COUNTY GOVERNMENT OF KITUI

Ministry of Environment, Tourism and Natural Resources

KITUI COUNTY ENVIRONMENT AND CLIMATE CHANGE POLICY, 2023

JANUARY, 2023

Submitted to the Kitui County Executive Committee by;

Hon. Meshack K. Muthusi, CECM for Environment, Tourism and Natural Resources

Signature..... Date..18/01/2023.....

APPROVAL

This Kitui County Environment and Climate Change Policy is hereby approved by the Kitui County Executive Committee during the KCEC...meeting held on 10TH/01/2023 at... GOVERNOR's BOARDROOM

Signed..... Date..19/1/2023.....

Governor

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FOREWORD

The Kitui county economy primarily depends on the environment and natural resources, as 95.3% of the population lives in rural areas and derives their livelihood mainly from these resources (KNBS, 2019a, KNBS, 2019b). The main economic activities in the county include agriculture, mining, micro and small-scale industries, and trade.

Agriculture is the backbone of the economy of Kitui county, playing a pivotal role in poverty reduction, food security and employment creation. The majority of the Kitui county residents derive their livelihoods from food crops, industrial crops (sisal and cotton and castor fruit), horticultural crops (mangoes, paw paws, water melons, tomatoes, avocado among others), livestock (cattle sheep and goats), poultry farming, apiculture, rabbit farming, pig farming and fishing. Tourism is also an economic activity in the county derived from the Kitui National Reserves and the Tsavo East National Park.

The environment and natural resources have been threatened due to climate change and variability and increased dependency on natural resources to meet basic needs. This situation is exacerbated by rapid population growth, increasing poverty levels, unemployment, poor land use practices, environmental degradation, inadequate policies, legal and institutional framework, poor implementation of laws and poor infrastructure. The over-dependence on land resources has often resulted in conflicts over water, pasture and agricultural fields.

The main environmental issues in Kitui county are the destruction of watershed areas, unsustainable waste management, land degradation (as a result of soil erosion, overgrazing, shifting cultivation, unsustainable and uncontrolled sand harvesting), increased deforestation attributed to unsustainable exploitation of wood fuel for domestic use, charcoal production, firewood production, declining soil fertility and resultant low farm yields, loss of biodiversity and alteration of the natural tropical habitat, land subdivisions into small uneconomic sizes and reduced productivity, outbreaks of pests and diseases, river bank erosion due to poor farming practices,

seasonality of rivers and emergence of dry river beds, overgrazing and overstocking, reduced forest cover and environmental pollution.

Therefore, the county Government of Kitui, in partnership with other actors, has developed this policy document to facilitate mainstreaming of climate change adaptation and mitigation in accordance with the national climate change act, 2016, and also act as a tool for addressing the challenges mentioned above.

Hon. Meshack K. Muthusi

CECM for Environment, Tourism and Natural Resources

ACKNOWLEDGEMENT

Environmental degradation and climate change impacts are likely to undermine the development outcomes of Kitui county and pose significant challenges to the resilience of ecosystems and livelihoods. The Climate Change Act (2016) states that a county Government may enact legislation that further defines the implementation of climate change functions relevant to the county. The formulation of this policy is a county specific response to this legislation.

The county Government of Kitui has employed various measures to address Climate Change. This policy demonstrates further commitment to mainstream climate change in all development initiatives. The policy will promote sustainable development while seeking a climate resilient, low carbon development pathway. It is designed to provide a framework that mainstreams matters climate change in development initiation, implementation, management, monitoring, resource mobilization and budgeting for climate change plans, projects and programs.

I wish to thank the Kitui County Climate Change Unit members who provided valuable information and data during the formulation of this policy. The departmental technical committee led by the Deputy Director for Environment, Energy and Mineral Resources - Mr. Benjamin Mukulo, Assistant Director for Environment and Climate Change – Mr. Dominic Mumbu, Chief Environment Officer - Ms. Damaris Musyoka and all environment and forestry officers, the Pan African Climate Justice Alliance (PACJA), the County Policy Development Committee and the Civil Society Organization (CSO) networks who worked tirelessly to ensure successful development of this policy.

Ms. Everlyne K. Musembi

Ag. Chief Officer for Environment, Tourism and Natural Resources

ABBREVIATIONS AND ACRONYMS

AF	Adaptation Fund
AIDS	Acquired Immune Deficiency Syndrome
ASALs	Arid and Semi-Arid Lands
ASDSP	Agricultural Sector Development Support Programme
CAADP	Comprehensive Africa Agricultural Development Programme
CBO	Community based organization
CCF	Climate Change Fund
CECM	county Executive Committee member
CFAs	Community Forest Associations
CIDP	county Integrated Development Plan
CoK	Constitution of Kenya
COP	Conference of Parties
CPAs	Charcoal Producers' Associations
CSO	Civil Society Organization
DFJ	December February June
EbA	Ecosystem Based Adaptation
EMCA	Environmental Management and Coordination Act
ESIA	Environmental and Social Impact Assessment
GCF	Green Climate Fund
GEF	Global Environmental Fund
GHG	Green House Gases
ICT	Information, Communication and Technology
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
JJAS	June July August September
KEFRI	Kenya Forestry Research Institute

KFS	Kenya Forest Service
Km^2	Square Kilometre
KMD	Kenya Meteorological Department
MAM	March April May
MTEF	Medium Term Expenditure Framework
MTP	Medium Term Plan
NASA	National Aeronautics and Space Agency
NCCAP	National Climate Change Action Plan
NCCP	National Climate Change Policy
NCCRS	National Climate Change Response Strategy
NDMA	National Drought Management Authority
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
° C	Degrees Celsius
PACJA	Pan African Climate Justice Alliance
R&D	Research and Development
REA	Rural Electrification Authority
SEKU	South Eastern Kenya University
SON	September October November
SWOT	Strength, Weakness, Opportunity, Threat
UNFCCC	United Nation Framework Convention on Climate Change
WRA	Water Resources Authority
WRUAs	Water Resources Users Associations

EXECUTIVE SUMMARY

Kitui county is in the Arid and Semi-Arid Lands (ASALs) of Kenya, which is climatically fragile and vulnerable to the adverse impacts of Climate Change and variability.

Environmental and climate change issues are both multi-dimensional and multi-sectorial. Hence, this policy shall be implemented in the county functions of Agriculture, Water, Livestock Development, Education, Gender and Information Communication Technology, Environment and Natural Resources, Health, Tourism, sports and Culture and Infrastructure, Transport and Communication, among others.

The policy identifies many challenges to the implementation of environmental conservation, climate change mitigation and adaptation measures and prioritizes interventions in the following; lack of policy, legal, regulatory and institutional framework on climate change adaptation and mitigation; low community and ecosystem resilience and inadequate adaptive capacity to climate change impacts; vulnerability of human and ecosystem to climate change impacts; low county resources' mobilization, low capacity for climate change financing; lack of mechanisms that facilitate climate change research and development; and inadequate co-ordination of climate change adaptation and mitigation initiatives.

In matters of environment and climate change, this policy is awake to the reality that there are winners and losers, hence has documented the opportunities that it presents and the strategies that shall be used to translate them into economic benefits for the county residents while mitigating the impacts of climate change and variability. The level of skills and knowledge of the beneficiaries and their purchasing power predispose them to vulnerability to the issues at hand. Therefore, structured capacity building is central to successful adaptation and mitigation initiatives.

To ensure environmental sustainability, and adapt and mitigate climate change, this policy commits the county Government of Kitui to; facilitate the formulation and implementation of environmental conservation, climate change adaptation and mitigation acts, legal, regulatory and institutional framework; strengthen human and ecosystem resilience and adaptive capacity; enhance safety and security of human and ecosystem; improve county resource mobilization capacity for climate change

financing; promote partnership and collaboration on climate change adaptation research and development; and enhance climate change governance through co-ordination of adaptation initiatives by all stakeholders.

CHAPTER ONE: INTRODUCTION

1.1 Background Information

Environment is a broad term representing the totality of the surrounding such as plants, animals, microorganisms, socio-economic and cultural factors. It includes the physical aspects of the surroundings of humanbeings such as land, water, atmosphere, sound, odour, taste, the biological factors of animals and plants, and the social factors of aesthetics. It includes both the natural and the built environment.

Kitui county is in the ASAL region of Kenya and experiences adverse effects of climate change and variability. The county is among the most drought-vulnerable regions in the country. It has an area of 30,430 km² and a population of 1,136,187 (KNBS, 2019a), of which 95.3% of the population live in rural areas and depend on agriculture as their primary source of livelihood (KNBS, 2019a, KNBS, 2019b). The level of absolute poverty in the county is estimated at 47.5% (County Government of Kitui, 2020).

Kitui county is in the lower Eastern ASAL region of Kenya between latitudes 0°10' and 3°0' south and longitudes 37°50' and 39°0' east and experiences adverse effects of Climate Change and variability. The county has an altitude of 400-1800 meters above sea level (County Government of Kitui, 2018). Due to its semi-arid climate, the county is among the most drought-vulnerable regions in Kenya. The average annual precipitation range is 400-1000 mm, with an annual average rainfal of 750 mm. The eastern part of the county is the driest, receiving less than 500 mm of rainfall, on average, every year. Precipitation in the long rainy season, from March to May, is erratic and unreliable; precipitation in the short rainy season, October to December, is more reliable in terms of amount and distribution. Most farmers in Kitui county depend on the short rainy season for agricultural productivity: it contributes 60% of the county's crop production, compared to 40% during the long rainy season. The annual average temperature for Kitui is 21-31°C. The western part of the county is nearly 10°C cooler than the eastern part.

Climate change in the Intergovernmental Panel on Climate Change (IPCC) refers to a change in the state of the climate that can be identified by changes in the mean

and/or the variability of its properties, and that persists for an extended period, typically decades or longer (Houghton et al., 1990). According to the United Nations Framework Convention on Climate Change (UNFCCC), climate change is a change of climate which is attributed directly or indirectly to human activities that alters the composition of the global atmosphere (UNFCCC, 2008).

Globally speaking, the resources human beings depend on for survival, such as fresh water, a clean atmosphere, and a stable climate, are now under serious threat from the effects of climate change and variability. Climate change and variability manifestations started many years ago, but the existence of environmental politics due to the global dimension of environmental issues slowed its appreciation by world leaders. The same reason delayed the needed shift of global focus from the traditional environmental concerns of conservation of natural resources and the damage caused by pollution to addressing the impacts of climate change and variability.

The climate projection for the ASALs of Kenya includes more prolonged and frequent dry periods interspersed with intense but shorter and unpredictable periods of rainfall. Such weather patterns will likely deplete water and pasture resources, leading to natural resource scarcity and conflicts. The manifestation of climate change is in terms of scorching weather, frequent droughts, flooding, harsh winds and storms, and increased emergence and outbreaks of crops, human, livestock, and plant pests and diseases. The environmental degradation and adverse conditions due to climate change and variability have actual and potential impacts on different sectors in the county.

1.1.1 Agriculture

Agriculture is critical for the economic growth and development of Kitui county. It is the main economic activity in the county, contributing to employment and food security. 95.3% of the population in Kitui county live in rural areas and depend on agriculture as their primary source of livelihood (KNBS, 2019a, KNBS, 2019b). 82% of the households in the county are engaged in agricultural activities (KNBS, 2019b). Agriculture generates about 87% of the county's rural population income (GoK, 2021b) and directly employs more than 35% of the population (ASDSP, 2014).

Climate change has made agricultural development in Kitui county considerably challenging. The direct and indirect impacts of climate change on agriculture in the county include changes in the quantity and quality of forage, unpredictable rainfall patterns, scarcity of water, extreme heat, the emergence of new pests and diseases such as desert locust invasions, and low crop and livestock yields. Furthermore, the frequency of extreme weather events such as floods, droughts and high temperatures has increased (GoK, 2021b). These adverse effects have compromised agricultural productivity in the county, contributing to food insecurity and poverty. 39% of the population in the county suffers from food poverty, compared to the national average of 32% (KNBS, 2019b).

1.1.2 Livestock Production

Livestock production is a primary economic activity in Kitui county, with 82% of the farming households involved in the production of livestock (KNBS, 2019b). The households depend on livestock for food and income generation (County Government of Kitui, 2018). The county has a high potential in livestock production and has developed programs for animal breeding and upgrading (GoK, 2021b). However, climate change impacts such as extreme weather conditions, frequent and prolonged droughts, new pests and diseases have posed a serious threat to livestock production and development in the county by causing unfavorable environmental conditions for the survival of animals, compromising fodder and feed production, and health and nutritional security of livestock. Climate change impacts have substantially lowered productivity in the livestock sector and led to enormous losses to farmers resulting from death of livestock.

1.1.3. Environment

The United Nations Environment Programme (UNEP), in her sixth regional assessment outlook report, recognizes Africa's rich natural capital – the diversity of flora, fauna, soil, geology, biodiversity, wildlife, water resources, landscapes, and habitats that, if they can be well managed they can transform livelihoods of the community and help greatly in alleviating poverty and diseases in Africa.

Africa's economic growth and stability are hinged on the sustainable management of its natural capital that involves making climate change impacts not to continue to affect sustainable production and growth. The environment and natural resources in Kitui county are valuable assets that must be sustainably management for present and future generations. They offer a range of benefits and opportunities for local and national economic development, improved livelihoods, and provision of environmental goods and services.

1.1.4 Forestry

Forestry plays a crucial role in the socio-economic development of Kitui county. It contributes to the livelihoods, income, and overall well-being of the people of Kitui county. The traditional uses of forests in the county include extraction of medicine to cure diverse human ailments, source of fuelwood for cooking and non-timber forest products such as wild fruits, nuts, honey, fodder, ornamental pods and seeds, food additives (spices, herbs, flavourings, sweeteners), fibres (furniture, clothing, construction) and game. The commercial uses of forests include the extraction of wood for timber, posts, poles, charcoal production and ecotourism in the Kitui National Reserves and the Tsavo East National Park. The ecological uses of forests in the county include climate amelioration, carbon sequestration, ecological preservation and restoration (conservation of biodiversity and genetic resources, control of floods and soil erosion, and preservation of soil fertility through nutrient cycling), watershed conservation and beautification of landscapes. Besides, forests in the county have provided opportunities for recreation, education and cultural enrichment.

However, climate change has adversely affected forestry development in Kitui county by decreasing the overall forest productivity. The direct impacts of climate change on forestry in the county are low rainfall and unpredictable rainfall regimes, which affect planning for tree planting; high rainfall intensity, which contributes to accelerated soil erosion; extreme weather events such as strong and frequent winds, high temperatures, frequent and prolonged droughts, which cause falling and death of trees; and new pest infestation like the cases of desert locust invasion.

Extreme weather events and severe drought conditions in the county have increased the frequency, intensity and extent of wildfires. Moreover, the warmer temperatures and drier conditions associated with drought are likely to increase the reproductive rate of certain insect species and expand the range and prevalence of forest pests and pathogens. Trees have less energy to defend themselves when stressed by drought and other challenging conditions: They become more vulnerable to pests, diseases and other disturbances leading to high tree mortality rates.

Furthermore, deforestation and land degradation are high in Kitui county due to agricultural expansion and the high number of people who derive their livelihoods from the declining forest resources (GoK, 2021b, KNBS, 2019b). These have compromised forestry development in the region by causing low vegetation cover, extinction of tree species, and loss of germplasm and biodiversity. There have also been cases of over-exploitation of protected tree species such as East African Sandalwood (*Osyris lanceoata*), *Delonix elata* (Muange). Hence, there is a major concern that rare and endangered indigenous tree species will be extinct in the near future. The unsustainable harvesting of forest trees is deemed to increase pressure on the prices of forest products in the county and trigger human resource conflicts. Unsustainable exploitation of forest resources will compromise the attainment of Kenya's vision 2030 (GoK, 2007) and the constitutional (GoK, 2010) target of 10% forest cover.

1.1.5 Water

Climate change has significant impacts on water resources in terms of availability, quantity, quality and distribution. In Kitui county, the drought cycle frequency has decreased from 5 years span to annually. This has come about due to low rainfall and high evaporation rates caused by excessive heating and prolonged droughts associated with climate change. Water scarcity in the region has led to increased distances to watering points hence advancing the vulnerability of communities to climate change impacts. Furthermore, the unregulated and illegal river sand-harvesting as a livelihood support activity for the people in Kitui county has had significant negative impacts on river water quality and quantity and degraded the river ecosystems.

1.1.6 Energy

The fragile ecosystem of Kitui county is put at risk by the continued deforestation to meet the growing demand for wood fuel inside and outside the county. The majority of people in the county primarily rely on firewood (81%) and charcoal (9%) for cooking (KNBS, 2019b). There has also been an increasing demand for charcoal outside the county. This has contributed to unsustainable tree harvesting resulting in the extinction of valuable indigenous species and loss of germplasm. Extreme weather events and prolonged droughts due to climate change have compromised the regeneration of natural vegetation resulting in accelerated soil erosion and environmental degradation. Further, climate change has altered the energy generation potential of hydropower plants: Temperature fluctuations, changes in rainfall patterns, frequent and prolonged droughts are the major signs of climate change that have substantial effects on hydroelectric dams and increasingly hamper electricity production. Rising temperatures affect hydropower generation by increasing losses from reservoirs through evaporation which consequently affect hydropower generation. Changes in precipitation alter the potential, generation output, peak level and seasonal variations of hydropower. Furthermore, the illegal exploitation of coal at Mui Basin in Mwingi East Sub-county has negative environmental impacts, necessitating effective and efficient technology for clean energy production.

1.1.7 Soil Fertility

Soil fertility is the ability of soil to sustain plant growth by providing essential plant nutrients and favorable chemical, physical, and biological characteristics as a habitat for plant growth. Soil productivity is the ability of the soil to produce crop per unit area. The maintenance and improvement of soil fertility are essential for proper plant growth.

Climate change has direct and indirect impacts on soil development processes and properties related to crop production. The drivers of climate change, such as moisture, temperature and CO_2, have variable effects on various soil processes and properties, having relevance in soil fertility and productivity. The direct effects include changes in organic carbon transformations and nutrient cycling through altered moisture and

temperature regimes in the soil or increased soil erosion rates due to an increased frequency of high-intensity rainfall events. Hence, the projected changes to climate will affect soil fertility adversely and aggravate the negative environmental impacts on vegetation, water quality and agricultural production.

1.1.8 Mining

In Kitui county, the unsustainable harvesting of sand is the key issue causing significant environmental degradation and thus contributing to climate change effects. Sand is an increasingly valuable commodity in Kitui county. Despite the current ban on sand harvesting in the county, illegal sand mining and its transportation have been reported in various parts of the county. Unsustainable harvesting of sand has resulted in riverbank collapse, deepening of river beds, sinking deltas and loss of biodiversity (fauna and flora) hence lowering river water quality and quantity and threatening inland fisheries. On the other hand, coal mining at Mui Basin in Mwingi East Sub-county has significant environmental impacts. Burning coal produces several gaseous by-products, including carbon dioxide, nitrogen oxide, sulphur dioxide and methane gas, all of which contribute to global climate change. Mining is one of the major emitters of greenhouse gases. The use of explosives in mining releases greenhouse gases to the atmosphere. Mining also involves large diesel trucks and loaders running around emitting CO_2, which is the main contributor to climate change. Deforestation to make way for mining operations reduces C sinks contributing to more CO_2 in the atmosphere. Furthermore, mining contributes to population displacement, environmental pollution and degradation, excessive use of energy and water, and health hazards, which compromise resilience to climate change impacts. Illicit mining activities compound environmental damages and result in conflicts and loss of taxes/royalties. The present scenario in Kitui county points to the need for swift action to regulate mining activities, including monitoring, law enforcement, and a participatory approach to managing resources. This policy will guide sustainable mining and especially of the sand resources to meet development needs and livelihoods of people in Kitui county.

1.1.9 Tourism

Kitui county has great potential for tourism development. The tourism sector offers great opportunities for economic growth and rural development in the county. There are several tourist sites and attractions in the county. They range from national parks and reserves to heritage sites and hiking trails. However, the extreme climatic conditions in the county affect tourism demand directly by influencing destination choices and the possibility of repeat visits, as well as indirectly by influencing the quality of the experience, formulating negative perceptions and uncertainty about a destination's attractiveness.

Tourism development in the county will help create job opportunities for local residents, strengthen the local economy, promote local handicrafts, contribute to local infrastructure development, reduce poverty, plant a sense of cultural exchange between foreigners and citizens, and conserve the natural environment and cultural assets and traditions. Rural tourism will create an alternative source of income in the non-agricultural sector for rural dwellers.

1.1.10 Fisheries Development

Fisheries offer a paradigm shift in farming activities occasioned by climate change. In Kitui county, fishing has long been an important source of human nutrition and revenue for the vulnerable communities living in rural areas, aiding them to cope with climate change impacts. The smaller-scale fisheries in Kitui county primarily rely on inland bodies of water such as rivers and dams. But, some inland fisheries are based on fish farming, where fish are raised in giant tanks or ponds, mainly for subsistence use.

Fish farming in Kitui county offers an excellent opportunity for economic development and food security. However, fisheries development in the county is seriously threatened by the adverse impacts of climate change. The main challenge to inland fisheries in the county is the seasonality of water bodies such as rivers, and fluctuations in water levels due to changes in rainfall patterns and losses through evaporation during hot seasons. Moreover, the increasing water temperatures affect the breeding, growth and migration of fish. Furthermore, the locations of inland

fisheries often have multiple uses. In most cases, they serve as water supply for the local populations or sources of water for irrigation. These contradicting uses sometimes impair the water quality and compromise fish production. Many freshwater fish species have been threatened or extinct due to overfishing or poor water quality at inland fisheries as communities compete for the limited resources in pursuit of food and income to adapt to climate change impacts. Human encroachment to wetlands for purposes of agricultural activities also have adverse effects on fish breeding habitats and the stability of hydro-ecological transition zones.

1.1.11 Waste Management

Climate change affects waste management processes and operations that are subject to weather-related impacts. For instance, high-intensity storms and increased flooding cause disruption to waste management supporting infrastructure such as roads and drainage lines, which affect delivery of waste. Frequent and high-intensity storms cause surface run off, which destroys waste collection facilities and leads to pollution resulting from waste transportation to water bodies and other areas. Changes in site hydrology and temperatures affect waste management processes, such as landfill degradation rates. Increased sunshine and exposure to UV radiation and increased pathogen and vermin activity pose health risks to waste management workers.

1.1.12 Health

According to the World Health Organization (WHO, 2022), climate change is the single biggest health threat facing humanity. Health and well-being are inextricably linked to the natural environment. As our planet continues to warm, many people will experience worsening physical and mental health impacts (IPCC, 2022).

In Kitui county, environmental pollution and climate change are posing severe adverse impacts on the health sector. The environmental conditions (i.e. increasing temperatures and changes in rainfall patterns) are becoming more suitable for increased disease vector populations, leading to frequent outbreak of diseases. Climate change has also reduced access to safe, clean drinking water from drought-induced scarcity and contamination caused by high storm intensity and floods. This has got adverse effects on health. Moreover, the negative effects of climate change,

such as low and unpredictable rainfall, high rainfall intensity, extreme temperatures, drought, pests and diseases, have compromised agricultural production in the county (GoK, 2021b), resulting in high rates of food insecurity and malnutrition (GoK, 2021a). Furthermore, the destruction of natural habitats and loss of biodiversity resulting from harsh weather events and severe droughts in the county (County Government of Kitui, 2018, GoK, 2021b) are known to increase diseases spread between animals and humans (United Nations Fountation, 2020). Besides, the adverse effects of climate change on wildlife have led to the encroachment of game and snakes into human habitats leading to human injury and increased incidences of snake bites and bee stings that have put more pressure on heath infrastructure and medical services. The adverse effects of climate change on human health contributes to low productivity and poor development.

1.1.13 Land Use Planning

Lack of proper land use planning is a serious drawback to climate change mitigation in Kitui county. Some forest areas within the county have been cleared for other purposes such as agriculture, settlements and road construction hence increasing vulnerability of the county to climate change impacts. Poor urban planning has contributed to environmental pollution through improper storage and disposal of waste in urban areas. Furthermore, the extreme temperatures, floods, droughts and storms associated with climate change have costly impacts on land infrastructure and housing. Poor infrastructure limits access to essential services, particularly for the poor and other vulnerable communities who live in rural and marginalized settlements. There is a need for proper spatial and urban planning for better climate change governance in the county.

1.1.14 Special programs and disaster risk management

Climate change has direct and indirect impacts on the effective enjoyment of a wide range of human rights, including the rights of individuals with multiple vulnerability factors who have minimal access to emergency support. Persons in vulnerable situations, owing to factors including geography, poverty, gender, age, indigenous or

minority status, national or social origin, birth or other status and disability, experience heightened exposure and vulnerability to climate-induced human rights harms.

In Kitui county, climate change has exposed people to extreme temperatures, changing rainfall patterns, water scarcity, drought, land degradation, and loss of adaptive capacity and ecosystem services. People living in such states are amongst the most affected by climate-related harms. These harms have implications for the right to self-determination, the right to life, the right to health, and cultural rights, among other human rights. These impacts also severely affect peoples' livelihoods and may act as a driver of migration.

The adverse impacts of climate change on individuals with multiple vulnerability factors require adequate measures that take into account their specific requirements and ensure their participation in disaster response planning for emergency situations and evacuations, humanitarian emergency response and healthcare services.

The meaningful inclusion and participation of persons in vulnerable situations within disaster risk management and climate-related decision-making at the county level lie at the heart of a human rights-based approach to climate action.

1.2 Justification

The survival and socio – economic well-being of Kitui people and Kenya generally is ultimately intertwined with the environment. Most people depend directly or indirectly on environmental goods and services. In addition, Kenya's environmental resources contribute directly and indirectly to the local, county and national economy through revenue generation and wealth creation in productive sectors such as agriculture, forestry, livestock, water, energy, tourism, fisheries, mineral resources, trade, industry and among others.

The manifestation of negative impacts of climate change in terms of emerging diseases for crops, humans and livestock; new crops and livestock pests; increased frequency of droughts; high temperatures; unreliable and erratic rains; irregular spatial distribution; and extent of flooding in the county are discernible. The impacts

of Climate Change cause entire season crop failure and depletion of pasture lands, leading to loss of livestock. The environment is highly degraded by the last resort human activities through unregulated sand harvesting and tree felling for fuelwood and other needs, which serve as coping mechanisms, especially in rural areas.

These facts demonstrate that the vulnerability of the people of Kitui county to the adverse impacts of climate change and variability is quite high. There is, therefore, a great need for a structured way of addressing climate change and variability in the county that plugs into the national policy, legal and regulatory framework. This policy aims at creating legal and regulatory frameworks that will facilitate action.

1.3 Policy goal

The goal of this policy is to enhance environmental conservation, build communities' resilience and green technology for sustainable development of Kitui county.

1.3.1 Specific goals

1. To inform the legal framework and regulations for environmental conservation, climate change adaptation, mitigation and social justice in Kitui county.
2. To enhance the resilience and adaptive capacity of human and ecosystems to the impacts of climate change.
3. To develop structured, efficient and effective information management and dissemination system, including early warning systems.
4. To develop and promote adoption of sustainable green technologies in development and planning.
5. To enhance the county resource mobilization capacity for climate change financing.
6. To initiate and support county environmental conservation and management, climate change research and development.

7. To enhance partnerships and collaboration with key players and actors for effective implementation of climate actions in the county.
8. To develop co-operative climate change mainstreaming and governance.
9. To promote landscape rehabilitation and ecosystem-based adaptation approaches.
10. To establish an elaborate institutional framework for climate action in Kitui county.

CHAPTER TWO: SITUATIONAL ANALYSIS

2.1 Introduction

Kitui county is in the ASAL region of Kenya and among the most drought-vulnerable areas of the country. The county's absolute poverty level is high at 47.5% (County Government of Kitui, 2020). The majority (95.3%) of the population in the county live in rural areas and depend on agriculture as their primary source of livelihood (KNBS, 2019a, KNBS, 2019b). Agriculture significantly contributes to rural employment, food security and income in the county (KNBS, 2019b). However, the effects of climate change and variability, manifesting as severe droughts, floods and heat waves, constrain success. These effects are exacerbated by socio-economic issues such as poverty, rapid population growth, poor land use and agricultural practices and over utilization of fragile ecosystems. These issues threaten the sustainability of natural resources and human well-being, and trigger resource scarcity which results in resource use conflicts, especially over water and pasture land.

2.2 Achievements

The awareness of climate issues and mitigation efforts in the county since the year 2013 has been rising. Kitui is one of the counties in Kenya where the pilot climate change adaptation and mitigation measures have been implemented through funding from the Department for International Development (DFID) through the Adaptation (ADA) Consortium, Christian Aid and Anglican Development Services Eastern.

The lead county agency mandated to promote climate adaptation and enhance mitigation among the county residents is the county department of environment and climate change or any other department that climate change will be domiciled. The pilot program put Kitui county on an early path toward developing a framework for adaptation. This started with the mobilization of key stakeholders to work together to put in place the implementation framework. The structures put in place to enable programme implementation are the county Climate Change Unit, Steering and Interim Technical Committees, as well as the Ward Planning Committees.

Kitui county has mainstreamed climate change adaptation into county Integrated Development Plans (2013-2017, 2018-2022 and 2022 - 2027) and other county plans.

The County Executive Committee Member for Environment, Tourism and Natural Resources is mandated to carry out a climate risk assessment. Several development partners such as the World Bank, African Development Bank, Global Environment Facility, among others have shown interest to support environmental conservation and climate change actions in the county.

There is a need to increase awareness of climate change impacts among communities in Kitui county by state and non-state actors. This is already happening with development partners intervening at the community level through donor support. The county government of Kitui is already implementing programs that promote indigenous knowledge on crops, bee keeping and honey production, and livestock breeds' improvement as recommended in climate smart agriculture and integrated into the county agriculture policies and aspirations. There are other actors in the field whose contributions are to build synergy. However, co-ordination through a well-established policy, legal and regulatory framework is required.

The establishment of the Kitui County Environment and Climate Change Policy and an Act, and the Climate Fund are such initiatives that aim at creating an enabling environment for implementing climate change adaptation and mitigation measures in Kitui county.

2.3 Challenges facing Environmental Conservation, Climate Change Adaptation and Mitigation in Kitui county

The situation analysis; Strength, Weakness, Opportunity and Threat (SWOT), and other analysis tools have revealed various various measures put in place by the county government of Kitui to adapt and mitigate climate change. However, there are priority factors that hinder the implementation of the adaptation and mitigation actions in the county, which include the following;

(i) Lack of policy, legal and regulatory framework on climate change adaptation;

(ii) Low community resilience and inadequate adaptive capacity to the impacts of climate change;

(iii) Vulnerability of human and ecosystem to the impacts of climate change;

(iv) Low county resource mobilization capacity for climate change financing;

(v) Lack of mechanisms that facilitate climate change research and development; and

(vi) Inadequate co-ordination of climate change adaptation initiatives.

2.4 Policy Interventions and Context

Despite the various negative impacts that climate change poses on the socio-economic development of Kitui county, it presents the county government, businesses, and the local people with opportunities. The Kitui County Environment and Climate Change Policy aims to exploit the opportunities fully. The following are some of the priority interventions in that pursuit;

2.4.1 Facilitate formulation of policy, legal and regulatory framework

Kitui county lacks clear and appropriately designed policy, legislative and institutional frameworks to guide the implementation of climate change adaptation and mitigation interventions. Hence, there are no structures explicitly created for the implementation of activities to translate climate change responses from concept to reality.

2.4.2 Strengthen resilience and adaptive capacity to the impacts of climate change

The multi-sectoral and multi-dimensional nature of the impacts of climate change means that strengthening the resilience and adaptive capacity of human and ecosystems calls for mainstreaming climate change interventions into different sectors of focus. This is the major way of building adaptive capacity, enhancing climate change resilience and strengthening capacities for disaster risk reduction by engaging the beneficiaries of the intended interventions through public participation in climate change responses, awareness creation, consultation, representation and access to climate information services. This includes their involvement in the initiation, development and implementation of programs and plans to enhance the resilience and adaptive capacity of human and ecological systems to the impacts of climate change.

2.4.3 Enhance safety and security of communities against the impacts of climate change

The county does not have current quantitative data on the impacts of climate change in most sectors. The residents, too, have not internalized matters of climate change and variability, although things happening around them have raised the alarm about the change. The risks of climate change manifest as a result of a breakdown in the link between target groups with early warning systems on; drought, flooding, and precipitation variability and extremes.

The manifestation of climate change is a complex and dynamic phenomenon that requires continuous collection and assessment of up-to-date multi-disciplinary and multi-sectoral data, adoption and/or development of systems that will enable the country and counties to plan for potential climatic risks, respond to emergencies triggered by climatic events and tap opportunities generated by climate change and variability. The county Government of Kitui shall establish effective and efficient mechanisms of communication and information dissemination on matters of climate change.

2.4.4 Improve county resource mobilization capacity for climate change financing

The availability of adequate and predictable financial resources is critical for the implementation of adaptation and mitigation measures to the impacts of climate change and variability. On this basis, it is requisite for county Governments and private sector institutions to proactively mobilize financial resources from all available sources– international, domestic, public, private, and through Public-Private Partnerships (PPPs). These financial resources will enable the national and county governments to achieve set economic development goals while promoting green-growth and addressing the impacts of climate change. The county Government of Kitui shall establish appropriate mechanisms for resource mobilization in this pursuit.

2.4.5 Promote collaboration on climate change research and development

The basic need for effective intervention in climate issues is the availability of adequate knowledge and skills. Research and technology play a critical role in determining and implementing optimal and cost-effective climate change adaptation and mitigation strategies and interventions. The National Climate Change Policy (2016) acknowledges that stakeholders play distinct yet complementary roles in research and technology advancement. For instance, the national government creates an enabling environment for research and technology development through investment in research programs and technology development, enactment of overarching legislation which promotes research, and fund research programs.

The private sector and Civil Society Organizations (CSOs) implement best-case practices and lessons learned from research findings, invest in research and modern technologies, and fund research programs. Academia undertakes scholarly research which informs climate change interventions at national, local and grassroot levels and fund research programs. The local communities participate in the implementation of research programs, and provide data on indigenous, local and traditional knowledge that inform the research study and the nature of climate change adaptation and mitigation initiatives that will continue to inform action. Hence, the county Government of Kitui shall promote collaboration in climate change research and development, training, and capacity building.

2.4.6 Enhance co-ordination of Climate Change Adaptation initiatives

In the devolved system of governance, the constitution assures proximate and easily accessible services to people. Implementing adaptation, mitigation and sustainable development measures related to climate change and variability involves working with different government departments and development actors. In order to effectively and efficiently intervene, there is need for co-ordination and collaboration among stakeholders. The county government shall thus establish a framework for supporting efficient and effective co-ordination and consultation for enhanced performance in matters of climate change. The framework will facilitate structured involvement of the National and county Governments, development partners, private sector and Civil

Society Organizations' involvement in building climate change resilience and engagement in the promotion of green technologies. The joint climate change adaptation assessment is usually more effective when initiated at an early stage of project development so that appropriate adaptation measures can be built into project planning, design, operation and maintenance to promote climate resilience.

2.5 SWOT Analysis

In order to prioritize interventions, an analysis of the climate change adaptation policy implementation environment was conducted so as to identify, isolate and target the most critical actions with highest impact on improving resilience and adaptive capacity of human and ecosystems. The detailed SWOT, PESTLE and Risk analyses are attached as annexes. The following is a presentation of the summary of sector-specific opportunities identified.

2.5.1 Infrastructure and Urban Development

The Climate Change and Variability phenomenon presents the sector with the opportunity for the establishment of competent road construction companies, construction of quality climate-proof road works, a paradigm shift from construction drifts in the county to bridges, construction of log bridges over impassable streams without bridges, integrating water harvesting in infrastructure development by channeling and harvesting storm waters from towns and construction of concrete electricity poles.

2.5.2 Waste management

There are opportunities in the county for investment in sustainable waste management technologies, which include; engineered landfills, gasification technology, electricity production from waste, silage production, briquettes, plastic and glass recycling, rejuvenation of rivers etc.

2.5.3 Water sector

There is an emerging trend of increased rainfall eastwards (Africa and Kenya) which presents households and institutions (schools, hospitals, hotels, among others) with

an opportunity for water security through the installation of innovative climate-proof water harvesting and storage infrastructure. The county Government, working together with the development partners, will enhance the construction of sand dams as a way of controlling runoff.

2.5.4 Other opportunities

There are numerous opportunities for state and non-state actors in the county as a result of climate change and variability which include but are not limited to; climate-smart agriculture, developingment of early warning and alert systems for flash floods; establishment of commercial woodlots; water catchment rehabilitation; establishment of county climate change fund; irrigation production system; creation of climate information services system; and establishment of solar plants for renewable energy production.

In order to promote clean energy use, shops and businesses that install solar panels will get some rebates on their statutory payments. This is an opportunity to have youth acquire needed skills and knowledge in the energy sector; hence, the youth in the county will be trained on the installation of solar panels and construction of sand dams to help combat unemployment and poverty in the county. Residents will also be trained in bee keeping.

2.6 Emerging issues from the SWOT Analysis

2.6.1 Political goodwill and leadership

Political good will and support of the top leadership are critical for the mobilization of communities to create an entry point for the successful implementation of development initiatives.

2.6.2 Increasing frequency of droughts and floods

Climate Change and variability in Kitui manifests through increased frequency of droughts, floods and high temperatures. This is both a threat and an opportunity in that livelihood zones are negatively affected but there is an unexploited potential in the long hours of intense and uninterrupted sun shine, which is an opportunity for

tapping solar energy. There is also a need to introduce and promote the growing of drought-tolerant, high-value, multipurpose tree species such as *Melia volkensii* (Mukau) and soil conservation species such as dryland bamboo.

2.6.3 Climate financing

The manifestation of the negative impacts of climate change is discernible in Kitui county. However, the implementation of adaptation, mitigation and sustainability initiatives requires financing amidst scarce resources in the county.

The establishment of a policy, Legal and regulatory framework anchoring the county Climate Change Fund Regulations, 2018 is a key step towards realization of mitigation, adaptation and sustainability by plugging into the national and global climate funds.

2.6.4 Establishment of the State Department for the Arid and Semi-Arid (ASALs) and Regional Development

The establishment of this department by the national government presents an opportunity for County Government of Kitui to benefit through a policy, legal and regulatory framework window which this policy stands to open.

2.6.5 Emerging crops and livestock diseases and pests

Global warming due to climate change and variability is likely to affect the quality of fruits and vegetables for which Kitui county has high potential. The incidences of pests and diseases of crops and livestock have increased because of enhanced pathogen and vector development, rapid pathogen transmission and increased host susceptibility.

2.6.6 Idle land and irrigation farming potential

The Kitui county topography is suitable for irrigated agriculture. The potential for exploitable irrigation can be expanded through the development of the Tana and Athi River basins, where there are numerous sandy streams.

2.6.7 Declining water table

The most apparent climate change mitigation measure in the agricultural sector is irrigation. The increased demand for irrigation and other water uses would increase with the rise in temperatures and evapotranspiration rate, resulting in lowering of the groundwater table. This can be regulated through underground water abstraction and by replenishing recharge by constructing water harvesting infrastructure such as sand dams.

2.6.8 Kitui county charcoal production management

Kitui county enacted the Kitui County Charcoal Management Act of 2014 to regulate operations leading to charcoal production in order to strike a balance between energy needs and degradation of the environment. However, the effectiveness of this law came to question when by the year 2017, environmental degradation attributable to energy needs reached an intolerable level leading to an executive order banning the charcoal trade. Hence, there should be a proper scenario analysis in policy and legislation processes. This policy seeks to address this challenge through enforcement and compliance, efficient energy solutions, alternative livelihoods, and sensitization on sustainable energy conservation.

2.6.9 Inter-county resource-based conflicts

Peace and security are critical to human safety and livelihood stability since conflicts affect workers, crops and livestock enterprises.

The manifestation of security issues on resilience building include the displacement of farmers due to escalating conflicts among communities over natural resources. There are conflict-prone sections of Kitui county that border Tana River county, where displacement of residents and destabilization of their livelihoods are common.

2.6.10 Human-wildlife conflicts

It is expected that climate change in Kitui county will increase the frequency of droughts. This will push wild animals, such as snakes, lions and elephants to wander further in search of water and food. Therefore, incidences of snake bites at home are

likely to increase. On the other hand, lions have come into conflict with humans when they kill livestock in none traditional wildlife areas. These incidences disrupt human livelihoods. This policy puts in place strategies to minimize human-wildlife conflict.

CHAPTER THREE: OBJECTIVES AND STRATEGIES

3.1 Introduction

This chapter outlines the policy objectives, directions and strategies for responding to environmental and climate change concerns in Kitui county. It places the main focus on the enhancement of community livelihoods and environmental conservation for sustainable development, mainstreaming of climate change actions in key county development plans, policies and programs in order to build communities' resilience and work towards green economy development pathway. These objectives, directions and strategies provide more specific guidance on how the overall goals and statements of this policy will be attained.

3.2 Strategies

Environmental degradation, climate change and variability is a complex and multi-faceted issue that requires a combination of multi-disciplinary and multi-sectoral solutions. On this basis, it is imperative that different departments and stakeholders work together as a block to address this issue. The Kenya National Climate Change Policy (2016) stipulates that the government should play an overarching role in the strategic planning and management of climate change responses.

Therefore, this section specifies the strategies that the county government of Kitui shall pursue under each policy intervention in order to achieve a climate resilience goal while working in collaboration with stakeholders.

3.2.1 Policy objective 1: To institute and strengthen the policy, legal and regulatory framework on environment and climate change

This policy recognizes that the establishment of a robust and sound policy, legal and regulatory framework to guide the environment and climate change sector is critical for sustainable development.

Policy direction

The county government of Kitui shall establish a policy, legal and regulatory framework to fast-track the development of Kitui county Environment and Climate Change policy.

Strategies

(i) Formulate and adopt the policy;
(ii) Enact appropriate laws and regulations;
(iii) Establish relevant institutions and structures;
(iv) Ensure enforcement and compliance with existing policies and legislation; and
(v) Support knowledge management and experience sharing.

3.2.2 Policy Objective 2: To strengthen partnerships and development of a framework for sharing trans-boundary resources

Policy direction

The county government of Kitui shall enhance and promote partnerships, collaboration and linkages with key players in the implementation of various environmental and climate change actions, especially in addressing multi-sectoral and cross-cutting issues.

Strategies

(i) Stakeholders' engagement and mapping;
(ii) Establishment of commitment framework and mode of operations;
(iii) Development of engagement tools such as Memoranda of Understanding and Contracts of Agreements; and
(iv) Continuous monitoring, evaluation and reporting.

3.2.3 Policy Objective 3: To enhance and strengthen resources mobilization

Policy direction

The county government of Kitui shall enhance and strengthen a resources' mobilization mechanism for the implementation of various environmental and climate change actions in the county.

Strategies

(i) Mainstream climate resilience into all Kitui county government development plans, programs and implementation;
(ii) Institute and operationalize county climate change fund mechanism;
(iii) Lobby for adequate budgetary allocation;
(iv) Development of bankable concepts and proposals; and
(v) Staff recruitment, training and capacity building.

3.2.4. Policy Objective 4: To enhance climate change resilience

Policy direction

The county government of Kitui shall establish mechanisms for enhancing climate change resilience in the county.

Strategies

(i) Mainstream climate change in county sectors;
(ii) Establish a county climate change fund mechanism;
(iii) Support the adoption of climate change actions and technologies such as water harvesting, climate-smart agriculture, renewable energy, clean cooking, ecotourism promotion and packaging;
(iv) Constitute a county Climate Change Unit (CCU) and establish a climate information system; and
(v) Create partnerships, collaboration and linkages among key players and stakeholders.

3.2.5. Policy Objective 5: To enhance tree growing and forest conservation

Policy direction

The county government of Kitui shall establish mechanisms for tree growing and sustainable forest conservation.

Strategies

(i) Disseminate dryland forestry technologies;
(ii) Support the establishment of massive tree seedling nurseries in the county;

(iii) Support the establishment of community commercial woodlots and demonstration plots;

(iv) Support the application of seed ball broadcasting techniques for afforestation;

(v) Commercialize tree growing and develop forest product value chains; and

(vi) Organize tree growing and forest conservation competitions and award schemes.

3.2.6. Policy Objective 6: To enhance environmental safeguards and reduce environmental pollution

Policy direction

The county Government of Kitui shall establish mechanisms for enhancing environmental safeguards and reducing environmental pollution.

Strategies

(i) Enforce the law and regulations;

(ii) Environmental civic education, awareness and sensitization;

(iii) Streamline environmental impact assessments and environmental audits;

(iv) Adopt appropriate measures and technologies for waste management; and

(v) Support environmental inspections and surveillance.

3.2.7. Policy Objective 7: To rehabilitate and restore degraded and critical catchments, ecosystems and landscapes

Policy direction

The county government of Kitui shall establish mechanisms for rehabilitating and restoring degraded and critical catchments, ecosystems and landscapes.

Strategies

(i) Identification, mapping and documentation of degraded and critical catchments, ecosystems and landscapes;

(ii) Initiate and support land reclamation and rehabilitation activities;

(iii) Support the establishment of community-organized and user groups;

(iv) Support community training, capacity building and empowerment;

(v) Develop and implement specific site landscape rehabilitation management plans;

(vi) Support the development of nature-based enterprises such as regulated sand harvesting, gums and resins, ecotourism, bee keeping, small-scale irrigation, tree nurseries and landscaping commercialization; and

(vii) Support community value addition of nature-based enterprises and strengthening marketing.

3.3 Guiding Principles

The implementation of this policy will be informed by the following guiding principles:

3.3.1 National values and principles of governance, rights and fundamental freedoms

The constitution of Kenya (CoK) (2010) articulates national values and principles, rights and fundamental freedoms of persons residing in Kenya.

The Kitui County Environment and Climate Change Policy will adhere to the CoK and all the rights articulated therein.

3.3.2 Right to sustainable development

The implementation of this policy activities will cater for the needs of the current and future generations.

The expected outcome of this policy is people-centred development, human well-being, ecological integrity and green growth.

3.3.3 Partnership

The implementation of this policy will require building and strengthening partnerships, collaborations and synergies among multi-sectoral and multi-disciplinary stakeholders from the public, government, NGOs, CSOs and private sector, as well as vulnerable communities and populations, including women and youth.

3.3.4 Equity and social inclusion

This policy will ensure fair and equitable allocation of resources taking into consideration disproportionate vulnerabilities, responsibilities, capabilities, disparities, and inter– and intra-generational equity.

3.3.5 Maladaptation avoidance

The climate change responses will be implemented in such a way that maladaptation does not occur.

3.3.6 Cost effectiveness

The selected climate change actions will be comprehensively assessed to ensure that they provide the most benefit to society at the least cost.

3.3.7 Ecosystem-based Adaptation (EbA)

This policy emphasizes using biodiversity and ecosystem services through sustainable management, conservation and restoration of ecosystems to help people adapt to the adverse effects of climate change.

CHAPTER FOUR: LEGAL AND INSTITUTIONAL FRAMEWORK

Kitui county Environment and Climate Change Policy is a county-specific response to the constitution of Kenya 2010 and other related instruments according to the national climate change adaptation strategy. The legal and institutional frameworks that will facilitate the implementation of this policy are as follows;

4.1 Legal framework

Global problems such as environmental degradation, climate change and variability need global solutions, with local and regional actions focusing on specific issues in the spirit of thinking globally but acting locally. The legal framework in the Kitui Environment and Climate Change Policy is hinged on the history of the events and actions that led to the global acknowledgment of climate variability, its effects and impacts on sustainable land resources management.

In recognition of the serious threats posed by climate change, the national government continues to take bold measures to secure the country's development against the risks and impacts of climate change. The major milestone in this endeavor is the Constitution of Kenya, 2010 avocates for the maintenance of at least ten percent of tree cover of the land area. The Kenya Vision 2030 targets the planting of at least seven billion trees to address food, water and energy security. The Kitui county Environment and Climate Change policy is in line with the national constitutional framework and a move in the right direction for the county and the nation in general.

Climate change impacts have been a burning issue in the global arena for a while and have resulted in numerous international negotiations which have led to various agreements aimed at combating climate change impacts.

This policy provides a pathway toward realizing food and water security, improved health, wealth and employment creation in the Kitui county despite the reality of climate change and variability. It will therefore operate within the framework of various global and regional frameworks, county aspirations and national-level legislations and policies, some of which include;

i. The Paris agreement

This agreement came into being after protracted negotiations over many years, marked in particular by the failure of the Conference of Parties (COP) at Copenhagen, to usher in a successor agreement to the Kyoto Protocol. The Paris Agreement, aims at holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

ii. The Inter-Governmental Panel on Climate Change (IPCC) Assessment Reports

The IPCC assessment reports consistently demonstrate that warming across Africa, consistent with anthropogenic climate change, has increased considerably over time. Future impacts are also likely to be overwhelming and substantial to cause wide fluctuations in thermal and precipitation dynamics. In response to the current and future impacts of climate change, Parties to the UNFCCC agreed to submit Intended Nationally Determined Contributions (INDCs) as the new global climate governance framework to limit the increase in the global average temperature to well below 2°C above pre-industrial levels. With the signing of the Paris Agreement, INDCs transitioned to nationally determined contributions (NDCs) upon which the global climate actions will be built after 2020. Having embraced the green growth pathway in their Agenda 2063 and signed Paris Agreement, the imperative for African countries is to re-examine their options for NDC implementation under the changing global political landscape to effectively promote climate-resilience and low carbon emission development. However, translating NDCs into concrete actions requires, among others, implementation plans that prioritize specific sectoral climate actions as well as predictable finance flows, sustained capacity building, and the transfer of relevant technologies from the developed country Parties. Kenya's NDC towards meeting the goals of the Paris Agreement aims to cut down its carbon emissions by 30 percent by the year 2030.

iii. The National Climate Change Framework (NCCF) of 2016

The NCCF of 2016 provides a long-term and overarching legislative and institutional framework that can facilitate the necessary direction, guidance, co-

ordination and high-level political buy-in to mainstream climate change across government and enable the effective implementation of actions to address climate change.

iv. **The Climate Change Act (2016) and the Climate Finance Policy (2016)**
These facilitate the development and mobilization of financial resources, management and implementation of mechanisms to enhance climate change resilience and low-carbon development for sustainable development.

v. **The Kitui County Environment and Climate Change Policy**
The Kitui County Environment and Climate Change Policy is an acknowledgment that the county's economy is heavily dependent on natural resources such as land water, livestock, forest, wildlife, minerals, solar and wind which remain susceptible to the effects and impacts of climate change and variability. The policy is expressly clear on strategies to mitigate these effects, which mainly manifest as severe droughts, floods and heat waves are exacerbated by socio-economic issues such as poverty, rapid population growth, poor land use and agricultural practices, and over-utilization of fragile ecosystems. These issues threaten the sustainability of natural resources and human well-being, and trigger resource scarcity, which results in resource use conflicts, especially over water and pasture.

4.2 Institutional Framework

There are many organizations discretely involved in environmental conservation and climate change issues in general, but there are vital institutions that must play their unique and critical roles in the implementation of this policy. The organizations include; the county department in charge of environment, climate change and natural resources, government departments, state agencies, research institutions, institutions of higher learning, and other stakeholders.

There is a need to establish various county environmental and climate change institutions such as the Kitui County Climate Change Unit (KCCCU), County Climate Change Steering and Technical Committees and Ward Climate Change Planning Teams. Through these institutions, there shall be a formal link between the county

government of Kitui and other non-state actors involved in environmental and climate change actions in the county. This is for purposes of effective co-ordination to ensure equity, avoid duplication of efforts and ensure enough resources are mobilized to build communities' resilience.

The county government of Kitui will put in place appropriate resource mobilization for climate financing that will involve the stakeholders establishing a county climate fund with an annual budget allocation of an agreed percentage of the annual development budget and appeal for additional support from development partners. This fund will benefit county residents through an established institutional framework in different grassroot programs on adaptation, mitigation and sustainable development.

4.3 Monitoring, evaluation, reporting and learning

The county government of Kitui, in collaboration with stakeholders, shall develop a monitoring and evaluation framework based on a participatory approach to monitor and evaluate programs and projects enshrined in this policy to ensure effective and efficient implementation of the policy strategies.

4.4 Policy review

The success of implementation shall be reviewed from time to time with the participation of key value chain and sector stakeholders to adjust to emerging dynamics, incorporating lessons learned and up-scaling success stories.

ANNEXURES

Annex I: Implementation matrix for five years

Table 1: Environmental conservation and climate change adaptation and mitigation implementation matrix

Policy Objectives	Strategies	Activities	Key Performance Indicators	Actors	Timeline	(Budget KES millions)
To implement policy, legal & regulatory framework	Policy formulation Enactment of laws; Enactment of regulations; Adherence to standards; Collaboration with key stakeholders;	Implementation Fast track Application and enforcement Conduct regular inspection Imposition of declarations, levies, fines and penalties;	Enact climate change act; Enact sand harvesting and management act; Enactment of waste management act; Development of regulations and guidelines;	Department of Environment and Forestry	5 years	5
To strengthen partnerships and sharing of transboundary resources	Stakeholder meetings & engagements; Partners mapping Development of MoUs/Agreements; Develop commitment frameworks;	Holding consultative meetings and workshops; Implementing joint activities and work plans; Cross-site visits, benchmarking	List of partners & stakeholders; MoUs/Agreements signed Reports; Minutes; Plans developed;	Department of Environment and Forestry & partners	5 years	15
To enhance and strengthen resources mobilization	Mainstream climate actions in C.I.D.P. Constitute & operationalize Kitui county Climate Change Unit; Constitute & operationalize Kitui county Climate Change Fund; Concepts and proposals writing & development; Staff hiring and supportive infrastructure (offices, furniture, machines, training/capacity building);	Development of concepts, cabinet memos, MoUs, and agreements; Staff hiring & recruitment; Committee member appointment; Holding meetings & workshops;	No. of concepts and proposals developed; No. of projects implemented; No. of reports developed; No. of staff recruited; No. of staff trained; No. of machines, furniture procured; Amount of funds allocated/raised	Department of Environment & Forestry; county Public Service Board, Human Resources Management Department, Financial institutions and other stakeholders	5 years	20
To enhance climate change resilience	Mainstream climate change in county sectors; Establish county climate information system; Support adoption of climate change technologies,	Hold meetings & training workshops; Install appropriate software; Upscale use of e-extension;	No. of meetings & workshops held; No. of technologies adopted; No. of projects implemented; No. of beneficiaries;	Environment & Forestry, KMD, NGOs, CBOs	5 years	300

Policy Objectives	Strategies	Activities	Key Performance Indicators	Actors	Timeline	(Budget KES millions)
	including water harvesting; renewable energy, clean cooking; climate-smart agriculture, conservation agriculture; ecotourism; Support the establishment of climate change unit and fund;	Capacity building for staff and farmers; Source, package and disseminate information	No. of software No. of meetings held;			
To enhance tree growing and forest conservation	Community training & dryland forestry technologies dissemination; Tree seedlings production; Establishment of commercial woodlots; Develop forest products value chains; Organize tree growing & forest conservation competition & award scheme	Farmers' identification & mapping; collating & packaging of dryland forestry technologies; procurement of tree nursery materials and tree seeds; farmers' training and capacity building	No. of dryland forestry technologies adopted; No. of tree species promoted; No. of tree seedlings planted; % of tree cover & forest cover achieved; No. demonstration farms established; No. of farmers trained; No. of tree nurseries established;	Environment & Forestry Department; KFS; KEFRI; NGOs; CBOs;	5 years	350
To enhance environmental safeguards and reduce environmental pollution	Enforce existing laws & regulations; carry out environmental education & awareness; strengthen EIAS/EAs processes in the county; Adopt appropriate measures for sustainable waste management; Support environmental inspections and surveillance	Carry out community environmental awareness & sensitizations meetings; train communities on sustainable development; develop environmental awareness materials; Train environmental clubs and patrons on environmental conservation and climate change concepts	No. of meetings held; No. of awareness materials developed and produced;	Environment & Forestry Department; NEMA; NGOs; CBOs;	5 years	15
To rehabilitate and restore degraded & critical catchments, ecosystems & landscapes	Identification & mapping of catchments; development & implementation of catchment/ecosystem rehabilitation plans; support	Carry out catchment/ecosystem delineation; constitute community conservation groups; community	No. & size of catchments delineated and rehabilitated; No. treatments adopted; No. of beneficiaries; No. of organized	Environment & Forestry Department; NEMA;WRA, KWTA,	5 years	50

Policy Objectives	Strategies	Activities	Key Performance Indicators	Actors	Timeline	(Budget KES millions)
	establishment of community user/organized groups; promote nature-based enterprises such as gums & resins, sand harvesting, bee keeping, among others	training and capacity building; support products value addition and chain values;	community groups established;	NGOs; CBOs;		
TOTAL						**755**

Annex II: Stakeholder analysis

Table 2: Key environmental conservation and climate change adaptation stakeholders

Stakeholder	Function/ Role/ Responsibility	Competitive Advantage	Target	Assistance in Climate Change Adaptation and Resilience Building
Farmers	• Community development and empowerment	• Platform for • Engagement and custody of indigenous tradition knowledge	Climate Resilience and Adaption	• Implementation of adaptation and mitigation measures • Integration of Climate issues into livelihoods
Community-Based Organizations (CBOs)	• Community development and empowerment	• Platform for • Engagement	Climate Resilience and Adaptation	• Implementation of adaptation and mitigation measures • Integration of Climate issues into livelihoods
county Government Of Kitui	• Development support	• Constitutional mandate, resources	Delivery of proximate, easily accessible services	• Provision of • resources for mitigation and resilience building
National Government	• Formulation and enactment of overarching policies and legislation • Capacity building services to county staff	• Overarching mandate	Development support	• Provision of • resources for mitigation and resilience building
Research Institutions	• Research and sharing of findings	• Advanced research • facilities and skills	Contribution knowledge to Improve mitigation and resilience building	• Development of appropriate scientific research output
Institutions of higher learning	• Staff training and • induction	• Training facilities and skilled personnel	Develop skilled manpower	• Supply of skilled human resources
Pest Control Products Board	• Regulation and • advisory	• Legal Mandate	Maintain standards	• Quality assurance of pesticides and chemicals
Kenya Plant Health Inspectorate Service (KePHIS)	• Regulatory	• Legal Mandate	Seed quality Control	• Quality assurance of seeds
National Environmental Management Authority (NEMA)	• Regulatory	• Legal Mandate	Safe and sustainable environment	• Environmental Impact Assessment Programmes
Kenya Wildlife Service (KWS)	• Protection of Wildlife	• Legal Mandate	Wildlife Conservation	• Reduce human, crop, • livestock and wildlife • conflict
Non-Governmental Organizations (NGOs)	• Policy implementation and Advocacy	• Grass root network and resource mobilization	Localized community support	• Complement government efforts in policy advocacy and • dissemination

Stakeholder	Function/ Role/ Responsibility	Competitive Advantage	Target	Assistance in Climate Change Adaptation and Resilience Building
Print and electronic media	• Dissemination of • information	• Wide coverage	Inform the public	• Publicity and awareness creation
Bi-and multilateral Development Partners	• Support • development projects	• Financial resources	Provision of complementary resources	• Funding programs and Capacity building
Financial Institutions	• Provision of • Financial facilities, • saving and credits	• Advisory, Corporate-social • Responsibilities	Resources, investment and capacity building	• Provision of financial • facilities
Private Sector	• Resource • mobilization	• Entrepreneurship, • Investment in facilities, • finances, corporate social responsibilities, and own resources	Investments, compliance with regulations and standards	• Resources, current • technology, • awareness creation, • capacity building
Parliament/county Assembly	• Legislation	• Constitution Mandate	Enactment of agricultural bills and policies	• Approval of budgets, • policies and • legislations

Annex III: Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis

Table 3: SWOT analysis on environmental degradation and impacts of climate change in Kitui county

Strengths	Opportunities
• Experienced and trainable staff • Established workflow structures • Existing aspirations and plans • Supportive development partners • Geographical positions of the county between Tana and Athi Rivers • Available land for tree growing & afforestation	• Global Climate Change Adaptation Fund • Availability of technology • Established World best practices • The National Climate Change Policy • The National Climate Change Adaptation Fund • Availability of dryland forestry technologies • Laws and Regulations
Weaknesses	**Threats**
• Low adoption of appropriate technology • Inadequate number of technical staff • Lack of adequate water harvesting infrastructure. • Inadequate technical staff capacity on matters of climate change • Low literacy levels on disaster management and climate issues • Lack of staff succession plan • Lack of Monitoring, evaluation and learning structures • Poor infrastructures • Population pressure in high-potential areas • Large tracks of denuded lands • Lack of synergies among development partners • Limited use of alternative sources of energy • Weak implementation of existing laws and regulations • High levels of illiteracy	• Unpredictable weather patterns • Increased frequency of droughts • Topography and geological conditions • High water salinity • Inter-county resource-based conflicts • Human-wildlife conflict • Emerging pests and diseases • Poor connection to the national grid/Poor power distribution. • Natural resource degradation • Lack of policy, legal and regulatory framework for sustainable land use • Poaching in National Parks and game reserves • Globalization • Low integrity • Ignorance • Low survival of the planted tree seedlings • High incidences of poverty • Seasonal rivers within the county

Annex IV: The Political, Economic, Social, Technological, Legal and Environmental (PESTLE) analysis

Table 4: PESTLE analysis of the Kitui county climate change adaptation

Factor of Change	Type of Change	Impact on climate change mitigation	Mitigation Measures
Political	Devolution: Creation of Counties and further administrative units (Sub-counties, wards and villages)	• High expectations from leaders and farmers • High competition for resources; budget allocation and projects • Pressure for the provision of adequate proximate services to farmers	• Deployment of staff and devolution of adequate enabling resources (funds, transport, office accommodation, ICT equipment and related resources). • Sensitization and awareness creation
Economic	Limited sources of livelihood	• Unemployment • Increased vulnerability levels • Increase in social evils • Food and income insecurity • Low purchasing power	• Capacity building, education and youth empowerment • Women empowerment • Wealth creation • Establish mechanisms for risk and vulnerability assessment • Identify and support viable value chains • Support market access and linkages
Social	Increased urbanization, rising population and cultural beliefs	• Pressure on land for infrastructural development • Sub-division of land into uneconomically viable units • Low adoption of appropriate mitigation measures	• Supportive policy legal and regulatory framework • Sensitization and awareness creation • Provide alternative sources of livelihood • Promotion of youth-friendly enterprises
Technological	Increased technological Development and availability	Ease of diagnosis, communication and dissemination of information	• Sensitization and training • Collaboration on capacity building and promotion of appropriate technologies for adoption mitigation • Promotion of collaborative research on climate-resilient technologies
Legal	Constitutional change and other Frameworks	Inconsistencies in policy and institutional arrangements	• Awareness creation and sensitization on issues of regulation

			• Development, review and harmonization of policy and legal frameworks • Mainstream and integrate Disaster Risk Reduction Strategies within and across all sectors • Enforce compliance with environmental regulations and standards
Environmental	General global shift in weather patterns	• High unfavourable temperatures • Loss of biodiversity (fauna and flora) • Environmental degradation	• Promotion of low carbon economy • Development of early warning systems, climate and risk monitoring systems, sustainable risk reduction frameworks and plans, insurance schemes, diversification of livelihoods and capacity building

Annex V: Risk analysis

Table 5: Risk analysis of the implementation of Environment and Climate Change Policy

Nature of Risk	Level	Mitigation Measure
Change of priorities with the change of governance	High	• Stringent legal redress • Sustained sensitization and awareness creation on the sustainability of initiatives
Occupational hazards	Medium	• Establishment and operationalization of county Disaster Management agency • Awareness creation and capacity building, • Establish effective early warning systems and county Risk Reduction Frameworks and plans • Strict adherence to procedures, standards and regulations
Conflicted interests	High	• Adequate and responsive engagements with stakeholders
Poverty	High	• Integrated planning and development approaches • Multi-stakeholder involvement in sensitization forums on appropriate value chains • Promoting alternative livelihoods and incentivizing the community on various value chains • Promotion of value additions for value chains

Annex VI: Critical players in the institutional framework

Table 6: Critical players in the institutional framework

Stakeholder	Role in implementation
County Government of Kitui:	• Formulate environment and climate change policies and legal framework. • Integrate and mainstream climate change actions, interventions and duties set out in the Climate Change Act 2016, and the National Climate Change Action Plan into various sectors. • In the development, updating and approval of the County Integrated Development Plan and the County Sectoral Plans, mainstream the implementation of the National Climate Change Action Plan, taking into account national and county priorities. • The Governor of a county shall designate a county Executive Committee Member to coordinate environmental and climate change affairs. • Submit a report on the progress of implementation of climate change actions to the county Assembly for review and debate, and a copy of this report shall be forwarded to the Directorate for information purposes (NCCA 2016 No. 19).
Kenya Forest Service (KFS)	• Offer technical backstopping on afforestation and reforestation programs. • Offer forest extension services to communities. • Formulate for approval of the board, policies and guidelines for the management, conservation and utilization of gazetted forest areas in the county. • Manage and protect forests in the county. • Promote forestry education and training. • Enforce the conditions and regulations on logging, charcoal making and other forest utilization activities. • Collaborate with other organizations and communities in the management and conservation of forests and for the utilization of biodiversity therein (National Forest Conservation and Management Act, 2016)
Kenya Forestry Research Institute (KEFRI)	• Conduct research in forestry and allied natural resources. • Disseminate research findings and Establish partnerships and cooperate with other research organizations and institutions of higher learning in joint research and training.
Kenya Water Towers Agency (KWTA)	• Coordinate and oversee the protection, rehabilitation, conservation, and sustainable management of water towers; • Coordinate and oversee the recovery and restoration of forest lands, wetlands and biodiversity hot spots; • In consultation with the relevant stakeholders, identify water towers and watersheds for protection; • Assess and monitor rehabilitation, conservation and management activities in the water towers
National Environment Management Authority (NEMA)	• Offer technical backstopping on regulation and enforcement of environmental laws and legislations. • Coordinating the various environmental management activities being undertaken by the lead agencies. • Advise the government on legislative and other measures for the management of the environment or the implementation of relevant international conventions, treaties and agreements; Advise the Government on regional and international conventions, treaties and agreements to which Kenya should be a party and follow up the implementation of such agreements. • Render advice and technical support, where possible, to entities engaged in natural resources management and environmental protection, so as to enable them to carry out their responsibilities satisfactorily. • Prepare and issue an annual report on the State of Environment in Kenya and in this regard, may direct any lead agency to prepare and submit to it a report on the state of the sector of the environment under the administration of that lead agency.

Water Resources Authority (WRA)	• Develop community capacities to actively participate in water catchments and riverine ecosystems rehabilitation. • To develop principles, guidelines and procedures for the allocation of water resources. • To monitor, and from time to time reassess, the national water resources management strategy. • To regulate and protect water resources quality from adverse impacts. • To manage and protect water catchments. • To gather and maintain information on water resources and from time to time publish forecasts, projections and information on water resources. • To liaise with other bodies for the better regulation and management of water resources;
National Drought Management Authority (NDMA)	• Develop capacity of Kitui county Climate Change Committees to manage county Climate Change Adaptation Fund. Moreover, assist in disaster risk management. • Promote the integration of drought response efforts into development policies, plans, programmes and projects in order to ensure the proper management of drought. • Develop, in consultation with stakeholders, an efficient, drought early warning system and operate the system. • Facilitate national and county level drought contingency processes and the preparation of national and county level drought contingency plans. • Establish and review, in consultation with stakeholders and relevant institutions and agencies, drought preparedness strategies. • Identify, design and implement projects and programmes that shall strengthen resilience to drought and climate change. • Prepare and issue an annual report on the state of drought management in the county; (National Drought Management Authority Act, NO. 4 OF 2016)
Kenya Meteorological Services	• Institution of county Climate Change Information System (CIS) and provision of timely weather forecast. • Provision of meteorological and climatological services to agriculture, forestry, water resources management, civil aviation and the private sector including industry, commerce and public utilities for the better exploitation and utilization of natural resources for national development. • Co-ordination of research in meteorology and climatology including co-operation with other authorities in all aspects of applied meteorological research and evolvement of suitable training programmes in all fields of meteorology.
Higher Learning Institutions	• Help in developing various environmental and climate change plans and carry out research on communities' adaptability capacity. • Help in mapping and documentation of mineral resources in the county. • Advance and expand opportunities for higher education and research in dry land agriculture, forestry, mining, energy, water and environmental sciences.
Rural Electrification Authority (REA)	• In expansion of electricity infrastructure especially in rural areas. • Promote the use of renewable energy sources including small hydros, wind, solar, biomass, geothermal, hybrid systems
NGOs and CBOs	• Awareness creation and sensitization of sustainable development and environmental conservation. • Help in resources mobilization and implementation of various community adaptation projects.
Private Sector	• Support environmental conservation activities and initiatives through Corporate Social Responsibility. • Support environmental conservation competition and award scheme.
Community Forest Associations (CFAs)	• Afforestation and reforestation of degraded ecosystems. • Awareness creation and sensitization of sustainable development and environmental conservation.

Water Resources Users Association (WRUAs):	• Conservation and protection of riverine habitats and rehabilitation of degraded ecosystems. • Awareness creation and sensitization of sustainable development and environmental conservation.
Charcoal Producers Association (CPAs)	• Regulation of charcoal production in the county. • Awareness creation and sensitization of sustainable development and environmental conservation.

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