bernard 2018).

Land Degradation Neutrality (LDN): Kenya is committed to set to work on establishing the national LDN baseline and targets. An inception workshop to set Kenya's targets for LDN was held in Nairobi 22 - 23 February 2017, with over 50 participants from various institutions nationwide (Bernard 2018).

United Nations Decade on Ecosystem Restoration 2021-2030: It is a part of the global landscapes forum event "Kyoto digital edition. The forum aimed at increasing awareness of the importance of restoring ecosystems in order to restore healthy and sustainable ecosystems for today and the future. It seeks to put landscapes restoration at the forefront of national agendas, backing country level efforts to meet UN sustainable development goals including SDG 15, life on land. The initiative will not only advance SDG 15 but would help SDG 6 (clean water & sanitation), SDG 12 (responsible consumption and production), SDG 13 (Climate Action) and SDG 14 (Life below water) (Giulio 2020). The Decade will accelerate existing global restoration goals, for example the Bonn Challenge which aims to restore 350 million hectares of degraded ecosystems by 2030 and the AFR100.

International Conventions

The Government of Kenya recognizes the potential of sustainable land management practices in rehabilitating degraded land, minimizing degradation and enhancing food production. This has been evident in the government ratification of various international agreements such as the Sustainable Development Goals, whose goal is to promote sustainable natural resources management and utilization, United Nations Framework Convention on Climate Change (UNFCCC), United Nations Convention on Combating Desertification (UNCCD), Convention on Biological Diversity (CBD) and Ramsar convention.

Sustainable Development Goals (SDGs)

The SDGs are a universal function to end poverty, preserve the planet, and foster peace and prosperity among nations, (Kenya Vision 2030). Kenya is a member state of the United Nations adopted the global goals in January 2016. Though not a legal agreement the government has fully committed and aligned its national development strategies including the vision 2030 to the implementation and achievement of the goals. Vision 2030 is being implemented through consecutive five-year Medium Term Plans (MTP). The

Current MTP III (2018-2022) is better and more aligned to the SDGs. Further, the plans that stem out from the MTPs are sector plans, strategic plans, annual performance contract and work plans.

United Nations Framework Convention on Climate Change (UNFCCC)

On Environment and Climate Change, Kenya is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC), she became a signatory of the convention in 1994 and ratified it in 1997. The objective is to stabilize greenhouse gas concentrations and to tackle the impacts of Climate Change. Kenya is a Party to this treaty and its subsequent Kyoto Protocol. The treaty did not set binding limits on greenhouse gas (GHG) emissions for individual countries and omitted to establish enforcement mechanisms and hence it is considered legally non-binding. Its implementation is based on negotiated international treaties that may set binding limits on greenhouse gases. Voluntary membership and lack of an enforcement mechanism have allowed some of the major potential polluters out of the treaties, thus rendering any action by small member states ineffective in reducing global GHGs thresholds.

United Nations Framework Convention on Climate Change (UNFCCC) and its Paris Agreement identify forestry as a key vehicle for delivering global climate change goals. Under the obligation Kenya has developed; the Climate Change Policy and Act, and the National Climate Change Action Plan. The implementation of the action plan will contribute to the achievement of the 10% tree cover.

The Paris Agreement

The Paris Agreement was ratified by Kenya on 26th December 2016 under section 9 (1) of the treaty-making and ratification Act and entered into force for Kenya on 27th January 2017. Kenya's Nationally Determined Contribution (NDC) sets out the country's actions to contribute to achieving the global goal set out in the Paris Agreement. As set out in Article 2 (6), and read with Article 94 (5) of the Constitution of Kenya (2010), the Paris Agreement now forms part of the law of Kenya. Kenya's Nationally Determined Contribution are;

- Adaptation contribution - ensure enhanced resilience to climate change towards the attainment of Vision 2030 by mainstreaming climate change into the Medium Term Plans (MTPs) and implementing adaptation actions.
- Mitigation contribution - seek to abate GHG emissions by 30 percent by 2030 relative to the business as usual scenario of 143 MtCO2eq.

Achievement of the NDC is subject to international support in the form of finance, investment, technology development and transfer, and capacity development.

United Nations Convention on Combating Desertification (UNCCD)

Kenya ratified the United Nations Convention to Combat Desertification (UNCCD) on 24th June 1997. This is an international legal agreement for action to combat desertification and mitigate the effect of drought in arid, semi-arid and dry sub-humid zones. One of the main commitments of the affected and developing country Parties to the Convention is to develop National Action Programmes (NAPs). The Kenya NAP aims at reclaiming severely degraded areas, rehabilitating partly degraded areas, reducing further degradation of affected areas, and conserving areas that are not yet degraded. These goals are to mainstream into the national objectives of sustainable development that focuses on poverty alleviation, enhancement of food security, and environmental conservation.

The convention recognizes afforestation as key in arresting the spread of deserts. Kenya has committed to land degradation neutrality by 2030. National action plan for restoration of degraded sites in Arid and Semi-arid Land (ASALs) and Climate Smart Agriculture Strategy exist to support the national efforts.

Convention on Biological Diversity (CBD)

In 1992, Kenya participated in the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro. Kenya endorsed and adopted Agenda 21, and also signed the Convention on Biological Diversity (CBD). It ratified the CBD in 1994.

CBD has three goals that is conservation of biological diversity, sustainable use of the components of biological diversity and fair and equitable sharing of benefits arising from the use of genetic resources.

Kenya participates in the CBD's international programs of work in agro-biodiversity, dry and sub-humid lands, forests, inland waters biodiversity, islands, mountain ecosystems, and marine and coastal resources. Article 6 of the CBD obliges Parties to the CBD to prepare National Biodiversity Strategies and Action Plans (NBSAPs) to guide implementation of the requirements of the CBD at the national level. Kenya is committed to finalizing its NBSAPs as reported at the CBD/COP 13 in Cancun Mexico on the statement on Strategic Plan for Biodiversity 2011-2020 and the achievement of the Aichi Biodiversity targets and their implementation.

Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) 1971

Kenya also became a party to the Convention on Wetlands of International Importance especially as Waterfowl Habitat (1971) in 1990. Through this Convention, lakes Nakuru, Naivasha, Baringo and Lake Bogoria have been named as Ramsar sites, under the list of wetlands of international importance under article 2 (1) of the Ramsar Convention.

Kenya ratified the convention in 1990; Wetlands are among the world's most productive environments. They are cradles of biological diversity, providing the water and primary productivity upon which countless species of plants and animals depend for survival. They support high concentrations of birds, mammals, reptiles, amphibians, fish and invertebrate species. Wetlands are also important storehouses of plant genetic material.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

Kenya ratified this convention on in December 1978. CITES is aimed at protecting certain endangered species of wild fauna and flora from overexploitation through international trade, via a system of import/export permits. The convention focuses exclusively on trade and is premised on the view that the control of international markets will contribute to the preservation of endangered species.

CITES operates by listing endangered species in one of its three appendices, which constitute different levels of control in international trade. Numerous forest and animal species are included in the appendices, but at present only 16 tree species have been listed, mainly species used for timber. Listing of timber producing species of major commercial importance has become increasingly controversial in recent years, because some parties think this may have the potential to lead to the introduction of unfair trade restrictions. While listing in CITES appendices will help draw attention to the need to take action for better

management and conservation of given species, it is clear that listing, as such, does not conserve species (FAO 1999).

Montreal Protocol on Substance that Depletes the Ozone Layer

Kenya is a signatory to the Montreal Protocol on Substances that Deplete the Ozone Layer, a global agreement with universal ratification to protect the stratospheric ozone layer by phasing out the production and consumption of ozone-depleting substances. The Protocol was agreed on 16th September 1987 and entered into force on 1st January 1989. Kenya ratified the Montreal Protocol on 9th November 1988. Kenya's ratification of the Kigali Amendment to phase down the production and usage of hydrofluorocarbons was in progress in June 2018.

The convention establishes a framework for the adoption of measures to protect "human health and the environment against adverse effects ... from human activities which modify ... the ozone layer"(Article 2). The main relevance of the ozone regime for forests is the link between depletion of the ozone layer and the possible adverse effects this might have on forests (Article 1.2). For commercial forests, tree breeding and genetic engineering may be used to improve tolerance of ultraviolet-B (UV-B) radiation, but for unmanaged or natural forests these methods are not an option. While many forest tree species appear to be UV-B tolerant, there is some evidence that detrimental UV-B effects can slowly accumulate in trees from year to year (UNEP, 1998). While it can be argued that implementation of the ozone regime would be beneficial to forests, the ozone regime does not explicitly consider forests.

National Policies, Laws, Strategies and Plans on Agroforestry

On environmental sustainability, Kenya has developed several policies, strategies, plans and legal instruments to help conserve the environment such as;

Vision 2030

Kenya's Vision 2030 is the country's development blueprint document and proposes sustainable management of natural sources, conservation and combating environmental degradation as actions towards fulfilling the social development pillar. It aims to transform Kenya into a newly industrializing, "middle-income country providing a high quality of life to all its citizens in a clean and secure environment by the year 2030", while simultaneously meeting the Sustainable Development Goals for Kenyan's by 2030.

The Social pillar seeks to create just, cohesive and equitable social development in a clean and secure environment, while the Economic pillar aims to achieve an economic growth rate of 10 percent per annum and sustain the same till 2030 to generate more resources to address the SDGs. Agriculture is identified as one of the key sectors to deliver the 10 percent annual economic growth rate (Vision 2030).

To achieve this growth, transforming smallholder agriculture from subsistence to an innovative, commercially oriented and modern agricultural sector is critical. Among other approaches, this transformation is to be accomplished through: a) Transforming key institutions in agriculture, livestock, forestry and wildlife to promote agricultural growth, b) Increasing productivity of crops, livestock and tree cover, c) Introducing land-use policies for better use of high- and medium-potential lands, d) Developing more irritable areas in arid and semi-arid lands for both crops and livestock (Vision 2030).

On land use, the Vision 2030 notes that land in the high- and medium-potential areas as well as in arid and semi-arid lands (ASALs) remains under-exploited for agricultural production. Much of the available cropland

remains under-used with smallholders using only 60 percent of their land for agricultural production. It also calls for proper management of catchment areas and conservation of natural resources and the environment.

National Land Policy 2009

The Government of Kenya adopted the new Land Policy in 2009. This policy provides for private land ownership and the category of 'trust land' was changed into 'community land'. It also allows the demarcation of 'community land' and the allocation of its title to a particular community group. A six-step process is provided including documenting and mapping of customary land tenure systems; establishing a clear legislative framework and procedures for registration; reviewing all acquisitions; developing participatory processes; incorporating customary mechanisms of conflict resolution. The policy sought to recognize the rights of communities to access resources upon which they depend. Community Land Boards (community-elected) were established to manage access to the land.

The Policy also allows for secondary user access of land e.g. for access to water points, drought reserves or mineral licks and recognizes the particular role of women. Non-Kenyans were barred from owning freehold land and only allowed to hold land under 99-year leases. All public land was to be identified, registered and handed over to a National Land Commission. A strategy is being put in place to determine economically viable minimum sizes for different land uses. The government could compulsorily acquire any land that has minerals found on it to protect the communities from exploitation. These components have been endorsed and supported by the new Constitution (approved in August 2010) and which states that land laws should be revised and enacted to effect the new provisions (Article 68).

According to the Constitution of Kenya (2010), land in Kenya is classified as public, community or private. Public land includes protected mountains, hills, forests, national parks, rivers, lakes and other water bodies, territorial sea and the continental shelf; all roads, land on which public utilities stand e.g. offices, schools, hospitals, and all lands held by County Governments. Community land, on the other hand, consists of land lawfully registered in the name of group representatives, e.g. Cooperatives, ancestral lands, or any other land declared to be community land by an Act of Parliament. Private land consists of registered land held by any person under any freehold tenure or leasehold tenure. The land tenure system in Kenya has been facilitative of competitive private enterprise and general development. It is also a source of numerous conflicts across ethnic, economic and individual levels. Private land acquisitions are at the center of the reduction of protected public lands, with consequent impacts of water resources, biodiversity and ecosystems.

Generally, the National Land Policy articulates the land problems in Kenya quite openly. It highlights the mistakes of the past and reflects a determination to solve land-related challenges. The policy has an agrarian focus, dwelling less on the urban and peri-urban areas, and this is particularly true of the level of attention given to rapid urbanization and the need for the shelter it poses. Kenya is undergoing rapid urbanization and that it will likely accelerate in the future. There is a relationship between population growth, land pressure and rapid urbanization. Based on international evidence, urbanization is creating a rapidly rising demand for land and land prices in urban and peri-urban areas, and thus escalate competition and conflict over land in those areas. At the same time, population inflows into urban areas are not expected to slow down. Thus, there is growing pressure on rural land due to the demand to grow more food and cash crops to support the expanding population, especially since the majority of the country's population is still rural areas.

The National Land Reclamation Policy 2013

The Policy raises the alarming concern of the magnitude and veracity of land degradation. The focus of the policy is on the protection, management and restoration of marginal and degraded lands and addressing threats to land resources such as decreasing water supply, declining soil fertility, diminishing agricultural lands and deforestation.

It commits the government to the following key actions; identify and map all degraded lands and place them under a reclamation program, integrate the use of improved indigenous knowledge and latest research to manage degraded areas, create enabling environment for active participation of all stakeholders.

National Environmental Policy 2013

The National Environment Policy was also developed following the requirements of the Vision 2030 and the Constitution of Kenya 2010. It seeks to provide the framework for an integrated approach to planning and sustainable management of natural resources in the country. It recognizes the various vulnerable ecosystems and proposes various policy measures not only to mainstream sound environmental management practices in all sectors of society throughout the country but also recommends strong institutional and governance measures to support the achievement of the desired objectives and goal.

The Policy supports the management of ecosystems and sustainable use of natural resources, encompassing; forest ecosystems, freshwater and wetland ecosystems, coastal and marine ecosystems, mountain ecosystems, arid and semi-arid lands ecosystems, land, soils, minerals, biodiversity, wildlife resources, livestock and fisheries.

On the restoration of water and ecosystem restoration, the Policy proposes among others to promote and institutionalize payment for environmental services schemes to support catchment protection and conservation. Also, to ensure rehabilitation and restoration of degraded wetlands, riverbanks and lakeshores and, as appropriate, promote and support the establishment of constructed wetlands, and to involve and empower communities in the management of freshwater and wetland ecosystems.

To address unsustainable use of land in urban and rural areas, the Policy under section 4.6.2 offered to ensure implementation of the Constitution and the National Land Policy in a way that takes into account sustainable conservation and management of the environment and land resources. It also promised to promote and enhance best practices for optimal and sustainable land use, support land restoration policies and to involve and empower communities in land utilization and management.

To combat soil erosion, the policy promised to develop and implement a National Soil Conservation Policy (this has still not been done). It also offered to promote and support eco and organic farming to maintain soil fertility, ensure the protection of wetlands, riverbanks, hilltops and slopes from unsustainable practices to prevent soil erosion and environmental degradation. Further, the Policy intends to promote good soil management practices to avert landslides, mudslides, floods and other disasters that are preventable, as well as to involve and empower communities in soil conservation.

National Policy for Northern Kenya and other Arid Lands 2012

The National Policy for the Sustainable Development of Northern Kenya and other Arid Lands is also known as the ASAL Policy. The main objective of this policy is to facilitate and fast-track sustainable development in Northern Kenya and other arid lands by increasing investment in the region and ensuring that the use of

those resources is fully reconciled with the realities of people's lives. This is meant to lead to poverty reduction and wealth creation through investments in the sustainable development of the ASAL, enhance food security and reduce dependency on food aid by the population living in the ASALs.

Since economic growth, poverty reduction and inequality are inextricably related, this policy document promotes changes in resource distribution enhancing equity and access to economic resources while providing viable incentives to pastoralists, agro-pastoralists, small-scale farmers and traders in the ASALs. Improving natural resource management and utilization by strengthening pastoral land tenure systems and reducing and managing risks due to drought, floods, food and human insecurity are among the focus areas in this policy framework as expounded in section 4.

- The policy advocates for; reinforcing the authority of traditional natural resource management systems that promote sound environmental practices.
- Protecting and promoting indigenous knowledge and practice, promote environmental education and awareness, and intensify environmental conservation efforts.
- Protecting and increasing forest cover, riverine vegetation and critical water catchment areas in the ASALs, including special ecosystems such as Mts. Marsabit and Kulal.
- Strengthening research and extension systems relevant to rain-fed crop production, including soil and water conservation, organic farming and agroforestry.
- Mainstream climate foresight & climate adaptation into planning at all levels.

National Forest Policy 2014

Kenya's forests are important for economic development, environmental services, social and cultural values. They provide utility products such as timber, pulp and paper, poles and fuelwood both for industrial and domestic use. Forests are important for the conservation of biological diversity, regulation of water supplies, carbon dioxide sequestration and are a major habitat for wildlife. Also, forests provide a wide range of non-wood forest products.

The policy recognizes agroforestry as a viable option for the establishment of trees on farms and in pastures and as a way to enhance the cash flow and income of farmers. Key elements of the policy include; appropriate incentives to be provided to promote sustainable use and management of forest resources, indigenous forest management, farm forestry, industrial forest development, dry land forestry, forest health and protection, private sector involvement and participatory forest management.

National Food and Nutrition Security Policy (NFNP) 2010

The Food and Nutrition Security Policy under the domestic crop production recognizes the need to ensure that efforts are put in place to address food availability and access concerns and to improve the quantity and diversity of food to meet nutritional requirements. Amongst the key constraints that are to be addressed are declining soil fertility and high input prices, losses due to pests and diseases, climate change, inappropriate land use and inadequate access to credit. To improve the above conditions the government commits to promoting sustainable food production systems with particular attention to increasing soil fertility, agro-biodiversity, organic methods and proper range and livestock management practices, support sustainable irrigation and water management systems.

The policy further states that it will support and promote agroforestry, afforestation and re-afforestation to enhance livelihood systems and Kenya's environmental resources. The government also pledges to back

the role of markets and the private sector to provide agricultural inputs and financial services at affordable prices and favorable terms to farmers, pastoralist and fisherfolks.

Agriculture Policy Draft 2019

The Policy has been formulated in line with relevant provisions of the Constitution and provides a clear road map to the realization of Vision 2030 agricultural goals and targets. It identifies current challenges in the agricultural sector and outlines suitable guidelines to address them. It provides measures towards sustainable use of natural resources, particularly land and water, which are expected to boost agricultural production and productivity.

It provides guidelines to the National and County Governments; specifying the different roles towards ensuring household and national food and nutrition security; food safety; increasing agricultural production and productivity through the use of appropriate good quality and affordable inputs; facilitating access to premium domestic, regional and international markets and reducing post-harvest losses while promoting agribusiness, value addition and product development (Agriculture policy Draft 2019).

The policy recognizes that high population densities have led to a rapid decrease in land available for farming, soil nutrient depletion are some of the major causes of soil erosion and wood fuel and timber shortages. These problems, together with declining tree cover resulting from conversion of forests to settlements, are causing increasing concern about declining food security, sustainable development of agriculture and challenges related to climate change mitigation and adaptation. To remedy this situation, the Ministry of Agriculture, Livestock and Fisheries encourages farmers to practice agroforestry (Agriculture policy Draft 2019).

The policy notes that it is crucial to advocate for a compulsory establishment of farm forestry where every person who owns or occupies agricultural land shall establish and maintain a minimum of 10% of the land under farm forestry in any suitable configuration. These will help to: promote the establishment and sustainable management of farm forestry to maintain a compulsory farm tree cover of at least 10% on any agricultural land holding; Carbon sequestration and related environmental benefits; conserve water, soil and biodiversity; protect riverbanks, shorelines, riparian and wetland areas; provide fruits and fodder and sustainable production of wood, charcoal and non-wood products (Agriculture Policy Draft 2019).

The objective of the policy on agricultural mechanization is to make a contribution to agricultural development through the development and adoption of modern, appropriate, cost effective and environmentally safe mechanization technologies for crop, livestock and fisheries production.

Energy Policy 2012

It promotes efficient conversion and cleaner utilization of biomass energy. It also endorses agroforestry and social forestry programmes to increase stocks of woody biomass on farms. Stresses collaboration with other relevant ministries and stakeholders to grow and sustain tree cover to above 10%. It further, proposes incentives for private sector participation in generation, exploitation, production, distribution, supply and use of biomass energy.

Bamboo National Policy 2019

The goal of this policy is to develop a vibrant bamboo industry benefiting the present and future generations through sustainable management, increasing area grown with bamboo and enabling commercialization and value-addition.

Laws

The Constitution of Kenya 2010

The Constitution of Kenya is the supreme law of the land and therefore any other law must be enacted under the Constitution and in furtherance of the principles and values embodied in the Constitution. In its preamble, the Constitution acknowledges the need for the protection of the environment by providing that, "We, the people of Kenya…, respectful of the environment, which is our heritage, and determined to sustain it for the benefit of future generations…"

The new Constitution of Kenya was promulgated in August 2010. Hailed as a 'Green' Constitution, contains elaborate provisions with considerable implications for sustainable development. These range from environmental principles to the right to a clean and healthy environment as enshrined in the Bill of Rights. Chapter V is entirely dedicated to land and the environment. It also embodies a host of social and economic rights which are environmental such as the right to water, food and shelter, among others.

Concerning water resources, the Constitution recognizes water as a human right and espouses the protection of the environment and natural resources such as forests, game reserves, water catchment areas, including all rivers/springs, lakes and wetlands. It accords that water resources/catchment areas; rivers, lakes, protected areas and other water bodies should be held in trust for the people by the National Government.

Article 42 guarantees every person the right to a clean and healthy environment, which includes the right (a) to have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69; and (b) to have obligations relating to the environment fulfilled under Article 70.

Art.69 (1) (b) sets out certain obligations of both the state and persons in respect of the environment. The Article creates several obligations concerning the environment. First, it places an obligation on the state to inter alia; ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits; encourage public participation in the management, protection and conservation of the environment; establish systems of environmental impact assessment, environmental audit and monitoring of the environment; eliminate processes and activities that are likely to endanger the environment; and utilize the environment and natural resources for the benefit of the people of Kenya.

Article 70 (1) deals with the enforcement of environmental rights. It states that, "If a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to court for redress in addition to any other legal remedies that are available in respect to the same matter."

The above provision is deliberately wide in scope to ensure that any infringement of environmental rights, whether present or threatened is squarely dealt with. It also recognizes not only legal remedies but any other additional remedy. To ensure speedy and efficient redress of environmental matters, the Constitution has established a specialized environment court the Environmental and Land Court, a move that has been hailed as a first in Africa.

The constitution further incorporates the principles of equity in access to land and improving productivity, through Article 60 (1), which states that land should be held in Kenya in a manner that is equitable, efficient, productive and sustainable and in accordance, inter alia, with the principles of sustainable and productive management of land resources, transparent and cost-effective administration of land and sound conservation and protection of ecologically sensitive areas. Such a provision in the constitution advances the rights of the environment by ensuring that is safeguarded and enhanced for its own sake and the benefits of the present and future generations.

The Constitution also provides for the principle of public participation as one of the Principles and Values of governance under Article 10. The 2010 Constitution requires Parliament to seek the input of the public before enacting legislation. Previously, legislation in the country was enacted without the input of the public. To enhance public participation, the Constitution has established a devolved system of governance that gives every citizen at the lowest level of the society an opportunity to participate in the governance process including environmental governance.

The Fourth Schedule to the Constitution details the distribution of functions between the national and county governments. With regard to the environment, the national government is responsible for, first, the protection of the environment and natural resources with a view to establishing a durable and sustainable system of development, including, in particular (a) fishing, hunting and gathering; (b) protection of animals and wildlife; (c) water protection, securing sufficient residual water, hydraulic engineering and the safety of dams; and (d) energy policy and secondly the 'implementation of specific national government policies on natural resources and environmental conservation, including (a) soil and water conservation; and (b) forestry'. Public participation creates an avenue for stakeholder consultations thus making enforcement of environmental rights easier and faster without necessarily having to resort to court.

Environmental Management and Coordination Act (No. 8 of 1999) revised in 2012

Before the promulgation of the Constitution of Kenya, 2010, the main legislative framework for environmental management and conservation was the 1999 Environmental Management and Coordination Act (EMCA). The Act establishes the legal framework for the appropriate management of the environment including the necessary structural and institutional framework.

The 1999 Environmental Management and Coordination Act (EMCA) recognized for the first time the right of every person to a clean and healthy environment and gave every person *locus standi* to institute a case for any environmental rights violation.

It provided for the integration of environmental concerns in national policies, plans, programs and projects. Under the Act, a 5-year Environmental Action Plan at National, Provincial and District levels was laid down as a guideline to steer the country towards achieving its long term environmental agenda.

The enactment of this Act was a great milestone in the history of environmental management in Kenya. Its key elements include:

a) A declaration that "Every person in Kenya is entitled to a clean and healthy environment and must safeguard and enhance the environment" and that anyone has the *locus standi* before the court on matters of environmental protection and conservation. These were rights that were hitherto only recognized in policy documents and could not be enforced in a court of law. These provisions were later given constitutional support.

b) The law extended the meaning of illegal activities within several areas, including waste management and pollution and degradation of rivers, lakes, wetlands, coastal zones, agricultural areas, forests and biodiversity. c) The law also sets down the principles for Environmental Impact Assessment, and for the development of 5-year National Environmental Action Plans and similar plans to be developed at the provincial and district level.

In addition to these key elements, it also establishes a strong and comprehensive institutional framework for environmental management. This includes:

i). The National Environment Management Authority (NEMA), as the principal government institution charged with the overall coordination and supervision of environmental management in Kenya. NEMA is established under the Act as the principal institution responsible for supervising and coordinating the implementation and enforcement of the Act.

ii). The National Environment Council (NEC), chaired by the Cabinet Secretary is responsible for national environmental policy formulation.

iii). Provincial and District Environment Committees, composed of sector agencies, local government authorities and representatives of the public, are charged with carrying out environmental management at the local levels.

iv). The Public Complaints Committee is charged with investigating citizens' complaints over violations of the EMCA.

v). The National Environment Tribunal whose mandate is to decide on grievances and appeals against decisions made by NEMA for issues such as environmental licensing.

Effective implementation of environmental regulations is essential to improving and safeguarding a healthy and hospitable environment for all to enjoy. Kenya's environmental legal regime is adequate for the effective conservation of the environment and enforcement of environmental rights. The shortcomings in environmental conservation in this country can be attributed to the failure to adequately implement exiting environmental laws. This failure is due to a range of factors: weaknesses in institutional capacities of governmental institutions mandated to enforce laws, lack of political will and inadequate funding of government institutions that enforce environmental law.

An important legal instrument for the protection of Kenya's natural resources is guided by the Environmental Management and Coordination Act (EMCA). EMCA was enacted in 1999, against a backdrop of 78 sectoral laws dealing with various components of the deteriorating state of Kenya's environment, as well as increasing social and economic inequalities, the combined effect of which negatively impacted on the environment. EMCA contains several provisions that could be used to promote the conservation of forests and natural resources, including conservation easements, restoration orders, and environmental impact assessment.

On protection and conservation of the environment, EMCA has regulations covers the protection of forests, rivers, lakes, wetlands, traditional interests, hilltops and hillsides, mountain areas and forests. It also covers the reforestation and afforestation of hilltops, hill slopes and mountainous areas and planting trees or woodlots. Further, the Act covers the conservation of biological diversity (in suit and ex-situ) and energy

conservation. EMCA also covers the protection of environmentally significant areas, coastal zone, ozone layer and access to the genetic resources of Kenya.

The object and purpose for the establishment of EMCA were to exercise general supervision and coordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment. Provisions of the National Environment Action Plan are made under Section 38, 39 and 40 which elaborate the contents of the national environment action plan at national, provincial and district levels. The need to protect rivers, lakes and wetlands, hilltops, hillsides, mountain areas and forests together with the powers of the Minister in enforcing this are stated in Section 42, 44, 45 and 46 of this Act. Section 43 of this Act takes care of the traditional interests of local communities. The Act also emphasizes conservation of biological diversity under section 50, as well as prohibiting chemical degradation through Section 93, 94 and 98.

1) Under Section 9 (1) the policies were to be implemented by;
(i) Coordinating the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plans, programs and projects to ensure the proper management and rational utilization of environmental resources on a sustainable yield basis for the improvement of the quality of human life in Kenya.
(ii) Taking stock of the natural resources in Kenya and their utilization and conservation.
(iii) Establishing and reviewing in consultation with the relevant lead agencies, land use guidelines.
(iv) Examining land use patterns to determine their impact on the quality and quantity of natural resources.
(v) Advising the Government on legislative and other measures for the management of the environment or the implementation of relevant international conventions, treaties and agreements in the field of environment, as the case may be.
(vi) Advising the Government on regional and international environmental conventions, treaties and agreements to which Kenya should be a party and follow up the implementation of such agreements where Kenya is a party.
(vii) Undertaking and coordinating research, investigation and surveys in the field of environment and collect, collate and disseminate information about the findings of such research, investigation or survey.
(viii) Rendering advice and technical support, where possible, to entities engaged in natural resources management and environmental protection to enable them to carry out their responsibilities satisfactorily.

EMCA through Section 42 (1) protects rivers, lakes and wetlands by prohibiting any person from carrying out certain activities without carrying out an environmental impact assessment and obtaining written approval of the Director-General. The activities are;

- Erecting, reconstructing, placing, altering, extending, removing or demolishing any structure or part of any structure in, or under the river, lake or wetland.
- Excavating, drilling, tunneling or disturbing the river, lake or wetland.
- Introducing any animal whether alien or indigenous, dead or alive, in any river, lake or wetland.
- Introducing or planting any part of a plant specimen, whether alien or indigenous, dead or alive, in any river, lake or wetland.
- Depositing any substance in a lake, river or wetland or in, on, or under its bed, if that substance would or is likely to have adverse environmental effects on the river, lake or wetland.
- Directing or blocking any river, lake or wetland from its natural and normal course.

- Draining any lake, river or wetland.

Section 43 of EMCA takes care of traditional interests of local communities customarily residing within or around a lakeshore, wetland, coastal zone or riverbank or forest to be protected. Sections 44, 45 and 46 give guidelines on the identification and protection of hilltops, hillsides, mountain areas and forests. The Authority should, in consultation with the relevant lead agencies, develop, issue and implement regulations, procedures, guidelines and measures for the sustainable use of hillsides, hilltops, mountain areas and forests and such regulations, guidelines, procedures and measures should control the harvesting of forests and any natural resources located in or on a hillside, hilltop or mountain area so as to protect water catchment areas, prevent soil erosion and regulate human settlement. The Act advocates for afforestation or reforestation of the identified areas through encouraging voluntary self-help activities in their respective local communities, to plant trees or other vegetation in any area within the limits of its jurisdiction. This section also applies to leasehold or any other interest in land including customary tenure.

On biodiversity, Section 50 of this Act emphasizes the issue of biological diversity conservation through; identification, preparation and maintenance of an inventory of biological diversity of Kenya, determining the components of biological diversity that are endangered, rare or threatened with extinction, identifying potential threats to biological diversity and devising measures to remove or arrest their effects, undertaking measures intended to integrate the conservation and sustainable utilization of ethic in relation to biological diversity in existing government activities and activities by private persons, specifying national strategies, plans and government programmes for conservation and sustainable use of biological diversity, protecting indigenous property rights of local communities in respect of biological diversity and measuring the value of unexploited natural resources in terms of watershed protection, influences on climate, cultural and aesthetic value, as well as actual and potential genetic value thereof. The guidelines provided for in section 51 and 52 was meant to apply while conserving resources in situ.

Guidelines on the activities that help in the conservation, sustainable management and utilization of biological resources are described under Section 51, 52 and 53, more specifically for species threatened with extinction. It is stated that the Authority should, in consultation with the relevant lead agencies, prescribe measures adequate to ensure the conservation of biological resources in situ by issuing guidelines for;

(a) Land use methods that are compatible with the conservation of biological diversity.
(b) The selection and management of protected areas to promote the conservation of the various terrestrial and aquatic ecosystems under the jurisdiction of Kenya.
(c) Selection and management of buffer zones near protected areas.
(d) Special arrangements for the protection of species, ecosystems and habitats threatened with extinction.
(e) Prohibiting and controlling the introduction of alien species into natural habitats.
(f) Integrating traditional knowledge for the conservation of biological diversity.
(g) Mainstream scientific knowledge.
Section 71 and 72 allow the Standards and Enforcement Review Committee, in consultation with the relevant lead agencies, to advise the Authority on how to establish criteria and procedures for the measurement of water quality for various uses. Further, the committee is charged with the responsibility of analyzing conditions for discharge of effluents into the environment as well as the monitoring and control of water pollution. Under these sections, the Act also states the penalty for any person who contravenes the instructions.

Meanwhile, Sections 93, 94 and 98 prohibits chemical degradation caused by discharging any hazardous substance, chemical (pesticides and toxic substances), oil or mixture containing oil into any waters or any other segments of the environment contrary to the provisions of this Act or any regulations thereunder. Issues of environmental restoration orders are described under section 108 (1). It outlines the requirements of any person who may be served with the order. The person may be required to restore land, including the replacement of soil, the replanting of trees and other flora and the restoration as far as may be, of outstanding geological, archaeological or historical features of the land or the area contiguous to the land or sea as may be specified in the particular order; cease to take any action which is causing or may contribute to causing pollution or an environmental hazard; remove or alleviate any injury to land or the environment or to the amenities of the area; prevent damage to the land or the environment, aquifers beneath the land and flora and fauna in, on or under or about the land or sea specified in the order or land or the environment contiguous to the land or sea specified in the order; remove any waste or refuse deposited on the land or sea specified in the order and dispose of the same in accordance with the provisions of the order; pay any compensation specified in the order.

The Environment and Land Court Act No. 19 of 2011

The Act gives effect to Article 162 (2) (b) of the Constitution of Kenya and establishes a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to land, and to make provision for its jurisdiction functions and powers, and for connected purposes.

Land Act No. 6 of 2012

The Land Act gave effect to the Kenya Constitution's (2010) Article 68 that sought to consolidate the legal framework for land, enforce harmony, progressive and sustainable administration of land ownership, transactions and utilization for the economic and social benefit of Kenyans and its public and private institutions.

The Act gives effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land-based resources, and for connected purposes. Section 10 gives guidelines on the management of public land. Endangered or endemic species of flora and fauna, critical habitats or protected areas and land-based natural resources such as forests are taken care of under section 11 of the Act Part II of this Act outlines the general provisions for the management and conservation of public land. The Act stipulates the following values and principles;

(a) Equitable access to land; security of land rights;
(b) Security of land rights;
(c) Sustainable and productive management of land resources;
(d) Transparent and cost-effective administration of land;
(e) Conservation and protection of ecologically sensitive areas;
(f) Elimination of gender discrimination in law, customs and practices related to land and property in land;
(g) Encouragement of communities to settle land disputes through recognized local community initiatives;
(h) Participation, accountability and democratic decision making within communities, the public and the Government;
(i) Technical and financial sustainability;
(j) Affording equal opportunities to members of all ethnic groups;
(k) Non-discrimination and protection of the marginalized;

(l) Democracy, inclusiveness and participation of the people; and
(m) Alternative dispute resolution mechanisms in land dispute handling and management.

National Land Commission Act No. 5 of 2012

The National Land Commission, established in 2013, was to implement the Land Policy and take lead in all land matters, in conjunction with the Ministry of Lands, and other relevant country-level institutions. Land in Kenya may be registered in three forms, per the Constitution: public land (Article 62) private land (Article 64) and community land (Article 63). The administration of the Act is vested with the National Land Commission, and through it, all transactions, arbitrations for change of use is vested with the Commission or to delegated entities, including County Governments.

The National Land Commission Act (2014) instituted the Lands Commission which is mandated to identify and keep a record of all public land as well as plan for its use under section 8 of the act. This Act made further provisions as to the functions and powers of the National Land Commission, qualifications and procedures for appointments to the Commission; to give effect to the objects and principles of devolved government in land management and administration and for connected purposes. The issues on land management are stated in section 3 of this Act. The Act empowers the commission to enforce land principles outlined in Article 60 of the constitution and the national land policy. Section 6 and 16 of the Act recognize the existence of counties and therefore allows them to establish their committees and county offices while keeping in mind gender equity and ethnic diversity within the county. Establishment and composition of county land management boards - (6). The appointment of the members should be approved by the county assembly and should take into account the national values referred to in Article 10 and Article 232 of the Constitution and should reflect gender equity and ethnic diversity within that county.

The Land Registration Act No. 3 of 2012

This Act seeks to revise, consolidate and rationalize the registration of titles to land, to give effect to the principles and objects of devolved government in land registration and for connected purposes.

The Agriculture Act Cap 318

This Act promotes soil and water conservation and prevents the destruction of vegetation. It can help address the biggest threat to forest conservation i.e. short term shifting cultivation or the slash/burn agriculture, which is the main force behind forest degradation. Under the Act, the Minister can make rules to prohibit, regulate, control clearing of land for cultivation, grazing or watering of livestock thus complementing the Forests Act. Enforcement of the Act has been the biggest problem especially on the protection of riverbanks that have been cultivated resulting in soil erosion and heavy silt load on rivers.

Agriculture (Farm Forestry) Rules 2009

The Rules were instituted to promote the establishment and sustainable management of farm forestry for maintaining a compulsory farm tree cover of at least 10 percent of any agricultural landholding; conserving water, soil and biodiversity; protecting riverbanks, shorelines, riparian and wetland areas; sustainable production of wood, charcoal and non-wood products; providing fruits and fodder; and carbon sequestration and other environmental services. This is a requirement for all agricultural land owners. The Act emphasizes the need for the tree species/varieties not to have adverse effects on water sources, crops, livestock, soil fertility and the neighborhood and should not be invasive. Forest Act (No. 7 of 2005) applies

when a farmer is harvesting trees from his farm. To enforce this, an inspector is authorized to enter the farm and ascertain the situation and take measures appropriately.

Every person who owns or occupies agricultural land should establish and maintain a minimum of 10 percent of the land under farm forestry which may include trees on soil conservation structures or rangeland and cropland in any suitable configurations;

No agricultural landowner or occupier shall grow or maintain any *Eucalyptus species* in wetlands and riparian areas.

Part II Farm Forestry Inspection and Enforcement and Rule 6 on Maintenance of the 10 per cent tree cover stipulates that an inspector may at any reasonable time enter upon any agricultural land or commercial nursery situated in an area in respect of which he is authorized to be an inspector for ascertaining whether the farm owner or occupier has complied with 10 percent farm forestry or nursery requirement.

Rule 8 Protection of land prone to degradation, stating that:

(1) Every District Agricultural Committee shall identify land under its area of jurisdiction which is at the risk of land degradation and institute measures necessary for ensuring its conservation including the planting of trees.

(2) Where land is at the risk of degradation, the land owner or occupier shall be required to implement farm forestry measures as outlined in paragraph (1).

(3) Every District Agricultural Committee shall undertake measures to plant trees in any areas specified under paragraph (1) by encouraging voluntary self-help tree planting activities; undertaking farm forestry activities financed through devolved and any other funds.

(4) The Agriculture (Basic Land Usage) Rules shall apply to sloping lands

Rule 5, states that is compulsory establishment of forestry farm (1) Every person who owns or occupies agricultural land shall establish and maintain a minimum of 10 percent of the land under farm forestry which may include trees on soil conservation structures or rangeland and cropland in any suitable configurations; Provided that the species of trees or varieties planted shall not have adverse effects on water sources, crops, livestock, soil fertility and the neighborhood and should not be of invasive nature. Rule 5 (2) No agricultural landowner or occupier shall grow or maintain any Eucalyptus species in wetlands and riparian areas.

Rule 6, establishes maintenances of the 10 percent tree cover by stating that (1) An inspector may at any reasonable time enter upon any agricultural land or commercial nursery situated in an area in respect of which he is authorized to be an inspector for ascertaining whether the farm owner or occupier has complied with 10 percent farm forestry or nursery requirement.

Agriculture, Food and Fisheries Act No. 13 of 2013

The Agriculture, Fisheries and Food Authority Act (AFFA) No. 13 of 2013 came into effect on the 17th January 2014 and is the current legal instrument regulating the agricultural sector in Kenya. Before this, the agriculture sector had more than 130 laws that made the sector uncompetitive, inefficient and too bureaucratic for a conducive business environment. The merger process commenced with the consolidation of the Agricultural sector legislation which culminated in the enactment of three key laws,

namely; the Agriculture, Fisheries and Food Authority Act, 2013, the Crops Act, 2013, and the Kenya Agricultural and Livestock Research Act, 2013. AFFA, therefore, is an Act of Parliament that provides for the consolidation of the laws on the regulation and promotion of agriculture generally. The Act also provided for the establishment of the Agriculture, Fisheries and Food Authority, to make provision for the respective roles of the national and county governments in agriculture excluding livestock and related matters in furtherance of the relevant provisions of the Fourth Schedule to the Constitution and connected purposes. The Act outlines policy guidelines and rules on agricultural land preservation, utilization and development in part IV sections 21, 22 and 23.

AFFA repealed the former Agriculture Act of 1993 (Cap318) which can be said to be responsible for much of the agricultural activities, challenges and/or gains made over the last 20 years. The former Agriculture Act (Cap 318) had specific rules meant to prevent the destruction of vegetation on lands with slopes exceeding 35%, and prohibit cultivation in slopes between 12% and 35% unless the soil is protected from erosion. However, it was unsuccessful in curtailing land degradation, partly due to technicalities that make its enforcement impractical. By comparison, the current AFFA is silent on limits of slopes allowable for cultivation but sets Rules on preservation, utilization and development of agricultural land under section 22.

AFFA has comprehensive land preservation guidelines. Under Section 23 states that "the conservation of the soil, or the prevention of the adverse effects of soil erosion on, any land, may, prescribe national guidelines for any or all of the following matters":

Prohibiting, regulating or controlling the undertaking of any agricultural activity including the firing, clearing or destruction of vegetation when such prohibition, regulating or controlling is deemed by the Cabinet Secretary to be necessary for the protection of land against degradation, the protection of water catchment areas or otherwise, for the preservation of the soil and its fertility;

Requiring, regulating or controlling—(i) The afforestation or re-afforestation of land;(ii) The drainage of land, including the construction, maintenance or repair of drains, gullies, contour banks, terraces and diversion ditches;(iii) Salinization, acidification and saltification of soil; Requiring the uprooting or destruction, without payment of any compensation, therefore, of any vegetation which has been planted in contravention of a land preservation order; Requiring the supervision of unoccupied land; and Prohibiting, restricting or controlling the use of land for any agricultural purpose excluding livestock.

Also, Section 40 of the AFFA calls for the participation of farmers in decision making stating that: For purposes of ensuring effective participation of farmers in the governance of the agricultural sector in Kenya, there should be close consultation with all registered farmers' organizations in the development of policies or regulations and before the making of any major decision that has effect on the agricultural sector.

Kenya Agricultural and Livestock Research Act No. 17 of 2013

The Kenya Agricultural and Livestock Research Act No. 17 of 2013 is an Act of Parliament enacted to reform research in agricultural and related sectors. It created a new research institution, the Kenya Agricultural and Livestock Research Organization (KALRO) by merging four state corporations, the former Kenya Agricultural Research Institute (KARI), the former Tea Research Foundation of Kenya (TRF), the former Coffee Research Foundation of Kenya (CRF) and the former Sugar Research Foundation of Kenya (KESREF). The Act defines the functions of organizations involved agricultural research as being responsible for (i) Promoting, streamlining, coordinating and regulating research in crops, livestock, marine and fisheries,

genetic resources and biotechnology in Kenya, and (ii) Expediting equitable access to research information, resources and technology and promotion the application of research findings and technology in the field of agriculture. The mandates of KALRO include to develop and promote SLM technologies and methodologies for the agricultural sector. However, its institutional structure does not have a dedicated center for SLM.

Crops Act No. 16 of 2013

Under Section 4, it requires the landowners or lessees of agricultural land to cultivate the lands they own or lease and make the land economically productive in a sustainable and environmentally friendly manner.

Forest Act of 2005 revised in 2012

The purpose of the Forest Act is to provide for the establishment, development and sustainable management, including conservation and rational utilization of forest resources for the socio-economic development of the country. The Act promotes community participation/involvement and protection of cultural interests, facilitating education and research, maintenance and protection of sacred trees, prohibiting activities that threaten forests such as mining and quarrying, and groves and other areas of cultural ethnobotanical and scientific significance. Section 18 of this Act established a Forest Management and Conservation Fund, meant for the following purposes:

a) The development of forests.
b) The maintenance and conservation of indigenous forests.
c) The promotion of commercial plantations.
d) The rehabilitation of provisional forests.
e) The provision of forest extension services.
f) Promotion of community-based forest projects.
g) Facilitation of education and research activities.
h) Establish of arboreta and botanical gardens.
i) Maintenance and protection of sacred trees and groves and other areas of cultural ethnobotanical or scientific significance.
j) The undertaking of surveys and establishment of databases.
k) The protection and management of unique trees for natural resources conservation.
l) The establishment of nurseries and production of seedlings.
m) Silvicultural practices and tree improvement.
n) The management and protection of protected trees.

However, the Forest Act is rather soft on enforcement. Article 50 lists the Forest Officer as being responsible for apprehending offenders, searching and/or confiscating materials stolen from forests including livestock. This is difficult to achieve without other law enforcement arms of government.

Forest Conservation and Management Act 2016

Section 6 (3) (a) (iii) highlights the need to develop "programmes for achievement and maintenance of tree cover of at least 10% of the land area of Kenya". Section 37 (1) requires every County Government to, establish and maintain arboreta, green zones or recreational parks for use by persons residing within its area of jurisdiction. In this regard, every County shall cause housing estate developers within its jurisdiction

to make provision for the establishment of green zones at the rate of at least 5% of the total land area of any housing estate intended to be developed.

The Local Government Act, Cap 265

This Act empowers County Councils to make by-laws used to control cutting of timber, destruction of trees and shrubs and afforestation. It also authorizes local authorities to take measures necessary to control bush fires, quarrying for minerals, sand, gravel, clay or stones. The Act is applicable to trust lands where resource exploitation needs control. Fires have been listed as a major threat to our forests, so an opportunity is available for engaging communities in firefighting and control.

The Fisheries Act, Cap 378

The Act regulates trout fishing in the forests and protects fish breeding areas and is relevant to mangrove management at the coast but often clashes with the Wildlife Act, especially in the management of marine parks.

Wildlife Conservation and Management Act of 2013

The Act was adopted in 1976 but since then 8 amendments and revisions have been done with the latest being in 1990. The Act was adopted 3 years after Kenya ratified the CITES so it deliberately inbuilt most of CITES recommendations. As provided for in the Act, the process of gazettement and de-gazettement requires parliamentary approval so the heightened level of decision-making and legitimacy of the whole process ensures no grabbing of protected area.

Water Act No. 8 of 2002

The Water Act (2002) is an Act of Parliament that provides for the management, conservation, use and control of water resources and for the acquisition and regulation of rights to use water; to provide for the regulation and management of water supply and sewerage services; to repeal the Water Act (Cap. 372) and certain provisions of the Local Government Act; and for related purposes. To enhance the participation of local communities in water management, the Water Act provides for the establishment of Catchment Area Advisory Committees (CAACs), and Water Resources Users Association (WRUAs). The principal functions of CAACs include; to advise WRMA on conservation of water resources, to advise on use and apportionment of water resources and to advise on the grant, adjustment, cancellation or variation of any permit to use water resources. However, WRUAs are more grassroots-based and have greater mandates on water resources use and conservation. For proper management of the quality and quantity of water and equitable distribution, the Act under section 35 allows for the issue and withdrawal permits for given water uses.

The Act also provides for agreements with any person to protect the catchment under section 71. The license allows catchment protection, drainage of land, carrying out soil conservation measures or the control of vegetation or more effectively collecting, conveying or preserving the purity by the person. It states in section 75 that the person can construct and maintain drains, sewers and other works for intercepting, treating or disposing of any foul water arising or flowing upon such land. Section 94 prohibits obstruction or pollution of a watercourse or water resource by throwing any rubbish, dirt, refuse, effluent, trade waste or other offensive or unwholesome matter or thing into or near to any water resource.

The Lakes and Rivers Act, Cap 409, 2009

This is an Act of Parliament to regulate dredging and the use of steam vessels on certain lakes and rivers. Under the third schedule, the Act protects the land from degradation by laying out regulations on the

dredging of lakes and rivers to reduce the occurrence of erosion. Section 6 states that if in the opinion of the inspector the dredging or any operations connected therewith have caused any groin, shoal, deposit or other obstruction to be formed, either at or near the site of the operations or in any other part of the lake or river, which causes or tends to cause erosion or other danger to the stability of the bed of the lake or river or the navigation, the groin, shoal, deposit or other obstruction shall be removed immediately upon the receipt of a written notice from the inspector.

The Energy Act 2012

Under section 103 (1) of the Act, promotes the development and use of renewable energy technologies, including biomass. It also empowers the Minister to provide an enabling framework for efficient and sustainable production, distribution and marketing of biomass and charcoal under section 103 (2) (b). It further under the same section subsection 2 (c) promotes the use of fast-maturing trees for energy production, including biofuels, and the establishment of commercial woodlots, including peri-urban plantations.

Forest Charcoal Rules of 2009

In Kenya the regulation of charcoal is a function under KFS being the agency that issues charcoal production and movement permits, but despite this, most of the time other authorities are also prone to "regulate" it such as the is prone to police, KWS, Administration Police, county askari, etc.

Under the law, the business of charcoal production and transportation is supposed to be regulated by the county governments. However, most counties in Kenya are not in a position to regulate this business because they have not signed the Transition Implementation Plans (TIPs) that will give them the necessary power to do this. So far only 17 have signed the TIPs with KFS, which means that the charcoal business remains almost unregulated in spite of the existence of the Forest Conservation Management Act 2016.

Charcoal Production

The production and movement of charcoal in Kenya is subject to the 2009 Forest (Charcoal) Regulations. Under these rules, a producer of charcoal must be a member of a Charcoal Producer Association. The regulations lack an application track for individual landowners, contain a number of unclear provisions and are built around a highly centralized application approval process. Production permits are not being issues while the Moratorium is in place.

According to Matthew (2013), the Environmental Management and Coordination Act (EMCA, 1999) provides a workable legal framework for charcoal production on private land and empowers District Environment Committees (DECs) to process applications from landowners to make charcoal. It is a decentralized and relatively efficient system that draws on the technical expertise and local knowledge of a cross-section of government departments. There is nevertheless a need for greater clarity on the preferred format for applications via DECs and the scale or nature of charcoal production for which a stipulated requirement for an Environmental Impact Assessment may be waived (Matthew 2013).

Charcoal movement regulations

The transportation of charcoal requires a movement permit under the 2009 regulations. The permits were issued by the local KFS officer or by the KFS County Ecosystem Coordinator after payment of a fee per bag (MENR 2013). Permits are time-limited and vehicle-specific, making it particularly difficult for charcoal to be moved in small volumes or redistributed from storage depots. The regulations are vague on the carriage

of fewer than four bags and unofficial interpretations result in fleets of bicycles, motorbikes and donkeys ferrying charcoal unimpeded to urban markets (Matthew 2013). The movement of charcoal is subject to significant extra-legal payments to police officers that may exceed 20-25% of the retail price (Matthew 2013; Ndegwa 2010). These payments are a highly variable element for those who produce charcoal only infrequently such that many landowners opt to sell their charcoal at farm-gate and avoid being involved in transportation (Matthew 2013).

Charcoal trade and retail regulations

The regulations make it illegal to trade in charcoal from unlicensed producers and traders are expected to keep records of all suppliers and their licenses. Enforcement of these rules is unrealistic, however. It is also questionable whether the KFS mandate extends to the regulation of retail enterprise (Matthew 2013).

The Chief's Authority Act Cap 128 of 2012

It allows chiefs to restrict the cutting of trees or arbitrary use of water.

Climate Change Act of 2016

The Climate Change Act, 2016 is the main legislation guiding Kenya's climate change response through mainstreaming climate change into sector functions, and it is the legal foundation of the National Climate Change Action Plan. The Act adopts a mainstreaming approach that includes the integration of climate change considerations into all sectors and in County Integrated Development Plans. The Act establishes the National Climate Change Council, chaired by His Excellency the President. The Council is responsible for overall coordination and advisory functions. The Act also establishes the Climate Change Fund a financing mechanism for priority climate change actions and interventions.

County level policies and Laws

The Constitution of Kenya 2010

The Constitution of Kenya (2010) created the devolved system of government comprised of the National Government and 47 County Governments. The concept of devolution goes beyond mere decentralization of government services, providing a form of self-governance at the local level and a process of equitable sharing of resources. The County Governments have a key delivery role in implementing the Climate Change Act, 2016, having jurisdiction, as set out in the Fourth Schedule (Part 2) of the Constitution, over sectors relevant for climate change such as agriculture, soil and water conservation, forestry, water and sanitation, and health. Article 203(2) of the Constitution requires that County governments be allocated a minimum of 15% of national revenue received annually, but the allocation often surpasses the minimum thus giving County governments considerable scope to influence climate change investments.

The Constitution of Kenya advances gender equality, starting in Chapter 4, the Bill of Rights that "women have the right to equal opportunities in political, economic and cultural spheres," and to achieve that equality, requires that government put in place and implement affirmative actions that deliver equity for women. This commitment to gender equality and implementation of gender equity is taken up in section 7(6) of the Climate Change Act, 2016 that requires the President to ensure compliance with the two-thirds gender principle when appointing members to the National Climate Change Council. Further, section 8 (2) (c) of the Climate Change Act, 2016 obligates the Cabinet Secretary responsible for climate change affairs to formulate and implement a national gender and intergenerational responsive public education and awareness strategy.

County Government Act 2012

The Act is derived from Constitution 2010 and it stipulates that County governments shall plan for the Counties and no public funds shall be appropriated outside a planning framework developed by the County Executive Committee and approved by the County Assembly. This requirement is meant to ensure that funds are prudently appropriated and used for the sole purpose as stipulated in the County Integrated Development Plans (CIDPs). The CIDPs are developed in line with Kenya Constitution 2010, the SDGs, and Vision 2030 MTP III (2018-2022). As such CIDPs provide the essential linkages of the National and County Governments by facilitating the implementation of Vision 2030 flagship projects as well as other projects and programs that will ensure implementation of Kenya Vision 2030 at both levels of Government.

Under the provision of Section 21 of the Act, County Governments are assigned the following functions concerning the management of the forest.

a) Implementation of national policies on forest management and conservation;

b) Management of all forests on public land defined under Article 62(2) of the Constitution

c) Preparation of an annual report, with the approval of the County Assembly, for the Service on the activities of the county government about this Act and any national policies on forest management and conservation;

d) Promotion of afforestation activities in the county;

e) Advising and assisting communities and individuals in the management of community forests or private forests; and

f) Enter into joint management agreements with communities or individuals for the management of community forests or private forests.

The Act provides, as part of the objective of county planning, for the maintenance of a viable system of green and open spaces for a functioning ecosystem and the attainment of a 10% tree cover all geared towards protection and conservation of the environment.

A County Assembly may enact legislation for the better carrying into effect of the provisions of this section. Despite this mandate being stated in the constitution, the majority of the counties have not created the Transition Implementation plans which ensure that there is a clear framework for collaboration in forestry functions stated above between the national government and the county government.

Devolution laws; these laws ensure that there is participatory and capacity development at the county and community level.

Urban Areas and Cities Act of 2011

Section 37(1) of the Urban Areas and Cities Act, 2011 requires that a city or urban area integrated development plan shall be aligned to the development plans and strategies of the county governments. The city or urban area integrated development plan is expected to be the basis for the preparation of environmental management plans, the preparation of valuation rolls for property taxation, provision of physical and social infrastructure and transportation, preparation of annual strategic plans for a city, disaster preparedness and response, overall delivery of service including provision of water, electricity,

health, telecommunications and solid waste management; and the preparation of a geographic information system for a city.

Transition to the devolved Government Act 2012

Its main objective is to transfer of functions from the central government to the county government as illustrated under six schedule of the constitution of Kenya. This enables the Counties to initiate processes that will ensure there is the capacity to undertake the functions as provided under the Fourth Schedule to the Constitution, keeping in mind the criteria established under Section 24 of the Transition to Devolved Government Act.

Public Finance Management Act of 2012

It provides for the effective and efficient management of public resources. Section 125 of the Act requires the budget process for county governments in any financial year to consist of the integrated development planning process which includes long term and medium-term planning as well as financial and economic priorities for the county over the medium term. Section 126 of the Act further obligates each county government to prepare an integrated development plan that includes strategic priorities for the medium term that reflect the county government's priorities and plans, a description of how the county government is responding to changes in the financial and economic environment; and, programs to be delivered.

The Intergovernmental Act 2012

This Act establishes a framework for consultation and cooperation between the national and county government. This is per the requirements of Article 6(2) which defines the governments at national and county levels as distinct and interdependent. The two levels of government are required to conduct their mutual relations based on consultation and cooperation. Further Article 189 (a) requires the two levels of government to perform their functions and exercise powers in a manner that respects the functional and institutional integrity of the government and the other level.

Climate Change Fund regulations

Makueni, Garissa, Wajir, Isiolo and Kitui enacted climate change Fund regulations that allocate a portion of their development budgets to county-level funds that support local adaptation and mitigation while Kisumu County created institutional structures to mainstream climate change in their daily implementation of projects and programmes.

The County Climate Change Funds (CCCFs) identify, prioritize and finance investments to reduce climate risk and achieve adaptation priorities. Community-level planning committees identify adaptation needs, guided by transparent decision-making criteria. CCCF investments to build climate resilience largely focus on livestock, water, natural resource governance and climate information services.

Ministry of Environment and Forestry and Kenya Forestry Service (KFS) are working with County Governments and private landholders to plant trees and develop reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) actions.

Strategies

Agricultural Sector Development Strategy (2010-2020)

The Agricultural Sector Development Strategy (ASDS) 2010-2020, was developed to be in line with the Kenya Vision 2030, and to upscale the agricultural sector. Drawing from the Vision 2030, under the economic and social pillars, it emphasizes the enhancement of productivity of crops and livestock, incomes, and food security and nutrition. ASDS outlines ways to transform the agricultural sector to encompass innovative, commercially-oriented and modern agricultural undertakings. The overall goal of the agricultural sector is to achieve an average growth rate of 7 percent per year over the next 5 years. The mission of the ASDS is therefore to create an innovative, commercially-oriented and modern agriculture to ensure a food-secure and prosperous nation. The overall development and growth of the sector were anchored in two strategic thrusts: (a) Increasing productivity, commercialization and comprehensiveness of agricultural commodities and enterprises; and (b) Development and managing the key factor of production.

On improving land use and crop production, the ASDS proposes that the subsector would gain a dynamic equilibrium of agricultural land through sustainable land-use practices and environmental conservation. In land-use development, the subsector should conceptualize and develop irrigation schemes and soil and water conservation programs, reclaim drylands, and protect forests and riverbanks. Through this intervention, the subsector should enhance sustainable land management by promoting the development and adoption of soil and water conservation measures, agroforestry, riverbank protection, water-harvesting technologies, and equipping and improving agriculture mechanization stations.

Further, the Strategy proposes developing and implementing a land-use master plan, noting that in rural areas, land-use practices are largely incongruent with the specific ecological zones. Uneconomic land subdivisions coupled with poor land-use practices are responsible for accelerated land degradation and declining land productivity. In urban areas, a proliferation of informal settlements, urban sprawl and encroachment into protected land remain key challenges. The escalation of desertification as a result of land degradation and climate change poses risks to the lives of people living in ASALs. This intervention facilitates the development and implementation of an agricultural land-use master plan for more efficient use of all forms of land.

ASDS also calls for improving environmental conservation and enhancing conservation and management of resources, including the forests, grasslands, wetlands, coral reefs and mangroves which are biodiversity hotspots. It also calls for developing river basins and large water body resources, conserving river banks, water bodies and catchments, as well as protecting, conserving and managing forest resources.

Agricultural Sector Transformation and Growth Strategy (ASTGS) 2019-2029

In 2015 the Ministry of Agriculture, Livestock and Fisheries conducted an institution Architectural Assessment to establish the institutional and policy landscape of the agriculture sector in Kenya. The study found that poor sector coordination had resulted in reduced investments in the agriculture sector both at national and counties level. The Cabinet secretary resolved to establish a mechanism to enhance coordination in the sector through an inclusive consultation process.

In 2016 the Joint Agricultural Sector Intergovernmental secretariat was asked to review the 2010 Agricultural Sector Development Strategy and design a new Agriculture Transformation and Growth

Strategy that is compliant to 2010 Constitution, the CAADP Malabo Declaration. Hence the creation of the Agricultural Sector Transformation and Growth Strategy in 2019.

The Strategy is based on the belief that food security requires a vibrant, commercial and modern agricultural sector that supports Kenya's economic development sustainably and its commitments to regional and global growth. The ASTGS has three anchors to drive Kenya's 10-year transformation; that is increase small-scale farmer, pastoralist and fisherfolk incomes, increase agricultural output and value add and Boost household food resilience.

ASTGS is aligned with the medium term national agriculture sector priorities and medium term investment plan III, the 100% food and nutrition security aspiration in the Big Four agenda, SDGs and the African Union agenda 2063.

National Agricultural Sector Extension Policy 2012

The National Agricultural Sector Extension Policy (NASEP) is a broad sector-wide policy enacted to take care of changes that took place in the agricultural sector since 2001, at the time of the formulation of SRA, cognizant of the strategic plans of the sector ministries.

The NASEP draws its strength from the ASDS principles, with the objective is to promote and guide the realization of demand-driven, sustainable and effective pluralistic extension system. The long-term goal is to have private sector-led and fully commercialized extension services such as that already provided by private companies. In recognition of the increasing role of other stakeholders in extension services provision, the Government promises to:

I. Promote pluralism in extension service delivery and institute mechanisms to coordinate extension services for improved quality services.
II. Continue to be involved in providing agricultural extension services either directly (using existing Government institutions) or indirectly mainly in areas where private sector participation is still low (e.g. in ASALs) with special attention to vulnerable groups.
III. Invest in building capacity of ESPs, extension clientele and relevant institutions.
IV. Promote decentralized extension service provision through clientele organizations and other grass-root institutions /forums organized at all levels, in line with the Government's devolved structures.

The NASEP concedes that it is a big challenge to develop comprehensive and dynamic extension packages that include cross-cutting issues such as sustainable use of natural resources and gender. It, therefore, seeks to embrace sustainable environmental management through wider community participation in natural resource management and formulation of conservation strategies. Some of the approaches that are proposed include; taking into consideration the importance of indigenous knowledge and technologies, promoting farmer innovations, developing guidelines for the operations of extension-led extension provision such as farmer-to-farmer extension, Farmer Field Schools and addressing agro-ecological diversity and that recognize socio-economic and cultural characteristics of the clients and promote enterprise diversification.

National Climate Change Response Strategy (2010) strategic plan and an operational action plan

Kenya between 2009 and 2010 developed the National Climate Change Response Strategy (NCCRS). Both the NCCRS and the National Climate Change Action Plan (NCCAP) (2013) seek to mainstream an inclusive and equitable low-carbon development pathway for the country in the face of climate change. The Action Plan feeds into Vision 2030's Second Medium Term Plan (2013 – 2017) and lays a solid foundation for reducing vulnerability to climate change and enhancing climate adaptation in the country. The NCCAP seeks to ensure that climate change is mainstreamed in all development plans. It takes adaptation and mitigation efforts in all key sectors including livelihood diversification, development of human capital, water resources conservation and development, climate-proofed infrastructural development (roads and energy), afforestation and reforestation, and climate-resilient agricultural systems, among others. As a result, intervention programs are implemented through line ministries in collaboration with development partners.

The NCCRS has wide-ranging recommendations towards making Kenyan agriculture climate-resilient, including the provision of downscaled weather information and farm inputs; water harvesting e.g. building of sand dams for irrigation; protection of natural resource base (soil and water conservation techniques); and research and dissemination of superior (drought-tolerant, salt-tolerant, pest and disease resistant) crops.

Climate change mitigation also features in NCCRS. Through it, efforts are made to limit the current and future emissions by increasing potential sinks for GHGs. In Kenya, the sectors associated with high emissions include forestry (due to loss of forests from logging and land-use change), energy, agriculture and transport. The proposed mitigation interventions include projects of the Kenya Forest Service's Forestry Development Plan (FDP); Energy Ministry's Green Energy Development; as well as other interventions in the transport and agricultural sectors. The Forestry Development Plan (FDP) aims at growing 7.6 billion trees during the next 20 years.

Kenya Climate-Smart Agriculture Strategy (2017-2026)

The objectives of the Kenya Climate-Smart Agriculture Strategy (KCSAS) are to adapt to climate change and build the resilience of agricultural systems while minimizing greenhouse gas emissions. The actions will lead to enhanced food and nutritional security and improved livelihoods.

National Agribusiness Strategy 2012

The National Agribusiness Strategy (2012) was developed to support the need to transform smallholder agriculture from subsistence activities to innovative, commercially-oriented, internationally competitive and modern agricultural as stated in the Vision 2030 under the economic pillar. One of the key drivers for this transformation is agribusiness- a sector that comprises types of businesses involved in agricultural production, including farming and contract farming, seed supply, agrichemicals, farm machinery, processing, marketing and retail sales.

One of the main factors identified as contributing to the current low farm productivity is inappropriate land use, which degrades the quality of Kenya's natural resources. To improve productivity, there is a need to attract investment by creating an enabling environment and putting performance above politics. Such funds should be used to improve agricultural water management to include expanded irrigation infrastructure.

National Water Management Strategy 2010

The objective of the National Water Services Strategy (NWSS) is to provide an effective and efficient response to the challenges facing water service provision in the country. The overall goal of the NWSS is to ensure sustainable access to safe water and basic sanitation for all Kenyans. The key principles of the NWSS relevant to land degradation and Sustainable Land Management (SLM) are sustainable access to safe water and basic sanitation as a human right; Sustainability of water and sewerage services (WSS) systems through cost-recovery by taking into account a pro-poor pricing policy, meeting, equity as well as economic and environmental concerns; Environmentally friendly operations of water and sanitation services, e.g. polluter pay principle applies. The strategy separately outlines specific strategies for both urban and rural settings.

Plans

National Climate Change Action Plan (2018-2022)

NCCAP 2018-2022 aims to further Kenya's development goals by providing mechanisms and measures to achieve low carbon climate-resilient development in a manner that prioritizes adaptation. This plan builds on the first Action Plan (2013-2017) and provides a framework for Kenya to deliver on its Nationally Determined Contribution (NDC) under the Paris Agreement of the UNFCCC. The action plan guides the climate actions of the National and County Governments, the private sector, civil society and other actors as Kenya transitions to a low carbon climate-resilient development pathway.

National Adaptation Plan (2015-2030)

Kenya's National Adaptation Plan 2015-2030 was submitted to the UNFCCC in 2017. The NAP provides a climate hazard and vulnerability assessment and sets out priority adaptation actions in the 21 planning sectors in MTP III.

The National Forest Programme (2016 -2030)

It is the first cross-sectoral and multi-stakeholder national framework for developing and coordinating forest development aimed at meeting the needs of Kenyans in the next 15 years. It builds on the constitutional values and principles of the Kenya Vision 2030, and advances forest development to 2030. In this way, forestry development values, principles and time targets now mirror national development goals. The National Forest Programme is a national multi-stakeholder, cross-sectoral framework involving national and county governments, communities, civil societies and the private sector in promoting sustainable forest management.

Logging moratorium and Charcoal

Moratorium on Logging

On the 24th of February 2018, the government declared a national Moratorium on logging in public and communal lands, which included logging for charcoal production. Since that time, no permits for charcoal production and trade have been issued. On 20th December 2018 it was agreed that an amendment to the Moratorium would be made to allow for harvesting of *Prosopis juliflora* (mathenge) in Baringo County (press statement from the Ministry of Environment and Forestry, Office of the Cabinet Secretary). The government is yet to make a decision about how the policy should apply to mathenge infested areas, however.

The moratorium is said to have drastically reduced charcoal production. According to a report by Clement Ngoriareng, head of dryland forestry at the KFS he states that "there has been massive drop in production, save for local consumption" (Omungo 2018). This means that families that used to gain an income from charcoal production now have less incentive to control the spread of mathenge (Omungo 2018).

Institutional Framework

A large number of institutions are engaged in SLM and agroforestry ranging from implementation of programmes, providing funding and oversight. These institutions include government ministries such as ministries which provide funding and oversight on SLM activities. Other organizations e.g. UN, Bilateral, multilateral organizations provide funding and implementation support. There are recipients of donor funds e.g. NGOs, ministries, Community Based Organizations (CBOs), WRUAs, pastoral organizations, farmer unions which implement policy and projects on SLM.

SLM and agroforestry is addressed variously by the Ministries of Agriculture, Livestock and Fisheries; Environment and Forestry; Water and Irrigation and Lands. But at the operational level, each ministry has its staff implementing interventions relevant to its niche. As a result, SLM is not accorded the multi-stakeholder coordination requisite for growth. Granted that much progress has been made over the last 50 years with expansion of soil and water conservation and in recent years, tree planting, but the actors are many and uncoordinated. There has been considerable restructuring of institutional and regulatory frameworks since the mid-1990s. The formulation of laws and policies is a slow process involving the setting up of task forces and cross-sectoral consultations.

The institutional and administrative approaches are mostly sectoral and budgetary support for policy implementation is not always evident. There is no one-stop-shop to address targeted investments for SLM for smallholder land users and Kenya. As yet, there is no Country Strategic Investment Framework (CSIF) addressing SLM well. Such a framework will be useful as a tool for policy advocacy, resources mobilization, investment planning, project targeting as well as responding to emerging issues and opportunities. The prospects for a Kenya SLM Investment Framework (KSIF) are viable under Kenya Agricultural Productivity and Sustainable Land Management Project (KAPSLM) given that national policies already support such ventures, and KAPSLMP is embedded in the Ministry of Environment and Forestry (MoEF), whose core business SLM falls under. Based on this, it is recommended that Kenya should develop a KSIF to help address the apparent gaps in investment in the SLM.

Strengths, Weakness, Opportunities and Threats (SWOT) Analysis

Analysis of SWOT inherent in the relevant laws				
Legislation	**Strengths (in promoting agroforestry)**	**Weakness**	**Opportunities (including where things can be improved)**	**Threats**
Constitution of Kenya 2010	• The Constitution requires the government to maintain a national tree cover of at least 10 per cent under Article 69 (b). • The Constitution is supportive of Sustainable Land Management (SLM). • Articles 42, 60 (c) and 69 (a-h), of the Constitution recognize the rights to a clean and healthy environment, sustainable and productive management of land resources. • Every Kenyan has the responsibility to ensure that they protect and conserve the environment. Any Kenyan (individually or in a group) can approach the court and apply for orders when others, including the government violate these rights. • Article 183 (1) (b) and (d) obligates county governments to implement national legislation in their counties and to perform the functions required of them by the Constitution and by national legislation. • Under Article 186, county governments are assigned the specified functions, including agriculture, county planning and development, implementation of specific national government policies on natural resources and environmental conservation such as soil and water conservation and forestry, and ensuring and coordinating local level community governance.	• Being a broad, long-term national document, the Constitution does not mention tacitly "sustainable land management" or "ecosystems" and thus could be misinterpreted as being vague on SLM issues. • Conflict of obligations under the fourth schedule part 1 (22) which vests the role of the environment with the National government especially the natural resources according to Article 62 (3) but it also gives the responsibility of execution of some national government policies on environmental conservation on the county governments under Article 185 (4). It is not clear what these national policies on natural resources are, there is lack of coordination and hence it's difficult to know how the functions will be discharged (Kariuki 2018).	• Parliament is required to approve any use of Kenya's natural resources and therefore should be fully involved in the negotiation of agreements relating to the use of the country's minerals, oil, coal, forest products and wildlife. • Article 56 provides for the representation of minority and marginalized groups (women, youth and minorities) who have been traditionally excluded from decision-making in their communities and government. For example, participation by Ogieks in Mau Forest as well as the Endorois in Lake Bogoria resources has only been recognized recently after community campaigns in and out of court. • In Article 35, citizens have the right to access all information held by the government and its agencies. This is particularly important in relation to Environmental Impact Assessment (EIA) licenses that are issued on questionable grounds.	• The Constitution demands that communities be at the heart of natural resource management, many are still left out of the country's multi-billion dollar mining industry (Miriam 2014). • The Constitution has structural aspects which infringe on county powers and functions on issues of agriculture as per Fourth schedule part (1) example the Agriculture, Fisheries and Food Authority. How does one reconcile its functions and those of county governments, the relationship between county legislation and operations of the Authority and vice versa, and mechanisms for intergovernmental relations and conflict resolution mechanism under its institutional framework?

Agriculture, Food & Fisheries Act (AFFA) 2013	• AFFA has harmonized the institutional arrangement in the agriculture sector, merging the numerous State corporations and thus reducing overlaps. • It expanded the definition of agriculture to be more exhaustive (includes fisheries). • AFFA supports soil and water conservation and other SLM activities, including prevention of noxious and invasive weeds. • On the protection of soils, water and land, the Act in section 21-23 provides for gazettement of land development, preservation and use guidelines and rules by Cabinet Secretary. • Section 12 of AFFA Act empowers AFFA to support farmers of scheduled crops with affordable inputs and credit.	• AFFA does not limit cultivable slopes, meaning very steep slopes may be cultivated, which could trigger land degradation including landslides. • The Act does not adequately provide for punitive measure for causing land degradation or failure to implement SLM. • The Act is not clear on cooperation between counties on areas of comparative advantage given the trans-county nature of some of the production areas needs to be reviewed. • Though the discretion given to the (AFC) Agricultural Finance Corporation Board may be used to support low-income smallholder farmers with loans, the terms of the same loan has to be approved by the Cabinet Secretary for Finance, thereby removing the discretion.	• The Act regulates various agricultural uses of land including fisheries, and agroforestry. • The aim is to enhance sustainability and hence conserve and protect the environment. • It authorizes the government to require farmers to grow certain crops, restrict land use in the name of land preservation and several other measures geared towards maintenance of the environment. This gives AFFA greater mandate than the former institutions tasked with developing the crops sector. • The Agriculture, Food & Fisheries Authority, having been formed from merging of previous independent institutions has the potential, adequate infrastructure and experience to provide the foundation for a transformed agriculture sector.	• Under the current constitution, agriculture is devolved to the counties and Article 69 (1) (b) obligates the State to work to achieve and maintain a tree cover of at least 10 % of the land area in Kenya which means collaboration with the counties is key to achieving AFFA's mandate which has not been easy (MoEF 2018). • AFFA has no special support packages for the poor farmers or smallholders; the fund is also not yet operational, and no rules have been gazetted for managing the fund.
Legislation	**Strengths**	**Weakness**	**Opportunities**	**Threats**

Environmental Management and Coordination Act (EMCA) - 1999	• On SLM, EMCA under Section 42, 44, 45 and 46, upholds the protection of rivers, lakes and wetlands, hills, mountain areas and forests. • It proposes land use methods that are compatible with conservation of biological diversity. • EMCA has been instrumental in enforcing control of pollution of water resources and land. • Under section 38 and 40 of the Act, it recognizes the cultural and social principles traditionally applied by communities in Kenya for the management of natural resources. • The Act empowers the National Environment Management Authority (NEMA) to develop and publish in the Kenya Gazette guidelines for the protection of hilltops, hillsides, mountains and forests. •The guidelines encourages agroforestry and woodlands on farmlands and sets a target of 10% land holdings under trees, citing Farm Forestry Rules of 2009.	• EMCA covers environmental issues at industrial, commercial and domestic levels quite well, but its implementation focuses on urban areas, with less focus on SLM in rural settings. • EMCA 1999 does not mention climate change. • The Act does not mention the consultative procedures which are in place in matters regarding information flow between both levels of government. • The Act has been overtaken by other legislation and is now outdated. For instance, there are demands in the 2010 Constitution that are not covered by the act. • Most sectoral laws were enacted after the act had been developed, for instance the Water Act 2002, Forest Act 2005 and the Land Act 2012.	• More cases relating to environmental offences under EMCA Cap 386 have been prosecuted. This is because prior to the enactment of the EMCA, environmental cases could only be addressed under private law as contractual issues or under public nuisance which could only be brought by the attorney general on behalf of the public. It addresses; • Limited institutional capacity and resources to mobilize and link activities effectively within and between sectors. • Inadequacies in some environmental sectoral laws in articulating the links between development, population and environment. • Limited budgetary provisions to finance effective implementation of the environmental programmes set out in national development plans • Institutional mechanisms for dialogue among actors and sectors in the processes of policy formulation, implementation and review. All this empower the environmental institutions functionality. • The Guidelines direct support for organic farming in peri-urban areas and recommends soil protection against erosion through ploughing and planting along the contours while practicing crop rotation, applying manure and crop residues to crops in place of fertilizers, as well as utilizing integrated pest management plans and terracing.	• There is a lack of manpower assigned at county office level to enforce the EMCA regulations. • Political influence in approving of projects without the proper consultation with the local county offices. • Lack of awareness of the need for an EIA by the general public.

The Land Act (2012)	• The Land Act streamlined land rights and security of tenure. It accommodated the protection of public lands. • The Act allows for the protection of the environment and prevention of degradation. • The preamble to the Act states that it gives effect to Article 68 of the Constitution to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land based resources. • Parliamentary consent is required to convert public land to private land in effect prevents irregular and illegal conversion of public utility land for the benefit of a few individuals to the detriment of the public. • Section 5 provides for recognition and enforcement of tenure in the form of freehold, leasehold, customary, and others. • It empowers the National Land Commission in section 11 to identify ecologically-sensitive areas.	• The Act did not set proper limits for subdivision of land, thus there are un-economical subdivision of lands still on-going. • The Act does not adequately cushion the poor and landless from exploitation by the rich especially when it comes to reacquiring community land that the county should be controlling but the national laws prevail per court jurisdictions and the Constitution.	• All land held on leasehold titles will revert to the Government on expiry of the term. However, where the immediate past owner of the land is a Kenyan citizen, the Commission is required to grant them the right to re-acquire the land, so long as the land is not required for public purposes. • Following the promulgation of the Constitution, foreigners who held freehold titles or leasehold titles that were for a term exceeding 99 years, had their titles reduced to 99 year leasehold titles.	• Land issues are governed by many laws, most of which are incompatible. This has led to complexities in land administration and management. • The Trust Lands Act, Local Authorities Act and Chiefs' Authority Act all pose potential risks of conflict of interest or of power relations. There is therefore a need to urgently harmonize all these policies and laws. • The new laws are silent on whether holders of Government Land Act and Land Titles Act title deeds will be allowed to transact with their title deeds, pending their examination and fresh registration. • This appears not to be permitted and will almost certainly cause delays in ongoing transactions related to land held under such title deeds. • Political will to apply the law is also weak in the sense that it has a lot of loopholes that need to be tabled in parliament to ensure equality and fairness in the land matters (Masaku 2013). • The Land Act does not appear to empower the National Land Committees to allocate land to needy individuals, but only to groups, and may therefore not address fully the Constitutional value and principle of equity with respect to land.

Forest Act (2005)	• Upholds forest establishment, development (inclusive of all forests), protection and sustainable management, including conservation and rational utilization of forest resources. • Promotes community participation in tree planting and protection of cultural interests, facilitating education and research. • The Act enhances personal accountability by discouraging livestock straying into forests to the extent of auctioning them after five days upon failure by the owner to reclaim them, proceeds of which are paid to the owner less the amount incurred by KFS for the cost of caring for them. • It takes cognizance of the role of farm forestry and dry land forests. • Provides for management plans for all major forest ecosystems, creation of a professional forestry society and the establishment of a forest management and conservation fund. • The Board of the Kenya Forests Service is empowered by section 7 to provide incentives in the promotion of forestry and tree-planting.	• The Act is rather soft on enforcement. Article 50 lists the Forest Officer as being responsible for apprehending offenders, searching and/or confiscating materials stolen from forests including livestock. This is difficult to achieve without other law enforcement arms of government. This is because of the penalties put in place do not deter the offenders from committing the offenses. • The low penalties for offences compared to the value of the resources in question. • Inconsistencies with other sectoral policies and laws example cases of double gazettement of forest by the Wildlife Conservation and Management Act. • Lack of security of tenure for people living on government and trust lands has resulted in opportunistic exploitation of forest resources both by the local communities and government. • The Forests Act is silent on specific measures on promotion of multi-purpose trees and the prevention of introduction of unsuitable exotic plants.	• Section 24.1 of the Act provides an incentive for people who own private forests as well as arboreta and recreational parks to get registered with the Kenya Forest Service (KFS) hence entitled to receive technical advice on appropriate forestry practices from KFS as well as receive loans to develop the forest. • The recipients are further exempted from payment of land rates and such other charges on land under which the forest is established. • The law contains many innovative provisions to correct previous shortcomings and creates an enabling environment for developing the institutional capacity of the relevant agencies especially research institutions advocating for better farming systems. • It nurtures transparency and accountability and encourages the formation of public-private partnerships. • The Act also seeks to promote commercial tree growing. • In section 25 farm-forests are registered with the Forestry Service, thereby entitling them to receive technical advice, financing and land-rate exemptions.	• The incentive under this act fits more for capital endowed individuals owning private forests, institutions or body corporates, not a small scale farmer, who may not even own a mini-forest, defined as a group of trees occupying less than 10 ha of land. • More active involvement of local communities is currently hampered by lack of information on potential benefits as well as lack of awareness on the mechanisms for benefit sharing. • There is also conflict between the 2005 Forests Act and the Wildlife (Conservation and Management) Act (Cap 376), especially where forests are double gazetted. • The wildlife law does not allow consumptive utilization of natural resources within national wildlife parks while the Forest Act does.

Water Act (2002)	• The Water Act separates the functions of Government from direct implementation to those of policy direction, oversight and regulation. • It provides for the participation of local communities (WRUAs) in water resources management and catchment protection. • It is supportive of SLM in water catchment areas.	• The Water Act 2002 is outdated and not been harmonized with the Constitution 2010, Vision 2030, and recent issues such as climate change. • Although the Water Bill (2014) has undergone a second reading in Parliament, it is yet to become law and could change substantively before then. • Ignorance and lack of information on water and environment conservation by the public.	• Development of guidelines and regulations to implement the Water Act of 2002 to address the issue of county government becoming territorial with regard to water resources development along common borders e.g. Elgeyo Marakwet County and Uasin Gishu County.	• The Water Act of 2002 provides for the formation of committees to manage catchment areas gazette under the Act. The Forests Act also provides for the formation of committees at the conservancy level for managing forests. There is no clear linkage between the two committees which are made up of different individuals.
Kenya Agricultural and Livestock Research Act (2013)	• Streamlined the institutional setups of agricultural research, by merging the commodity-based research institutes to be under one umbrella KALRO. • Section 5(2) (b) provides that KALRO will prioritize research in agriculture as guided by national policy.	• Functions of SLM seem lost since there was no institution created to handle NRM/SLM, which was put as a "Cross-cutting issues" including research on land degradation/ SLM.	• It promotes and coordinates agricultural research activities in Kenya. • To address the challenge of water for agricultural production, the organization promotes technologies that enhance water use efficiency and reduction of losses. This includes conservation agriculture, agroforestry practices, green house technologies, small scale irrigation practices, land conservation measures, integrated soil fertility management and good agronomic practices.	• Section 5 (2) (b) of KALRO Act and section 4 (d) of the AFFA Act allocates the same mandate and function of determining research priorities to KALRO and AFFA respectively, thereby precipitating conflicts. • KALRO may conflict with the National Commission for Science, Technology and Innovation in matters pertaining to general regulation of agricultural research; section 24 of KALRO provides for cooperation between KALRO and the predecessor of the Commission but it is not clear why the duplication of mandates is necessary.

The Agriculture (Farm Forestry) Rules of 2009	• Aims to maintain a 10 percent farm forest cover on every agricultural land holding. Under Rule 4, aim to regulate the destruction of vegetation for agricultural expansion by; • Combating climate change, • Conserving water, soil and biodiversity, • Protecting riverbanks, shorelines, riparian and wetlands. • The species of trees or varieties that are required to be planted shall not have adverse effects on water sources, crops, livestock, soil fertility and the neighborhood and must not be of invasive nature. • The Rules stimulate the development of agricultural land in accordance with the accepted practices of good land management and good land husbandry. • Advocates for sustainable production of wood, charcoal and non-woods products.	• The compliance certificate incentive may not be a key motivation as the certificate does not translate to any tangible gains from acquisition of the certificate for the compliant farmer, in that the certificate does not excite the farmers to work hard to plant trees to attain it. • Under Rule 11.5 where damage is due to public utility service, no compensation or commitment to the farmer is assured.	• Rule 11.1 of the Act offers an incentive of valuation of damage and tree compensation guidelines to a landowner or occupier who suffers damage to his farm forest trees. • Every District Agricultural Committee shall: identify land at the risk of degradation and establish measures necessary for ensuring its conservation including planting of trees; prepare and oversee the implementation of annual seedling production plan for the benefit of landowners or occupiers in the district. • The Rules also contain provisions on enforcement measures and inspection, by the district officers and committees	• Disincentive for the farmer is that review of farm tree compensation guidelines will be done after every five years, as stipulated in Rule 11.4, which is too long a period and it may not reflect the true value of the damage incurred by the less resource- endowed small-scale farmer. • For a small scale farmer who may have maintained trees for other uses, there is an inhibitory regulation stipulating that a person shall not harvest trees from a farm forest without notification and approval by the District Agricultural Committee (DAC), for which a farmer has to incur a cost in the form of time and transport charges.
Analysis of SWOT for relevant policies and strategies				
Policy	**Strengths**	**Weakness**	**Opportunities**	**Threats**
Kenya Vision 2030 (2007)	• Vision 2030 introduced land reforms and paved the way for the National Land policy. • Vision 2030 gives prominence to the environment both as a basis on which development is anchored and as a test of the sustainability of its programmes and projects. • It proposed the development of the land information system. • It also upholds sustainable management of natural resources, promising to intensify conservation of strategic natural resources (forests, water towers, wildlife sanctuaries and marine ecosystems).	• Vision 2030 was enacted before the new Constitution 2010; hence issues of devolution are not captured by this development blue print. • Other than mentioning soil erosion under situation analysis, the Vision does not provide further details on soil conservation. • The Vision is national in nature and thus requires further disaggregation of issues in its application at local levels. Smallholder land-tenure interests are covered but by default as	• Through joint enforcement units among different sectors that are affected by environment, different initiatives could be addressed for example rehabilitation of urban rivers, rehabilitation water towers and reclaim the degraded land (GOK 2018). • Vision proposed raising the standards of the country's water resource management, storage and harvesting capability. • Tree cover increased to an estimated 7.29 percent in 2017 from the estimated 7.2 percent reported in 2013 and there is still room for more growth (NEMA 2011). • A total of 47 County Environmental	• Urbanization will also occur at a rapid rate by 2030, it is estimated that more than 60 per cent of Kenyans will be living in cities and towns. These changes are likely to impact adversely on the environment, which will require effective management to ensure sustainability. • Kenya's growing population should be addressed by Vision 2030 because increase in the number of people living in the same area adds pressure on land and its resources.

	• On agriculture, the Vision facilitated the formulation of land use polices for better utilization of high and medium potential lands. • It proposed enhancing disaster preparedness in all disaster-prone areas and improving the capacity for adaptation to global climatic change. • The Environmental Management and Coordination Act 1999 and Wildlife Conservation and Management Act 2013 were reviewed. In addition, the Forest Conservation and Management Act, 2016, Natural Resources Act, 2016, Water Act 2016, and Climate Change Act 2016 were enacted. The National Environment Management Authority (NEMA) was also accredited as a National Implementing Entity for the Green Climate Fund.	there is no special attention to this issue. • The issues of sustainability of land as a natural resource, biodiversity conservation, organic farming and farm energy are not addressed, unless under the broad principle of "sustainable development". Family-farming as a facilitator for smallholder performance is not mentioned (PELUM 2015). The specific good environmental conservation practices that warrant rewards are not clarified (PELUM 2015).	Action Plans have been developed and finalized (NEMA 2011). • Vision 2030 does make reference to climate change adaptation in the context of building capacity as part of the environment. • The Vision 2030 has also captured a number of climate change goals and strategies, including; - conservation of forests through rehabilitation of degraded water catchment areas, - implementation of compensation for environmental services to include carbon markets and use of biotechnology, - integration of climate change into development planning.	

National Environment Policy (NEP) 2013	• The NEP was formulated following the requirements of the Vision 2030 and the Constitution of Kenya 2010 and thus fits well with the devolved system of government. • NEP identifies Kenya's critical ecosystems and natural resources. It proposes measures to enhance conservation and management of ecosystems and sustainable use of natural resources. • It provides a framework for integrated ecosystem approach to conserving environmental resources. • It upholds tenets of public participation, equity, the precautionary principle, subsidiarity, and addressing climate change. • Key objectives are to provide incentives, encouraging awards for people who observe practices that conserve the environment. • Advocates for disincentives - actions taken to discourage environmental destruction, for example, fines and arrests for those who destroy the environment. • The Policy recognizes that inappropriate agricultural practices may lead to contamination of water courses and bodies through excessive use of agricultural pesticides and fertilizers. • It promotes integrated watershed development programmes along mountain slopes and forested areas, with the participation of local people, to prevent further damage.	• The broad nature of NEP is such that it does not address SLM very strongly, albeit it mentions involving communities in soil conservation. • The policy narrative uses uncommon titles such as "integrated pest management" and "integrated watershed development" without definition, thereby rendering interpretation variable.	• It proposes to manage and control poverty levels which put pressure on the environment due to lack of choices. For example illegal cutting of trees and charcoal burning to support family needs. • It aims at harmonizing the environment sub-sector (land, forest, wildlife and water) policies and laws with the requirements of both the Environmental Management and Co-ordination Act (EMCA) of 1999 and the Constitution of Kenya (2010). • Increase the use of other renewable sources of energy (for example solar, wind and biogas) and reduce overreliance on hydroelectric sources. • Manage the negative effects of climate change and related disasters including droughts and floods. • Restore (possibly to their original condition) areas that have been destroyed and restock lost biodiversity (plant and animal varieties). For example, efforts to re-plant trees in parts of Mau Forest and removal of water hyacinth in Lake Victoria should be encouraged if not supported.	• As an environmental policy it pays too little attention to climatic change and largely suggests only studies and impact assessments for mitigation.

National Policy for the Sustainable Development of Northern Kenya and other Arid Lands (ASAL Policy) 2012	• The ASAL Policy reinforces other positive policy options articulated in Kenya Vision 2030, the Constitution of Kenya, 2010 and the National Land Policy. • The Policy seeks to strengthen the resilience of ASAL communities to drought and other climate related disasters. • Interventions target drought management and climate change, land and natural resource management, livestock production and marketing, dry land farming, livelihood diversification, and poverty and inequality.	• Although the ASAL policy has promised actions such as dry land farming to boost food security, policy implementation under the devolved system of government is unclear within the county and national government level. • The ASAL policy recommended the formation of the National Drought and Disaster Contingency Fund (NDDCF), which has yet to be created.	• Ensure that the interests of pastoralists, particularly pastoralist women, are adequately and appropriately addressed in new land legislation and institutions, in line with the National Land Policy.	
National Land Policy (NLP) 2009	• The Policy supports sustainable land use practices and restoring the environmental integrity of land by facilitating sustainable management of land based resources. • It postulates benefit-sharing from land based natural resources. • Puts in place appropriate legal measures to ensure that men and women are entitled to equal rights to land and land-based resources. • Put in place mechanisms to curb selling and mortgaging of family land without the involvement of the spouses. • The policy advocates for sustainable production to avoid land deterioration due to population pressure, massive soil erosion and variability in climatic patterns among other things. • Provision of incentives to induce land owners to use their land sustainably.	• The policy is silent on guiding the exploitation of fragile lands and those at risk of degradation e.g. very steep slopes. • The Policy was enacted before the promulgation of the new Constitution and therefore needs to undergo the necessary revision and re-alignment. • The Policy does not address the Constitutional value and principle of equity with respect to land.	• The policy takes a holistic approach, providing incentives such as security on community land, acquisition of land rights by inheritance, with or without a will, to promotion of soil conservation methods. The policy recognizes that; • Access to land shall be assured for all Kenyans on the basis of equity, fairness, sustainable management and efficient utilization of the land. • Women are not sufficiently represented in institutions that deal with land. • Women rights under communal ownership and group ranches are also not defined and this allows men to dispose of family land without consulting women. • Few women have land registered under their names and lack of financial resources restricts them from entering the land market. • International Conventions on Women's Human Rights relevant to women's property rights ratified by Kenya Government have not been translated into policies or laws.	• Some incentives under the policy have turned out to be a disincentive to small scale farmers. In line with the NLP, the introduction of taxes, formation of cluster settlements, minimum land size determination and privatization of delivery of services, such as valuation and survey are issues faced by small scale farmers, because of their inability to pay taxes, especially during the initial years, and to incur the costs of valuation and survey, in view that the incurred costs may not be necessarily subsidized.

Agricultural Sector Development Strategy (ASDS) 2010-2020	ASDS proposes to: • Improve management of the environment and natural resources. • Improve pollution and waste management. • Enhance conservation and management of resources. • Develop and implement appropriate mechanisms for protecting, conserving and sustainably managing forest and wildlife resources. • Conserve river banks, water bodies and catchments. • Implement the National Climate Change Response Strategy. • Improve food security, as well as address desertification. • Develop pastures and forage.	• The ASDS predates the era of devolution and thus its implementation is constrained by the fact that agriculture became a devolved function, a factor not reflected in its governance structure. • Poor sector coordination has resulted in reduced investments in the agriculture sector both at national level and in the counties. • The side-effects of agricultural mechanization are glossed over and the prudence that is necessary to protect soils is not provided for (PELUM 2015). • While directing protection of groups vulnerable to climatic changes, no specific policy measures are recorded. • The modern farming methods which should be adopted by smallholders as directed in the policy are not specified (PELUM 2015).	• Creation of new Agriculture Transformation and Growth Strategy that is compliant with the Constitution of Kenya 2010 and the Comprehensive Africa Agriculture Development Programme (CAADP) Malabo Declaration in 2016 complements the value of ASDS. • ASDS includes climate adaptation as a priority but the agricultural components of the Climate Change Strategy provide more details on prioritized activities. • ASDS recognizes that reforms in the agricultural sector require drastic actions to take into account the existing and emerging concerns about sustainable agriculture and climate change adaptation in Kenya. • It advocates for an incentive that closely relates to conservation agriculture with tree is the facilitation of multiple cropping systems with the aim of enhancing productivity per unit of land as well as woodland rehabilitation and afforestation projects introducing high-value commercial tree species.	• ASDS was not written with counties in mind. • The realization of most of the set-out targets in ASDS which would lead to economic growth are likely to be hampered by the impacts of climate change (Parry 2016).

National Climate Change Response Strategy (NCCRS) 2010	• The NCCRS is quite prescriptive. It lists addressing land degradation by building soil and stone bunds, creating grass strips and contour levelling as well as incorporating trees or hedgerows and promoting Conservation Agriculture. • It also proposes protecting and conserving water catchment areas, river- banks, and water bodies from degradation and contamination e.g., by imposing a water levy to generate funds for investment in conservation of water catchment area. • Provides a broad coordinated framework for government, private sector, civil society and other stakeholders to integrate climate change and variability considerations into national development planning and implementation at various levels.	• The implementation plan does not accommodate new changes such as devolution. Hence the roles for national and county governments are not well delineated.	• Aims to advance integration of climate change adaptation and mitigation into "all government planning, budgeting and development objectives since it's not well articulated in Vision 2030. • It prioritizes action in the country's most vulnerable sectors. • Agroforestry is mentioned briefly only as a mitigation measure under agriculture and not as an adaptation measure	• A National Climatic Change Strategy document should elaborate and clarify a policy in greater details. The directed enhancement of climatic resilience and adaptive capacity should therefore have shed light into specific interventions that would be done during implementation; this is the same for the vaguely mentioned "mechanisms for sustainable utilization of natural resources".

Analysis of the County Strategies on Agroforestry and Climate Change

Analysis of the County Integrated Development Plan Strategies on Agroforestry and Climate Change (Source, 2018-2022 CIDPs)				
County Name	**Agroforestry promotion**	**Strategies for agroforestry**	**Climate change**	**Strategies related to climate change**
Mombasa	Promotion of agroforestry and green economy the county is engaged in the following activities; • Woodlots practice and farm boundaries is common in parts of Likoni, Changamwe and Kisauni Sub-Counties. The products are used mainly for domestic use and not commercial. Conservation of mangroves is also done to improve fish production as they act as hatcheries and breeding grounds for fish. • The Coast Development authority has rehabilitated Mwakirunge and Nguu-Tatu hills in 2011 to protect the water catchment areas and prevent soil erosion, no other efforts have been	• The County is in the process of enacting a Renewable Energy Policy, County climate change policy and environmental policy. • They have the following programmes-tree planting to increase tree cover in (public schools, ECD centers, and county institutions. • Land and water conservation and rehabilitation of degraded lands.		

	done despite presence of a number of degraded catchment areas such as Kashani, Dongo Kundu and Majaoni. • To provide wood fuel and generation of energy for industries, Bamburi Cement factory is rehabilitating its quarries by planting trees as a future source of energy for its manufacturing plant in Kisauni Sub-county. • Improve of soil fertility by growing fertilizer trees, a few nitrogen-fixing trees are grown in the county. *Leucina lecocefara* species is particularly common in parts of Likoni, Changamwe and Kisauni. The tree is also popularly used as a fodder crop for animals. • Growing of fruit trees for improved nutrition both for domestic use and surplus for markets Mango and coconut trees are very common in the county. Other fruit trees that are common include oranges, lime and grapes. The Coconut Development Authority has been established with a view of promoting the economical use of the coconut trees in the coastal region. The Authority has introduced fast maturing coconut varieties with aim of making the crop more economically viable. • Beautification activities in towns, highways, schools, homes and other public places • The Municipal Council of Mombasa through planting of trees along highways and in public parks and other open spaces in the city. Examples include Uhuru Gardens along Moi Avenue, Mama Ngina Drive, along Jomo Kenyatta Public Beach and Treasury Square Gardens. Through the Kenya Youth Empowerment Programme (KYEP) and Economic Stimulus Programme (ESP) programmes, trees have been planted in schools across the county.			

Kwale	• The county natural environment is currently heavily degraded through sand harvesting, deforestation and charcoal burning. • Most farmers have adopted Agro-forestry and green economy as a result of on-going promotion of Agro-forestry and tree planting sensitization programmes in the county. This will reduce dependency on indigenous forest for wood fuel. • Kayas rehabilitation is on-going to maintain Kaya Catchment for ground water rejuvenation as well as protection of Marere Water Catchment in Shimba Hills Forest. There is horticulture farming at Kubo and Msambweni Division for both domestic consumption and commercial use.	• Implementation of County forest management plan • Afforestation and rehabilitation of fragile and degraded ecosystems • Development of community forests • Soil conservation • Development and maintenance of forest infrastructure • Protection control/mitigation of pollution • Develop Carbon credit schemes • Enhance water catchment areas		
Kilifi	• Agro-forestry is practiced by farmers in view of supporting livelihoods of the local communities, mitigating soil erosion and enhancing of water and soil conservation in the count. • Practices of planting fruit trees such as citrus, cashew nuts, coconuts and mangoes. • Nature based enterprises such as bee keeping, butterfly farming, tree seedlings production, and extraction of herbal products is carried out by a few farmers.	• Tree planting campaigns have been done by Government Agencies in collaboration with stakeholders. • Rehabilitation and conservation of water catchments • Increasing the proportion of forest cover • Strengthening environmental protection and • Rehabilitation of degraded forests especially in hotspots, rangelands and along riverbanks. • Structured capacity building programmes..	• The county associate climate change with reduced rainfall, food insecurity, increased incidences of environmental diseases, all of which impact negatively on the health of the community and its ability to participate in productive activities.	• Capacity building for the local community to effectively mitigate, adapt and build resilience to climate change and other natural disasters.

Tana River	• Provision of the on-farm investment form of production of fruits, honey, horticultural crops, woodlots, silage and fodder. • Protection of water catchment areas such as riparian forests areas, springs, rivers, ponds and lakes. • Deliberate integration of tree crops and the physical structures like the Fanya Juu Fanya Chini earthworks and terracing, and water harvesting efforts to reduce soil erosion. • Planting of the shelter belts and alleys is being done in the county to control both water and wind erosion. • There have been efforts to introduce value fruit trees, for example through budding and grafting.	• The county recognizes that Charcoal trade can be sustained through organized and licensed Charcoal Producers Associations (CPAs). • Integrate environmental issues in county development planning • Develop and implement charcoal regulations • Implement the 10 million tree programme	• Climate change is associated with "shifting weather patterns, for example, threaten food production through increased unpredictability of precipitation, rising sea levels contaminate coastal freshwater reserves and increase the risk of catastrophic flooding"	• The county has been intensifying and planting carbon sequesters tree species that purify air. The county is putting in place some climate change mitigation measures which include; • Good governance, • Practicing sustainable approaches to development, • Developing a comprehensive land use planning, • Creation of awareness on the effects of climate change among the population, • Identifying and protecting ecologically sensitive and fragile areas and discarding old practices • Embracing modern and sustainable practices/ technologies.
Lamu	• In Lamu County the ecosystems is under enormous pressure from increasing human population. • The population is extracting and using resources at an accelerated rate from a resource base that is vulnerable and finite. • The pressure on the natural resources is manifested in vegetation removal, land and water resources degradation and pollution, overfishing and degradation of fish habitats.	• Rehabilitation and protection of the water towers and catchment areas. • Equitable distribution of resources Protect the environment. • Environmental conservation where projects include: planting of mangroves and other terrestrial tree species to boost Lamu county forest cover and conserve water catchment areas. • Provide sufficient water for irrigated farming. • Creation of awareness raising activities for conservation of flora and fauna and preservation of biodiversity. • Draft, enact and enforce Livestock/Rangeland management policies and bills that promote limit degradation of rangelands • Establishment of conservancy to conserve our grazing area and its ecosystem • Increase youth and women participation in integrated agricultural value chains by coming up with relevant loan products	• Climate change is a reality especially for Lamu communities who draw their livelihoods from natural environment. • The 2009 and 2010 droughts are considered the worst in the last 30 years affected the communities in Lamu especially the Orma who lost most of their livestock.	• Build resilience of pastoral and agro-pastoral communities to calamities such as drought and floods. • Promote livestock insurance. • Promote efficient water use by promoting drip irrigation and other climate smart agriculture technologies.

Taita Taveta	• The county admits that the benefits of agroforestry add up to a substantial improvement of the economic and resource sustainability of agriculture. Some of the major contributions to environmental degradation include: • Illegal harvesting of forest products e.g. trees for building poles, timber, fuel wood, medicinal use; clearing of grass as fodder for animals. • Rampant stone harvesting for building construction in forests, public lands, roadsides without subsequent rehabilitation of the quarries has resulted in severe soil and land wastage as a result of erosion and landslides. In some areas e.g. Mwakingali in Voi, these activities have resulted in accidents where disturbed rock outcrops break off and roll into homes e.g. during extraction, and during the rainy season. • Uncontrolled harvesting of wood for charcoal and use of old methods of burning and uneconomical kilns that result in high wastage of the wood.	• Re-afforestation and afforestation • Creating education and enforcement awareness • Community sensitization • Enhancing environmental protection • Implementing joint action plans with national government bodies • Decommissioning and restoration of mines • Improved agroforestry practices on farm. • Develop non forest products found in dry land • Hilltops, woodland and riverine rehabilitation	• Like most Counties, Taita Taveta County is already feeling the effects of climate change cause by environment degradation. Widespread poverty, recurrent droughts, floods, overdependence on rain-fed agriculture, and availability of few coping mechanisms all combine to increase people's vulnerability.	• Mainstreaming of climate change measures • Strengthened resilience and adaptive capacity to climate related hazards and natural disasters
Garissa	• The county acknowledges agroforestry as an economical practice that has improved livelihoods Main causes of environmental degradation are; • Illegal encroachments • Un planned human settlements, • Logging and over-grazing, • Mushrooming of settlements on grazing land, • Increase in population, • Climate change, • Influx of refugees • Charcoal burning. • Frequent floods during rainy season have also contributed greatly to environmental degradation	• There are approximately 47 agro forestry nurseries where some are registered under Horticultural Crop Development Authority (HCDA). • The nurseries have both fruit and forest trees seedlings. The county ensure farmers are supported; • Through appropriate partnerships to have sufficient land under tree cover, • Ensure adequate information, education and training on establishment, • Management conservation and tree planting is provided and ensure that there is improvement of planting materials to improve quality and shorter growing rotations through grafting of fruit trees • Restoration of degraded sites and management of invasive species (Prosopis julifora)	• Climate change has profound adverse impacts on all sectors. • Climate change resulted in insufficient and increasingly erratic rainfall patterns, diminishing pastureland, decrease in water resources	• Increasing forest cover through afforestation and protection of the existing forest • Enhance management and conservation of forest and sustainable utilization of forest resource Garissa County Adaptation Fund • Promote advance carbon resilience and low carbon development in the county • Supporting Climate compatible development planning, implementation • Engaging private sector in climate resilience • Enhanced adaptation to climate change risks

Wajir	• There are few farmers practicing agroforestry in their farms mainly in Wajir North Sub county and hence the need for more sensitization on the area in order to increase forest cover. Environmental degradation has resulted to; • loss of grazing land and shrinking of water resources, • Loss of biodiversity, • Desertification, • Human to human conflicts and human-wildlife and • Floods.	• Regulate land utilization and control of invasive weeds and trees. • Extension services to cover soil and water conservation. • Agro-forestry promotion. • Soil fertility improvement. Legal and policy enforcement • River rehabilitation programmes. Woodland management plan. • Formation of community forest associations • Enforcements of laws/bi-laws. • Enhance environmental conservation and management of dry lands. • Enhance tourism for environment conservation and economic development. • Increase forest cover in the county through afforestation and reforestation of indigenous and fruit trees. • Identify and rehabilitate degraded sites in the county • Invest in technologies that can harness charcoal and other products from proposes to reduce further encroachment on the rangeland • Community awareness on environmental degradation and mitigation strategies • Domesticate the national charcoal act and regulations to promote sustainable utilization of forest resources • Promote afforestation in the county by establishing tree nurseries through women, youth groups and community institutions to increase tree cover from 1.9%	• The effects of climate change are evident in a number of ways; the amount of rainfall is unpredictable, frequent and prolonged drought and unpredictable floods.	Wajir County Adaptation Fund • Enhance the harnessing and distribution of renewable energy • Enhance low carbon climate resilient development initiatives. • Increase community awareness and capacity for conservation and tap into carbon trade. • Promote private investment in renewable energy including training youth & women with skills like briquette making, energy saving stoves. • Encourage propagation of drought resistant species of grass & trees. • Establish a functional early warning by upgrading and modernizing meteorological services and equipment System • Domesticating National Legislation, regulations and policies to suit county needs • Operationalize County Climate Change policy • Promote climate change programmes and initiatives • Monitoring the impacts of climate change in the county by establishing Directorate for climate change coordinating structures from county

Mandera	• Promotion of tree planting is done to generate income. • The County Government encourages maintenance of tree nurseries, where farmers sell tree seedlings. • The county also motivates individuals to plant trees in their homesteads. • Major degraded areas are forests and quarry mines, which are exploited for charcoal and building material such as timber and bricks. • Overgrazing, charcoal burning, and quarrying activities are the leading means through which environmental degradation has occurred in the County.	• Laws to conserve vegetation and endangered species. • Control of unplanned grazing, logging & charcoal burning. • Community/Civic education. • Enforcement of environmental regulations • County forests management and extension programme • Improved policy guidance on environmental management and access to clean energy • Conservation, protection and rehabilitation of wetlands and water catchment area • Sustainable charcoal burning technology. • Soil & water conservation.	• The County seeks support to effectively mitigate against adverse effects of drought, floods and other climate-driven disasters. • The county is prone to disasters such as drought, floods and diseases exacerbated by adverse effects of climate change. • They also agree that, there is uncoordinated disaster preparedness and responses, thus the need to allocate adequate resources and develop resilience mechanisms.	• Improve resilience capacity of local communities
Marsabit	• Agroforestry activities in the county are limited by the harsh climatic conditions with less than one per cent of the population practicing farm forestry in areas around Marsabit and Sessi in Moyale. • Environmental degradation in the county is mainly as a result of deforestation and forest encroachment due to dependence on firewood and overgrazing. Other drivers of environmental degradation include; • Non-compliance with the law, • Weak enforcement of the environmental regulations, • Inadequate disposal of non-biodegradable materials like plastics and polythene, • Low levels of environmental awareness and • Low social responsibility on environmental matters at individual and community levels.	• Involve and empower communities in the management of county ecosystems and promote environmental education and awareness. • Promote efficient adaptation measures for productive and sustainable resource management in the county. • Restoration of degraded land. • Protection of fragile ecosystems. • Grazing management. • Fodder production. • Conservation awareness and • Waste management (manure, crop residues)	• The County's economy is highly dependent on climate sensitive sectors of pastoralism, agriculture and tourism. • Frequent droughts have led to erosion of livelihood opportunities through livestock deaths and crop failure which together negatively affect food security and stagnate the gains made on poverty reduction in the County.	Adaptation strategies include; • Improving water harvesting techniques. • Exploration and utilization of other sources of energy that are reliable like solar, wind and geothermal, establishment of suitable tree plantations. • planting of drought resistant and fast-maturing seedlings. • Strengthening linkages between community education and awareness. • Improve capacity for adaptation to global climatic change. • Mainstream climate change into all county development plans and policies. • Develop and promote the use of green energy.
Isiolo	• The practice of agroforestry has been encouraged by Kenya Forest Service (KFS) to improve soil fertility in the county. • KFS has been promoting the planting of *Grevilia robusta* and the *Lucina spp* to improve soil fertility.	Land reclamation activities include: • Controlled grazing, • Settlement systems, • Water harvesting, • Building of terraces and gabion's and	• Isiolo is one of the most vulnerable counties to climate change in Kenya. • The County is hot and dry in most months of the year	Isiolo County Adaptation Fund • In its first year the fund supported investments in improved rangeland management, water infrastructure development, livestock disease

	• The *Lucina spp* can also be used as animal feed. • The vegetation within the County is very low and scattered. • Charcoal burning, sand harvesting, overgrazing and overstocking in most parts of the county has been rapidly depleting the vegetation cover leaving land exposed to soil erosion. • Much of the soil erosion is also caused by strong winds which lead to massive environmental destruction.	• Pasture reseeding. • Planting of fruit trees using modern methods of water harvesting in the rehabilitated areas. • Reconstitute basin slopes. • Undertake restoration of silted ponds. • Initiate afforestation and reforestation programmes. • Integrated land use plans. • Forest fire management and prevention as well as promoting energy efficiency. • Forest conservation and promotion of other construction materials will be prioritized so as to ease pressure on the county's forests. • Involve and empower communities in the management of county ecosystems and promote environmental education and awareness. • Strengthen Environmental Governance and harmonize sectoral policies, legislation and regulations.	hence the vegetation cover is very low and scattered. • Environmental degradation has led to decreased vegetation cover; increase of environment-related diseases. • Agricultural and livestock productivity is worsened by limited, unreliable and poorly distributed rainfall pattern. • Some of the key vulnerabilities emanating from climate change include drought and unpredictable rainfall, floods, and spread of water and vector-borne diseases, loss of forests and wetland ecosystems, land degradation and desertification and scarcity of portable water.	control, access to climate information through a community radio system, and the strengthening of government institutions and processes. Some of the adaptation strategies, to mitigate the impact of unpredictable drought are; • Introduction of drought resistant crop varieties, • Use of community irrigation, • Use of water saving irrigation and • Putting more land into production. The other risk due to drought and unpredictable rainfall is loss of income to farmers. Which calls for; • Improved weather forecasting, • Introduction of better adapted livestock, • Food processing and preservation techniques and • Establishment of food banks so as to adapt and cope with the effects of climate change • Enhance disaster preparedness in all disaster-prone areas. • Improve capacity for adaptation to global climatic change.

Meru	• The County agrees that agroforestry has an ability to raise the capacity of farmlands to conserve more biodiversity. Major contributors of environmental degradation include; • Farming, • Mining, • Road construction, • Human settlements and • Overstocking of livestock • degraded river ecosystems, hill ecosystems and forest ecosystems • Stone and sand mining quarries	• Establish county environmental policies and programs. • Awareness campaigns on environmental such as on the appropriate agricultural methods, trees species. • Implementation of the existing legislations and policies on environmental conservation. • Enhancing environmental conservation education in schools. • Intensify soil and water conservation. • Promote Conservation Agriculture. • Regulation of farm tree cover, riverbank and water tower protection, and cultivation on slopes above 35%. • Soil amelioration interventions. • Ensure that all landowners have at least 10% of their property under tree cover. • Establishment of tree nurseries to assist in afforestation and reforestation programmes. • Extension services for farm forestry and greening activities in schools		
Tharaka Nithi	• The ministry of environment has rolled out project on farm and dry land rural forest extension. • The farmers are therefore advised to integrate tree planting activities on their farms to help/support in fighting against climate change, increase tree cover percentage and improve food security. County faces many environment challenges that include; • Deforestation, • Soil erosion, and • Land degradation. Some of the activities that pose risk to the environment include; • Farming on hill side, • Illegal /massive grazing on gazetted and non-gazetted hills, • Charcoal burning, • Sand harvesting and • Quarrying.	• Introduction of commercial forest farming. • Establish tree planting campaigns. • Promote programmes on non-wood forest products. • Promote agro-forestry programmes. • Enhance catchment protection and ground water recharge. • Monitoring of water levels and quality. • Control illegal deforestation activities. • Strengthening of existing community forest associations. • Control human wildlife conflicts. • Enforcement of the existing policies. • Afforestation/rehabilitation of degraded lands. • Conservation and protection of existing tree cover.	• The county has been experiencing climate change due to deforestation, farming in the riparian land and encroachment to water resources and riverine areas.	• Use of innovations and technologies. • Climate Smart Agriculture. • Community capacity building. • Dissemination of information. • Carbon credit. • Early warning systems. • Domestication of national and international policies, laws and treaties in climate change. • Water resource management. • County climate change policy, policy and strategy. • Mainstreaming climate change in all sectors programmes and projects. • Climate change champions.

Embu	• As a practice it increases soil organic matter and available nutrients thus increasing farm productivity levels. • The county sees a high potential for agroforestry planting especially at the riverbanks, wetlands, springs and planting in school and other institutions through a School greening programme. Environmental threats in the county include; • Land /soil degradation due to human activities. • Charcoal Production • Land degradation • Loss of soil productivity • Deforestation of hill tops and dry lands • Sand Harvesting	• Formation of Water Resources Users Associations (WRUA's) which have been actively involved in planning, management and decision-making in the conservation of riverbanks. • Training on improved farming practices. • Promotion of kitchen garden establishments. • Tree planting. • Encourage reforestation and agro forestry. • Establishment of wood lock. • Plant indigenous trees and bamboo along the river line.	• The county experiences its share of climatic change through increased periods of drought, erratic weather patterns and increased temperatures especially in Mbeere North and Mbeere South sub counties	• Prevention, tolerance, resilient, change of land use practices. • Restoration of degraded environments. • Application of modern and appropriate farming technologies. • Awareness raising campaigns. • Promotion of wood energy efficiency and conservation through using improved stoves at household levels.
Kitui	• Kitui County faces several environmental degradation challenges, such as high rate of deforestation, degradation of upstream catchment and unsustainable charcoal burning. • At the time of writing the CIDP2018-2022, there's no data on the volume and value of charcoal trade although it has been significant.	• Effective environmental planning and coordination • Improved waste management • Promoting environmental awareness and capacity building • Tree growing to increase forest cover • Water catchment conservation and rehabilitation • Establishment of environmental clubs in institutions of learning • Mobilize public participation in environmental conservation activities • Develop and review policies to enhance compliance to environmental regulations including charcoal management Act, wood fuel value chain policy, and sand harvesting bill and noise pollution regulations • Identify and promote drought tolerant tree species for propagation • Promote community participation in growing trees • Promote commercial growing of high value and multipurpose tree species • Development of County forest and farm forestry conservation policies and bills • Forest resource mapping	• The county is characterized by a rapidly growing population, water scarcity, falling food production and low resilience to climate change. • The combined effects of climate change and rapid population growth are increasing food insecurity, environmental degradation and poverty levels in the county. • The County aims improve communities' adaptation capacity and resilience against impacts of climate change and variability.	Kitui County Adaptation Fund • Implement measures to enhance resilience to climate change and variability • Promotion and adoption of renewable energy • Operationalization of climate change fund regulation • Awareness creation on climate change adaptation and mitigation measures • Development of Kitui County Climate change legislative framework

Machakos	• Major contributors to environmental degradation include; Unsustainable and rampant Sand harvesting, unsustainable cooking methods such as firewood and charcoal which has led to deforestation and soil erosion.	• Polluter Pay Principle, PPPs, public sensitization and awareness. • Implementation and enforcement of the Sand Harvesting Act 2014. • Implementation of forest Transitional Implementation Plans (TIPs) • Afforestation. • Implementation of water resource management action plans. • Mapping of county forests. • Formulation of county policy on other minerals. • Developing state of the environment report.	• The County recognizes that climate change is a global concern that requires concerted efforts to mitigate against and adapt to its effects.	Mitigation and adaptation strategies include; • Sand Harvesting Act. • Afforestation. • Reforestation. • Promotion of clean cooking and use of green energy. • Livestock and crop zoning. • Introduction of drought resistant crops and livestock breeds.
Makueni	• The county is faced with serious environmental degradation as a result of population pressure, pollution, soil erosion, charcoal burning, land and watershed degradation and logging, prolonged drought and forest fires.	• County wide range rehabilitation. • Pasture development and conservation. • Pasture development in gullies and denuded areas in Mbooni, Kilungu, Nzaui, Kibwezi West and Kilome. • Training community level workers on making soil and water conservation structures. • Promote reforestation activities as well as enact and enforce laws against deforestation. • Undertake tree planting activities at institutional and household level. • Rehabilitate water towers and wetlands. • Implement the school greening programme by supporting schools with seedlings once a year during the short rains season which are more reliable in the county.		• Promote of climate smart agriculture practices. • Promote of farm ponds construction. • Promoting of drought and disease tolerant crops production. • Promote irrigation, soil and water conservation. • Mainstream climate change and environment into county development. • Climate Information system. • Enhance climate change adaptive capacity.

Nyandarua	• One of the Governor's undertaking in the manifesto is engaging friendly forest communities in reforestation, commercial agro forestry and developing cottage industries for forest products. • A number of farmers and institutions have been able to establish woodlots in their farms. • Most of the trees planted on farms provide a source of income when sold to saw millers. The county faces environmental threats, these include: • Degradation of Lake Ol'bollosat due to encroachment and pollution from human settlements and agricultural activities. • Increased quarrying activities which have caused loss of vegetation cover and topsoil making topsoil vulnerable to erosion. • Threats to forests due to excessive logging, charcoal production, cultivation, settlement, and forest fires. • Blocking of natural water ways by farmers resulting in increased volumes of water in fewer water ways leading to increased erosion and flooding. • Poor waste management, both liquid and solid waste.	• River line tree planting. • Sensitization of Community Forest Associations (CFA) on forest protection for sustained benefits from the forest. • Enforcing conservation efforts by arresting and prosecuting offenders. • Farmers are been advised and sensitized on Agro-forestry tree species like Calandra, leucaena and casuarinas. • Promotion of fruit trees like mangoes and avocadoes. • Provision of advisory information to tree growers. • Promotion of the establishment of commercial woodlots. • Urban and roadside tree planting and beautification. • Promotion of efficient wood and energy utilization technologies.	• As per the requirements of the Climate change Act, the county has created the County Executive Committee Member for water and environment management to coordinate climate change affairs.	• Promote the carbon credit trading programmes. • Development of alternative sources of energy including biogas, solar, electricity, energy saving jikos. • Encouraging farmers to move from range management of livestock to zero grazing. • Promote greenhouse farming for enhanced productivity; encourage farmers in the drier areas of Ndaragwa, Kipipiri and Olkalou to adopt high value drought resistant crops and irrigation farming.

Nyeri	• The major cause of environmental degradation is cultivation on fragile areas such as steep slopes, wetlands, riparian reserves, industrial waste from coffee and tea factories and quarrying activities.	To promote agro-forestry the county is doing the following: • Encouraging farmers to plant eco-friendly trees such as Grevilia robusta (mukima) within the farms. • Distribution of tree seedlings to farmers and schools. • Promotion of tree nurseries through distribution of certified seeds. • Promotion of planting water friendly species like bamboo and indigenous trees in riparian reserves and wetlands. • The county has taken an initiative to encourage farmers to plant fruit trees in their farms that is, macadamia, mango grafted avocados, grapes, tree tomatoes and oranges. • Encourage reforestation and agro forestry. • Enhance regulation of solid and liquid waste disposal. • Increasing tree cover by 2% in the entire county. • Rehabilitation of degraded land areas. • Expanding the water coverage for rural and urban areas. • Ensuring provision of affordable, safe and clean water.	• The county has experienced different climate change issues such as loss of tree cover is also affecting the rainfall patterns giving rise to unpredictable seasons, Drought leads to loss of biodiversity, drying up of water bodies, water pollution, human wildlife conflict, increased trekking distance to water points and community conflicts.	Climate change mitigation measures include; • Conservation of existing natural forests. • Planting of trees to increase forest cover which act as carbon sink. • Adopting green economy and sustainable management of waste. • Increasing area under irrigation. • Promoting usage of alternative sources of energy in cooking and water pumping.

Kirinyaga	Major contributors to the degradation of the environment are; • Deforestation. • Poor solid waste disposal. • Cultivation along riverbanks by the community. • Pollution from industries and farmers. • Illegal logging.	Strategies applied by the county include; • A number of farmers and institutions have been able to establish woodlots in their farms. These are mainly for commercial, which are mainly timber and logs and they sell to traders who mostly target neighboring counties. • Rehabilitation of degraded catchment areas at Kangaita, Castle Lodge and Kathandeini forest stations while river line tree planting is ongoing. • Degraded sites in farmlands have been implemented, steep slopes in river banks have continuously been planted with indigenous trees by KFS, youth and Agriculture departments. • Farmers have embraced the practice of planting Agro forestry tree species like calliandra, Leucaena, casuarinas. • Nearly all the households grow fruits trees like mangoes and avocadoes. Some have fruit orchards on their farms.	• Climate variability and extremes is emerging as a major threat to sustainable development of the county. There has been rise in temperatures which have resulted in increase of malaria, erratic rainfall resulting to drying up of some rivers and also flooding especially on the lower parts of Mwea. • The county is also already experiencing the effects of the recession of the glaciers on Mt Kenya which is a water tower in the county.	To address climate change the county has been; • Planting more trees especially along the rivers, roads, public places and schools. • Public education on awareness of environmentally friendly technologies and their transfer to the community. • Promotion of drought resistant crops.
Muranga	• The county has 267,744 acres under farm forestry in 204,557 farms, a slight reduction due to increased farming of both cash crops and food crops. There are 282,774 people involved in farm forestry with an average of 105 trees per farm.	• Animal feeds production ventures: Planting of fodder crops across the slopes have also been encouraged as soil conservation method and helps retain soil fertility in sloppy areas. • Rehabilitation of degraded sites and catchment areas, riverbanks stabilization and planting of water friendly trees. • Protection of riparian lands. • Prevention of soil erosion by using retention ditches, grass strips, trash lines and Fanya Juu. • Establishing tree nurseries and supplying tree seedlings to farmers for planting.	• Murang'a County's Fiscal Strategy Paper notes the links between climate change, food insecurity, and loss of biodiversity. • It also identifies challenges to be addressed, including the lack of an early warning system, weak environment and disaster management committees, lack of expertise at the county level, unreliable data, and inappropriate farming practices	• Provision of carbon sinks: The carbon trade is an agreement made between a buyer and a seller of carbon credits. • Those who reduce emissions or sequester carbon receive payments and those who have to decrease emissions can buy carbon credits to offset their emissions.

Kiambu	• Farmers in the county have taken up farm forestry as an income generating activity. They sell timber and poles for commercial purpose. Causes of environmental degradation in the county include; • Increased population leading to massive deforestation and encroachment of water catchment areas. • In addition, industries have emissions that have led to lot of air and water pollution. • Farming has also led to pollution due to the release of various agrochemicals in the water sources.	• Demarcation and enforcement of riparian areas zones. According to water law, the riparian zone extends 30 meters from the highest water mark of the river flow. • Gazettement of wetlands as public land to prevent encroachment. • Rehabilitation of the catchment areas. • Enhance and promote private sector participation in protection, conservation and utilization of water resources. • Promote agroforestry. • Mapping of natural resources. • Enforcement of legislations to protect the environment. • Creating awareness among community members. • Afforestation. • Creation and adherence of Forest Management plans. • Encourage development of community owned tree nurseries. • Re-location of humans on forest and water tower lands. • Rehabilitation of quarries. • Introduce social cost to quarry owners. • Construction of gabions. • Carry out EIA/EA.	Kiambu County has shown commitment to protect the climate system for the benefit of the present and future generations by supporting the United Nations Framework Convention on Climate Change (UNFCCC) process by addressing climate change variability and vulnerability.	The county has the following strategies to mitigate climate change; • Institutionalize legislative arrangements that governs climate change actions and establish the county environment committee EMCA.No.8 of 1999 Revised 2016. • Facilitate Public participation awareness, access to information, ownership and oversight of county's climate change response efforts and Action Plans. • County government building partnerships with various stakeholders from the public, government, non-governmental organizations, civil society and private sector, as well as vulnerable communities and populations including women and youth, to achieve effective implementation of this goal. • Realignment of County's development model to one that is climate resilient, based on lower GHG emissions, and takes full advantage of the green economy. • County accessing international financing for ambitious climate resilient and low emission development programmes. • Ensure that all sources of finances are mobilized. • Afforestation and reforestations campaign. • User pays and polluter pays" principles.

Turkana	• The county has some of the potential agroforestry sites are Turkwel Riverine Forest, Kerio Riverine and small waterways for spate irrigation. • Farmer Managed Natural Regeneration (FMNR) and Pastoral Managed Natural Regeneration (PMNR) hold promise for integrating trees into agricultural and pastoral areas. Environmental degradation is caused by the following; • Overgrazing leaving vegetation without enough time to regenerate. • Poor farming practices. • Infestation of invasive species. • Deforestation. • Unsustainable irrigation resulting in soil salinization. • Abandonment or lack of reclamation associated with mining. • Unregulated charcoal production	• Encourage public participation in the management, protection and conservation of the environment in Turkana County. • Establish a legislative framework for an integrated approach to the management, protection and conservation of the environment in Turkana County. • The Polluter Pays Principle: The polluter and users of environmental resources shall bear the full environmental and social costs of their activities. • Environmental resources in Turkana County 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. • Enforce the provisions of the Forests (Charcoal) Regulations, 2009 as read together with the relevant sections of the Forest Conservation and Management Act, 2016.	• Turkana County is subject to the impacts of climate change, contributed to by land degradation, livestock keeping, deforestation, and burning of fossil fuels, among others. • Climate change has been associated with disasters such as floods capable of causing loss of life and property, drought and famine, loss of livestock, and increased vector borne diseases in the county.	• Develop and implement a robust Climate Change Adaptation Programme in line with the National Climate Change Strategy (NCCS). • Identify and raise awareness amongst the people of Turkana County on the opportunities for adaptation measures through promotion of appropriate technology transfer and capacity building. • Develop an integrated and improved County early warning and response system for climate and disaster risks with a clear strategy for dissemination of information at the grassroots. • Integrate traditional adaptation and early warning mechanisms into the County climate change programmes.
West Pokot	• There are few farm forests in the county with woodlots for commercial purposes. • The Kerio Valley Development Authority have set up fruit seedling demonstration plots at Kongelai to encourage farmers to engage in farm forestry as a source of income. • Several community based organizations are also engaged in woodlot establishment as an income generating activity. Some of the environmental degradation activities include; • Poor disposal of both solid and liquid wastes. • Unsustainable farming methods. • Charcoal burning. • Overgrazing. • Deforestation. • Human encroachment of the protected areas.	• Planting more trees and improved farming practices like intercropping and agro-forestry need to be promoted in the county. • Strengthen protection of this catchment areas. • Improvement of soil fertility by growing fertilizer trees to sustain agriculture. • Enhancing participatory forest management and promoting land reclamation. • Conserving the natural forest and woodlands. • Environmental policies and laws formulated and implemented.	• The impact of climate change in the county is mostly manifested by flooding, prolonged drought and landslides. • Due to rising demand for forest products as well as poverty and urbanization, there has been an upsurge in encroachment in forest and water catchment areas, charcoal burning and deforestation. This has in effect led to increased desertification.	• Provision of Carbon Sinks such as Carbon Trading to offset greenhouse gas emission that is responsible for global warming and climate change. • Sensitization of the community on the benefits of forests and clean environment. • Dryland forest farms developed

Samburu	• Agro forest activities have been initiated in order to reduce soil erosion and enhance its fertility. • The main forms of environmental degradation in the county are; soil erosion, loss of forest cover, invasive tree species, and poor disposal of solid and liquid waste.	• Community sensitization and mobilization, on the protection of these water catchment areas. • Intensification of afforestation and reforestation activities in areas where charcoal is produced to make charcoal production sustainable. • Improvement of soil fertility by growing fertilizer trees. • Engaged in the sensitization of pastoral communities on the importance of controlled grazing. • Rehabilitation of degraded areas. • Soil conservation structures consisting gabions and terraces have also been developed in erosion prone areas and regions. • The department of Environment also partnered with the National Environmental Management Authority (NEMA) in the development of the County Environment Action Plan.	• The County has not been spared impacts of climate change and environmental degradation. • The County has witnessed repeated droughts, occasional floods and reduced vegetation cover and diminishing surface water volumes overtime. • Climatic variability further reduces the capacity of land to support human livelihoods thus accelerating environmental degradation as evidenced by increased reduction in vegetation cover and pasture, soil erosion, and increased resource-based conflicts.	• Through the consultative forums the communities will be trained on the economic value of the carbon trading in the County. • Encouraging the communities to plant trees and incentives will be provided for maintaining forests. • Promotion of reforestation and afforestation through establishment of tree nurseries. • Promotion of drought resistant seed varieties for food and fodder crops. • Promotion of drought resistant livestock species such as camels. • Promotion of pasture production and conservation. • Education and awareness creation. • Environmental conservation. • Water catchment areas protection; • Promotion of renewable energy and energy saving devices.

Trans Nzoia	• Due to increased threats the forest in the County face, the County administration has put in place measures to promote efficient utilization of wood products and enact laws that would curb wanton destruction and enforcement of 10% of farm land under tree cover. Some of the environmental threats include; • Encroachment. • Deforestation. • Illegal logging. • Fire outbreaks. • Climate change effects. • Poor agricultural practices. • Unsanitary solid waste disposal. • Landslides.	• Rehabilitation and restoration of the two degraded water towers and riparian land. • Encouragement of establishment of woodlots and boundary tree planting. • Agro-forestry farming. • Fruit trees farming. • Creation of urban green spaces. • Promote agro forestry practices to provide wood fuel, improve soil fertility and water conservation as well as building material and fodder production for livestock. • Plant one million trees every year	• The County is experiencing the effects of climate change which are manifested in form of increased intensity and frequency of cyclical droughts and floods.	• Create a climate change unit anchored in the department of Environment and Natural Resource for coordination purposes. • Implement the climate change Act of 2015, the National Climate Change Strategy and Plan. • Climate information gathering and dissemination should be up scaled alongside enhancing the communities and ecosystem resilience and adaptive capacity to climate change effects. • Mainstream environmental integration into all projects and programmes. • Develop and implement environment policy, laws, regulations and guidelines.
Uasin Gishu	Some of the environmental threats include; • Soil erosion. • Charcoal burning. • Low fertility. • Loss of nutrients bases through runoff. • Illegal logging and deforestation.	• Effective partnerships (public private partnership) in solid waste management to achieve effective garbage collection and disposal. • Increase forest cover through Afforestation. • Protection and conservation of riparian areas. • Effective pollution control measures that is noise, water and air pollution. • Strengthen weather information services. • Beautification of parks, roundabouts, streets and recreational facilities.		

Elgeyo Marakwet	• Agroforestry has been practiced across the four sub-counties particularly in the highlands. • Although agroforestry is practiced in Kerio Valley, it is done on small scale levels due to drought and termite challenge, particularly during dry seasons. Major causes of environmental degradation include; • Deforestation, overgrazing and charcoal burning has led to soil erosion, landslides, mudslides and rock fall. • High population growth has exerted pressure on land and eventually led to encroachment into the forest, riparian reserve and fragile ecosystem. • Farming on beyond maximum allowable gradient	Agroforestry practices adopted by most farmers include; • boundary planting, • woodlot establishment, • roadside planting and • Plantation establishment. • Mapping and protection of wetlands and springs. • Enforcement of existing laws and regulation on logging • Enforcement of the Agricultural Act on maximum allowable gradient. • Planting of indigenous trees and bamboo on riparian reserves		
Nandi	• In the county, farmers practice farm forestry so as to increase the percentage of forest cover on their land and also for commercial purposes. Major environmental threats include; • Deforestation, • Overgrazing and • Landslides during rainy season.	• Protecting and conserving all water sources and catchment areas in the County; • Regulating river water abstractions. • The County Government will promote the establishment of tree nurseries under a PPP arrangement. • The County Government will identify and ring-fence all wetlands and riparian ecosystems away from encroachment. • A GIS based map will be prepared showing all natural resources in the county. • The County Government will actively engage the Water Towers project to expedite the rehabilitation and gazettement of the escarpments and wetlands as water towers. • Sensitization and creating awareness on the need to plant fruit trees. • Formulating environment policies and regulations • The public will be sensitized and encouraged to adopt on-farm forests by utilizing 10% land cover.		• Strengthening the sustainable use and management of ecosystems and implement integrated environmental and natural resource management. • Investing in, developing, maintaining and strengthening people-centered multi-hazard, multi-sectoral forecasting and early warning systems, disaster risk and emergency communications mechanisms, social technologies and hazard monitoring telecommunications systems. • All county plans and programmes will incorporate climate change as a component. • In collaboration with FAO, NEMA and other development partners, the County Government will sensitize communities on the dangers of global warming resulting from environmental degradation.

Baringo	Challenges facing conservation of natural environment in the county are; • Poor solid waste management, • Soil erosion, • Deforestation, • Water pollution, • Human wildlife conflict, • Inadequate funding to environmental conservation, • Inadequate staff, • Lack of education to the residents on the importance of environmental conservation, • Population pressure and, • Poaching.	To conserve the environment the County will; • Integrate environmental issues in development planning. • Implement solid waste management plan. • Maintain public parks, open spaces and road reserves. • Increase tree cover in the County, through plant nursery management, planting and controlling cutting of trees. • Develop and enforce environmental standards and regulation. • Create environmental awareness through public education and sensitization. • Prevent and control environmental pollution through monitoring and enforcement of environmental regulation. • Improve garbage collection. • Expand the sewer system. • River regeneration. • Back filling of abandon quarries. • Prevention of flooding and expansion of storm water drainage system and proper disposal of waste.	• The County has been experiencing extreme variations in weather patterns. This has resulted to drying up of water sources/reducing water levels, occurrence of landslides and frequent flooding resulting to land degradation and massive soil erosion.	• Establishment of tree nurseries. • Enhancement of afforestation programs. • Climate proof infrastructure. • Adaptation measures practiced.
Laikipia	• Farm woodlots are a common feature in the southern parts of the county. • The farmers use the woodlots for timber, poles, fuel and bee keeping. • Farmers also practice fruit trees farming in main fruits are citrus (oranges and lemons), avocadoes, mangoes, coffee and nuts (macadamia) Land degradation is severe, it's mainly caused by; • Overstocking, • Charcoal production, • Water surface run-off and • Sand harvesting.	• In schools a pupil adopts a tree. • CFA and WRUAS adopt a tree for 3 years. • Improved governance WRUAS & CFAs capacity building • Range management • Land-use Planning • Afforestation • Inclusive governance in resource management • Rehabilitate degraded catchment areas via afforestation and reclaim riparian areas • Rehabilitation of springs • Water catchment policy formulation and enactment of a bill		• Capacity building and advocacy • Reduce green-house gases emission • County-based climate change policy

Nakuru	• The County through the agricultural extension officers are encouraging farmers to practice agro-forestry in their farms to increase forest cover as well as to control soil erosion and enhance diversity. Environmental degradation in Nakuru County is mainly as a result of; • Inappropriate farming methods, • Effects of climate change, • Poor solid waste and liquid waste disposal, • Soil erosion, • Inadequate sanitary facilities, • Massive felling of trees for firewood, • Encroachment of forest reserves, timber and • Clearing land for agricultural use.	• Environmental Policy Management; Forest development policy Management. • Solid waste management and enforcement of waste policies, standards and regulations. • Enforcement of waste management policies, standards and regulations. • Public nuisance, air, land and noise pollution control. • Water catchment and riparian land protection, regulation and conservation. • Conservation of County Parks, gardens beaches and recreation facilities. • Energy regulation Security and conservation; • Identification of renewable Energy sites for development as per legal notice No.157. • Promotion of green economy initiative. • Electricity and gas reticulation and energy regulation. • Borehole site identification and drilling. • Water and sanitation services including rural water and sanitation services in small and medium towns without formal service providers.		• Mainstreaming of climate change responses / issues into development planning, decision making and implementation of county plans and programmes • Build resilience and enhance adaptive capacity to the impacts of climate change • Formulate programs and plans to enhance the resilience and adaptive capacity of human and ecological systems to the impacts of climate change • Mainstream and reinforce climate change $ disaster risk reduction into strategies and actions of public and private entities. • Mainstream intergenerational and gender equity in all aspects of climate change responses. • Provide incentives and obligations for private sector contribution in achieving low carbon climate resilient development • Promote low carbon technologies, improve efficiency and reduce emissions intensity by facilitating approaches and uptake of technologies that supports low carbon, and climate resilient development. • Facilitate capacity development for public participation in climate change responses through awareness creation, consultation, representation and access to information. • Mobilize and transparently manage public and other financial resources for climate change response. • Provide mechanisms for, and facilitate climate change research and development, training and capacity building.

				• Cascading climate change Act to the county's functions. • Enhance partnership and collaboration in funding and capacity development on climate change. • Harmonization of cross-sectoral functions on climate change by mainstreaming the principle
Narok	• The main agro-forestry activities in the county include border tree planting, trees interspersed in cropland, trees in soil conservation structure, and woodlots. • Adoption of bamboo and planting of other trees for commercial and environmental reasons is also gaining ground. • There are 88 registered agro-forestry nurseries in the county with 56% of the registered nurseries being in Transmara East sub-county. Environmental degradation in the county is mainly as a result of • Unsuitable farming methods, • Effects of climate change, • Poor solid waste management, • Soil erosion, • Inadequate sanitary facilities, • Massive deforestation for charcoal, timber and firewood; • Land clearing for agricultural use; • Poor physical planning in urban areas; • Quarrying activities; • Pollution from agro-chemicals and • Alien and invasive species.	• Drafting of a forest produce bill to legislate logging and charcoal production activities in the county. • Operationalizing of the Narok County Environment Act 2017. • Capacity building on environmental conservation. • Enact land use policy to prevent further demarcations. • Extension services to cover waste water treatment management. • Nutrient enrichment. • Conserve mara water tower. • Gazettement of all forests in the county. • Formulation of policy on harvesting of forest products. • Reforestation programmes and projects in all schools. • Policy Formulation on sand harvesting. • Rehabilitation of sites after sand harvesting quarrying activities	• Changes in climatic conditions resulted in fluctuations in agricultural and livestock production in the County.	• Integration of environmental concerns and environmental education among the various actors groups should be promoted to enhance environmental stewardship. • Drafting and implementation of a climate change policy and work plan including the formation of the Narok County Climate Change Fund.
Kajiado	• Agro-forestry involves planting trees alongside crops. There are 54 farms involved in agroforestry across the county. The County has been highly degraded due to; • Illegal tree felling, • Charcoal burning, • Over harvesting of sand risking loss of bio-diversity, • Pollution and loss of aesthetic value, • Flash floods are a common menace during long	• The County has enacted charcoal harvesting Act, 2015 to guide in management of the forest resource and collaborates with the Kenya Forest Service (KFS) in enforcement. • Investing in tree planting and management initiatives, sustainable forest management and conservation for increased forest cover. • Focus on wildlife conservation and management to address issues of human-wildlife conflict and ending poaching to address both demand and supply of illegal wildlife	• The major types of climate change disasters that occur in the county are drought and famine; flash floods and winds; and environmental pollution and degradation.	• The local pastoral communities continue to adjust to climate variability by maintaining mobility as they respond to spatial and time-related weather changes. • Farmers are planting drought resistant crops like cassava, sorghum, millet and early maturing maize varieties. • Strengthening resilience and adaptive capacity to climate related

	rains season mainly because of erosion and • Lack of vegetation cover.	products. • Protection of eco-fragile ecosystems and increasing the vegetation cover by planting trees. • Enforce polluter pays principle and mandatory Environmental Impact Assessment (EIA) for all projects. • Conduct environmental audit for industries. • Awareness creation for communities on pollution encourage them to participate in EIA. • Tree planting, adopt a Tree, one school per ward. • Sensitization and training of the community on forest management. • Implementation of Reduce Emission of Deforestation and Degradation (REDD) project.		hazards and natural disasters. Develop an early warning system to alert members of the community at risk of these disasters and thus allow efficient response. • Training the community on climate change mitigation, adaptation, impact reduction and early warning. • Construction of solid waste management infrastructure e.g. dump sites and recycling plants; restoring forest cover by planting drought resistance trees. • Formulation and implementation of the Charcoal policy, Sand Policy, and Quarry and Mining Policy. • Increasing investments in natural resources exploitation. • Rehabilitation of quarry mines among others. • Creation of a climate change unit in every county department • Investing in renewable energy such as solar and biogas • Develop a County Climate Change Policy • Resource mobilization for climate change • Support the establishment of environmental friendly industries

Kericho	• Agro forestry is widely practiced in the county due to the reduced land sizes and the benefits accrued from the practice. • The demand for wood fuel for the many tea factories in the county has resulted to most farmers combining both trees and crops in their farming activities. Environmental degradation in the County is caused by; • Increase in the number of tea and coffee factories, • Population pressure on available land including water catchment areas and hilltops, • Rural urban migration, • Unplanned and uncontrolled settlements, • Ineffective enforcement of Environmental Policies and Laws, • Inefficient solid waste management and • Lack of awareness on environmental issues.	• Collaboration between County Government and relevant National Government Ministries, Departments and Agencies in addressing conservation and sustaining the water bodies. • To ensure behavioral change in our communities, puts us in a unique position to protect natural resources and habitats. • Increase area under tree cover. • Identify, demarcate, protect and secure all wetlands. • Enhance waste management systems. • Implementation of the forest management plans. • Ensuring strict enforcement of forest policies. • Carry out regular monitoring and operations in forested areas. • Planting of more indigenous tree. • Increase conservation efforts through sensitizing the community.	• The impacts of climate change have clearly manifested in the county. • The main climate events are associated with rising temperatures and increased precipitation. • These have particularly become frequent and more severe in the past two decades presenting huge additional burden towards sustainable development of the county. • Rising average temperatures have made the county a favorable habitat for anopheles mosquito. This explains the increasing cases of malaria in areas hitherto unknown for the disease.	• Strengthen the capacity of the county governments to deal with climate related hazards and natural disasters through integration of climate change adaptation and mitigation into local planning to reduce the emissions and increase their resilience to environmental shocks. • Reforestation and forestation is critical in combating climate change and minimizing its impacts.

Bomet	• The culture of tree planting is fairly entrenched in the citizenry of the county and agro forestry remains an alternative entry point in the conservation of the existing state forests which are currently facing extreme pressure caused by over exploitation for products. The notable agro forestry practices in the county include: • Trees on boundaries, • Live fences and hedges, • Trees in homesteads and around schools, • Trees on soil conservation structures, • Trees as wind breaks, • Trees along rivers and streams, • Woodlots, • Trees along roads and paths, • Trees on gullies, • Alley cropping, • Fodder lots and • Improved fallows. The major degraded areas and contributors to environmental degradation within the county include: • Hill tops and hill slopes, • Wetlands and river banks caused by planting of eucalyptus trees, wetland reclamation e.g. Oinob Maasai in Konoin, • Surface run-off channels leading to soil erosion e.g. Kipsegon quarry, • Sand and stone mining areas e.g. Sachora near Kyogong; • Crop lands because of mono-cropping and • Pasture lands due to overgrazing.	• Inventorying and mapping of natural resources within the basin, • Environmental protection, regulation and coordination, • Water catchment area conservation, control and protection and • Coordination of climate change affairs within the basin. • Develop programmes, projects and activities aimed at restoring the health and resilience of the ecosystem. • Develop and implement alternative livelihood programmes for the riparian communities. • Conserving soil and water. • Embrace agroforestry to increase tree cover. • Enforcing existing environment al policies, laws and legislation.		• Increase agricultural productivity and build resilience to climate change risk in the targeted smallholder farming and pastoral communities. • Strengthen resilience and adaptive capacity to climate related hazards and natural disasters. • Integrate climate change measures into county policies, strategies and planning. • Improve education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning.

Kakamega	• The county recognizes that agro-forestry promotes farm forestry products by providing fuel wood, fruits, fodder, shade, medicine timber, soil fertility and erosion protection. • However, adoption of agro-forestry is minimal in sugar growing areas since farmers prefer to keep pure stands. The major contributors to environmental degradation are; • Poor waste management initiatives, • Lack of a designated waste disposal site, quarrying, • Poor land use practices, • Low degree of enforcement of the environmental laws and • Encroachment on the gazetted forest land, hill tops and slopes.	• The county will work very closely with the National Environment Management Authority (NEMA) on environment protection, promotion of environmental conservation, compliance, enforcement and monitoring. • The department will ensure that major projects in the county undergo environmental impact assessments/audits and that the environmental monitoring plans are fully implemented. • Increase patrols by KFS and community policing to ensure no illegal logging. • Promotion of nature based enterprises to empower communities neighboring the forest to reduce dependence on the forest. • Plant more trees to replace the aging ones Involvement of community in forest management plan. • Undertake afforestation and re afforestation. • Catchment protection and conservation. • Sensitization on sustainable use of water bodies.	• Environmental degradation has had adverse effects on the lives of the people. • This includes declining water volumes/ levels and drying of many springs and streams, unreliable weather patterns resulting in reduced farm yields, frequent flash floods and general rise in temperature.	• The County will also ensure integration of climate change risks and renewable energy technologies into environmental assessments and county projects. • Downscale and implement national policies on climate change to create resilience through adaptation, mitigation, policy and advocacy programmes to the residents. • Reclaim the wetlands and plant bamboo and other vegetation. • Use of solar energy and biogas for pumping water, lighting and other domestic uses. • Installation of rain water harvesting systems in all public buildings. • Planting of indigenous trees. • Use of farm yard and compost manure. • Control of effluent discharge in County abattoirs. • Bio-engineering in all County public works.
Vihiga			• In Vihiga, climate change has been felt in the county as high temperatures are experienced with heavy and erratic rainfall. • More dry spells interfere with the soil and crop productivity and natural disasters like hailstorms have become a common feature during rain period and they do affect crop production. • Wetlands are fast diminishing in size due to deforestation, siltation as a result of soil erosion and human livelihood activities	• Vihiga's CIDP discusses climate change as a standalone subject. It limits climate change impacts to environment degradation and soil erosion. Strategies outlined in Vihiga's CIDP include striving to adopt environmentally sustainable methods that preserve and enhance soil and ground water. • This will include terracing to prevent soil loss and degradation through erosion, radically reducing tillage, rotating crops and applying natural fertilizers to improve soil structure and fertility. • Farmers will be encouraged to monitor precipitation patterns to

			including increased settlements. • Sources of water such as rivers, springs and wells suffer reduced sizes and low water volumes with obvious pollution. This has led to crop failure and increase in malaria cases.	change crops or use different harvest and planting dates. • Early warning and management systems will be put in place to facilitate adaptation to climate variability and change. • Further, the county is responding to climate change through public education, promotion of drought resistant crops and indigenous trees, forestation. Despite these efforts, the county lacks clarity on climate change financing. • Further, the current CIDP has largely ignored the role of indigenous knowledge and is largely research data-deficient

Bungoma	• The county notes that farmers' decisions about tree growing are influenced by the advantages to be obtained from them. • This are divided into economic, social, environmental, land use and cultural services. • This includes diversification of economic activities, mitigation of climate change impacts on agriculture, job creation, diversified land use and use of local and indigenous knowledge respectively. Major Environmental threats in the county include; • Invasive species. • Loss of biodiversity. • Solid waste management. • Floods, lightening, heavy storms and landslides. • Deforestation.	Measures to curb invasive species in the county include; • Planting native plants and removing any invasive plants in farms/gardens. • Supporting communities to learn more about invasive species and how to avoid spreading them. • Regular cleaning/sterilizing equipment used outdoors to remove insects and plant parts that may spread invasive species to new places. • Promoting natural resource management and minerals extraction. • Supporting biodiversity management. • Protected areas management. • Promoting sustainable land management and restoration of degraded forest. • Supporting wetlands and water resources management. • Promoting sustainable waste management, pollution and noise reduction. • Mainstreaming community participation in natural resource management. • Promote forestry research and development. • Develop County-wide community based and institutional tree planting initiatives. • Scale up agroforestry-based alternative livelihood systems. • Promote implementation of sustainable management of forests. • Develop a robust and functional County Forest Monitoring System. • Promote forestry in urban development planning.	• The County is prone to climate related disasters such as floods, lightening, heavy storms and landslides. Their effects include; destruction of settlements and sources of livelihoods.	• To mitigate these disasters and hazards, the County has a Disaster Management Policy Framework. • Mitigating climate variability and change. • Addressing natural disasters, risks and vulnerability. • Adapt, domesticate and implement the National Climate Change Policy. • Inform and create awareness on climate change mitigation strategies.

Busia	• The County acknowledges that to effectively reach the 10 per cent forest cover envisaged under the Kenya Vision 2030, it is imperative that tree planting efforts are stepped up. The major contributor to environmental degradation in the county include; • Deforestation and forest encroachment due to dependency on firewood. • Logging for timber and charcoal. • Noncompliance with the law due to weak enforcement of the environmental provisions; • Forest fires. • Inadequate disposal of non-biodegradable materials like plastic and polythene. • Destruction of trees by livestock. • Lack of sewage systems. • Unsustainable management practices of ecosystem and the inherent biodiversity. • Inadequate reforestation programmes. • Low levels of environmental education, others include. • Urbanization. • Sand harvesting. • Poor land management practices. • Unsustainable management of ecosystem.	• Create County environmental management and safety framework policy. • Protect all the degraded areas. • Afforestation. • Soil conservation. • Riverine protection: riparian, wetland, riverine basin. • Protection control/mitigation of pollution. • Increase forest cover through afforestation and hill top rehabilitation. • Capacity building for farmers. • Rehabilitation and restoration of degraded landscape.	• Climate change has affected the ecosystem in Busia County, especially terrestrial and fresh water biodiversity. • All these ecosystems have recorded decline in both volumes of species and quality of life hitherto supported indigenous fauna and flora. • Unsustainable utilization of environmental resources leads to unsustainable livelihoods characterized by poverty and climate change.	The Busia County Energy Development Bill, 2014; • It promotes the production of energy through the use of renewable energy sources in accordance with climate, environment and macroeconomic considerations in order to reduce dependence on fossil fuels, ensure security of supply and reduce emissions of carbon dioxide and other greenhouse gases and for connected purposes

Siaya	• Agroforestry is part of solution to the environmental degradation challenges that are facing Siaya County. The solutions are in form of ecological and economic benefits that is; • It contributes to sustainable agriculture, • Complements food and nutritional security in diverse ways through provision of tree foods such as fruits and leafy vegetables, • Improve farmers' incomes through the sale of tree foods and tree products, • Provision of fuel for cooking, • Use of fodder tree species such as *Calliandra* spp. for improved milk production, • Promotes environmental sustainability, • Reduces impacts of climate change and • Promotes biodiversity among other benefits Some of the factors that contribute to environmental degradation include; • Land disturbance/damage. • Pollution. • Population growth. • Deforestation.	The county will improve on the existing agroforestry systems by; • Supporting more profitable agroforestry enterprises and increase the capacity of farmers to sustainably produce. • Process and market agroforestry products through promotion of specific agroforestry value chains, while maintaining biodiversity. • Involvement of youths and women in establishing and managing commercial tree nurseries for sustainability of agroforestry interventions in the county will be enhanced. • Afforestation programmes. • Rehabilitate and restore the degraded wetlands, reclaim and protect lakes shores, river and stream bank. • Involve and empower communities in the management of natural resources. • Devise means to measure the value of unexploited natural resources in economic terms. • Promote and institutionalize payment for environmental utility services to support catchment protection and conservation and participate in jointly developed approaches for sustainable management of overlapping county resources. • Involve and empower communities in the management of tree cover ecosystems. • Determine and map out potential areas for agro and land forestry.	• Under the CIDP-2018-2022, they acknowledges that climate change is "arguably the defining environmental challenge to the County's sustainable development". • Siaya County experiences a number of climate-related disasters in different magnitudes. • Amongst the most serious of them is flooding experienced in Usonga and Mahawa swamp in West Ugenya.	• Enacting a climate change law to support implementation of the NCCRS and implementation of afforestation, reforestation, water harvesting, and land use zoning activities.

Kisumu	• Farm forestry and commercial forestry are lowly adopted in Kisumu County. Environmental degradation is caused by; • Discharge of raw waste into the lake. • Invasion of water hyacinth and hippo grass. • Rapid urbanization trends coupled with low investment in infrastructure impacting enormous pressure in the urban environment. • Weak coordination mechanisms in the implementation of environmental conservation role. • Poor Solid Waste Management.	• Enforcement of the waste management. • Afforestation and water conservation. • Improve on solid waste management. • Regulate and enforce proper environmental impact assessment codes before construction • Mapping of forest cover. • Farmland reforestation. • Wetlands protection and conservation. • Protection and conservation of river banks and riparian lands. • Biodiversity management and eradication of alien species. • Strengthen enforcement of national and county environmental policies and laws.		

Homabay	Agro forestry serves diverse purposes in the county including: • Generation of income through farm forest, that is, it had been noted that there is a direct proportionality between the benefits for farmers and adoption of forestry enterprises; • Protection of water catchment areas through the collaboration of the Zonal Forestry Management offices in Homa Bay County and the Ministry of Environment and non-state partners on rehabilitation and conservation of designated forestry areas. • Prevention of Soil Erosion through the collaboration of Kenya Forest Services Main causes of environmental degradation in the county are; • Deforestation resulting to reduction in vegetation cover that has left the land bare and vulnerable to soil erosion, low rainfall and flash floods. • Poor disposal of solid waste materials such as plastics, nylon papers, packaging tins, food remains and fecal matter. • Firewood and charcoal production. • Poor agricultural practices.	• Promotion of afforestation and agro forestry. • Reclamation of wetlands and catchment areas. • Rehabilitation of degraded rangelands • Improving governance and decision making over environmental resources. • Offering price incentives and regulatory interventions. • Promotion of green initiatives for production, energy and transportation. • Strengthening compliance. • Reversing deforestation. • Promotion of afforestation and agro forestry. • Protection of riparian reserves and wildlife routes. • Rehabilitation of degraded rangelands. • Planting of trees. • Compensation of wildlife victims • Soil and water conservation of croplands.	• The County acknowledges that urgent action must be taken to halt global warming and reduce climate change risks while encouraging sustainable development. • Climate change will increase the frequency and intensity of natural events like droughts, wildfires, heat waves and rainstorms in Homa Bay. • This could disrupt food production and cause famines.	• Promoting the use of raw materials from sustainable sources including using production techniques that that use renewable energy. • Encouraging transition to organic/conservation agriculture, protection of food prom loss/waste and diets shifts to foods produced using green technology. • Inspiring use of recycled and biodegradable materials including using water purified from waste water. • Focused on ensuring energy efficiency in public transportation, public services and domestic use through education, training and awareness creation; creation of energy efficiency centers (hubs) and funding of demonstration projects. • Promoting non-motorized transport modes such as cycling and walking including through programs such bike shares and development of pedestrian streets. • Developing green building guides and applying the same to public buildings. • Invest massively in the planting of trees and development of green infrastructure including urban parks/gardens, green ways/belts and forests.

Migori	• Agro-forestry systems in the county majorly consist of cultivation practices which combine arboreal species with either annual or perennial crops in a manner which seeks optimal use of land together with maximum return. • Farm woodlots farming is commonly preferred as farmers use them for timber, poles, fuel and bee keeping. Environmental issues in the county include; • Deforestation, • Soil erosion, • Desertification, • Flooding, • Littering and • Solid waste collection	• Create balance between development and environmental protection. • Minimize the negative environmental impacts of new developments in the county. • Establish systems for proper waste disposal e.g. dump sites, cemeteries and sewerage treatment plants. • Carry out resource mapping, ensure improved access and protection of environmental, cultural, tourism and scenic assets in the County. • Enhance the forestry. • Improve beach management. • Improve riparian area management. • Provision of mining equipment's and trainings on modern technologies. • Greening schools and other institutions. • Urban forestry, agro forestry and afforestation. • Roadside tree planting. • Establishing of arboreta.		• Formulation and implementation of climate change policy. • Mainstreaming climate change in their programmes and projects.

Kisii	• To promote agro-forestry, the county is making efforts towards training and encouraging farmers to plant environment friendly trees such as *Grevilliae robusta* and establishment of tree nurseries. • Promotion of water-friendly species like bamboo and indigenous trees in riparian reserves and wetlands should also be encouraged The major contributor to environmental degradation are; • Cultivation on fragile areas such as steep slopes, wetlands, riparian reserves and quarrying activities for hard core and ballast. • Quarrying activities, this has led to landslides and soil erosion hence reduced productivity. • Inadequate solid and liquid waste management facilities particularly in the urban and peri-urban areas. This has led to blockage of drainage systems in urban centers causing flooding and destruction of property. • Deforestation and poor farming practices leave the soil bare making it prone to soil erosion.	• Enforcement of water management and use policy. • Rivers and springs protection and rehabilitation. • Protection of riparian land. • Enforcement of forestry policy. • Reforestation and afforestation programme. • Enforce County Solid Management Act, 2015. • Map wet lands. • Rehabilitate degraded sites. • Rehabilitation and protection of water catchment areas and riparian reserves. • Afforestation and improving aesthetic value of the land. • Public participation and stakeholder involvement on environmental issues. • Establishment and management of tree nurseries across the County. • Replacement of blue gum trees along riparian areas.		
Nyamira	• The county has placed a lot of emphasis on farm forestry to increase the tree cover from 15 % to 35 % for provision of wood fuel and timber. Environmental degradation in Nyamira County is mainly a result of • Unsuitable farming methods, • Effects of climate change, • Poor solid waste management, • Soil erosion, • Inadequate sanitary facilities, • Cultural practices, • Massive cutting down of trees for firewood, timber, • Clearing land for agricultural use, • Poor physical planning in urban areas, • Quarrying activities, • Pollution and effluents from agro-chemicals.	• Embarked on awareness creation on the economic and environmental benefits of Bamboo farming as alternative to Eucalyptus in catchment areas. • Promote tree nursery establishment. • Capacity build staff/communities. • Promote farm enterprise • Environmental protection on Waste Management. • Develop an inventory of quarry sites. • Capacity build community on safe operation o quarries		

Nairobi	• In the County agroforestry is practiced in the Peri-urban areas of Kasarani, Dagoretti and Westlands Sub-counties. • Farmers through the help of extension officers are trained in tree Nursery establishment as well as tree planting in accordance with the farm forestry rules of 2009. • Major environmental challenges include poor urban planning ranging from high human density, poor and insufficient sewerage networks, and inadequate solid waste management systems.	• Enforce City by-laws and implement environmental sustainability policies. • Rehabilitation of rivers like Kabuthi, Mutuini, Ngong and Nairobi Rivers. • Waste management techniques will be applied and collection points established where refuse can be collected from a central point. • Partner with organizations that promote waste management like recycling of plastics and use of bio gas that utilizes human waste. • Implementations of projects require Environmental Impact Assessments (EIA) and Environmental Audit (EA) reports to ensure that the required environmental standards are observed. • Develop and enforce environmental standards. • Integrate environmental issues in county development planning. • Prosecute illegal water connectors. • Recruit more environmental officers. • Audit of water and sewerage system. • Conducting an environmental sanitation campaign. • Investing in additional water production and distribution of infrastructure. • Reduction of water loss. • Enforcement and policing of environmental regulations. • Increase public education and awareness on environment.	• The major causes of climate change are greenhouse gas emission, particulate matter in atmosphere, high level of deforestation and urbanization.	• Establishment of early warning systems. • Monitoring climate change and disseminating information to the farmers. • Adaptation of new technology in both solid and waste management as opposed to using open dumping sites. • Diversify energy sources by investing in renewable sources of energy. • Water harvesting, recycling and conservation.

References

Agnes, M. & Peter, O. 2013. Benefits of Agroforestry Farming Practices among Rural Households in Kenya: Experiences among Residents of Busia County. University of Eldoret, School of Environmental Studies

Ambreena Manji, 2012. The Politics of Land Reform in Kenya. *African Studies Review*, vol 57

Gérard, B. 2013. Advancing Agroforestry on the Policy Agenda A guide for decision-makers. Food and Agriculture Organization of the United Nations Rome.

Giulio, N. 2020. New UN Decade on Ecosystem Restoration offers unparalleled opportunity for job creation, food security and addressing climate change. FAO.

Government of Kenya, 2018 Marking 10 years of progress (2008-2018); Sector Progress and project updates report.

Bernard, F. 2018. Policy Synthesis and Stakeholder Identification in Kenya. World Agroforestry, Nairobi.

FAO. 1999. *State of the World's Forests 1999*. Rome. Also available on the Internet: www.fao.org/forestry/FO/SOFO/SOFO99/pdf/sofo_e/coper_en.pdf

Kariuki, M. 2018. Devolution and Natural Resource Management in Kenya. University of Nairobi, School of Law.

KFS (Kenya Forest Service). 2013. Report on National Forest Resource Mapping and Capacity Development for the Republic of Kenya (Volume 2). Forest Preservation Programme, Report No. KEF09/11494/01. Kenya Forest Service, Nairobi.

Leakey, R. 1996. Definition of agroforestry revisited. *Agroforestry Today* 8(1), 5–7

Masaku, O. M. 2013. An Analysis of the Post 2010 Land Laws. School of Law, Moi University.

Matthew, O. 2013.The Legally Compliant Charcoal Industry and its Barriers to Growth in Kenya. NIRAS Finland.

MoEF. 2018. Taskforce Report on Forest Resources Management and Logging Activities in Kenya. Ministry of Environment and Forestry. Republic of Kenya, Nairobi.

MENR. 2013. Analysis of the charcoal value chain in Kenya. Ministry of Environment, Water and Natural Resource. Republic of Kenya, Nairobi.

Miriam, Gathigah. 2014. "Weak Laws and Capitalist Economy Deplete Kenya's Natural Wealth" Inter Press Service. http://www.ipsnews.net

National Environmental Management Authority. 2011. State of the Environment and Outlook 2010; Supporting the Delivery of Vision 2030.

Ndegwa GN. 2010. Woodfuel value chains in Kenya and Rwanda: Economic analysis of the market oriented woodfuel sector. Master Thesis. Cologne University of Applied Sciences, Germany.

Omungo, R. 2018 Kenya Charcoal business trying to nip invasive tree in the Bud.

Otsieno F. S , Musa G. A. and Gilbert O. O . 2014. Factors Influencing Development of Farm Forestry in Lugari District, Kakamega County, Western Kenya. Kenya Forestry College, Londiani, Kenya; 2 School of Natural Resource and Environmental Management, University of Kabianga,

Parry, J. E. 2016. Review of current and planned adaptation action in Kenya. CARIAA Working Paper no. 16. International Development Research Centre, Ottawa, Canada and UK Aid, London, United Kingdom. Available online at: www.idrc.ca/cariaa.

PELUM, 2015. Agricultural Policies & Legislation: Gaps on Integration of *elum* Principles and Practices Report 2015

Sinclair, F. 1999. A General Classification of Agroforestry Practice. Agroforestry Systems 46(2): 161–80.

UNEP. 1998. *Frequently asked questions about ozone to the Environmental Effects Assessment Panel.* Internet document: www.unep.org/ozone/faq-env.shtm

Policies

UN general Assembly, Transforming our world: the 2030 Agenda for United Nations Sustainable Development, 21 October 2015, A/RES/70/1.

Government of Kenya. (2008) Kenya Vision 2030

Government of Kenya. National Land Policy 2009

Government of Kenya. National Land Reclamation Policy 2013

Government of Kenya. National Environmental Policy 2013

Government of Kenya. National Policy for Northern Kenya and other Arid Lands 2012

Government of Kenya. National Forest Policy 2014

Government of Kenya. National Food and Nutrition Security Policy 2010

Government of Kenya. National Agricultural Sector Extension Policy 2012

Government of Kenya. Energy Policy 2015

Strategies

Government of Kenya. Agricultural Sector Development Strategy (2010-2020)

Government of Kenya. Agricultural Sector Transformation and Growth Strategy (2019-2029)

Government of Kenya. National Climate Change Response Strategy 2010

Government of Kenya. Kenya Climate Smart Agriculture Strategy (2017-2026)

Government of Kenya. National Water Management Strategy 2010

Government of Kenya. National Climate Change Action Plan (2018-2022)

Laws

Government of Kenya. The Constitution of Kenya 2010.

Government of Kenya. Environmental Management and Coordination Act, 1999

Government of Kenya. Land Act 2012

Government of Kenya. National Land Commission Act 2012

Government of Kenya. Land Registration Act 2012

Government of Kenya. Agriculture Act 2012

Government of Kenya. Agriculture (Farm Forestry) Rules 2009

Government of Kenya. Agriculture, Food and Fisheries Act 2013

Government of Kenya. Kenya Agricultural and Livestock Research Act 2013

Government of Kenya. Crop Act 2013

Government of Kenya. Forest Act 2005

Government of Kenya. Local Government Act Cap 265

Government of Kenya. Fisheries Act Cap 378

Government of Kenya. Climate change Act 2016

Government of Kenya. Chiefs Authority Act 2012

Government of Kenya. Forest Charcoal Rules 2009

Government of Kenya. The Lakes and Rivers Act 2009

Government of Kenya. Wildlife Conservation and Management Act 2013

Government of Kenya. Water Act of 2002 revised 2016

International Conventions

The Convention on Biological Diversity of 5 June 1992 (1760 U.N.T.S. 69)

Convention on International Trade in Endangered Species 1979

Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) 1971

Montreal Protocol on Substance that Depletes the Ozone Layer 1987

UN General Assembly United Nations Framework Convention on Climate Change: resolution/adopted by the General Assembly, 20 January 1994, A/RES/48/189

UN General Assembly, Implementation of the United Nations Convention on Combating Desertification in those Countries Experiencing Serious Drought and/ or Desertification, particularly in Africa, 18 February 1999, A/RES/53/191