KISII COUNTY CLIMATE CHANGE ACTION PLAN

2023- 2027

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Foreword

Climate change is known to cause unprecedented impacts to the lives, livelihoods, environment and economy of the entire world. These impacts are further localized to specific regions, including Kisii County. The drivers of climate change, being increased amount of greenhouse gases in the atmosphere, are largely contributed by developed nations which heavily invest in non-renewable energy sources like coal. Despite the fact that developing and least developed countries like Kenya, contribute negligible amount of greenhouse gases into the atmosphere, they are the ones that bear the brunt of negative climate change impacts.

Kisii County has an economy that is highly driven by climate sensitive sectors. This means that any changes in the climate parameters ought to highly disrupt the viability of its economy. Prolonged dry spells, periodic flash floods, erratic rainfall, changes in weather patterns and increased temperatures are some of the impacts that are already being felt in the county. These impacts are expected to be enhanced in frequency and magnitude, thanks to climate change.

The county government of Kisii therefore recognizes the predicament its residents may be subjected to, if nothing is done to counter these negative impacts of climate change. For this reason, therefore, the County department of Water, Energy, Environment, Natural resources and climate change spearheaded the development of the Kisii County Climate Change Action Plan, 2023-2027. The action plan will guide mainstreaming of climate change into the planning processes across all departments and sectors in the County. Mainstreaming will involve both adaptation and mitigation actions.

This action plan is informed by the Kisii County Climate Change Policy, 2019, the Kisii County Climate Change Act, 2021 and the Kisii County Participatory Climate Risk Assessment report, 2023. All these will lead to attainment of sustainable development goals, as well as spur a low carbon/green economy.

H.E. Paul Simba Arati
Governor, Kisii County Government

Executive Summary

This Kisii County Climate Change Action Plan is a culmination of a rapid risk assessment that was concurrently carried out to identify the climatic risk areas that affected the County. Introduction of this Action Plan comprises of the background to climate change action plan, purpose and objectives of the action plan, scope of the action plan and the expected outcomes of the plan. To inform this action plan a literature review which involved a global, regional and local critique of best practices and benchmarks elsewhere has been carried out. Some of the Countries reviewed include, Canada, South Africa, Pakistan, the middle east among others.
The action plan also presents the risk identification and analysis. In this section the affected sectors and the risks there in have been identified. These sectors include agriculture, Environment, natural resources, and energy, Trade, tourism and industry, Education, Infrastructure and Health.

The main climate change hazards or risks include, prolonged drought spells, flash floods and flash floods, increased rainfall intensity, changing weather patterns, landslides, mudslides, hailstorms, thunderstorms, soil erosion, pollution, deforestation, land fragmentation, occasional forest fires, among others.

The action plan presents the climate change context in Kisii County, including the climatic zones, rainfall patterns, temperature patterns, legal framework and guiding principles to climate change.

Finally, this climate change action plan presents, interventions which have been presented in the form of an action plan matrix. The matrix is arranged according to the priority climate change action area, Strategic Climate Action Priorities in the PCRA, Institutional framework for implementing the Kisii county CCAP, Roles of the CCU and the functions of the Climate change committees. The stakeholder participation process is also presented here. To aid the actualization of the Climate Change Action Plan, an implementation matrix has been developed.

Ronald Gideon Nyakweba
County Executive Committee Member - Water, Energy, Environment, Natural Resources and Climate Change

Acknowledgement

The Climate change action plan taskforce wishes to thank the Governor of Kisii County, H.E Hon. Paul Simba Arati, for the support he provided during the inception and preparation of this Action Plan. Great accolades to the Financing Locally Led Climate Action (FLLoCA) program, which provided financial resources through the Climate Change Institutional Support Grant. I wish to commend the unwavering support from the County Executive Committee Member in charge of Climate Change, Hon. Ronald Nyakweba during the entire process of the development of the Kisii County Climate Change Action Plan. The technical working group through the able leadership of the director in charge of climate change MS Anne Omwoyo did a commendable job through stakeholder engagements at all levels. Various stakeholders from the National Government, County government and civil society organizations gave their much-valued input that made the process a success. Much gratitude goes to members of staff in the directorate of climate change including Fredrick Osoro, Dennis Onyancha, Sarah Bukenyi, Hyline Simba, Delphine Ogachi and Linet Mwango, who worked tirelessly to ensure the Kisii County Climate Change Action Plan (2023-2027) was developed. Finally, much appreciation goes to the Kisii County assembly for their contribution and oversight throughout the process.

Erick Mobegi
Chief Officer - Water, Energy, Environment, Natural Resources and Climate Change

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Acronyms and Abbreviations

CCCAP	County Climate Change Action Plan
CIDP	County Integrated Development Plan
PCRA	Participatory Climate Risk Assessment
CCAP	County Climate Action Plan
CCU	Climate Change Unit
CCSC	County Climate Steering Committee
CCCPC	County Climate Change Planning Committee
CCWPC	Climate Change Ward Planning Committee
PA	Paris Agreement
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
NCCRS	National Climate Change Response Strategy
NAP	National Adaptation Plan
NCCAP	National Climate Change Action Plan
FLLoCA	Financing Locally Led Climate Action

Definition of terms

Adaptation means adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Adaptive capacity refers to the ability of systems, institutions, humans, and other organisms to adjust to potential damage, take advantage of opportunities, or respond to consequences.

Climate change refers to a change in the climate system that is caused by significant changes in the concentration of greenhouse gases due to human activities, and which is in addition to the natural climate change that has been observed during a considerable period.

Global warming refers to the observed or projected gradual increase in global surface temperature.

Greenhouse gases (GHGs) are gases that absorb and emit radiant energy within the thermal infrared range. The main GHGs measured in a GHG inventory are, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), Sulphur hexafluoride (SF6) and nitrogen trifluoride (NF3).

Mitigation refers to human interventions to prevent or slow down atmospheric GHG concentrations by limiting current or future emissions, and/or enhancing potential sinks for greenhouse gases.

Resilience refers to the capacity of social, economic and environmental systems to cope with a hazardous event, trend, or disturbance. It is manifested through responding or reorganizing in ways that assert the essential function, identity, and structure of the system, while also maintaining the capacity for adaptation, learning and transformation

Climate Risk refers to the potential for adverse consequences for human or ecological systems brought about by climate variability and climate change.

Climate Hazard refers to natural events in weather cycles e.g., droughts, wild fires, flash floods and strong winds

Vulnerability refers to the propensity or predisposition to be adversely affected. It encompasses a variety of concepts and elements, including sensitivity or susceptibility to harm, and lack of capacity to cope and adapt.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Kisii County is a County in the former Nyanza Province in southwestern Kenya. Its capital and largest town is Kisii. The county has a population of 1,266,860 people. It borders Kisii County to the North East, Narok County to the South, and Homa bay and Migori Counties to the West. The county covers an area of 1,318 km.

Climatic conditions: In terms of climatic conditions, Kisii receives an average rainfall of 1500 millimeters, with long rains falling in March and June. Maximum temperature range between 21 °C – 30 °C (69.8 °F – 86 °F) and minimum temperatures range between 15 °C – 20 °C (59 °F – 68 °F).

Administrative and political units: There are nine constituencies, nine sub-counties, forty-five county assembly wards, one hundred and three locations and two hundred and thirty-seven sub-locations. The sub-counties often work directly with national government.

1.2 Background

The Climate Change Unit coordinated the development of KCCCAP 2023- 2027 through a multi sectoral working group drawn from sectors highly affected by climate change. This included County's departments responsible for Disaster Risk Reduction; Agriculture, urban development, water, forestry, health, Sanitation and human Settlements, energy and transport. Considering the cross-cutting nature of climate change sector, players and actors participated and have been considered as key institutions that will realize achievement of strategic objectives within their jurisdiction.

This KCCCAP was developed after conducting a Participatory Climate Risk Assessment through a co-created participatory approach and the outcomes used to inform the Climate Change Action Plan. The Participatory Climate Risk Assessment provided an understanding of the climate hazards the County is exposed to and their probability of occurrence alongside their historical, current and potential impacts.

1.3 Purpose of a climate action plan

The Kisii County Climate Change Action Plan (2023-2027) seeks to provide mechanisms and measures to achieve low carbon climate resilient development, in a manner that prioritizes adaptation, and recognizes the essence of enhancing the climate resilience. Specifically, it aims to: Align climate change actions in the County with the national development agenda, including the Kenya National Priority, Enhance the resilience of the grass root community through provision of opportunities for participation of the private sector, civil society, and vulnerable groups within society, including children, women, older members of society, persons with disabilities, youth, and members of minority or marginalized communities; vulnerable groups, including children, women, youth, persons with disabilities, the elderly, marginalized and minority communities.

While the reasons for engaging in climate action planning can be many, they essentially fall into one of two categories: "You have to" or "You want to" i.e., reasons that are externally driven or those that are internally driven, or what one might term as;

1. Policy mandates
2. Policydirection

1.4 Objectives of the Climate Change Action Plan

The main objective of this CCAP constitutes the following:

a) Approaches for analyzing action to climate change (including linkages with resilience and criteria for evaluating adaptation options).

b) Sectoral adaptation needs and action plans to reduce vulnerability including.

c) Role of ecosystem services in supporting adaptation to climate change and building resilience to its impacts.

d) Technologies for adaptation to climate change.

e) Building institutional and human capacity to respond to climate change (including demand-driven knowledge management and mobilization).

f) Addressing the social impacts of climate change such as gender, migration and human health.

g) Adaptation and mitigation synergies.

h) Availability and accessibility of climate knowledge and information (including climate monitoring and early warning systems).

i) Performance indicators for adaptation actions.

j) Strategic adaptation partnerships (including role of various actors at County levels).

k) Preparation of overlay maps for vulnerability assessment.

1.5 Scope of the Climate Change Action Plan

The scope of this climate change action plan will be to the following level and tasks

i. Review the County climate related policies, communications and other relevant County and National planning document including the Climate Change Act 2016, National Climate Change Response Strategy (NCCRS), National Adaptation Plan (NAP), National Climate Change Action Plan (NCCAP), Vision 2030, among others, with a view to identify priority adaptation actions.

ii. Review and document existing adaptation programs and projects being implemented by different actors such as government, private sector, civil society organizations and local communities with the objective of documenting experiences and up-scaling the lessons learnt as well as informing the Third generation CIDP III.

iii. Identify priority adaptation options and actions plans that reduce vulnerability and build resilience, building on the findings from (i) and (ii) above, including the Kisii County Participatory Climate Risk Assessment (PCRA).

- ✓ Establish the availability and access to localized climate data (both current and projected).
- ✓ Identify the level of risk that different sectors face with regards to climate change.
- ✓ Clarify the role to be played by private sector in adapting to climate change.

iv. Develop performance indicators to assess the impacts of adaptation actions.

v. Develop spatial overlay approach to construct vulnerability index.

vi. Facilitate stakeholder consultative sessions constituted for purposes of discussing the CCAP.

1.6 Process followed in developing the Climate Change Action Plan

The process of coming up with the CCAP was two phased. In the first phase, the county government, through the support of technical working group conducted a participatory climate risk assessment at the ward level (community representatives from all the 45 wards), while in the second phase, action planning followed as indicated in the table below;

Table 1: CCAP Process

KEY PHASES	KEY STEPS
Participatory Climate Change Action Planning	**Step 1:** The technical working group reviewed the documents that were required in the development of the Kisii County Climate Change Action Plan. The PCRA report was of great importance in this work since it greatly informed the KCCCAP
	Step 2: Data was collected from all the 45 wards with the assistance of the technical working group. The exercise provided stakeholders and community representatives at the ward levels with an opportunity to actively review and respond to the findings of the county climate risk analysis (and other relevant documents) by validating the broad thematic priority areas and suggesting concrete actions/investments consistent with them
	Step 3: County Climate Change Action Plan development, The Process was guided by the Participatory Climate Risk Assessment Report on the identified Climate risks and hazards A draft KCCCAP report was developed whereby all the relevant stakeholders were involved in the analysis of the data received from the wards through the public participation process and the report writing process at ATC Kisii.
	Step 4: Validation Workshop for the CCCAP The Validation workshop was held at ATC Kisii to present the draft CCCAP to key stakeholders for analysis and validation to ensure quality control by addressing gaps in the report and refining proposed actions based on realistic situational assessment by diverse stakeholders.
	Step 5: Public feedback The validated CCCAP report was shared to different stakeholders and made available at the Climate Change Directorate Offices for further analysis and provision of comments and inputs.
	Step 6: Development of Second (or Final) Draft of CCCAP The Final KCCCAP report was
	Step 7: Presentation of the CCCAP to the County Executive The CCCAP report was presented to the executive of the County for discussion, approval and adoption as a county plan. The County Executive Committee presented the CCCAP to the County Assembly for Approval
	Step 8: Presentation of the CCCAP to the County Assembly The CCCAP forwarded to the county assembly for discussion and adoption through the County assembly committee of Environment and water of the house. The Kisii County Assembly approved the CCCAP report.

Women, Youth, ethnic. Minorities and, people living with disabilities, and other marginalized groups were part of the community engagements as indicated in the ward engagement reports.

1.7 Guidelines for Climate Action Planning

Climate action planning presents public and private agencies with the opportunity to engage with jurisdictional partners to demonstrate and ensure consideration of the strong

potential of climate change plan to provide substantial reductions of GHGs at a local, regional and global scale. Governments have a unique role in climate action planning, as it provides more carbon-efficient economic activities.

Globally, National and State or County governments intend to facilitate greater use of non-carbon modes of economic activities such as lower-energy homes and neighborhoods. Modeling of these combined benefits has shown that governments can reduce regional GHG emissions equal to many times those it emits.
Thus, Climate change action plan emerges as a key GHG reduction tool and needs to increase rather than decrease its carbon footprint as long it does so due to system expansion and increased capacity, rather than due to reduced efficiency. The focus has been on non-carbon-based strategies such as low-carbon fuels and battery technologies while disregarding the direct and indirect emission reductions attributable to economic activities, statewide and regional CAP approaches to the economic sector.
The aim of climate change action planning is to ensure Sustainability, and preserving the environment and by, being socially responsible and maintaining economic viability, with an overall contribution to quality of life, which is integral to what is done and what is provided to the public sector.
Governments have made it a strategic objective and have made great strides to increase the sustainability of their own organizations, in great part as a way to become more resource efficient, engage more with employees and customers and grow non-carbon emissions, market share and funding support.
And the drive toward sustainability is increasing as issues such as climate change, energy independence, preservation of resources and quality of life rise to the forefront in the public and political arenas.

As part of the broader sustainability efforts, many local jurisdictions are developing climate action plans (CAPs) to understand how to reduce their greenhouse gas (GHG) emissions. National agencies are also striving to take a leadership role on this issue, through advocating for strategies and investments to provide the public with clean economic choices that help to reduce GHG emissions locally, regionally and globally, while at the same time improving their own performance. They are also recognizing that climate change could have substantial impacts on their operations and are seeking to anticipate and respond proactively.
The Guiding Principles for the preparation of the Kisii County Climate Change Action were:

(a) Locally led decision making to the lowest level
Responding to actual adaptation and mitigation needs in Kenya through taking of measures that reduce the adverse effects of climate change and preventing or minimizing the causes of climate change.

(b) Equity and social inclusion
Addressing the needs of vulnerable groups within society including those of children, women, older members of society, persons with disabilities and youth through addressing structural inequalities an inclusive approach to climate change action.

(c) Consultation and cooperation
Implementing actions through consultation and cooperation between national and county governments and active participation of the community, civil society and private sector.

(d) Fairness
Ensuring that climate actions do not create competitive disadvantage for the Kenyan private sector, relative to its trading partners.

(e) Dynamic and flexible planning
Ensuring flexible programming to address even emerging needs of the community occasioned by climate change.

(f) sharing of best practices and lessons learned

Investing in local capabilities including indigenous knowledge, community innovations and and sharing of good practices and lessons learnt

1.8 Underlying climate resilience

Climate resilience is the ability to withstand and recover from the resulting impacts of Climate change. It is a complex concept that encompasses a wide range of factors, Including social, economic and environmental.

There are several key factors contributing to climate change resilience. These include;

Adaptive capacity: The ability of a system to adapt to changing conditions. This can be achieved through a variety of means, such as developing new technologies, changing practices, or building infrastructure that is more resilient to climate change.

Social cohesion: Community cohesion is key during times of need. This is important as the community plans and experiences the shocks of climate change related disaster.

Economic diversification: Creating alternative income sources for communities can help to reduce the risk of economic collapse in sectors likely to be impacted by climate change.

Environmental health: The health of the environment is equally at stake with increasing impacts of climate change, hence protecting the environment from the impacts of climate change such as extreme weather events and air pollution resulting from human activities.

Mainstreaming Climate resilience into the County programs is important in reducing resulting negative impacts of climate change. Significant investment in climate resilience projects can help protect people, property and environment from the resulting effects of climate change

Impacts of Climate hazards in the County

Kisii County is projected to experience dry seasons in the future. This is from the projected climatic trends that indicate Kisii shall receive a higher rainfall amount during rainy days and relatively higher number of dry days during the short rains season.

This is likely to increase the impacts of climate change felt by the community. The impacts of prolonged dry spells will contribute to low productivity and reduced water quantities from existing water sources. Increased cases of pests and diseases occurrence have also been noted in the recent years. The emergence of Invasive species have been noted across the county. Increased occurrence of malaria cases have been noted and are linked to the increase of disease vectors such as malaria which affect children, expectant mothers, the elderly and terminally ill.

Climate change hazards have also contributed to the reduced quality of water, contributing to increased cases of water-borne diseases. The elderly and persons with disabilities (PWDs) are populations that are mainly affected by the effects of climate change. They are

found vulnerable to flash floods and reduced quality of water and reduced productivity from crops.

Women are mostly affected by reduced water quantities because culturally they are delegated to bear the responsibility of fetching water for domestic use. Declining water levels in springs and reduced water levels in wells and rivers have left women exposed as their main source of water remains affected by climate change because they take more time accessing water and do not have authority over resources within their households.

1.9 Spatial distribution of risks

Kisii county has a total of nine sub-counties namely Bobasi, Bomachoge Borabu, Bomachoge Chache, Bonchari, Kitutu Chache North, Kitutu Chache South, Nyaribari Chache, Nyaribari Masaba and South Mugirango having a total of 45 wards. The spatial distribution of climate hazards across the various wards within the county is mainly determined by existing human practices and the areas topographical features.

The county relatively small geographical size has made the area have minimal variation on the climate hazards within the various sub-counties and wards as illustrated in the table.

Sub-county	Ward	H1 (*3)	H2 (*2)	H3 (*1)
Bobasi	Bassi Bogetaorio	Flash floods	Pests and diseases	Landslides
	Bassi Boitangare	Flash floods	High temps	Pests and diseases
	Bassi Central	Flash floods	Prolonged dry spells	Diseases
	Bassi Cache	Prolonged dry spells	Flash floods	Landslides
	Masige East	Heavy rains	Thunderstorms	Prolonged dry spells
	Masige West	Heavy rains	Thunderstorms	Prolonged dry spells
	Nyacheki	Prolonged dry spells	Flash floods	Livestock diseases
	Sameta Mokwerero	Prolonged dry spells	Flash floods	Landslide
Bomachoge Borabu	Bokimonge	Waste disposal	Swamps	Water shortage
	Bombaba Borabu	Flash floods	Pests and diseases	Prolonged dry spells
	Boochi Borabu	Prolonged dry spells	Flash floods	Hailstorms
	Magenche	Landslides	Flash floods	Strong winds
Bomachoge Chache	Boochi Tendere	Flash floods	Hailstones	Landslides
	Bosoti Sengera	Flash floods	Landslides	Thunderstorms
	Majoge Bassi	Flash floods	Water pollution	Swamps
Bonchari	Bogiakumu	Hailstorms	Flash floods	Landslides
	Bomariba	Water shortage	Diseases	Prolonged dry spells
	Bomorenda	Human diseases	Prolonged dry spells	Changing rain patterns
	Riana	Prolonged dry spells	Flash floods	Changing rain patterns
Kitutu Chache North	Kegogi	Flash floods	Prolonged dry spells	Invasive diseases
	Marani	Flash floods	Prolonged dry spells	Landslides
	Monyerero	Flash floods	Thunderstorm	Landslides
	Sensi	Hailstorms	Thunderstorm	Flash floods
Kitutu Chache South	Bogeka	Flash floods	Prolonged dry spells	Landslides
	Bogusero	Prolonged dry spells	Flash floods	Landslides
	Kitutu Chache central	Prolonged dry spells	Flash floods	Poor drainage
	Nyakoe	Prolonged dry spells	Flash floods	Strong winds
	Nyatieko	Flash floods	Water pollution	Prolonged dry spells
Nyaribari Chache	Birongo	Soil erosion	Prolonged dry spells	Hailstorms
	Boraracho	Landslides	Soil erosion	Prolonged dry spells
	Ibeno	Prolonged dry spells	Hailstorms	Pests and diseases
	Keumbu	Prolonged dry spells	Hailstorms	Lightening
	Kiogoro	Prolonged dry spells	Hailstorms	Lightning
	Kisii Central	Prolonged dry spells	Prolonged dry spells	Hailstorms
Nyaribari Masaba	Gesusu	Prolonged dry spells	Soil erosion	Thunderstorms
	Ichuni	Prolonged dry spells	Flash floods	Thunderstorms
	Kiamokama	Prolonged dry spell	Hailstorms	Deforestation

	Masimba	Prolonged dry spells	Flash floods	Diseases
	Nyamasibi	Prolonged dry spells	Thunderstorms	Landslide
South Mugirango	Botetenga	Landslides	Prolonged dry spells	Hailstorms
	Boikanga	Flash floods	Landslides	Dry spells
	Chitago Borabu	Landslides	Prolonged dry spells	Erosion
	Getenga	Erosion	Prolonged dry spells	Swamps
	Moticho	Prolonged dry spells	Soil erosion	Pests and diseases
	Tabaka	Land slides	Prolonged dry spells	Diseases

Legend:

H1-Highly ranked hazard

H2: Moderately ranked Hazard

H3: Lowest ranked Hazard

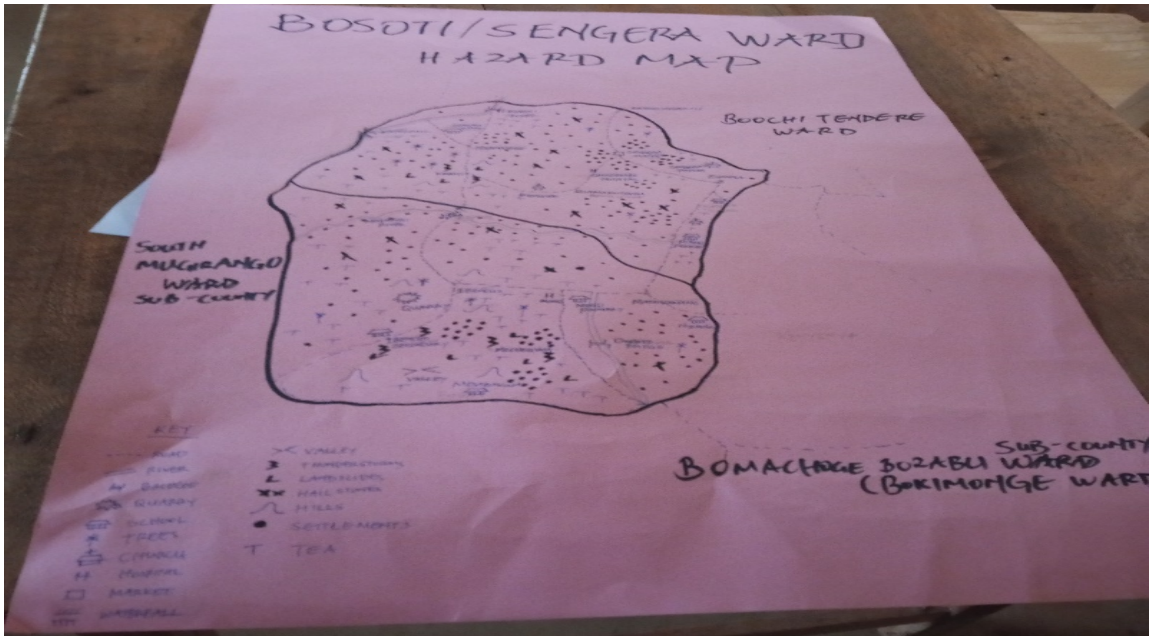
Table: Summary of likely impacts of climate change by sectors in the County

Sector	Likely impacts of climate change
Agriculture, Fisheries and Livestock	● Decline in overall crop yields in most areas due to erratic rainfall, excessive moisture conditions; and more pests, diseases, and weeds thus, greater risk to food insecurity. ● Uncertainty regarding the impact on the production of specific crops, but likely reduction in the yields of maize and beans, and potential reductions of export cash crops, such as tea, coffee and horticulture. ● Livestock deaths, caused by drought due to lack of pasture, reduced access to water and heat stress. ● Changes in disease patterns, and potential for re-emergence of climate related diseases, pests and invasive species.
Disaster and Risk Reduction	● Increased frequency and intensity of flooding, which could decrease people's ability to cope. ● Increased number of food insecure and malnourished people. ● Increased number of people without access to clean water. ● Safety risks associated with existing buildings that do not meet standards and codes. ● Destruction of key infrastructure investments in the county such as roads and drainage systems
Energy	● Decline in forest productivity, which restricts availability of fuel wood. ● Damage to infrastructure particularly power lines, transformers and poles.

Environment	● Increased likelihood of contestation and conflict over diminishing natural resources. ● Increases invasive species, and new pests and diseases. ● Increase in stagnant air, which aggravates air pollution.
Forestry	● Increased exposure to fire, pathogens, and invasive species. ● Reduced provision of environmental resources and benefits, and forestry- associated economic activities. ● Survival rate of most tree species has reduced.
Health	● Shifts in the geographic range and incidences of malaria. ● Increase in water-borne diseases, such as cholera, and typhoid.
Public Works	● Damage to infrastructure, including roads and bridges, during heavy rainfall ● Interruptions to road networks because of flooding, and heavy rainfall events. ● Disruption of access to work, markets, education, and healthcare facilities, due to damaged infrastructure. ● Increase in risks from collapse, declining health of buildings, and loss of value, due to more frequent and heavier rain events and water encroachment. ● Increased cost of maintenance of the physical infrastructure as a result of extreme weather effects.

Trade and industry	● Greater resource scarcity, such as water and raw materials that are inputs in manufacturing processes. ● Greater risk of plant, product and infrastructure damage, and supply chain disruptions from extreme climate events. ● Higher costs to companies, including for insurance.
Water	● Reduced availability of surface water for activities, such as irrigation, livestock production, household use and industry. ● Increased water loss from reservoirs, due to evaporation. ● Lower water levels in boreholes and springs, particularly during dry seasons.

Photo of hazard map



Participants from Bosoti/Sengera during the hazard maps development

1.10 Brief overview of Climate Change actions in the County

Contribution to climate change is mainly attributed to the amount of greenhouse gases (GHGs) that humans release into the atmosphere. As carbon dioxide and other GHGs build up in the atmosphere, they trap heat, which causes global warming.

Most residents in the county rely on wood fuel and charcoal for cooking. The County also has a number of manufacturing industries majorly tea factories such as; Ogembo, Nyamache, Rianyamwamu, Eberenge among other tea factories that are likely to emit GHGs.

Adaptation is the main priority to climate change; actions are needed to reduce these emissions that are projected to increase due to population, investments in processing factories and economic growth.

1.11 Mainstreaming of KCCCAP in County Actions

Currently, the County has put in place strategies to eliminate the existing gaps in the quest to address climate change. These include the development of the Kisii County Climate Change Policy 2019, Kisii County Climate Change Act of 2021, and Kisii County Climate Fund regulations of 2021 which are vital for creating an enabling environment to attract funding and investments (both locally, nationally and internationally) to mitigate and adapt to climate change.

1.11.1 Climate Change in CIDP

County has mainstreamed climate change into its CIDP and Departmental Plans since it is a cross-cutting issue. These sectors include; Water Resources Management; Agriculture, Fisheries and Livestock; Land Use Management; Disaster Risk Reduction; Public Health; Energy; Public Works; Environment; Tourism, Wildlife & Culture; and Trade and Industry.

The County through the Department of Water, Energy, Environment, Natural resources and climate Change has a section in the CIDP III specifically highlighting Climate Change interventions planned for the County in the period 2023 -2027.

1.11.2 Other key Climate Actions / Strategies in the County

(a)Political Environment; Successful delivery of Kisii County Climate Change Action Plan (2023-2027) requires a supportive political and legal environment. The county`s political environment is favourable, as the political leadership at the County level is supportive of climate change action.

(b) Economic Environment; A stable and supportive economic environment is vital to the effective delivery of CCCAP (2023-2027). The actions in this Plan require resources that depend on a stable and supportive economy.

A sufficient budgetary allocation is vital for the implementation of the actions in this KCCCAP. However, this might not be achieved due to competing demands for the revenues collected. Therefore, the County will require implementing strategies to attract foreign climate financing to supplement the local allocation.

(c) Social Environment; The county's social situation is a key to the success of KCCCAP. A significant number of Kenyans live below the poverty line which translates to the county context. Most households rely on wood- based fuels that emit substantial GHGs and particulate matter during cooking. There is need for community empowerment and ownership of the projects in this plan for it to succeed.

CHAPTER TWO: POLICY ENVIRONMENT

2.1: Enabling Policy and Legal Framework at international level

There exist frameworks that provide the basis for concerted international action to mitigate climate change and to adapt to its impacts.

Its provisions are far-sighted, innovative and firmly embedded in the concept of sustainable development as described hereunder:

2.1.1 Paris Agreement

The Paris Agreement is an international agreement linked to the United Nations Framework Convention on Climate Change, The Agreement is a legally binding international treaty on Climate Change. It was adopted by 196 parties at the UN Climate Change Conference in COP 21 at Paris, France and entered into force on 4th November 2016.

The goal of the Paris Agreement the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperatures increase to 1.5oC above pre-industrial levels

2.1.2 United Nation Framework on Climate Change

The 21st Conference of Parties to the United Nation Framework on Climate Change (UNFCC- Cop 21) marked an important milestone in international climate governance system, shifting focus from "negotiations" to "implementation".

The international response to climate change is founded upon this convention. The Paris Agreement under the UNFCCC aims to strengthen the global response to the threat of climate change by keeping global temperature rise this century well below 2°C above pre-industrial levels. Under this convention, each country committed a set of actions known as the "Nationally Determined Contributions" aimed at combating climate change through establishment of policy and legal frameworks.

Kenya ratified the UNFCCC in 1994 and set out actions to contribute to achieving the global goal. The County has been actively participating in development of the second NDC that was submitted to UNFCCC.

2.1.3 Sustainable Development Goals

The Agenda 2030 on Sustainable Development Goals emphasizes the global commitment to address climate change with goal 13 addressing the need to take urgent action to combat climate change and its impact. The county is obligated to mainstream the SDG in CIDP and other Development blue print.

2.1.4 East African Community Regional Climate Change Master Plan 2011-2031

East African Community Regional Climate Change Master Plan 2011-2031 serves as a blueprint to guide regional climate change response measures in the long term. This will help deal with Trans-boundary climate change issues.

2.2 Enabling Policy and Legal Framework at National level

Kenya has shown commitment to protect the climate system for the benefit of the present and future generations by supporting the United Nations Framework on climate change. This has been exemplified in the constitution and other frameworks on climate change.

2.2.1 Constitution of Kenya 2010

The Constitution of Kenya 2010 established a devolved system of government and specifies the distribution of functions between the National and County Governments, as set out in the fourth schedule.

As set out in Article 2(6) of the Constitution of Kenya (2010), international convention such as the Paris Agreement form part of the laws of Kenya. The County Governments in accordance to Article 185 of the Constitution and County Government Act (2012) are empowered to develop county legislations hence, regulate devolved functions provided for in Article 186.

2.2.2 Climate Change Act 2016

This is the main legislation guiding Kenya's climate change response through mainstreaming climate change into sector functions, and it is the legal foundation of the National Climate Change Action Plan.

It recognizes the complementary role between the County Governments and National governments in the management of climate change matters. In addition, climate change impacts are localized placing County Governments in a vantage point to identify and address them.

A key objective of the Climate Change Act 2016, is to integrate climate change governance between the County and National Governments and also establish institutions mechanisms to mainstream climate change matters at both National and County levels.

The Act requires Counties to mainstream implementation of the National Climate Change Action Plan in the development of the County Integrated Development Plan and the County Sectoral Plans.

2.2.3 National Climate Change Policy (2018)

The Policy was developed to facilitate a coordinated, coherent, and effective response to the local, national and global challenges and opportunities that climate change presents.

This is achieved through the adoption of a mainstreaming approach that ensures integration of climate change considerations into the development planning process, budgeting, and implementation in all

sectors and at all levels of government. In its entirety, the Policy aims to enhance adaptive capacity and build resilience to climate variability and change while promoting low carbon development pathways.

2.2.4 The National Climate Change Response Strategy 2010

This was formulated by the Country to respond to the challenges and opportunities posed by climate change by strengthening and directing actions towards climate change adaptation and GHG emission mitigation.

This was to be achieved by ensuring commitment and engagement of all stakeholders while taking into account the vulnerable nature of Kenya's natural resources and society.

2.2.5 Kenya Vision 2030

This is an economic blueprint that seeks to create "a globally competitive and prosperous nation with a high quality of life by 2030". The Vision is anchored on three key pillars: economic; social; and political.

As a climate change adaptation measure, vision 2030 aspires to conserve water sources and initiate new ways of harvesting and using rainwater, underground water, and increasing acreage under irrigation.

The Plan envisages the rehabilitation of hydro- meteorological data gathering networks; construction of multipurpose dams and increasing tree cover by planting at least seven billion trees to address food, water, and energy security.

All efforts are incognizant of the fact that the Country is water-scarce amid the increasing water demand.

2.2.6 National Climate Change Action Plan (NCCAP) 2018-2022

This was a framework linked to the "Kenya National Priority" to enable Kenya to reduce vulnerability to climate change and to improve ability to take advantage of the opportunities that climate change offers.

NCCAP (2018-2022), sets out a vision for a low carbon climate-resilient development in a manner that prioritizes adaptation. This plan builds on the first Action Plan (2013-2017) and provides a framework for Kenya to deliver on its Nationally Determined Contribution (NDC) under the Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC).

The Plan guides the climate actions of the National and County Governments, the private sector, civil society, and other actors as Kenya transitions to a low carbon climate-resilient development pathway.

2.2.7 Climate Change Plans

Kenya developed the first NCCAP (2013-2017), National Adaptation Plan (NAP 2015- 2030), Kenya Climate-Smart Agriculture Strategy (2017-2026), Climate Risk Management Framework (2017), and National Climate Finance Policy (2018), among other sector plans and policies that address aspects of climate change.

2.3 Enabling Policy and Legal Framework at county level

The County of Kisii identifies Climate Change as a threat to development milestone achieved since devolution. Various policy and legislative framework have been developed as illustrated below:

2.3. 1 Kisii County Integrated Development Plan (CIDP 2023-2027)

The CIDP 2023-2027 commits to integrate climate change risks and adopt clean energy pathway through investment in renewable energy technologies. All key sectors affected by climatic hazards have mainstreamed climate change to make them resilient to the climatic effects. The CIDP has been tailored to implement national policies on climate change to enhance community resilience to climate change impacts through promotion of climate change adaptation and mitigation programmes. The target is particularly in agriculture, public works, environment, land use, water, energy, natural resource management and education sectors among others.

2.3.2 Climate plans and regulations at county government level

County Framework	Description
County Integrated Development Plan 2023-2027.	This is the County's five-year plan to guide development. It is required that the plan mainstream climate change.
County Annual Development Plan 2023/2024	Provides for mainstreaming of green economy considerations inall capital projects.
Kisii County ClimateChange Policy 2019	The Policy proposes a legislative framework to institutionalize climate change management as well as facilitate flow of climate finances from national and international sources to finance locallyled projects. The policy also recognizes the multidisciplinary and cross-cutting nature of climate change, both in terms of disciplines and sectors and recommends mainstreaming of climate actions into all sectors.
Kisii County ClimateChange Act 2021	The Act provisions for establishment of County Climate Change Fund; Climate change governance structures; climate change adaptation and mitigation plans; and up scaling of climate information services

The Kisii County Climate Change Fund Regulations, 2021 that	Provides for procedures for management, operations and winding up of the Fund, and for planning of climate change response interventions to be funded by it.

2.4 Sectoral adaptation needs and action plans to reduce vulnerability

Sectorial adaptation requires an approach which devolves relevant decision making to the levels where the knowledge and capacity for effective adaptations is based. Sowers et al. (2011) maintain that, in the Middle East and North Africa, the largely centralized systems of planning and revenue distribution lead to little consideration of changing climates and management, which renders their populations vulnerable to climate impacts on water resources due to weak integration with local constituencies.

The agricultural sector has the potential to contribute to climate change mitigation and improve resilience by adaptation. This sector contributes about 3.7% of Greenhouse Gases emissions (GHGs) globally besides deforestation activities, which also adds between 7% to 14%, of greenhouse gas emissions on a global scale (FAO, 2013). Climate change is set to adversely affect many agricultural dependent communities especially the small-scale farmers since they are less equipped in adapting to hostile shocks, aggravating the food insecurity and global poverty situation (Morton, 2007). As a result, both mitigating efforts in the reduction of Green House Gases discharges and adaptation strategies geared towards maintaining crop harvests are of nigh importance.

A study on the assessment of smallholder farmers' perception of climate variability and change and their adaptation strategies in Masaba South Sub-County, Kisii County revealed that 88.3% of noted a decrease in rainfall, 79.1% reported poor rainfall distribution, 88.3% late onset of rainfall while 76.6% perceived an increase in temperature. This perception reflected the actual climatic data obtained from the meteorological department for the area. The major climate-smart agriculture practices adopted by farmers in the area included; diversification of crops, change of planting time and crop rotation/mixed cropping. The adoption of climate-smart agriculture practices significantly correlated with the household size, monthly income, access to credit and farmers' perception of climate change. The study recommended incorporation and prioritization of climate change in the county and government development agenda as a means of enhancing the uptake of climate-smart agricultural practices (Nyang'au, 2021).

2.5 Role of ecosystem services in supporting adaptation to climate change and building resilience to its impacts.

Climatic changes have negatively impacted the ecosystem, economic livelihoods. This present a grave risk to food production sustainability and other subsistence practices in susceptible communities in Africa. To address these negative impacts appropriately, there is a need to enhance the resilience of local farmers to climatic changes. The potential vulnerability of the community depends on how they have adapted to changes in climate. In Sub-Saharan Africa, about 80% of Agriculture is managed by smallholder farmers, making this small-scale production the backbone of most SSA countries (FAO, 2012). To enhance resilience, it requires adaptation of approaches that will reduce the impact on agricultural production while mitigating the climate change causes (Talanow et al., 2021, Traore et al., 2015).

2.6 Technologies for adaptation to climate change.

Adaptation refers to adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change.

Adaptations vary according to the system in which they occur, who undertakes them, the climatic stimuli that prompts them, and their timing, functions, forms, and effects. In unmanaged natural systems, adaptation is autonomous and reactive; it is the process by which species and ecosystems respond to changed conditions. Adaptation to climate change has the potential to substantially reduce many of the adverse impacts of climate change and enhance beneficial impacts—though neither without cost nor without leaving residual damage.

Although the farmers some proven to be resilient, climate change is likely to outpace their current coping capabilities. Depressed levels of income and technology, coupled with social isolation from local markets and lack of institutional support, represent typical characteristics of smallholder farming systems. This makes them particularly vulnerable to changes in climate (Morton, 2007).

2.7 Building institutional and human capacity to respond to climate change

According to Kisii County development plan 2018-2022, the poverty levels in the county stood at 44.5% while the number of stunted children ranged between 36-46% (Kenya National Bureau of Statistics 2015). Approximately, 32% of the population in Kisii Central rely on food bought from the market and this situation has worsened to the extent that, about 47 % of the residents in Kisii County by 2014 had no enough food in their households (African Women Studies Centre 2014).

This has attracted a number of food programs in Kisii County including Njaamarufuku which deals with value addition and Kenya Agricultural productivity and agribusiness project that deals with improvement of agricultural system through adoption of agricultural technology. Food shortages may lead to many challenges in the county whereby it may reduce labour production, cause hunger and eventually reduce life expectancy. Despite the many studies and food security programmes active in Kisii County, there is still a high incidence of food scarcity. Among the investigated factors were; the effect of land fragmentation, use of agricultural land, and land use/cover changes on food security by Kumba et al (2015), the effect of land fragmentation on food security and implications of land use cover changes on food security (Nyariki et al 2014) and (Ogechi and Waithaka 2014) respectively. While all these aspects contribute towards understanding the cause of food insecurity in the County, the study believes that, the effects of climate variability and change has not been studied exhaustively, hence the purpose of this research.

2.8 Addressing the social impacts of climate change such as gender, migration and Human health.

Key factors that account for the differences between women's and men's vulnerability to climate change risks include: gender-based differences in time use; access to assets and credit, perception by formal institutions, which can confine women's opportunities, limited access to policy discussions and decision making, and a lack of sex cumulative data for policy change.

Access to livelihood resources is controlled in African communities. This includes resources such as land, water, trees, social networks, income, credit, government social protection and safety nets, infrastructure and education, and political power. Therefore, men and women are likely to have different options and safety nets for coping with climate change (Rossi and Lambrou, 2008). Climate change usually leads to decline in food security and livelihood opportunities and this causes considerable stress, for men and

boys, given the socially ascribed expectation especially in the African society where men are supposed to provide a livelihood for the household (Ongoro, 2011). This can lead to mental illness in some cases due to stress and low self-esteem. It has been recognized that men and boys are less likely to seek help for stress and mental health issues than women and girls (Masika, 2002). Stress is likely to be heightened after disasters, particularly where families are displaced and have to live in emergency structures or transitional housing. Overcrowding, lack of privacy and the collapse of regular routines and livelihood patterns can contribute to stress leading to anger, frustration and violence, with children (especially girls) and women who are the most vulnerable bearing the brunt (Bartlett, 2008). For instance, in the recent past in Kenya a number of children and spouse/partner murders related to increased resource scarcity in homes have been reported in both the print and electronic media and in Family Courts (Maingi Vs Republic, 2008). This was especially after the 2007 Political unrest in Kenya that led to families being displaced and forcefully evicted from their homes leading to family dislocation and new gender roles emerging.

2.9 Adaptation and mitigation synergies.

Mitigation and adaptation are the two strategies for addressing climate change. Mitigation is an intervention to reduce the emissions sources or enhance the sinks of greenhouse gases. Adaptation is an 'adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities' (IPCC 2001). Mitigation addresses the causes of climate change (accumulation of greenhouse gases in the atmosphere), whereas adaptation addresses the impacts of climate change. Both approaches are needed.

Afforestation and reforestation projects are eligible under the Clean Development Mechanism Reducing emissions from deforestation and forest degradation (REDD), an initiative now at the top of the international negotiation agenda, is based on financial incentives to preserve forests and thus maintain or increase carbon stocks. The linkages between forests and adaptation are twofold (Locatelli et al. 2010). First, as climate change will affect forests, adaptation measures are needed for forests to reduce negative impacts and maintain ecosystem functions (adaptation for forests). Second, forest ecosystems contribute to adaptation by providing local ecosystem services that reduce the vulnerability of local communities and the broader society to climate change.

To achieve food security reasonably, while mitigating climatic change, there is a need to preserve the essential resources and sustaining vital ecosystem services. In addition, a need for adopting to agricultural production methods that enable increased productivity and sustainable output. Climate-smart agriculture practices are recognized as the most appropriate adaptation strategies to achieve these objectives. These practices provide an increase in agricultural productivity, increase resilience, and reduce greenhouse gases that cause climate change (FAO, 2013). The synergies between ecosystem services explain the mitigation impacts of an adaptation project; for example, mangroves simultaneously contribute to protecting coastal areas and to storing carbon. However, there may be trade-offs between carbon and the local ecosystem services prioritized by an adaptation project. For example, spatial priorities for the conservation of hydrological ecosystem services and carbon may be different. In addition to these direct impacts of adaptation projects, other indirect impacts can result if an adaptation project prevents activity displacement and induced deforestation, for example if an agricultural adaptation project sustain crop productivity and reduce clearing forest through agricultural expansion.

In the context of climate change, soil is a key factor. Soil holds properties that can either

enable or prohibit both mitigation and adaptation. When correctly managed, soil (incl. crops grown on the land) can sequester carbon, host biodiversity and protect against flooding and erosion. If badly managed, it can be a source of GHGs and increase susceptibility to flash floods and erosion. Actions to promote soil management are therefore likely to entail synergies. The INDC of Burkina Faso notes that actions to sequester carbon in the soil will contribute to restoring degraded land and mitigating climate change, but also help preserve ecosystems and water resources, which will bring adaptation benefits. India has implemented a National Initiative on Climate Resilient Agriculture to protect and stabilize ecosystems while promoting resilient cropping and farming systems to minimize risks to climate extremes, as well as increase forest/tree cover.

A number of African countries highlight actions on livestock with mitigation and adaptation benefits, though not explicitly referring to these as synergies. Burkina Faso intends to improve animal welfare through greater water availability, achieved through master plans for water development and management, as well as establishing stone barriers, levees, filtering levees, terraces, half-moons, agroforestry, and dune stabilization. At the same time, they intend to focus on improvements in feed quality, which "could likely lead to reduced methane emissions" a mitigation benefit. Togo has similar plans to improve food and promote breeding and extensive farming, while Ethiopia focuses on the importance of livestock for local farm income and thus adaptive capacity. As agriculture sector adaptation strategies, the goal is to improve livestock production practices for greater food security while reducing emissions.

Ecosystem-based approaches are often discussed from an adaptation perspective. These approaches acknowledge that the impacts of climate change can be limited in terms of the influence on, inter alia, biodiversity and agricultural resilience. Actions may include better monitoring, more sustainable management principles, and conservation and restoration measures. Ecosystem-based approaches can be found in a number of contries, including Ethiopia, Costa Rica, Mexico, and Seychelles. In these cases, this is done explicitly through an ecosystem approach. Healthy ecosystems provide ecosystem services, such as carbon sequestration and water provision, which can have adaptation and mitigation benefits. The Seychelles focus on added benefits to society such as revitalizing the extension services and also providing opportunities for young Seychellois to study climate-smart and ecosystem based approaches to agriculture, put in place programmes for sustainable industrial and artisanal fisheries, sustainable Mari-culture, promote home gardening, improve port infrastructure for artisanal and industrial fisheries, reduce illegal, unreported and unregulated activities; and continue to support the insurance scheme for farmers and fishers", Mexican, which note that ecosystem-based adaptation will have added benefits for mitigation and society at large: "In Mexico there is a large diversity of ecosystems that provide society with a vast amount of environmental services such as carbon sequestration, provision and maintenance of water, habitat conservation for the permanence of species, reduction of impacts caused by meteorological disasters, and the formation and maintenance of soils.

Implementing climate-smart agriculture (CSA) practices is the most mentioned type of action to promote synergies identified in (I) NDCSs. However, CSA is often not recognized in the (I) NDCS of individual Parties as containing M&A inter-relationships, although CSA by definition acts at the intersection of mitigation and adaption, being composed of three main pillars: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or removing greenhouse gas emissions, where possible (FAO, 2013).

2.10 Availability and accessibility of climate knowledge and information

Research aimed at improving the knowledge base of specific climate change related impacts improve access to seasonal information necessary to better inform on decisions regarding planting and the timing of agricultural practices.

Successful implementation of adaptation actions depends on the availability of information, access to technology and funding (World Bank, 2010). To address this concern, the Nairobi Work Program established in 2006, with aim of assisting developing nations to make better informed decisions based on sound scientific, technical, and socioeconomic data with repeated calls for better observation systems and information sharing among others. (UNFCCC/SBSTA/2008/3). There is an ongoing need to promote information acquisition and dissemination. Research and development, knowledge, and technology transfer are important for promoting adaptive capacity information.However, providing information does not mean that users will be able to make effective use of it, and this information will often have to be tailored or translated to the individual context. Efficacy of scientific knowledge can be improved by calibration with local and indigenous knowledge.

2.11 Performance indicators for adaptation actions.

The identification of a set of suitable performance indicators for adaptation can be complicated since what constitutes success after an adaptation intervention changes over space and time, as climate change impacts differ across sites, temporal and spatial scales, and affects a series of sectors (Spearman and MacGray 2011; Pringle and Leiter 2018). In addition, if proposed performance indicators are limited, they may not capture the entire expected performance indicators outcomes. On the other hand, if the proposed performance indicators are too broad, they may not be useful in tracking adaptation success. (Olivier et al. 2013).

Nevertheless, focusing on a specific performance approach, such as ecosystem-based adaptation may be used at the project level, this may facilitate the identification of a set of others performance indicators for tracking adaptation outcomes. The definition of adaptation outcomes that can be achieved through ecosystem-based adaptation, and the indicators that can be used to monitor them, are critical for providing information on whether this approach is delivering the expected adaptation outcomes (Spearman and MacGray 2011; McKinnon and Hole 2015; Raymond et al. 2017), as well as for understanding which interventions are performing well, hence enabling a more targeted focus of future desired activities. Furthermore, the identification of adaptation outcomes could help practitioners to better plan and monitor their projects and help practitioners to design interventions that lead to specific adaptation outcomes. The identification of a suitable performance indicators could assist funders in assessing the adaptation impacts of their investments (SNIFFER 2012) and help policy makers evaluate progress towards the adaptation goals.

2.12 Strategic adaptation partnerships

The Stockholm Plan of Action for Integrating Disaster Risks and Climate Change Impacts in Poverty Reduction (Oct 2007), with participation from governments, bilateral and

multilateral agencies, civil society organizations, experts and researchers, outlines the following five recommendations for linking these related fields: Disaster risk reduction and climate change adaptation cannot be dealt with in isolation, Risks due to disasters and climate change must be known and measured, Disaster and climate change risk analysis must be integrated into national planning processes, including the poverty reduction strategy process, in each country, Disaster risk reduction and climate change adaptation are not sectors but need to be factors in all sectors and Capacity building is required at local, national, regional and global levels. National governments have a specific role in establishing the policy and regulatory environment to encourage adaptation by individuals, households and private sector businesses.

CHAPTER THREE
RISK IDENTIFICATION AND IDENTIFICATION OF PRIORITY CLIMATE CHANGE ACTIONS

3.1 Introduction

In order to come up with a climate change action plan that will work for the county, it was important to conduct a detailed risk assessment in order to identify the specific climate risks and their impact on the affected communities. This section presents the risk identification and analysis obtained from the PCRA report.

3.2 Impacts of Climate Hazards in the County

Table 2: Sectoral Risk Identification and Analysis

No	Sector	Climate Change risk	Resultant impacts	Level of Vulnerability		
				Low	Moderate	High
1	Agriculture	• Changing weather patterns	• Shifts in planting seasons • Low agricultural productivity due to crop failure • Post-harvest losses			√
		• Exposure to invasive and parasitic species & pathogens	• Low livestock and crop production		√	
		• Increased drought occurrences	• Reduced fish production • Livestock deaths due to decline in pasture and access to water and heat stress • Changes in disease patterns, and potential for re-emergence of climate related diseases and pests that affect livestock and crops e.g. fall armyworm		√	
		• Reduced water table and levels	• Water scarcity • Crop failure • Reduced livestock production • Reduced fish production			√
		• Deforestation	• Soil erosion • Reduced soil moisture • Reduced soil fertility •			√
		• Extreme land fragmentation/subdivision	• Encroachment to riparian lands • Low agricultural productivity • Loss of wetlands • Loss of biodiversity			√
2	Environment, natural resources, and energy	• Forest fires	• Increased greenhouse gas emissions • Loss of biodiversity • Loss of medicinal plant sources		√	
		• Drought	• Decline in forest productivity, which restricts availability of fuel wood • Water scarcity • Natural resources conflict that exacerbates		√	

			gender inequality and gender-based violence • Environmental degradation. • Desertification			
		• Landslides/mudslides	• Loss life and property • Loss of arable land • Environmental degradation		√	
		• Emergency of alien species	• Destruction of indigenous plants • Emergence of new pests and diseases		√	
		• Increased solid waste generation	• Increase in air pollution • Increased greenhouse gas emissions • Global warming due to rising temperatures • Water pollution from the spillage of waste into rivers • Increased disease-causing pathogens, insects and rodents			√
		• Loss of genetic material	• Extinction of indigenous plants and animal species • Establishment of a gene bank			√
		• Lightning strikes	• Loss of lives and property			√
3	Trade, tourism and industry	• Increased intensity and duration of extreme weather events such as rainfall	• Destruction of infrastructure and facilities • Risk to workers' health and safety • Loss of lives and property • Increased water borne diseases • Loss of livelihoods			√
		• Loss of indigenous knowledge and products	• Culture erosion			√
		• Water scarcity	• Rising risk of workers' safety and health • Increase of water borne diseases such as malaria, typhoid etc			
4	Education	• Flooding/ flash floods	• Loss of livelihoods • Destruction of infrastructure		√	
		• Prolonged Dry spells	• Declines in school attendance, and rising dropout rates		√	
		• Extreme high/low temperatures	• Increased cases of respiratory diseases • Reduced learning hours • Non-attendance of schools		√	
5	Infrastructure	• Climate variability (Flooding, Thunderstorms, Strong winds, Whirl winds and lightning strikes)	• Damage/ loss of infrastructure.			√
6	Health	• Climate extremes (Droughts, temperature, thunderstorms and flash floods)	• Increased number of people without access to clean drinking water • Increased cases of food insecurity and malnutrition • Increased exposure to diseases such as asthma, malaria and other respiratory diseases • Power outages that affect frigerated medicines and patients in high dependent units			√

3.3 Differentiated climate exposure and vulnerability of key groups and livelihoods in the County

The following is the differentiated impacts of the past and current climate trends and risks on the different key interest groups in the county, with a particular focus on women, youth, ethnic minorities, people living with disabilities and other marginalized and vulnerable groups.

Table 3: Differentiated climate exposure and vulnerability of key groups and livelihoods in the County

Hazard	Effects	Most affected
Prolonged dry spells	▪ Increase in poverty due to lack of rains, crops wilt. ▪ Human wildlife conflict given that wild animals invade for field. ▪ Loss of life due to acute hunger and famine; and due to conflicts ▪ Sell of properties e.g., land to sustain themselves ▪ Drop of businesses due to lack of farm produce and death of livestock. ▪ Young girls indulge in sexual favors hence early pregnancies due to hardship at home. ▪ Young girls opt to get married at an early age due to hardship. ▪ Increase of family conflict leading to divorces.	Farmers mostly affected Children and mothers Elderly and people with disabilities
Flash floods	▪ Property along the rivers is swept away-e.g., crops such as bananas, mangoes, green grams; livestock; structures such as shanties etc. ▪ Increased prevalence of human, livestock and crop diseases e.g., malaria due to mosquitoes, cholera, amoeba, bilharzias, worm diseases for humans; fungal, bacterial and fungal for crops etc. And consequently, reduced medical supplies ▪ Erosion of the top soil leaving the land unproductive ▪ Siltation of poor unproductive soils and alluvial soil (opportunity); siltation of water sources ▪ Submergence of crops leading to anoxia (rotting) and weathering and death thus crop failure ▪ Cut off of linkages e.g., roads and bridges ▪ Drop in business due to shortage in supply of goods and services ▪ Escalation of prices for most of the commodities in the markets ▪ Accidental loss of lives ▪ Improved crop yield	Mostly affected are children and mothers due to diseases associated with them such as the diarrheal and malaria
Land slides	• Loss of lives • Loss of livestock • Injury to people and animals • Displacements of people and animals • Loss of fertile soil • Destruction of property and structures • Increased costs of repair, replacement, or maintenance resulting from damage to property or installations within the boundaries of the responsible landslides or Landslide-caused flooding. • Loss of industrial, agricultural, and forest productivity and tourist revenues as a result of damage to land or facilities or interruption of transportation systems • Loss of tax revenues on properties devalued as the result of landslides; • Measures that are required to be taken, to prevent or mitigate additional landslide damage; Adverse effects	Bobasi and Bomachoge Chache sub-counties mostly affected

	on water quality in streams and irrigation facilities outside the landslide; • Loss of human or animal productivity because of injury, death, or psychological trauma	
Hailstorms	• Destruction of crops and farms (maize, legumes and tea most affected) leading to low yields • Destruction of property • Death or injury on the livestock especially the young ones-Livestock, mostly cattle and sheep, grazing in the open become the first victim of the hail. • Compromise grip on roads thus affect transport sector	Nyaribari Chache sub-county recorded the most hailstorms
Epidemics	▪ High mortality rates (death) especially for children under 5 years for malaria ▪ Stress leading to hypertension ▪ Mental effects e.g., the cerebral malaria and nuisance ▪ Loss of energy leading to low productivity thus leading to poverty ▪ Impaired sight in case of eye infections ▪ Disabilities	Children (especially under the age of five years) and lactating mothers by malnutrition, diarrheal infections (cholera and typhoid) and malaria.
Thunder and lightning	• Death of humans and livestock • Injury to humans and livestock • Destruction of trees and forests thereby destroying biodiversity. • Interference with power and communication	Bobasi, Bomachoge Chache, Kitutu Chache North Sub-counties most affected

3.4 PRIORITY CLIMATE CHANGE ACTIONS

The KCCCAP 2023-2027 takes into consideration the impacts of climate change on the county's socio-economic context. It integrates the proposed strategic actions and the County Departmental Annual Plans, CIDP, the Bottom-Up Economic Transformation Agenda 2022-2027, Vision 2030 and the SDGs. Adaptation actions prioritized in this KCCCAP are as a result of the devastating impacts of climate change experienced in County in the recent past as identified by the community during the Participatory Climate Risk Assessment. These effects include; flooding along Rivers and in urban areas, shifting of planting seasons, prolonged dry spells and emergence of new pests, parasitic plants and diseases. The community also identified their assets and resources including forests, rivers, wetlands which are affected by climate change. This Therefore, the actions in this KCCCAP are geared towards contribution to achieving sustainable development as well as empowerment of vulnerable groups, including women, the youth, persons with disabilities, and members of marginalized and minority communities to build their resilience. The outcomes of the implementation of these actions will include increased agricultural productivity, increased access to affordable and clean cooking energy, improved access to water and climate proofed infrastructure which will enhance the adaptive capacity of the community.

This section outlines the priority climate change actions envisaged in KCCCAP 2023-2027 for implementation in the County from 1st July, 2023 to 30th June 2027. The actions will:

- Enable all County Departments to concentrate efforts towards achieving climate change adaptation and mitigation objectives.
- Support achievement of the Bottom-Up Economic Transformation Agenda 2022-2027, Vision2030 and Sustainable Development Goals related to climate change.
- Enhance the adaptive capacity and build resilience of communities, with emphasis on vulnerable groups in the society.
- Require to be undertaken in a way that limits GHGs emissions, to ensure a clean carbon pathway development.
- Require climate action to be undertaken in an integrated manner that includes all

stakeholders ranging from the research institutions, academia, county departments, the civil society, the private sector and the community.

- Require that the proposed actions be locally driven to ensure community involvement and ownership of the projects.

Table: Priority Climate Change Actions per sector objectives

Priorities	Objectives
Disaster Risk (Flash floods and Drought)Management	Reduce risks that result from climate-related hazards/disasters, such as prolonged dry spell and Flash floods, to communities and infrastructure.
Food and Nutrition Security	Increase food and nutrition security through enhanced productivity and resilience of the agricultural systems, in as low-carbon a manner as possible.
Water and the Blue Economy	Promote multiple use of water sources, enhance the resilience of the water sector by ensuring access to clean water for domestic use, and efficient use of water for agriculture, manufacturing, domestic, wildlife, and other uses, and conservation of water resources
Forestry, Wildlife andTourism	Increase forest cover to over 10% of total land area, increase the resilience of the wildlife and tourism sectors, and rehabilitate degraded lands, including forest lands, riparian land and hill slopes. Promote adoption of renewable energy to reduce overreliance on fuel wood.
Health, Sanitation andHuman Settlements	Reduce incidences of malaria, zoonotic and other vector and water diseases that are projected to increase because of climate change, encourage climate-resilient solid waste management, and promote climate resilient buildings and settlements.
Manufacturing	Improve energy and resource efficiency in the manufacturing sector, promote uptake of renewable energy in the sector.
Energy and Transport	Climate-proof energy and transport infrastructure, promoterenewable energy development, increase the uptake of clean cooking solutions, and develop sustainable transport systems.

Priority Climate Change Actions per Sub-County

Table: Priority Climate Change Actions per Sub-county

No	Location	Climate Change Priority Area	Impact	Proposed Interventions
1	Municipal & Urban Areas	Flooding (Flash floods)	-Destruction of critical infrastructure Roads -Destruction of Business -Loss of life & injuries -Contamination of water sources	-Build climate-proof roads, Culverts, bridges, side drains etc. -Build & Upgrade proper drainage and sewerage systems

		Prolonged dry weather Conditions Unpredictable/Erratic Weather patterns	-Water Shortage -Airborne diseases -Crop failure -Low agricultural yields	Catchment Protection. **Through:** -Afforestation, -Reforestation, -Rehabilitation of wetlands -Proper Forest management plans -upgrade& expand water treatment facilities
2	Kitutu Chache North	Flash floods Prolonged drought Thunderstorms Heavy rains and Hailstorms Landslides Soil erosion/land degradation	-Destruction of Infrastructure -Low agricultural yields -Destruction of agricultural crops -Destruction of buildings and homes -Loss of property and lives -Water contamination	Build climate-proof roads, Culverts, bridges, side drains etc. -Build & Upgrade proper drainage and sewerage systems Catchment Protection- -Afforestation, -Reforestation, -Build gabions
3	Kitutu Chache South	-Prolonged dry spell -Flash floods -Landslides/ Mudslides -Diseases -Water pollution -Strong winds	-Low agricultural yields -Famine -Infrastructure destruction -Destruction of trees -Contamination of water -Water borne diseases	-Build climate-proof roads, Culverts, bridges, side drains etc. -Build & Upgrade proper drainage and sewerage systems -Building gabions
4	Nyaribari Masaba	Prolonged dry spell Flash floods Thunderstorms Hailstorms	-Low agricultural produce - Hunger -Destruction of infrastructure -Destruction of crops	Catchment Protection. -Afforestation, -Reforestation, -Rehabilitation of wetlands -Proper Forest management plans -upgrade& expand water treatment facilities
5	Nyaribari Chache	Prolonged dry spells Hailstorms Soil erosion Dry spells Land slides	Low agricultural yields -Famine -Infrastructure destruction -Destruction of trees -Contamination of	Build climate-proof roads, Culverts, bridges, side drains etc -Build & Upgrade proper drainage and sewerage systems Catchment Protection- -Afforestation, -Reforestation, -Build gabions
6	Bomachoge Borabu	Flash floods Prolonged dry spell Land slides Diseases	Low agricultural yields -Famine -Infrastructure destruction -Destruction of trees -Contamination of water -Water related sicknesses	Build climate-proof roads, Culverts, bridges, side drains etc -Build & Upgrade proper drainage and sewerage systems Catchment Protection- -Afforestation, -Reforestation, -Build gabions and dykes
7	Bomachoge Chache	Prolonged dry spell Hailstorms	Low agricultural yields -Famine -Infrastructure destruction -Destruction of trees -Contamination of water sources	-Build climate-proof roads, Culverts, bridges, side drains etc. -Build & Upgrade proper drainage and sewerage systems -Roof water harvesting and storage -Enhance clean and safe water supply -Public health awareness campaigns
8	Bobasi	Flash floods Prolonged dry spell Heavy rains Diseases	Low agricultural yields -Famine -Infrastructure destruction	-Build climate-proof roads, Culverts, bridges, side drains etc. -Build & Upgrade proper

		Thunderstorms	-Destruction of trees -Contamination of water -Water related sicknesses	drainage and sewerage systems -Roof water harvesting and storage -Enhance clean and safe water supply Public health awareness campaigns
9	South Mugirango	Landslides Dry Spells Soil Erosion Flash floods Diseases	Low agricultural yields -Famine -Infrastructure destruction -Destruction of trees -Contamination of water -Water related sicknesses -Destruction of soil fertility	Catchment Protection. -Afforestation, -Reforestation, -Rehabilitation of wetlands -Proper Forest management plans -upgrade& expand water treatment facilities -Roof water harvesting and storage -Enhance clean and safe water supply
10	Bonchari	Prolonged dry spell Diseases Flash floods Hailstorms Water Shortage	-Low agricultural yields -Famine -Infrastructure destruction -Destruction of trees -Contamination of water -Water related sicknesses	-Build climate-proof roads, Culverts, bridges, side drains etc. -Build & Upgrade proper drainage and sewerage systems -Roof water harvesting and storage -Enhance clean and safe water supply -Public health awareness campaigns

Alignment with other development agenda

a) The Bottom-Up Economic Transformation Agenda 2022-2027

The blue print prioritizes five sectors that form the core pillars of the strategy. This includes:

- Agriculture
- Micro, Small and Medium Enterprise (MSME) economy
- Housing and Settlement
- Healthcare
- Digital Superhighway and Creative Economy

On Environment and climate change the strategy commits to reduce emissions by 32 per cent by 2030. Key issues include climate change, impact mitigation, adaptation and resilience. The constitutional mandate to ensure at least 10 per cent land area forest cover calls for ecological sustainable development. It prioritizes value chains that include Biomass energy (wood fuel), agro-forestry and solid waste management.

b) Sustainable Development Goals (SDGs)

Relevant SDGs include; **Goal 1:** No Poverty; **Goal 2:** Zero Hunger; **Goal 3:** Good Health and Well-Being; **Goal 4:** Quality Education; **Goal 5:** Gender Equality; **Goal 6:** Clean Water and Sanitation; **Goal 7:** Affordable and Clean Energy; **Goal 8:**Decent Work and Economic Growth; **Goal 9:** Industry, Innovation and Infrastructure; **Goal 10:**Reduced Inequalities; **Goal 11:**Sustainable Cities and Communities; **Goal 12:** Responsible Consumption and Production; **Goal 13:** Climate Action; **Goal 14:** Life

below Water; **Goal 15:** Life on Land; **Goal 16:** Peace, Justice and Strong Institutions and **Goal 17:** Partnership for the Goals.

Summary of priority actions

Action	Expected Results by 2027	Adaptation/ mitigation/ Enabling	Collaborators
Enhance resilience of vulnerable populations to climate related shocks	• Acreage of fragile ecosystems rehabilitatedincreased. • Number of households given alternative livelihoodsin disaster prone zones. • Number of households able to cope with disasters by receiving donations increased by 29%. • Undertake resettlements • Number of trees planted in fragile ecosystems increased. • Number of households capacity build on disastermanagement increased	Adaptation	County Treasury and Planning, Kenya Metrological Department, County Department of Public Administration, County Department of Water Environment and Natural Resources, Lake Victoria South Water Service Board, Water Resources Authority (WRA), Water Resource Users Associations, community groups, Public Benefit Organizations, civil society and the private sector
Improve the ability of people to cope with climate related disasters	• People-centred early warning systems developed. • Number of recipients of climate information services who use the information in their risk management decisions increased • Bulk water harvesting and storage facilities increased	Adaptation	
Improve the Co-ordination an d delivery of disaster risk management.	• Improve the coordination of disaster risk management, including of flash floods, prolonged dry spell, disease outbreaks, landslides, and otherdisasters • Engendered County Disaster Risk Management plan; • Committees to coordinate disaster response at County levels; • Disaster Risk Management Fund to provide funds for disaster preparedness, mitigation of disaster impacts, and disaster recovery measures, particularly for vulnerable groups.	Enabler	
Technology an dknowledge management.	• Implementation of County climate information service plan. • Invest in GIS laboratory to utilize modern data tools to map vulnerability areas.	Enabler	
Enabling finance	• Contingency Fund allocations within Climate change finance to address urgent and unforeseen needs	Enabler	

Action	Expected Results by 2027	Adaptation/ mitigation/ Enabling	Collaborators
Farmers training on CA, Fall army worm management and production of organic fertilizers	• Increased number of farmers practicing CA	Adaptation	Department of Agriculture, Department of Water, Environment and Natural Resources, WRA, KFS, KMD, KALRO, Private sector, ICRAF, ILRI, farmer groups, Faith Based Organizations, Community Based Organization, Research Institutions, and self-help groups
Carry out integrated Pests anddisease control program	• Reduced incidences of pests anddiseases	Adaptation	
Train farmers on pre- and post-harvest management	• Reduced pre- and post-harvest loses	Adaptation	
Formation of addition	• Increased agricultural produce processing and marketing.	Adaptation	
Promote soil and waterconservation initiatives	• Reduced soil erosion and pollution	Adaptation	
Dissemination of weather and climate information (diversify media/ use of local languages)	• Improved usage of climate information	Adaptation	
Promotion of agro-forestry	• Increased farm forestry	Adaptation	
Promotion of tradition foods	• Improved traditional food production	Adaptation	
Construction of climate resilient irrigation and drainage infrastructure	• Increased production under small scale irrigation	Adaptation/ Mitigation	
Train farmers on production ofclimate resilient fodder	• Increased fodder production	Adaptation	
Provision of farm subsidies	• Increased number of farmers accessing subsidies	Adaptation	
Distribute and operationalizeclimate friendly milk coolers	• Reduced milk losses	Adaptation	
Caging of rivers, ponds and dams	• Increased fish production in cages	Adaptation	

Action	Expected Results by 2027	Adaptation/ mitigation/ Enabling	Collaborators
Establish climate resilient fishponds	• Improved fish production from ponds	Adaptation/ Mitigation	
Establish re-circulating aquaculturesystem	• Reduced carbon in aquaculture system	Adaptation	
Training households on diet diversification	• Improved diet diversification	Adaptation	
Provision of farm subsidies	• Increased number of farmers accessing subsidies	Adaptation	
Construction of reinforced water storage tanks	Number of storage tanks supplied to public institutions	Adaptation	County Treasury, County Department of Water, Environment and Natural Resources, County Legal office, Lake Victoria South Water Works Development Authority, GWASCO, Water Resources Authority, National Environment Management Authority, Water Sector Fund, Kenya Water Sector Network, Water Resource Users Association, Kenya Water Towers Agency, Private Sector, Civil Society Organizations
Construction of roof catchment in public institutions	No. institutions	Adaptation	
Conservation of riparian corridor	Number of KMs of riparian area on major riversconserved	Mitigation	
Flood control	Number of KM of embankments constructed along riverbanks in flood prone areas	Mitigation	
Adoption of green energy technologies	Number of water projects installed with water solar pumping supplies	Adaptation	
Increasing climate proof pipe watersupply	Number of KM of distribution line	Adaption	
Developing of policies and regulations	Water regulation established	Enabling	
Capacity building of WASH actors and staff	No. of trainings on water resourceclimate resilience building.	Enabling	
Install non-sewered waste water treatment units in Ogembo, Keroka, Suneka , Tabaka and other major towns in Kisii County	No. of waste water treatment units.	Adaptation	

Action	Expected Results by 2027	Adaptation/ mitigation/ Enabling	Collaborators
Restoration of degraded gazetted forest land	▪ 66 hectares of forest land restored aimed atplanting indigenous tree seedlings ▪ Establishment of 10 No. indigenous tree nurseries ▪ Fencing of 6 gazetted Forests	Mitigation	Kenya Forest Service, Water Resources Authority, National Environment Management Authority, County Departments of Environment and Natural resources, Kenya WaterTowers Agency, Kenya Forest Research Institute, Community Based organizations, Faith Based Organizations, conservation groups, research institutions and the community
Afforestation and re-afforestation outside gazetted forest areas	▪ 7 community forestd afforested. ▪ Number of hectares afforested through initiativessuch as greening of open public spaces, promotion of agro-forestry and landscaping, establishment of fruit tree nurseries	Adaptation	
Promotion of nature-based enterprises	▪ No of farmer groups supported in aquaponics. ▪ Value addition through promotion of cottage industry such as briquetting, bamboo cottageand bio fuel	Adaptation	
Capacity of actors on implementation of forest transition plans	▪ 5 sensitizations for TIPS implementation conducted	Enabling	
Develop county policies and regulation	▪ County urban and farm forest policies ▪ County natural resource Act ▪ County natural Resource Regulations	Enabling	
Reduce the incidence of malaria and other vector- borne diseases	▪ Uptake and utilization of malaria treatment services increased in new malaria areas to reduce the incidence of malaria ▪ Reduce malaria-related deaths ▪ Community-level interventions on malaria control scaled up county-wide.	Adaptation	
Reduce incidences of water borne diseases	▪ Increased sewerage connection	Adaptation.	Department of Health Services, Department of Environment & Water, National Environment Management Authority, WRA, GWASCO, Faith-Based Organizations, Public Benefit Organization, private sector, and civil society
Control flooding in human settlements	▪ Flood ways (manmade channels to divert flood water) constructed in select urban centres.	Adaptation	
Promote recycling to divert collected waste away from disposal sites.	▪ A circular economy solid waste management approach that diverts at least 90% of collected waste away from disposal sites toward various recycling practices in municipalities implemented.	Adaptation/ Mitigation	
Ensure climate proof waste management infrastructure	▪ Screen of existing and upcoming dumpsites for vulnerability to climate change, and plans developed to adapt to extreme climate patterns.	Adaptation	
Capacity building	▪ Strengthened enforcement of development control measures by capacity building the responsible County officers. ▪ Environmental education, sensitization and awareness on climate-related health risks,	enabling	

Action	Expected Results by 2027	Adaptation/ mitigation/ Enabling	Collaborators
	and proper solid waste management promoted.		
Policy and regulation	▪ Storm water harvesting strategy developed; ▪ Revision and implementation of the Solid wastemanagement strategy and Act.	Enabling	
Technologies and innovations uptake	▪ Modern solid waste management technologies adopted. Incentives provided to investors/developers who adopt green energy technologies e.g. use of solar,installation of rain water facilities and environmentally friendly waste management interventions (bio digester) and installation of lighting arrestors.	Enabling	
Adoption of clean /renewable energy and increased energy efficiency.	• Number of public and private institutions participating in energy efficiency and renewable initiatives.	Mitigation	Department of Trade, Industrializations and Tourism, Kenya Bureau of Standards (KEBS),NEMA, Environment Natural Resources and Climate Change, the private sector, research institutions, academia, civil society
Promote industrial symbiosis industrial zones	Scale-up of industrial symbiosis and environmentally sound technologies and practices in existing and upcoming industries. Circular economy to ensure composting of waste	Adaptation	
Capacity development	• Creation of awareness to promote resource efficiency within the sector through sustainable production andconsumption.	Enabling	
Policy and regulatory	• Legislations that encourage zonation of industries to promote industrial symbiosis. • Legislations to ensure proper treatment of industrialeffluents and water recycling.	Enabling	
Promote uptake climate resilient manner	Adoption of solar energy as an off-grid solution inindustries and households	Mitigation	State Department of Energy, Directorate of Energy, Energy Regulatory Commission (ERC), Kenya Power, Kenya Electricity Generating Company (KenGen), Kenya Power, Rural Electrification
Improve energy efficiencyand conservation	Energy efficiency and conservation projects delivered, which focus on: efficient lighting; energy efficiency in buildings; and Minimum energy performance standards	Mitigation	
Ensure climate proofing of existing and upcoming energy and transport infrastructure.	• Vulnerability assessment of the existing and upcoming energy and transport infrastructure done. • Periodic maintenance and improvement of existing energy and transport infrastructure.	Adaptation and Mitigation	

Action	Expected Results by 2027	Adaptation/ mitigation/ Enabling	Collaborators
Promotion of clean cooking with alternative fuels such as LPG and briquettes in both rural and urban areas.	• Increase in number of households using clean cooking with alternative fuels such as LPG in both rural and urban areas. • Reduction of GHGs emissions from the sector. • Reduced deforestation by reducing the demand for wood fuel. • Increased production of energy efficient cook- stoves and non-forest biomass fuel such as briquettes.	Mitigation	Authority (REA), Kenya Electricity Transmission Company (KETRACO), Kenya Climate Innovation Centre (KCIC), micro- finance institutions, the private sector, civil society, women's groups, youth groups
Technology andInnovation	Research undertaken on new and emerging energy technologies that would reduce GHG emissions in the energy sector such as adoption of biofuel, solar and wind energy	Enabling	
Capacity development	• Training and public awareness on the importance of adjusting to cleaner, efficientenergy household initiatives. • Trained Jua kali artisans on production of improved cook stoves;	Enabling	
Policy and regulations	Use of fiscal and tax policies and regulations toencourage uptake of clean cooking.	Enabling	

CHAPTER FOUR
DELIVERY MECHANISM FOR CCAP

4.0 DELIVERING THE KCCCAP 2023-2027

This section provides brief descriptions of the priority enabling actions to be addressed. These include;

- Enabling policy and regulatory framework;
- Technology and innovation;
- Capacity development and knowledge management;
- Climate finance and resource mobilization; and
- Transparency, Measurement, Reporting, and Verification Plus (MRV+)

4.1 Enabling Policy and Regulatory Framework

Development of comprehensive policy and regulatory framework for climate change is vital for the delivery of this KCCCAP. Kisii County has developed a County Climate Change Act 2021, Climate Change Fund regulations 2021 and a County Climate Change Policy 2019. The County has established climate change governance institutions such as the county climate change steering committee, the Climate Change Directorate to spearhead the implementation of the actions in this KCCCAP and the Ward Climate Change Planning Committee at grass root level to ensure delivery of locally led actions. It Also describes mechanisms to mainstreaming gender, youth and special needs Groups and proposes institutionalize to enable flow of climate finances from national and international sources climate finance and institutional arrangement.

Table: Priority enabling actions: Enabling policy and regulatory framework

Enabling action	Coordinating institution and relevant partners	Expected Results (Process Indicator)
Prioritise, develop and implement the needed regulations to effectively implement the County Climate Change Act, 2019 through a multi- stakeholder process.	Kisii County Climate Change Unit	The County Climate Change Policy and Climate Finance Policy developed and operationalized
Operationalisation of the County Climate Change Institutions	Climate Chang eDirectorate	Capacity building of climatechange institutions at all tiers
Sensitize and raise the awareness ofthe Community on Climate change	Climate Chang eDirectorate	Public sensitization forums in allwards

4.2 Technology and Innovation

Technology and innovation are a vital enable component for the success of this KCCCAP. This enables various sectors to apply research in technologies for climate

change infrastructure proofing, Climate Information Services (CIS), efficiency in energy and clean cooking technologies, water harvesting, plant and animal engineering. The objective of this section is to ensure the county embraces appropriate technologies to deliver the adaptations and mitigation actions.

This enabling action improves and promotes the capacity of the private sector, research institutions and academia to develop technologies and innovations that are vital for climate action. Provision of fiscal incentives and skill enrichment of the community is a vital aspect to promote locally- relevant technologies. Appropriate production technologies ensure sustainable production, consumption, resource efficiency and industrial symbiosis which are vital elements to the successof this plan.

Table: Priority enabling actions: Technology and Innovation

Enabling action	Coordinating institution and relevant partners	Expected Results (Process Indicator)
Promotion and enrichment of relevant traditional technologies as well as their incorporation into mitigation and adaptation.	• The academia andResearch institutions • The private sector • All relevant County Departments	Appropriate and locally led Technologies adopted in eachpriority sector
Encourage innovation in collaboration with the academia and research institutions and civil society organisations in a gender responsive manner.	• The academia andResearch institutions • The private sector • All relevant County Departments	New innovations adopted; sharing of best practices in thecommunity
Establishment and implementation of County Information Plan	□	
Identify policy and fiscal incentives to promote the uptake of climate-friendly technology and innovations (such as tax incentives, reduced energy tariffs, low-interest loans, and public-private partnerships).	• The academia andResearch institutions • The private sector • All relevant County Departments	Integration in County FinanceBill 2024

4.3 Capacity Development and Knowledge Management

Climate change-related knowledge management refers to the organization and sharing of climate change knowledge, while climate change-related capacity development is defined by the UNFCCC as “enhancing the capacity and ability of countries to take effective climate change action”. This involves collation and dissemination of climate change information to stakeholders for incorporation into the planning and decision-making processes.

Table: Priority enabling actions: Capacity development and knowledge management.

Enabling action	Coordinating institution and relevant partners	Expected Results
Operationalize a publicly accessible County Climate Information Service centre that includes a robust and up- to- date climate change information.	• KMD • All other relevantCounty Departments • The academia andResearch institutions • The private sector	County Climate Information Service implemented.
Operationalize a community empowerment, skills enrichment, and education centres for community awareness and outreach	• KMD • All other relevantCounty Departments • The academia andResearch institutions • The private sector	Community based climate information empowerment centres established. Capacity building of lead farmers to disseminate climateinformation
Operationalize and strengthen the capacity of governance structures to implement the County Climate Change Act 2021	• Public Service andAdministration	Capacity building of ward Administrator, community area Councils and Sub CountyAdministrators
Monitoring and Evaluation	• Climate Change Unit	Quarterly reports on progress
Evaluation of PCRA and the Workplan	• Climate Change Unit	Project implementation reportand score card
Review the County Climate Risk assessment to identify emerging climatic hazards, change vulnerability to inform identification and prioritisation of adaptation and mitigation actions.	• All other relevant CountyDepartments • The academia andResearch institutions • Private sector	Undertake County Climate change vulnerabilit yassessment.

4.4 Climate Finance and Resource Mobilization

Climate Finance plays a critical role towards building the County's resilience to impacts of climate change and variability. The transition to a low carbon and climate resilient development pathway requires a significant financial investment and interventions that will reduce the GHS emissions from key emitting sectors, climate proof sectors driving the economy and promote human well- being and ecological integrity. The County, in its Climate Change legislations provides for formation of a Climate Change Fund, climate change finance management strategies as well as facilitation of flow of climate finances from national and international sources. These policies ensure that climate activity is targeted to the lowest level

in the context of devolution be it a ward, village or community area. They also advocate for climate-compatible development, enhancement of social inclusion and promotion of public accountability. It is also expected that the County shall mainstream climate change in its annual and long-term development plans, and allocate a percentage of its budget contributing to climate finance.

Climate Finance is critical to realization of the actions set out in this plan and it is therefore imperative that the County boosts mobilization of adequate and predictable financial resources from domestic and international sources.

Table : Priority enabling actions: Climate finance and resource mobilization

Enabling Actions	Coordinating Institution	Process Indicator
Operationalization of the County Climate Change Fund	• County treasury • Climate change unit	• Transfer of own funding into the climate change fundaccount
Capacity building of the oversight committee for the Fund; annual budgeting and reporting;	• Climate Change Unit	• Capacity Building of the County Assembly committee responsible for climate change
Enhance the capacity of the climate finance management to mobilisation, tracking and reporting of financial flows.	• County treasury • All other relevant countydepartments	• County Climate resource mobilisation strategy developed and implemented • Capacity building of county treasury staff in tracking and reporting
Capacity building of the local community, private sector and civil society to develop bankable projects.	• Climate change unit • All other relevant countydepartments • Ward based climatechange committees	Project concepts developed for funding consideration

4.5 Monitoring and Evaluation: Measurement, Reporting and Verification Plus (MRV+)

The Monitoring and Evaluation of this KCCCAP 2023-2027will be mandate of the Department of Water, Environment and Natural Resources. The County Climate change Act 2021 provisions the county climate change steering committee with the role of promoting monitoring, evaluation, reporting and verification of climate change mitigation and adaptation initiatives. Adaptation actions under KCCCAP will be tracked through a monitoring and evaluation (M&E) system based on indicators.

M&E provides a vital mechanism to assess and manage progress of implementation of the proposed climate actions. Therefore, any M&E system needs to have a feedback mechanism which will ensure the continued assessment, collation and dissemination of information relating to climate change actions for ease of tracking progress, reporting and learning. This KCCCAP puts into consideration the 'Big Four Agenda': Food security and nutrition; Affordable

universal health care; Affordable housing; and Enhancing manufacturing, the Sustainable Development Goals andthe Vision 2030.

Kenya is expected to provide information on GHGs emissions, mitigation, adaptation, and the support received as in the Paris Agreement under the UNFCCC to achieve the country's NDC goals. As per the National Climate Change Act 2016, the National Climate change Council has been mandated to set targets for the regulation of GHGs emissions. The County is expected to track and report its GHGs emissions, adaptation and mitigation actions deployed to the National Council for Kenya's reporting to the UNFCCC.

Therefore, the following enabling actions must be in place for efficient M&E.

Table : Priority enabling actions: MRV+

Enabling actions	Coordinating institution and relevant partners	Expected Results (Process Indicator)
Establish and operationalise a functional County GHGs inventory and an MRV+ system for tracking mitigation for NCCC reporting. Strengthen its capacity for carbon management and verification.	• KMD • Climate ChangeUnit. • All other relevant county departments	Established County GHGs inventory and an MRV+ system.
Establish a system to track and report sector-based emissions; monitoring and reporting system.	• KMD • NEMA • Research Institutions andAcademia • Climate ChangeUnit. • All other relevant county departments	Reporting on sector-based emissions fully integrated in GHG inventory.

4.6 Institutional framework for implementing the Kisii County's CCAP

The Kisii County Climate Change Act, 2021 sets out institutional structures and responsibilities that guide oversight and management of this action plan. The KCCCAP will be implemented by the Climate Change Unit (CCU) which is domiciled in the department of Environment and Water. The directorate is headed by the Director of Climate Change. The County Climate Change Steering Committee (chaired by His Excellency the Governor of Kisii County) is responsible for oversight and overall coordination of climate change affairs within the County, including guiding the implementation of this action plan.

4.6.1 Roles of the CCU

a) Set county-specific targets for climate change actions, and develop strategies to achieve the targets;

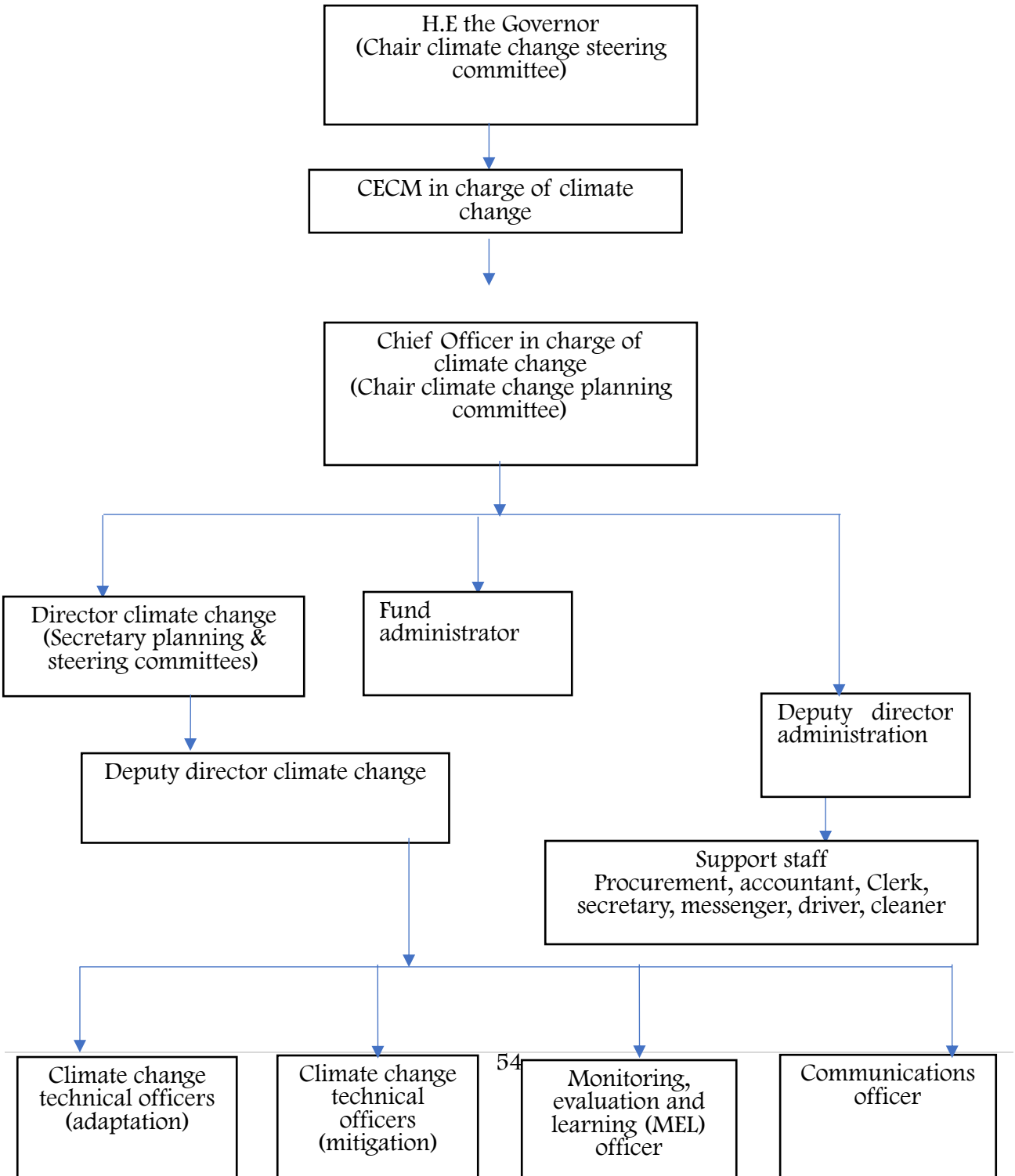
b) Mainstream climate change in CIDP and regularly update them;
c) Capture activity data and coordinate their analysis, documentation and dissemination;
d) Mainstream disaster risk reduction in development projects and spatial plans;
e) Approve and oversee implementation of county climate change actions;
f) Advise departments and the county assembly on legislative and policy measures necessary for climate change response and attaining low carbon climate-resilient development pathways;
g) Develop public education, awareness strategy and implementation programme;
h) Identify research and training needs and methods to disseminate information relating to climate change to all stakeholders;
i) Prepare quarterly and annual reports;
j) Establish and manage a climate change registry of actions by sectors public benefit organizations and the private sector;
k) Identify low carbon development strategies and coordinate related measurement, reporting and verification; develop and coordinate strategies for building resilience;
l) Coordinate with sub-county and ward administrators to ensure an impact on the ground;
m) Establish knowledge management centres on climate change at the sub-county level;
n) Build the inter-county platform, particularly to strengthen policy dialogue on shared resources, peer learning, and joint work-planning at sub-regional and regional levels;
o) Identify training and awareness needs related to climate change;
p) Data collection and analysis, as well as its communication to counties;
q) Establish communication and information dissemination channels on climate change.

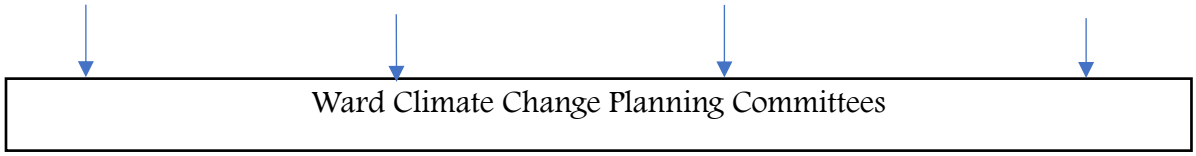
Table: Institutional arrangement of the CCU

Position	Roles and responsibilities
CECM	Coordinate and provide policy oversight of the CCU Liaise with the County Assembly,
CO in charge of climate change	Chairs the county climate change planning committee
Director climate change	Secretariat to the steering committee and sign off all reports before submission to CECM or other external partners. Oversee the day-to-day operations of the CCU secretariat. Coordinate all activities related to climate change in consultation with other Directors.
Fund administrator	Manage the climate change fund to ensure it delivers on the promised resilience among the most vulnerable. Keep records and coordinate all projects partners in delivering on their objectives. Manage all project budgets and report to funders.
Monitoring Evaluation & Learning	Develop and oversee implementation of an M&E strategy for the county covering all wards. Support ward officials through capacity development. Support documentation and development of stories of change for dissemination. Organize learning forums among wards across the county. Data collection and reporting to aid the revision of NDCs.
Communications officer	Develop and implement county the CC communication strategy; Media liaison – an important role in the translation of climate information – lessons from other well-performers e.g., malaria campaigns; Develop county climate change stories/documentaries; Is the COG Maarifa Centre Contact for information and documentation; Liaison County Assembly and Climate Change Directorate through the Governor's office. Recommended to sit in all climate change committees for information sharing.

Climate Change technical officers	a) Developing concepts and proposals on climate change adaptation and mitigation for funding purposes b) Conducting research on sustainable mitigation practices for adoption on the County c) Identifying potential partners and areas of collaboration in climate change mitigation and adaptation d) Disseminate knowledge to local community on climate change mitigation strategies through sensitizations and capacity building

Figure: Organizational Structure of the Climate Change Directorate





4.6.2 ***Figure: Organogram of the CCU***

4.6.2.1 The County Climate Steering Committee (CCSC)

The Kisii County Climate Change steering committee is chaired by H.E the Governor and the Director in Charge of Climate matters as its secretary. Membership comprises of; CECM Finance and Planning, CECM Agriculture, CECM Livestock and Fisheries, CECM in charge of Health, C ECM in charge of Water and Irrigation, County Director of Meteorology, County Director of Environment, One representative of Public Benefit Organizations working in the county ,One representative of the private sector in the county nominated, One representative of women in the county, One representative of youth in the county and One representative of persons with disability in the county.

The steering Committee will coordinate and oversee climate change responses in the County and also take responsibility of the following functions;

a) ensure mainstreaming of climate change into county planning and development process;
b) coordinate formulation and monitor implementation of the County Climate Change Action Plan, County Climate Finance Framework and any other county climate change policies, plans and strategies;
c) administer the County Climate Change Fund established under this Act;
d) review, approve and monitor implementation of Regulations for administration and management of the Fund;
e) review and make recommendations on the biennial report on implementation of the County Climate Change Action Plan and any other reports on climate change response interventions in the county;
f) advise the county government on legislative, policy and other measures necessary for climate change response and attainment of low carbon climate resilient development;
g) approve and oversee the implementation in the county of a comprehensive programme of climate change education, awareness creation and capacity building;
h) provide policy direction on research, training and dissemination of information relating to climate change to the public and other stakeholders of the county;
i) ensure positive linkages, interaction and synergy between the county, neighbouring counties and the national government in climate change response programming and action;
j) ensure a coordinated approach to climate change response programming and action within the county government, between the county government and national government, and among the different stakeholders in the county; and perform any other functions that may further the foregoing objectives and/or may be assigned by the county government.

4.6.2.2 Kisii County Climate Change Planning Committee

The County Climate Planning Committee is chaired by the chief officer, Climate Change and assisted by the secretary who is the Director in charge of Climate change. Other members include; Director in charge of Finance and Planning, Director in charge of Agriculture, Livestock and Fisheries, Director in charge of Public Health and Sanitation, Director in charge of Water and Irrigation, County Director of Environment, County Director of Meteorology or a designated representative, One representative of Public Benefit Organizations, One representative of the private sector in the county nominated by the county women's network, One representative of youth in the county, The Administrator of the Fund, who shall be an *ex-officio* member without any voting rights and County Director of Environment –NEMA.

Functions of the Planning Committee;

a) To coordinate planning, and implementation of projects and activities for climate change response in the county;
b) To coordinate implementation of the county climate change action plan and the county climate finance framework;
c) Establish guidelines to be used by ward planning committees in formulating climate response projects for funding by the county climate change fund;
d) Support ward planning committee in development and implementation of climate response projects;
e) Coordinate development and implementation of the county climate change fund regulation;
f) Advise the steering committee on strategies, priority programmes, projects and activities for climate change response in the county;
g) Formulate and implement strategic actions to foster climate change education, awareness creation and capacity development in the county;
h) To coordinate research and knowledge management on climate change, its impacts and strategies for responding thereto; formulate and implement a county monitoring, evaluation and reporting framework for climate change response.

4.6.2.3 Ward Climate Change Planning Committees

The County government cascaded climate change response strategies to the wards level by putting in place ward climate change planning committees. The Ward Planning Committees are comprised of; One male elder, one female elder, one male youth, one female youth, one male person living with disability, one female person living with disability, one person representing Community-based Organizations in the Ward and actively engaged in climate change response activities. The ward administrator is the Secretary, and an *ex-officio* member to the Ward climate change planning committee.

Functions of the Ward Planning Committee

a) Coordinate and mobilize communities and other stakeholders in the ward to design and implement climate change response activities;
b) Facilitate research and knowledge management at the ward level on climate change, its impacts and strategies for responding thereto;
c) Facilitate public education, awareness creation, and capacity building at the ward level on climate change, its impacts and strategies for responding thereto;

d) To coordinate, facilitate and manage community consultations on priority climate change response activities;
e) Participate in county planning and budgeting processes with a view to ensuring the mainstreaming of climate change and prioritization of climate change response in county development plans;
f) Facilitate public participation in climate change governance, implementation of agreed climate change response activities, and monitoring of those activities;
g) Coordinate and facilitate provision of technical support to communities in the ward in developing proposals on climate change response projects for funding by the county climate change fund;
h) To oversee implementation of climate change response projects funded by the county climate change fund and report thereon to the planning committee;
i) To perform any other functions that may be assigned to it by the planning committee.

4.7 Implementation Roles of other County agencies

The implementation of this plan is reliant on enabling environment, including the establishment of governance structures proposed in the County Climate Change Governance Framework and mainstreaming of climate change actions, interventions and duties into County Integrated Development Plans (CIDPs).

The implementation of actions in the Plan requires the involvement and contribution of all the stakeholders across the affected and vulnerable thematic areas. Below are some of the stakeholdersand their roles;

a) Government Agencies

The Government agencies will coordinate interventions by integrating the Plan into their Annual Development Plans. Medium Term Plans or County Integrated Development Plans to prioritize mitigation and adaptation projects. For instance, the Kenya Meteorological Department can provide climate information and NEMA to ensure environmental and social safeguards compliance.

b) Public and Private sector:

The county government recognizes the importance of building and sustaining partnerships with the public and development partners at all levels to ensure collective ownership of all climate change responses. Strengthening the working relations with the partners for efficient adoption of priority climate adaptation and mitigation actions is vital for successful KCCCAP implementation. Platforms such as the media are vital since they can provide vital information at times of emergency from warning on natural climate change related disasters and awareness creation.

c) Academia and research institutions:

These institutions are vital in performance of experiment based researches on different aspects of climate change adaptation and resilience and come up with innovations that can improve resiliencein terms of technologies and innovations.

d) Public Benefit Organizations:

These include non-governmental organizations, civil society organizations and faith-based organizations, amongst others. The civil society is vital in creation of public awareness, policy development, research and analysis, information sharing and promotion of adoption of improved technologies, livelihood support advocacy on societal issues.

4.8 Financial Requirement

The implementation of this KCCCAP 2023-2027 will require **Kshs. 7.884 billion.**

4.9 Guiding principles

Implementation of this Action Plan shall be guided by the following values and principles;

a) Community driven and bottom -up planning of responses to climate change;
b) Commitment to informed participation of communities in planning and implementation of climate change response interventions;
c) Recognition, respect and integration of knowledge, perspectives and experiences of communities in climate change response;
d) Planning and implementation of climate change response to be anchored in and supportive of devolution;
e) Flexible learning approach to addressing challenges of climate change;
f) Investments focused on achieving equitable benefits;
g) Inclusion of all major actors in planning and implementation of climate change response;
h) Protection of the climate system for the benefit of present and future generations;
i) Ensuring a just transition for all towards an environmentally sustainable economically and society in the light of county circumstances and developmental goals;
j) National values and principles of governance set out in Article 10 of the Constitution;
k) Values and principles of public services spelt out in Article 232 of the Constitution;
l) Promotion and protection of right to a clean and healthy environment in accordance with Article 42 of the Constitution of Kenya 2010;
m) Commitment to fulfilment of the state obligations in respect of the environment as stipulated Under Article 69 of the Constitution of Kenya, 2010.

4.10 Climate Change Action Plan Implementation Matrix

For the effective implementation of the County Climate change action plan, an implementation matrix has been prepared to assist the implementation team follow a sequence and pattern. This will help to implement the plan with accuracy and efficiency as shown in table and Appendix 1.

Table: Implementation matrix of the Climate Change Action Plan

SECTORAL IMPLEMENTATION MATRIX											
Sector	Priority Actions	Anticipated Outcome / Output	Output Indicators	Time-frame	Responsible (Actors)	Source of funds	Indicative budget in million (Kshs.)				
							23/24	24/25	25/26	26/27	27/28
Climate Information Services	Enhance weather observation network for improved weather forecast	Baseline survey of existing weather instruments in the County (government and privately owned) conducted	Number of baseline survey of existing weather instruments in the County conducted	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	1	0	0	0	0
		Automatic weather stations installed	Number of Automatic weather stations installed	2023 - 2027	Department of Meteorology	National Government County Government Development partners FLLoCA	50	50	50	50	50
		Establish a climate information centre to collate and disseminate weather information	Percentage of completion of climate information centre	2023 - 2027	Department of Meteorology	National Government County Government Development partners FLLoCA	50	50	10	5	0
Agriculture	Increase awareness on changing weather patterns and ideal seasonal crops	Trainings conducted on changing weather patterns and ideal seasonal crops to be planted	Number of trainings conducted on changing weather patterns and ideal seasonal crops to be planted	2023 - 2027	Department of meteorology Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	10	10	10	5	5

	Reduce post-harvest losses	Farmers sensitized on post-harvest handling mechanisms	Number of farmers sensitized on post-harvest handling mechanisms	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	4	4	4	4	4
		Purchase and installation of solar powered cold storage facilities for perishable agricultural produce in cooperatives and markets	Number of cold storage facilities purchased and installed for perishable agricultural produce in cooperatives and markets	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	20	20	20	20	20
	Promotion of Resilient livestock Pasture and Fodder varieties, fodder production and conservation	Increased access to steady supply of sufficient quantities of nutritious fodder	Number of farmers trained and demonstrations conducted	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	5	5	5	5	5
		Farmers trained on bailing of hay silage conservation	Number of bales of hay and kilograms of silage conserved/ sold/ fed to livestock	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	5	5	5	5	5
		Processing and utilization of crop by products as livestock feed resources promoted	Number of farmers trained and tonnes of bran, maize stover, bean haulms, finger millet stover, banana pseudo stem and leaves processed and used as feed	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	3	3	3	3	3

			Number of chaff cutters, feed choppers and pulverizers installed for feed processing	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	3	3	3	3	3
	Promotion of and demonstration on biogas production from livestock waste	Biogas systems constructed/ installed	Number of farmers trained and demonstrations conducted	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	5	5	5	5	5
	Livelihood diversification	Farmers trained on Black Soldier Fly (BSF) technology/ production	Number of farmers trained/tonnes of BSF larvae produced and used as feed	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	6	6	6	6	6
		Centres for value chain addition established (e.g., Bamboo products, banana, avocados, poles/posts treatment)	Number of centres for value chain addition established (Bamboo products, avocados, banana, poles/posts treatment)	2023 - 2027	Directorate of Environment and Natural resources, KFS, Agriculture	National Government County Government Development partners FLLoCA	200	200	100	100	50
	Increase surveillance and research on emerging invasive species and pathogens	Surveillance and research on invasive species and pathogens conducted	Number of surveillance and research on invasive species and pathogens conducted	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	3	3	3	3	3

		Biological and Chemical control measures applied	Number of biological and Chemical control measures applied	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	5	5	5	5	5
	Enhance the use of irrigation schemes	Acreage under Irrigation increased	Number of acreages under Irrigation increased	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	10	10	10	5	5
	Increase food productivity	Climate smart agricultural practices supported (including aquaculture holding units)	Number of climate smart agricultural practices supported (including aquaculture holding units)	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	10	10	10	5	5
		Fish multiplication centres modernized	Number of fish multiplication centres modernized	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	15	10	10	5	5
		Agricultural inputs subsidized	Number of agricultural inputs subsidized	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	20	20	20	20	20

		Indigenous vegetables value addition enhanced	Number of farmers trained, registered, and provided with farm input	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	3	3	2	2	1
			Number of vegetable solar dryers supplied	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	10	10	5	5	2
		Greenhouse farming promoted	Number of farmers trained and supplied with green houses	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	5	5	5	5	5
	Promotion of orphan/ traditional high value crops (F/millet, Cassava, cowpeas, sorghum, s/potatoes)	Orphan/ traditional high value crops promoted	Number of farmers trained and assisted with seedlings and other farm input for orphan/traditional high value crops promoted	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	15	15	15	10	10
	Improve soil/land productivity	Soil/ land conservation measures implemented (terraces, gabions, retention ditches)	Number of Soil/land conservation measures implemented	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	50	50	50	50	50

		Soil amendment through liming	Acreage of land whose soil is amended through liming	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	50	50	50	50	50
		Production of organic manure	Kilograms of organic manure produced by farmers	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	50	50	50	50	50
	Enhance surface runoff harvesting and storage for crop and livestock production	Water pans/weirs constructed	Number of water pans/weirs constructed	2023 - 2027	Directorate of agriculture, livestock and fisheries	National Government County Government Development partners FLLoCA	10	10	10	10	10
Environment, water, natural resources, and energy	Increase use of alternative/renewable sources of energy	Biogas plants (waste to energy) in public institutions constructed	Number of biogas plants (waste to energy) constructed in public institutions	2023 - 2027	Directorate of Energy	National Government County Government Development partners FLLoCA	100	100	100	100	100
		Solar panels and power backup systems installed in county projects, public institutions and facilities	Number of Solar panels and power backup systems installed in county projects, public institutions and facilities	2023 - 2027	Directorate of Energy	National Government County Government Development partners FLLoCA	150	150	150	150	150

		Install solar street lights in urban areas and market centres	Number of solar street lights in urban areas and market centres	2023 - 2027	Directorate of Energy, Municipalities	National Government County Government Development partners FLLoCA	50	50	50	50	50
	Rehabilitate degraded forests	County/ Community Forest surveyed, demarcated and gazetted	Number of surveys, demarcation and gazettement of county/Community Forests done	2023 - 2027	Directorate of Environment and Natural resources, KFS, NEMA	National Government County Government Development partners FLLoCA	20	20	20	20	20
		Afforestation/reforestation in degraded county/ community forests	Number of Ha of county/community forests afforested or reforested	2023 - 2027	Directorate of Environment and Natural resources, KFS, NEMA	National Government County Government Development partners FLLoCA	30	30	30	30	30
		Forest management plans developed	Number of forest management plans developed	2023 - 2027	Directorate of Environment and Natural resources, KFS	National Government County Government Development partners FLLoCA	5	2	2	1	1
	Increase tree seedlings production	County model tree nurseries established	Number of County model tree nurseries established	2023 - 2027	Directorate of Environment and Natural resources, KFS	National Government County Government Development partners FLLoCA	20	20	20	20	20

		Community tree nurseries supported (raw materials, capacity building)	Number of Community tree nurseries supported (raw materials, capacity building	2023 - 2027	Directorate of Environment and Natural resources, KFS	National Government County Government Development partners FLLoCA	5	5	5	5	5
	Promote agroforestry	Establish farmer field schools (Demo plots)	Number of farmer field schools (Demo plots) established	2023 - 2027	Directorate of Environment and Natural resources, KFS, Agriculture	National Government County Government Development partners FLLoCA	10	10	10	10	10
		Establishment of agroforestry and woodlot farms in different sub-counties	Number of agroforestry and woodlot farms in different sub-counties established	2023 - 2027	Directorate of Environment and Natural resources, KFS, Agriculture	National Government County Government Development partners FLLoCA	20	10	10	10	10
	Increase urban forest parks (urban green spaces)	Urban forest parks (urban green spaces) developed	Number of urban forest parks (urban green spaces) developed	2023 - 2027	Directorate of Environment and Natural resources, municipalities	National Government County Government Development partners FLLoCA	10	10	10	10	10
	Improve management of catchment areas including county and community forests	Capacity building conducted on forest management	Number of capacity building conducted on forest management	2023 - 2027	Directorate of Environment and Natural resources, KFS	National Government County Government Development partners FLLoCA	10	10	10	10	10

		Sub-catchment management plans developed	Number of Sub-catchment management plans developed	2023 - 2027	Directorate of Environment and Natural resources, WRA, NEMA	National Government County Government Development partners FLLoCA	5	3	1	0	0
		Support farmers in forest related enterprises like beekeeping etc. developed	Number of farmers supported in forest related enterprises like beekeeping etc. developed	2023 - 2027	Directorate of Environment and Natural resources KFS	National Government County Government Development partners FLLoCA	10	10	10	10	10
	Protect riparian lands, springs and catchment areas	Indigenous tree species and bamboo planted on riparian lands and catchment areas	Number of indigenous tree species and bamboo planted on riparian lands and catchment areas	2023 - 2027	Directorate of Environment and Natural resources	National Government County Government Development partners FLLoCA	200	200	200	200	200
		Campaigns and awareness creation conducted on removal eucalyptus tree species from riparian lands	Number of campaigns and awareness creation conducted on removal eucalyptus tree species from riparian lands	2023 - 2027	Directorate of Environment and Natural resources	National Government County Government Development partners FLLoCA	100	100	100	100	100
		Hydrogeological surveys conducted to establish abstraction vs recharge levels (to regulate borehole drilling)	Number of Hydrogeological surveys conducted to establish abstraction vs recharge levels	2023 - 2027	Directorate of water	National Government County Government Development partners FLLoCA	50	30	20	10	5

	Preserve indigenous vegetation	Herbal gardens developed	Number of Herbal gardens developed	2023 - 2027	Directorate of Environment and Natural resources	National Government County Government Development partners FLLoCA	5	5	5	5	5
	Rehabilitate fragile ecosystems and degraded lands	Fragile ecosystems and degraded lands rehabilitated (wetlands, gullies, abandoned quarries)	Number fragile ecosystems and degraded lands rehabilitated (gullies, abandoned quarries, wetlands)	2023 - 2027	Directorate of Environment and Natural resources	National Government County Government Development partners FLLoCA	50	50	50	50	50
	Enhance solid waste management	Recycling/collection centers for different solid waste streams established (plastics, e-waste, metals, etc.)	Number of recycling/collection centers for different solid waste streams established (plastics, e-waste, metals, etc.)	2023 - 2027	Directorate of Environment and Natural resources, NEMA	National Government County Government Development partners FLLoCA	30	10	10	5	5
		Land fill with modern solid waste treatment systems established	Number of land fill with modern solid waste treatment systems established	2023 - 2027	Directorate of Environment and Natural resources, NEMA	National Government County Government Development partners FLLoCA	150	50	0	0	0
		Establishment of composting facilities (organic waste to compost manure) at subcounty level	Number of composting facilities established	2023 - 2027	Directorate of Environment and Natural resources. Agriculture	National Government County Government Development partners FLLoCA	10	10	10	5	5

Water	Increase and sustain water availability	Water schemes established for water reticulation	Number of water schemes established for water reticulation	2023 - 2027	Directorate of water	National Government County Government Development partners FLLoCA	30	30	20	10	10
		Water springs protected	Number of water springs protected	2023 - 2027	Directorate of water	National Government County Government Development partners FLLoCA	20	15	10	10	10
		Boreholes drilled in water stressed areas	Number of boreholes drilled in water stressed areas	2023 - 2027	Directorate of water	National Government County Government Development partners FLLoCA	50	50	50	50	50
		Water tanks purchased and installed for roof water harvesting and storage in public institutions and projects led by vulnerable groups (e.g., women, PLWDs, Youths, Marginalized etc.)	Number of water tanks purchased and installed for roof water harvesting and storage in public institutions and projects led by vulnerable groups (e.g., women, PLWDs, Youths, Marginalized etc.)	2023 - 2027	Directorate of water	National Government County Government Development partners FLLoCA	20	20	20	20	20
Disaster management	Reduce lightning strike incidences	Lightening arrestors installed lightning prone areas	Number of lightening arrestors installed in lightning prone areas	2023 - 2027	Directorate of disaster management	National Government County Government Development partners FLLoCA	50	50	20	10	10

Trade, industry and tourism	Preserve indigenous knowledge and products	Museum (culture centre) established to act as a repository of traditional knowledge and products	Percentage of completion of museum (culture centre) established to act as a repository of knowledge and products	2023 - 2027	Directorate of trade	National Government County Government Development partners FLLoCA	30	10	10	0	0
Education	Reduce impact of Flash floods in learning institutions	Learning institutions climate proofed (e.g., raised foundation of class rooms in flood prone areas)	Number of learning institutions climate proofed	2023 - 2027	Directorate of education	National Government County Government Development partners FLLoCA	20	10	5	5	5
	Enhance water storage capacity of learning institutions	Increase storage capacity for rain water harvesting in learning institutions	Capacity (m^3) of rain water harvesting increased in learning institutions (water storage tanks)	2023 - 2027	Directorate of education Directorate of water	National Government County Government Development partners FLLoCA	20	15	10	10	10
	Improve health and nutrition of learners	Fruit trees planting programmes introduced in learning institutions	Number of fruit trees planted in learning institutions	2023 - 2027	Directorate of education Directorate of environment and natural resources	National Government County Government Development partners FLLoCA	20	10	10	10	10
Roads, Infrastructure, Lands and physical planning	Construction of climate resilient infrastructure	Bridges, culverts redesigned or constructed to contain increased flash floods	Number of bridges, culverts redesigned or constructed to contain increased flash floods	2023 - 2027	Directorate of roads, housing and infrastructure	National Government County Government Development partners FLLoCA	50	50	50	50	50

	Improve storm water management in urban centres and roads	Storm water drainage systems rehabilitated or constructed in urban centres and roads	Number of storm water drainage systems rehabilitated or constructed in urban centres and roads	2023 - 2027	Directorate of roads, physical planning	National Government County Government Development partners FLLoCA	30	30	30	20	20
		Effectively conducted Strategic Environmental Impact Assessment (SEIA), on all county programmes Undertake Environmental and Social Impact Assessment (ESIA) on all county projects Conduct, Environmental Audit (EA) on all county projects	Number of SEIA, EIA and EA conducted	2023 - 2027	NEMA	National Government County Government Development partners FLLoCA	10	10	8	5	5
	Preparation of physical and land use development plans	Physical and land use development plans prepared	Number of physical and land use development plans prepared	2023 - 2027	Directorate of lands and physical planning	National Government County Government Development partners FLLoCA	20	10	3	0	0
	Construction of non-motorized walk ways	Non-motorized walk ways constructed	Kilometers of non-motorized walk ways constructed	2023 - 2027	Directorate of lands and physical planning	National Government County Government Development partners FLLoCA	10	10	10	5	5
	Preparation of zoning plans for sustainable land use management	Zoning plans developed for sustainable land use management	Number of zoning plans developed	2023 - 2027	Directorate of lands and physical planning	National Government County Government Development partners FLLoCA	0	10	4	0	0

Public health and sanitation	Reducing spread of and infection from climate related pathogens and viruses	Vaccination campaigns conducted on emerging climate related diseases, including deworming of school going children (2-14yrs)	Number of vaccination campaigns conducted on emerging climate related diseases, including deworming of school going children (2-14yrs)	2023 - 2027	Directorate of public health	National Government County Government Development partners FLLoCA	15	10	10	10	10
		Distribute Long-lasting Insecticide treated Nets (LLITNs) to children under one and pregnant women for malaria prevention	Number of children under 1 and pregnant women who have received LLITNs for malaria prevention	2023 - 2027	Directorate of public health	National Government County Government Development partners FLLoCA	3	3	3	4	4
	Preventing malnutrition	Awareness creation on public health, nutrition and sanitation (Including menstrual hygiene)	Number of awareness creation campaigns conducted on public health and nutrition	2023 - 2027	Directorate of public health	National Government County Government Development partners FLLoCA	4	3	2	1	1
	Improving hygiene and sanitation in schools and health facilities	Construction of modern latrines with hand washing facilities in schools and health facilities	Number of latrines with hand washing facilities constructed in schools and health facilities	2023 - 2027	Directorate of public health	National Government County Government Development partners FLLoCA	15	15	5	3	2
	Improving medical waste management	Purchase of medical waste incinerators	Number of medical waste incinerators purchased and installed in health facilities	2023 - 2027	Directorate of public health	National Government County Government Development partners FLLoCA	6	6	5	5	5
TOTAL							**1,981**	**1,764**	**1,474**	**1,365**	**1,300**

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Appendices

Appendix 1: Investment priorities for FY 2023/2024under FLLoCA program

PRIORITIZED CLIMATE CHANGE INVESTMENT AREAS FROM THE WARD CLIMATE CHANGE COMMITTEES FY 2023/24

sectors	Project Name	Ward	Estimated Cost(Kshs.)
AGRICULTURE	Training and support farmers in bee keeping and poutry farming	Ichuni	1,500,000
	Training and supporting farmers in asquisition of Greenhouses for production of high value crops	Bassi Boitangare	1,000,000
	Training and supporting farmers in asquisition of Greenhouses for production of high value crops	Bassi Boitangare	1,000,000
	Training and supporting farmers in asquisition of Greenhouses for production of high value crops	Bassi Boitangare	1,000,000
	Snail keeping/farming	Bassi Central	1,000,000
	Establishment of grafted fruit tree nurseries	Riana	2,000,000
	Establishment nurseries for avocado and tissue culture bananas	Bomorenda	1,500,000
	Establisment of grafted nurseries (avocado and bananas	Masige East	1,500,000
	Establishment of grafted friut tree nurseries avocado and bananas	Bokimonge	1,000,000
	Establishment of grafted fruits	Bombaba Borabu	1,000,000
	Establishment of grafted fruit nurseries	Boochi Borabu	1,000,000
	Establishment of grafted fruit nursery and other indigenous trees	Kisii Central	3,000,000

	Establishment of tree nursery for grafted fruits indigenous trees and bamboo	Moticho	1,000,000
	Establishment of nurseries for grafted fruits, tissue culture bananas and indigenuos tree species	Sensi	1,000,000
	Esatablishment of tree nursery	Keumbu	2,000,000
	Tree nurseries indigenous trees and bomboos	Bassi Bogetaorio	3,000,000
	Soil erosion control	Magenche	2,000,000
	Establishment of tree nurseries for grafted fruits and indigenous	Bogeka	1,000,000
	Bee keeping	Bombaba Borabu	1,000,000
	Sub-Total		**27,500,000**
sectors	**Project Name**	**Ward**	**Estimated Cost(Kshs.)**
ENVIRONMENT AND NATURAL RESOURCES	Soil Conservation/Land and planting of indigenous trees	Nyakoe	1,000,000
	Survey, demarcation and rehabilitation of wetlands	Bogeka	2,000,000
	Greening nyatieko program	Nyatieko	3,000,000
	Masimba waste management MRF/transfer stations	Masimba	3,000,000
	Protection of riparian land by replacement of eucaliptus trees with indigenous species and bamboo	Kiamokama	2,000,000
	rehabilitation of degraded sites / aforestation and re-aforestation	Ichuni	1,000,000
	Tree nuseries for for indigenous trees bamboo	Nyamasibi	1,000,000
	Establishment of tree nurseries for indigenous trees	Masige East	1,500,000
	Protection and rehabilitation of county forest	Bomorenda	1,500,000
	Establishment of tree nurseries	Magenche	1,000,000
	Establishment of indigenous trees Bamboo	Bombaba Borabu	1,000,000
	Land/soil erosion control	Majoge Bassi	2,000,000

	Spring/riparian land protection at riarwara	Bosoti Sengera	2,000,000
	Soil/land conservation of degreded area	Keumbu	1,000,000
	soil/land conservation, aforestation to prevent land slides at Isanal Egetai	Bobaracho	3,000,000
	Rehabilitaion of Nyanturago wetland	Ibeno	2,000,000
	Survey /Demacation of Nyanturago wetland	Ibeno	1,000,000
	Control of landslides	Sensi	2,000,000
	Establishment of indigenous tree nurseries (giant bamboos)	Monyerero	1,500,000
	Afforestation, riparian land protection	Boikanga	1,500,000
	Afforestation	Moticho	1,000,000
	Survey and demarcation of county forests	Moticho	1,000,000
	Eestablishment of indigenous tree nurseries	Getenga	1,000,000
	Survey and demarcation of county forest and wetlands	Getenga	500,000
	Waste disposal management	Bogetenga	1,000,000
	Quarry management	Bogetenga	2,000,000
	Rehabilitation of degraded sites	Tabaka	1,500,000
	Land reclamation from Degraded land due to soapstone mining	Tabaka	1,500,000
	Sub-Total		**43,500,000**
sectors	**Project Name**	**Ward**	**Estimated Cost(Kshs.)**
WATER AND SANITATION	Borehole Drilling	Bogusero	3,000,000
	Rehabilitation,solarlization and reticulation of water projects	Nyakoe	2,000,000
	Provision of water tanks	Gesusu	2,000,000

	Rehabilitation of borehole (nyabisi,mobamba)	Nyacheki	2,000,000
	Rehabilitation and reticulation of anate water schemes	Masige West	3,000,000
	water reticulation from Nyaguku borehole	Sameta Mkwerero	3,000,000
	Supply of water tanks to public institutions	Boochi - Tendere	2,000,000
	Borehole drilling at Itibo market	Bassi Chache	3,000,000
	Supply of water tanks to public institutions	Bassi Central	2,000,000
	Supply of water tanks to public institutions	Bomariba	2,000,000
	Supply of water tanks to public institutions	Riana	1,000,000
	Riokindo water project - reticulation	Bokimonge	2,000,000
	Rehabilitation of Riangombenene borehole	Kiogoro	1,500,000
	Supply of water tanks to public institutions	Kiogoro	1,000,000
	Borehole reticulation and solarization	Kisii Central	3,000,000
	Reticulation of water line from Kienguku borehole to Birongo market	Birongo	1,500,000
	Rehabilitation of Nyansakia bohelole to serve Kegogi	Kegogi	3,000,000
	Supply of water tanks in school and hospital	Monyerero	500,000
	Etago borehole project	Etago	3,000,000
	Gravity water supply project	Boikanga	1,500,000
	Borehole solarization and rehabilitation - Orienyo borehole	Getenga	1,500,000
	Sub-Total		**43,500,000**
sectors	**Project Name**	**Ward**	**Estimated Cost(Kshs.)**
DISASTER MANAGEMENT	Lightening Arresters	Gesusu	1,000,000
	lightening and thunder arrestors	Nyamasibi	2,000,000
	Installation of lightening arrestors	Nyacheki	1,000,000
	Istallation of lightening arrestors	Bomariba	1,000,000

	Istallation of lightening arrestors	Majoge Bassi	1,000,000
	Installation of lightening arrestors	Bosoti Sengera	1,000,000
	Lightening arrestors installation	Birongo	1,500,000
	Installation of highmast thunder arrestors	Monyerero	4,000,000
	Sub-Total		**12,500,000**
ENERGY	Establishment of green energy (solar panels) to public institutions	Marani	3,000,000
	Promotion of energy saving sources of energy (morden jikos)	Boochi Tendere	1,000,000
	Sub-Total		**4,000,000**
sectors	**Project Name**	**Ward**	**Estimated Cost(Kshs.)**
METEOROLOGICAL DEPARTMENT	Installation of automatic weather station at kiamoiro CIS Centre	Bogiakumu	3,000,000
	Sub-Total		**3,000,000**
sectors	**Project Name**	**Ward**	**Estimated Cost(Kshs.)**
CLIMATE CHANGE	Community education and sensitization	Kiamokama	1,000,000
	Sub-Total		**1,000,000**
	GRAND TOTAL		**137,000,000**

Appendix 2: PCRA technical working group members

	Directorate being represented
1.	Climate change
2.	Meteorology
3.	NEMA
4.	Devolved units
5.	Social Services
6.	Administration environment
7.	Water
8.	Energy
9.	Economic planning
10.	Physical planning
11.	Environment
12.	Public health
13.	Education - ECDE
14.	Agriculture
15.	Public participation

Fig: PCRA TECHNICAL WORKING GROUP INDUCTION HELD ON 26TH APRIL 2023

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