KIRINYAGA COUNTY
CLIMATE CHANGE ACTION PLAN

2023 – 2027

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FOREWORD

Climate change is a global problem that has increased the frequency and magnitude of extreme weather events, leading to loss of lives, diminished livelihoods, reduced crop and livestock production, and damage to infrastructure, among other adverse impacts that demand global solutions and international efforts. The international response to climate change is founded upon the United Nations Framework Convention on Climate Change (UNFCCC). The Paris Agreement under UNFCCC aims to strengthen the global responses to the threats of climate change by setting out Nationally Determined Contributions (NDCs) to be adhered to by each nation in order to achieve the global goals set out in the Paris Agreement and includes both adaptation and mitigation contributions. Various intergovernmental panels on climate change emphasize on the need to strengthen the resilience and adaptive capacity of developing communities that have continued to bear the blunt impact of climate change.

Climate change has taken a toll on various economic aspects of Kirinyaga County. Therefore, the Kirinyaga County Government has enacted the Climate Change Regulations and the Climate Change Policy. Through this policy, the County

Government has developed a five-year Climate Change Action Plan (KCCCAP) covering 2023-2027 to guide in mainstreaming climate change adaptation and mitigation actions into her sector functions. This plan builds onto the CIDP 2023-2027 and provides a framework for the county to deliver on climate action.

The plan and the regulations bring together various stakeholders such as the private sector, civil society, and other climate change actors to develop pathways for climate resilience and adaptation addressing the negative impacts of climate change. These actions include tree plant programs, protection and conservation of forests and hills, energy efficiency programs, and drought management interventions. Significant financial resources need to be mobilized and channeled towards climate-resilient activities. To enable the county to take advantage of available opportunities, the right institutional and financial mechanisms have been put in place so that resources are directed efficiently towards county climate resilient development priorities. The county government leadership is looking forward to creating partnerships with local and international development partners and non-state actors to mobilize adequate resources to implement the Kirinyaga County Climate Change Action Plan.

VERONICA W. WAWERU

COUNTY EXECUTIVE COMMITTEE MEMBER

ENVIRONMENT, ENERGY, CLIMATE CHANGE, NATURAL RESOURCES, WATER & IRRIGATION

KIRINYAGA COUNTY

ACKNOWLEDGMENT

We acknowledge the Governor of Kirinyaga County Government H.E. Anne Mumbi Waiguru EGH and her entire County Executive Committee Members for their immense support towards the development of the Kirinyaga County Climate Change Action Plan 2023–2027. The collective efforts in the development of this action plan cannot be underscored as it has pulled the efforts of over 500 consultations including meetings and workshops for capacity building and designing it.

The department wishes to thank the technical working group led by the Chief officer, Environment, Energy, Climate Change and Natural Resources Ms. Maureen Muthoni Mwangi through whom the process of participatory climate risk assessment roadmap was designed, identification of the key stakeholders and representation of the Vulnerable and marginalized groups and ensured the overall coordination in conjunction with the climate change unit of the county government including Kaara Muriithi, Deputy Director Climate Change Adaptation, Dr. Michael Ndwiga, Doreen Mwangi –Director Gender, James Gathura – County Director Meteorology, Economists Naomi Mumbi, George Macharia, Sylvester Njau, Physical Planner Esther Frinah Wambui and Francis Ng'ang'a – Chief Agricultural

Officer for the delivery of action plan. We would specially thank the Department of Agriculture, livestock production, and Fisheries for their immense support for the development of this action plan who through their partnership that we were able to consult with the community–driven development committees that represent the agricultural livelihoods in all the wards in the county.

The department would like to thank the members of the society who have been part of this journey. These are the community representatives from all wards who committed their time to the identification of the climate risks and hazards in the community consultations to be part of this Action plan. Civil society organizations, community–based organizations, national and county government departments and agencies, private sector especially commercial banks, and representatives of the vulnerable and marginalized were key players in the deliberations for this action plan. Finally, the department wishes to thank the National Treasury for their invaluable guidance and facilitation towards the development of this action plan. It is through their partnership that the department was able to host the County Multi stakeholders' workshop for validation of this action plan.

MAUREEN MUTHONI MWANGI

CHIEF OFFICER – ENVIRONMENT, ENERGY & CLIMATE CHANGE & NATURAL RESOURCES

KIRINYAGA COUNTY

CCCAP TASK FORCE

S/No.	NAME	DESIGNATION	DEPARTMENT
1	Kaara Muriithi	Deputy Director– Climate Change and Adaptation	Environment

2	Benson Mukungo	Director Agriculture	Agriculture
3	Dr.Richard Gichangi	Director Livestock	
4	Evans Kago	Public Health Officer	Health
5	Doreen Nyaguthii	Director Gender	Gender
6	Haniel Kinyua	Director Cooperatives	Trade
7	Lawrence Muchira	Director Budgets	Finance
8	Naomi Mwangi	Economist	

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ACRONYMS

BETA	Bottom–Up Economic Transformation Agenda
CAIP	County Aggregation and Industrial Park
CCAP	County Climate Change Action Plan
CCD	Climate Change Directorate
CECM	County Executive Committee Member
CIDP	County Integrated Development Plan
CSA	Kenya Climate Smart Agriculture Strategy
GH	Elder of The Golden Heart
GCF	Green Climate Fund
GHGs	Greenhouse gases
GEF	Global Environment Facility
ICT	Information and Communications Technology
KARLO	Kenya Agricultural Research and Livestock Organization
KCCCAP	Kirinyaga County Climate Change Action Plan
KCSAS	Kenya Climate Smart Agriculture Strategy
KMD	Kenya Meteorological Department
MTP	Medium Term Plan
NAP	National Adaptation Plan
NCCAP	National Climate Change Action Plan
NEMA	National Environmental Management Authority
PCRA	Participatory Climate Risk Assessment
SAIC	Climate smart Sagana Agro–Industrial City

SLM	Sustainable Land Management
UNFCCC	United Nations Framework Convention on Climate Change

DEFINITION OF TERMS

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.

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.

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.

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

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.

EXECUTIVE SUMMARY

Kirinyaga County Climate Change Action Plan (KCCCAP) 2023–2027 is a five year plan to steer Kirinyaga's climate change action. The Plan derives from the Kenya National Climate Change Act of 2016, which requires the County Governments to develop Action Plans to guide mainstreaming of climate change into their functions and development. KCCCAP 2023–2027 will aid the achievement of Kirinyaga County development goals by providing mechanisms to realize carb low–carbon

climate–resilient development. It emphasizes on sustainability, while prioritizing adapting sustainability climate resilience for vulnerable groups, including women, youth, persons with disabilities, and marginalized and minority communities.

Kirinyaga County Climate Change Action Plan 2023–2027 was developed from evidence of climate change in the county. Climate–related disasters, particularly droughts and floods were frequent and their impacts adversely affected the economy and livelihoods in the county. The frequency of cold days and nights, had greatly increased. Temperature rise spanned across all seasons, and rainfall patterns had changed. With an economy that is dependent on climate–sensitive sectors, such as agriculture, water, energy, tourism, wildlife, and health, these changes in the county climate were identified as great threats to Kirinyaga county Communities.

The priority climate actions are in the six mitigation sectors set out in the United Nation Framework Convention on Climate Change (UNFCCC); agriculture, energy, forestry, industry, transport, and waste. The actions are expected to lower GHG emissions. The Plan was developed through an extensively consultative process led by the Kirinyaga County Climate Change Unit that conducted over 500 stakeholder consultations, supported by the Adaptation, and Mitigation. The taskforce

produced Adaptation and Mitigation report which are part of Kirinyaga County Climate Change Climate Change Action Plan.

Priority areas underpin Kirinyaga County Climate Change Action Plan 2023–2027; Disaster Risk Management; Food and Nutrition Security; Water and the Blue Economy; Forestry; Wildlife, and Tourism; Health, Sanitation, and Human Settlements; Manufacturing; and Energy and Transport. Through these priority areas, climate change action is aligned to the Kenyan Government's Bottom up Transformation Agenda, and the Sustainable Development Goals (SDGs). Kirinyaga County Climate Change Action Plan 2023–2027 seeks to increase the number of households and entities benefiting from devolved adaptive services. Kirinyaga County Climate Change Action Plan (KCCCAP) 2023–2027 aims to further county's development goals by providing mechanisms and measures to achieve low carbon climate resilient development in a manner that prioritizes adaptation at the county level.

This plan builds on the National Climate Change Action Plan (2023–2027) and provides a framework to help Kenya deliver on her Nationally Determined Contribution (NDC) under the Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC). KCCCAP 2023–2027 guides the climate actions of Kirinyaga County Government, the private sector, civil society and other

actors as Kirinyaga transitions to a low carbon climate resilient development pathway. These climate actions are meticulously mainstreamed in Kirinyaga County Integrated Development Plan (CIDP) 2023–2027.

BACKGROUND AND CONTEXT

1.1 Background

Kirinyaga is one of the 47 counties of Kenya located in the Mt. Kenya region of the country. It covers an area about 1,478.1 Km^2 (KNBS, 2019) and borders Murang'a County to the West, Embu to the East, Machakos to the South, Nyeri to the North. The county is rich in natural resources with the main features being Mount Kenya, Murinduko and Kamuruana Hills. The main rivers in the county include Sagana, Thiba, Nyamindi, and Rupingazi, and several wetlands and natural water springs. The terrain is fair, making the exploitation of the rivers for irrigation a success.

The monthly mean temperature in the county is about 16.8–27.8oC (GoK, 2013). Rainfall is bimodal, with the Long rains, normally 1,200 –1,600 mm, coming between March and May and the Short rains, normally 500 –1500 mm, coming between October and December. There are year–to–year variations of amounts of rainfall received as well as variations across regions within the county. Agriculture is the main economic activity in Kirinyaga County. Agriculture comprises mainly cultivation of cash and food crops, and rearing of livestock and fish.

Climate change has increased the frequency and magnitude of extreme weather events in Kirinyaga causing loss of property, diminished livelihoods, reduced crop and livestock production, and damaged infrastructure, among other adverse impacts. An example is the torrential rains and severe flooding from March to May 2018 that devastated communities that were already struggling to recover from a prolonged drought. Climate change is likely to negatively impact Kirinyaga's future development and achievement of the goals of Mountain Cities Blueprint — the long-term development blueprint — and the county Government's agenda that focuses on ensuring food and nutrition security and improved livelihoods for the county residents.

Kenya takes climate change seriously, as demonstrated by the enactment of the Climate Change Act (Number 11 of 2016). This Act requires the Government to develop five-year National Climate Change Action Plans (NCCAP) to guide the mainstreaming of adaptation and mitigation actions into sector functions of the National and County Governments. Kirinyaga County Climate Change Action Plan (KCCCAP) 2023-2027 aims to further the county's development goals by providing mechanisms and measures to achieve low carbon climate resilient development in a manner that prioritizes adaptation at the county level. This plan builds on the National Climate Change Action Plan (2018-2022) and provides a framework to

help Kenya deliver on her Nationally Determined Contribution (NDC) under the Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC). KCCCAP 2023–2027 guides the climate actions of Kirinyaga County Government, the private sector, civil society and other actors as Kirinyaga transitions to a low carbon climate resilient development pathway.

1.2 Purpose and Process of the CCCAP

The program seeks to further Kirinyaga's development goals by providing 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 of vulnerable groups, including children, women, youth, persons with disabilities, the elderly, and marginalized and minority communities.

1.2.1 Guiding Principles

- **Public Participation**

In addressing the effects of climate change principle of public participation will be key in all aspects of development.

- **Responsiveness**

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;

- **Fairness**

Ensuring that climate actions do not create competitive disadvantage for the Kirinyaga private sector, relative to its trading partners.

- **Precautionary Principle**

Threats of climate change damage to the environment, whether serious or irreversible, lack of full scientific certainty shall not be used as reason for postponing cost-effective measures to prevent environment degradation.

- **Right to a clean and healthy environment**

Under the 2010 Constitution every person in Kenya has a right to a clean and healthy environment and a duty to safeguard and enhance the environment.

- **Right to sustainable development**

The right to development will be respected taking into account economic, social and environmental needs. Kenya seeks to achieve people-centered development that builds human capabilities, improves people's wellbeing and enhances quality of life.

- **Partnership**

Building partnerships, collaboration and synergies among various stakeholders from the public, government, non-governmental organizations, civil society and private sector, as well as vulnerable communities and populations including women and youth, will be prioritized to achieve effective implementation of this Policy.

- **Consultations and Cooperation**

Embracing a system of consultation, negotiation and consensus building in government administration between and within the national and county governments.

- **Equity and social inclusion**

Ensuring a fair and equitable allocation of effort and cost, as well as plough back of benefits in the context of the need to address disproportionate vulnerabilities, responsibilities, capabilities, disparities, and inter— and intra-generational equity.

- **Special needs and circumstances**

The special needs and circumstances of people and geographic areas that are particularly vulnerable to the adverse effects of climate change will be prioritized.

This includes, but is not limited to, vulnerable groups such as women, children, the elderly and persons with disability.

- **Avoiding maladaptation**

The climate change response will be conducted in such a way so as to avoid maladaptation, defined by the UNFCCC as any changes in natural or human systems that inadvertently increase vulnerability to climatic stimuli.

- **Integrity and transparency**

The mobilization and utilization of financial resources shall be undertaken with integrity and transparency in order to eliminate corruption and achieve optimal results in climate change responses.

- **Cost–effectiveness**

The selection of climate change interventions will take into account available alternatives in order to identify appropriate choices that provide most benefit to society at least cost.

1.2.2 Steps in the Participatory Climate Change Action Planning

a) Review of the Key Documents

The Participatory County Risk Assessment team convened a one-day workshop to review key documents for the purposes of development of the county climate change action plan. The documents that the team deliberated on are;

- ➢ *Participatory Climate Risk Assessment report*– This report laid the basis of the review to guide on the priorities.
- ➢ *The County Integrated Development Plan 2023-2027*– The document informs on the development priorities in the county for the next five years.
- ➢ *National Climate change Action Plan*– This is the national document that has the country's priorities in climate action. The seven national strategic objectives guided the team on the design for the best adaptive and mitigation interventions for the county.
- ➢ *County Climate Information Services*– The team relied on climate information from the office of the county director of Meteorological services who is part of the county climate change unit.

Proposed Budget estimates for 2023-2024 – This informed the proposed county development expenditure for the 2023/2024 financial year.

b) Collecting of Public Input

The PCRA team informed the attendees of the ward climate change consultations on the intended County Multi-stakeholders' workshop for the Phase II of the process. The PCRA team informed the community stakeholders that they will avail a copy of the ward PCRA reports once finalized to ascertain their input during the consultations. The ward representatives were requested to avail any information that they would like incorporated for the county deliberations. They were also extended an invitation to participate in the deliberations at the county level.

c) Drafting of the County climate change action plan

The PCRA team convened for a three days retreat to draft the county climate change action plan after synthesis of the information gathered. The exercise involved collating information on priority actions as identified and aligning it with the county integrated development plan and the government manifesto. The process ensured emphasis on inclusion of the input from the public consultations done at the community level.

d) Validation Workshop

The County held a one-day validation workshop for the county level consultations. The draft county climate change action plan was presented to the key stakeholders identified in the stakeholders mapping and experts for analysis and validation of the

priority actions as received from the community consultations. The PCRA team captured the outputs of the workshop to incorporate them in the draft action plan.

e) Public Feedback

The draft county climate change action plan was circulated to the stakeholders and experts after incorporating the outputs of the validation workshop to ensure that their input was correctly captured.

f) Development of the final draft of the County climate change Action plan

The PCRA team held a meeting to develop the final draft climate change action plan complete with an implementation framework and matrix and the summary budget projections for delivering the plan.

g) Presentation of County Climate Change Action Plan to the Executive Committee

The draft county climate change plan was presented to the county executive committee for discussion, approval and adoption as a county plan.

h) Presentation of County Climate Change action plan to the county assembly

The draft climate change action plan was presented to the county assembly through the committee on Environment, Water and Natural Resources who the chairman table the draft climate action plan for adoption and approval.

1.3 Underlying Climate Resilience Context

1.3.1 Impacts of Climate Hazards in Kirinyaga County

The impacts of climate hazards in Kirinyaga are summarized in Table 1.

Table 1: Impacts of Climate Hazards in Kirinyaga County

Hazard	Direct Impacts	Indirect Impacts
Water scarcity	• Inadequate water storage	• Poor sanitation and likelihood of suffering from water borne diseases
	• Low water connectivity	• Reduced quality of water • Increase in the cost of acquiring the water resource • Internal conflicts during the scramble for the water resource
Human wildlife conflict	• Interruption of human life/ livelihood – birds, hippos, monkeys, & wild snakes	• Economic distress (costs of treatment of the affected persons) • Unprecedented permanent disabilities • Loss of life • Reduction of household income
	• Damage of plants on farms	• Unprecedented instances of food shortage from reduced harvest • Increase in food price because of the reduced harvest • Loss of livelihood/ farmer income
	• Harm on livestock (chicken, goats etc)	• Reduction/Loss of income • Reduced/Loss of livestock

Pest and diseases (livestock and crops)	• Infestation on crops and livestock (affect the health of the crop)	• Reduced crop yield • Food insecurity • Loss of livelihood for the farmers and traders who rely on farm and animal products for business.
	• High cost of invasive control	• Reduced household income
	• Affect the health of the livestock	• Loss of livestock (death)
Hazard	**Direct Impacts**	**Indirect Impacts**
		• Reduced household income/ loss of livelihood • Reduced productivity of the livestock • Low market price for the animals
Erratic rains	• Loss/crop failure	• Reduced yield resulting in food/fodder shortage. • Reduced household income
	• Missed planting seasons	• Reduced productivity
Floods	• Loss of crops and livestock	• Reduced productivity/ reduced household income
	• Water scarcity	• Water rationing
	• Accelerated riverbank erosion	• Busting of riverbanks and flooding of riverbanks
Land degradation (pollution, deforestation,	• Public nuisance, • Air population, water pollution • Bleeding site for	• Contraction of vector–instigated infectious illness. • Impoverishment of the quality of air, water and land resources

soil erosion)	invasive insects, depleted quality of soils	
Drought	• Retarded growth of crops/ Loss of crop	• Reduced harvest • Increase in food price • Loss of household income • Increased instances of mental instability as a result of losing crops or livestock (economic losses) • Increased immorality and early pregnancies
	• Loss of fodder crops	• Deterioration of animal health • Low market prices for livestock • Deaths of livestock • Loss of livelihood and reduction of household income • Low birth rates for livestock • Reduced milk production

1.3.2 County Climate Hazard Map

The main hazards facing the communities in Kirinyaga County include water scarcity, flooding, land degradation (deforestation, soil erosion, and pollution), pests and diseases, erratic rains, drought and human–wildlife conflict (Figure 1 and Table 2).

Figure 1: Climate Hazard Map

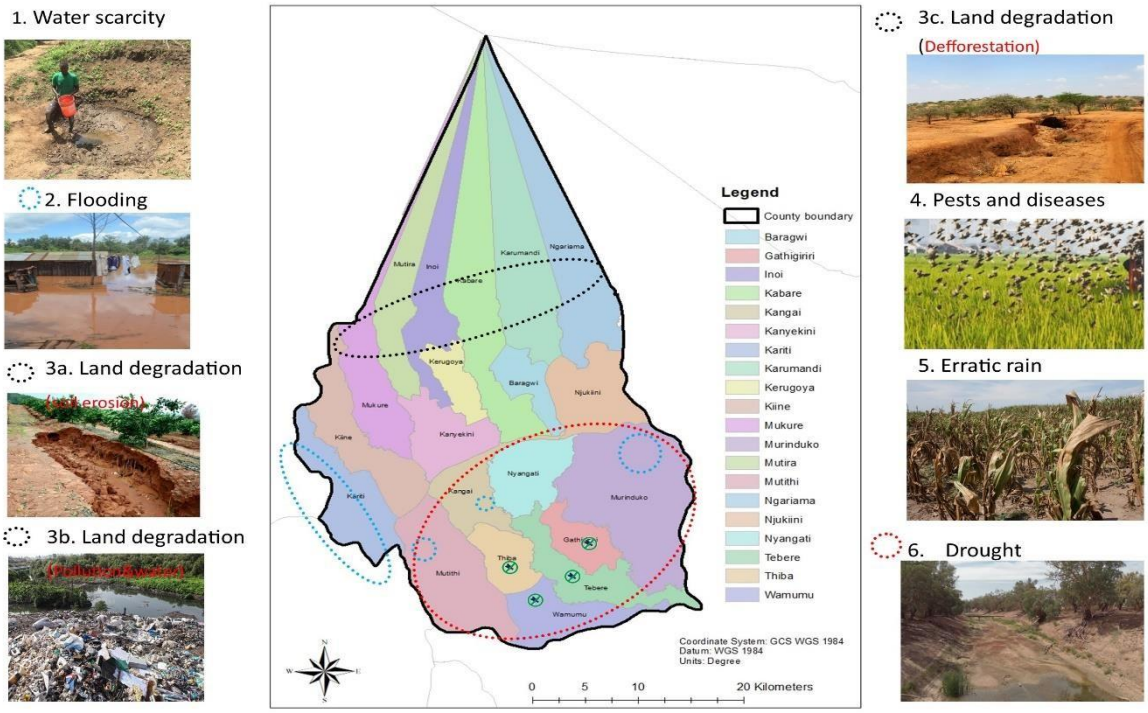

Table 2: Climate Hazards per Ecological Zones

Ecological Zones	Wards	Risks /Hazards
Upper–land	Kabare, Njukiini, Ngariama, Karumandi, Mutira, Inoi.	• Solid–Waste • Erratic rains • Pest and Diseases (Livestock and plants) • Human–Wildlife conflicts • Land degradation (soil erosion, deforestation, and pollution (solid waste)
Midland	Kiine, Mukure, Kanyekiine, Kerugoya, Baragwi, Njukiini	• Pollution • Erratic rains • Pest and Diseases (Livestock and plants) • Human–Wildlife conflicts

		• Water scarcity • Land degradation (pollution, land degradation, and deforestation)
Low–land	Tebere, Wamumu, Thiba, Nyangati, Kangai, Murinduko, Gathigiriri. Mutithi	• Floods • Pollution • Erratic rainfall • Land degradation (Pollution and soil erosion) • Human–wildlife conflicts • Drought • Pests and diseases

1.3.3 Differentiated Climate Exposure and Vulnerability

Based on the PCRA process the following exposure and vulnerability were identified by the community (Table 3).

Table 3: Climate Exposure and Vulnerability

Tool	Hazard	Vulnerability	Capacities identified
Hazzard Mapping	Drought	• Loss of life • Soil erosion, • Inaccessibility to clean and safe water • Food shortages • Human and animal death	• Investing in watersaving Irrigation technologies • Training and building capacity in conservation farming • Planting drought resistant crops

		• Gender based violence (political and civil conflicts)	• Construction of water pans
	Land degradation (deforestation, soil erosion, landslides) and floods, pollution).	• Extinction of indigenous crop/tree varieties • Air and water pollution • Exposure to illness and disease • Destruction of property	• Water tower/catchment, and River conservation • Installation of dykes • Agro–forestry • Waste material recovery facility
	Floods	• Destruction of property and livelihood.	• Development of dykes • Conservation of rivers through planting of bamboos trees.
	Land degradation (Pollution)	• Illnesses from disease–causing Microorganisms	• Waste material recovery facility

Tool	Hazard	Vulnerability	Capacities identified
Historical Timeline	Excess Precipitation, Flooding & Drought	• Food and water shortages, soil erosion • Loss of livelihood	• Post–harvest technologies (use of hematic bags) • Irrigation projects • Training in

			conservation farming
	Human–wildlife conflict (Birds and Monkeys)	• Injuries and loss of property (crops)	• Birds and monkey control mechanisms
Seasonal Calendar	Crop, livestock and human disease diseases and drought	• Loss of livestock/Loss of crop	• Climate smart farming • Use of indigenous knowledge to manage diseases • Training on the value chains
	Scarcity of water	• Inadequate water storage • Low water access	• Bulk water storage tanks at Sagana (Kariti and Kiine wards), • Investment in community water projects, • Invest in domestic water harvesting technologies

	Drought	• Poor crop yield	• Diversification of livelihood enterprises • Capacity and training
	Pests and diseases	• Reduced crop yield • Poor quality of yield • Diminished livelihoods.	• Integrated pest management system and Good Agricultural Practices (GAP)
Daily Clock	Drought	• Food insecurity, • Crop failure	• Diversification of livelihood enterprises • Capacity and training
	Water crisis	• Inadequate water storage • Low water connectivity	• Establishment of bulk water storage facilities
Tool	**Hazard**	**Vulnerability**	**Capacities identified**
			• Investment in community water projects, • Invest in domestic water harvesting technologies
	Human–wildlife conflicts	• Injuries and loss of property (crops)	• Birds and monkey control mechanisms

1.4 Brief Overview of Climate Change Actions in Kirinyaga County

1.4.1 Mainstreaming of NCCAP in Kirinyaga County Actions

The county government has been mandated to mainstream climate change actions in all the sectors so as to build resilience and adaptive capacity so as to be able to contribute to the nationally determined contributions as per the Paris agreement. The just concluded CIDP 2023–2027 has outlined key sector priority areas in responding to climate change. Kirinyaga County is predominantly agriculture with 70% of population deriving their livelihood from crop production and livestock keeping.

The county climate change actions aim to; improve access to adequate, reliable and affordable quality water, conservation, control and protection of the catchment areas, provide sewerage systems in the urban centres, provide improved sanitation facilities in the market centres, create awareness on importance of safe sanitation to households, implement environmental policies and practices, ensuring compliance with environmental legislation, control of erosion on hills, water catchment, wetlands, protection of river line and riparian land, promotion of green energy and sustainable natural resources management and conservation forestry extension services; increasing forests and tree cover; awareness creation on forest

values and products, implementations of government and world related agenda on natural resources.

1.4.2 Climate Change in Kirinyaga County CIDP

Kirinyaga county Government has taken bold steps to mainstream climate actions in the third generation CIDP 2023–2027. The investments envisioned in the CIDP 2023–2027 are cross cutting in all county government departments with an intention to improve the resilience of communities and climate proofing the physical infrastructure. The county government has planned to establish a Climate smart Sagana Agro–Industrial City (SAIC) for job creation and prevention of post–harvest losses. The efforts involve increasing the resilience of agricultural sector by incorporating climate smart agriculture, good agricultural practices and improving the market linkages for the produce through value addition and aggregation centers.

The county government has also planned to promote agroforestry by promoting fruit trees growing as a panacea to food and nutrition security and increase the tree cover through farm forestry. Water scarcity resilience has been mainstreamed by having investments to increase water connectivity to households and farms for both domestic and irrigation purposes. Further the county government is committed to institute bulk water harvesting and storage by building bulk water

storage tanks and community dams across selected sites in the county as well as procurement and distribution of smallholder domestic water harvesting tanks to vulnerable communities. Sustainable solid waste management, protection and conservation of the riparian areas and wet lands are incorporated in the CIDP as a measure to reduce pollution in urban areas and water sources by construction of waste material recovery facilities and growing of bamboo in riverine ecosystems.

The county government has planned to improve drainages in the built–up areas through cabro paving and subsequent drainage infrastructure to check on flooding hazards during torrential rains. Cut off drains, terraces and incorporation of sustainable land management practices are interventions that the county government has planned to support the communities reduce soil erosion in the agricultural lands.

1.4.3 Other Key Climate Actions/Strategies in Kirinyaga County

Table 4: Other Key Climate Actions/Strategies in Kirinyaga County

Sectors	Existing Adaptation/ Current Strategies	Alternative Interventions/ Resilience Strategies
Agriculture, Livestock, Veterinary and Fisheries sector	• Traditional conservational farming – use of Terraces, mulching, organic manure use	• Upscale climate smart agriculture – use of contours • Embrace use of compost manure

• Selected Small–scale water harvesting and storage • Water abstraction in the southern ecological zone	• Building capacity community members on up scaling on–farm water harvesting technologies.
• Minimal adoption of drought tolerant crops and early maturing crop	• Up scaling the early maturing and drought tolerant varieties • Invest in a seed–propagation technology for drought tolerance variety of crops • Revitalization of Kamweti ATC to facilitate farm demos on drought resistant crops — (demonstrations of the new crop and livestock technologies, innovations, and management practices Increasing the productivity, commercialization, and competitiveness of the rice and cotton sectors through knowledge and technology promotion)
• Use of Sprinkler irrigation during dry seasons • Use of earth–canals to distribute water in the irrigation schemes	• Adoption of water saving irrigation technology — drip irrigation technology • Advocacy and investment in expanded coverage of area under water saving irrigation infrastructure

		• Construction of concrete canals with a regulated gradient.
	• Household level forage conservation	• Investing in Silage technology, hay bailing, pasture reseeding and bulking, • Investing in controlled community feed stores

Sectors	**Existing Adaptation/ Current Strategies**	**Alternative Interventions/ Resilience Strategies**
	• Use of uncontrolled pesticides in the farms	• Use of organic and ratified farm inputs to promote sustainable food production. • Possession of an integrated pest management system.
Environment, Energy, Climate Change, Water and Irrigation Sector	• Hand pump boreholes •	• Installation of green energy to pump water for domestic use from boreholes • Increase water connectivity to the households – investing in infrastructure and completing the water supply system.

	• Low–capacity dams (earth, sand and pans) Siltation of dams	• Frequent de–silting and rehabilitation of earth dams, • Construction of earth dams, sand dams and water pans, use of liners and green surface cover, • Promotion of farm pods
	• Small scale irrigation schemes	• Extension of existing pipeline
	• Utilization of Existing natural springs	• spring protection (fencing)
	• Existing rock outcrops	• rock catchment
	• Use of unsustainable water harvesting at some optimal levels	• water tanks, run off water harvesting • Improvement of ground vegetation
	• Deforestation	• Invest in fruit trees Afforestation, • Riparian tree planting, commercial nursery establishment, • Investing in bamboo propagation technology, agroforestry, • Initiate school greening programs, climate smart markets, Material Recovery Facility, water reuse and recycling, promotion of renewable energy for Agrobased industry, provision of climate services, mainstreaming ICT use, woodlot establishment, promotion of commercial

Sectors	**Existing Adaptation/ Current Strategies**	**Alternative Interventions/ Resilience Strategies**
		forestry, Energy saving jikos, biogas production technologies, solar energy mechanisms
	• Use of skips and skip loaders, and open dumping & pit latrines and unsustainable septic tank.	• Investment in waste material recovery facility • Invest in a liquid waste management system within the industrial and commercial sections in the country
Transport, Public Works and Infrastructure (Disaster Risk Management)	• Routine Grading of access roads	• Opening of new access roads for market access, road bridges and drifts for climate proofing actions establishment of new market centers
	• Fire station and fire–fighting machines	• Strategic location of Hydrants

	• Construction of dykes to prevent floods and flash floods from affecting the community	• Conservation of the riparian land/ riverine (planting of trees)
Department of Trade. Cooperatives, Tourism, Industrialization and Enterprise Development	• Construction of aggregation centers across the county • Construction of agroindustrial city	• Securing and dedicating a plan for CAIP – County Aggregation and Industrial Park (formalized to handle and promote food security, export income) • Development of Climate smart Sagana Agro-Industrial City • Installation of solar lighting across the infrastructures • Expand the water harvesting systems

POLICY ENVIRONMENT

2.1 National Policy Context

2.1.1 National Perspective

A robust framework of policies, plans and institutions is being progressively established at the National and County levels to address climate change. The foundation of the institutional and legal framework for climate change action is the Constitution of Kenya (2010). Article 10 sets out national values and principles of governance, such as sustainable development, devolution of government, and public participation, that are mandatory when making or implementing any law or public policy decisions, including climate change. Article 42 provides for the right to a clean and healthy environment for every Kenyan, which includes the right to have the environment protected for the benefit of present and future generations through legislative and other measures.

The Constitution of Kenya (2010) created the devolved system of government comprised of the National Government and 47 County Governments. The concept of devolution goes beyond mere decentralization of government services, providing a form of self–governance at the local level and a process of equitable sharing of resources. The County Governments have a key delivery role in implementing the Climate Change Act, 2016, having jurisdiction, as set out in the Fourth Schedule (Part 2) of the Constitution, over sectors relevant for climate change such as

agriculture, soil and water conservation, forestry, water and sanitation, and health. Article 203(2) of the Constitution requires that County governments be allocated a minimum of 15% of national revenue received annually, but the allocation often surpasses the minimum thus giving County governments considerable scope to influence climate change investments. The Constitution of Kenya advances gender equality, stating in Chapter 4, the Bill of Rights that "women have the right to equal opportunities in political, economic and cultural spheres," and in order to achieve that equality, requires that government to put in place and implement affirmative actions that deliver equity for women.

This commitment to gender equality and implementation of gender equity is taken up in section 7(6) of the Climate Change Act, 2016 that requires the President to ensure compliance with the two thirds gender principle when appointing members to the National Climate Change Council. Further, section 8(2)(c) of the Climate Change Act, 2016 obligates the Cabinet Secretary responsible for climate change affairs to formulate and implement a national gender and intergenerational responsive public education and awareness strategy. The Climate Change Act, 2016 is the key legislation guiding Kenya's climate change response, setting the legal basis for mainstreaming climate change considerations and actions into sector functions, and providing the legal foundation of the NCCAP. This NCCAP 2018–

2022 responds to provisions in the Climate Change Act, 2016 that require the updating of the NCCAP every five years.

2.1.2 National Legal and Policy Context

- ***Constitution of Kenya (2010)***

A robust framework of policies, plans, and institutions is being progressively established at the National and County levels in Kenya to address climate change. The foundation of the institutional and legal framework for climate change action is the Constitution of Kenya (2010). Article 10 sets out national values and principles of governance, such as sustainable development, devolution of government, and public participation, which are mandatory when making or implementing any law or public policy decisions, including those relating to climate change.

Article 42 provides for the right to a clean and healthy environment for every Kenyan, which includes the right to have the environment protected for the benefit of present and future generations through legislative and other measures.

County Governments have a key delivery role in implementing the Climate Change Act, 2016, having jurisdiction, as set out in the Fourth Schedule (Part 2) of the Constitution, over sectors relevant to climate change action, such as agriculture, soil and water conservation, forestry, water and sanitation, tourism, and health.

- ***Kenya Vision 2030 and its Medium-Term Plans***

Kenya Vision 2030, the country's development blueprint, recognized climate change as a risk that could slow the country's development. Climate change actions were identified in the Second Medium Term Plan (MTP) (2013–2017). The Third Medium Term Plan (2018–2022) recognized climate change as a crosscutting thematic area, and mainstreamed climate change actions in sector plans.

- ***National Climate Change Response Strategy (2010)***

Kenya's National Climate Change Response Strategy was the first national policy document on climate change. It sought to advance the integration of climate change adaptation and mitigation into all government planning, budgeting, and development objectives.

- ***National Climate Change Action Plan (2018–2022)***

Kenya's National Climate Change Action Plan, 2018–2022 is a five–year plan that seek to further Kenya's development goals in a low carbon climate resilient manner. The plan has set out adaptation, mitigation, and enabling actions.

- ***National Adaptation Plan (NAP) (2015–2030)***

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

Nationally Determined Contribution (NDC) (2016)

Kenya's NDC under the Paris Agreement of the UNFCCC includes mitigation and adaptation contributions. In regard to adaptation, "Kenya will ensure enhanced resilience to climate change towards the attainment of Vision 2030, by mainstreaming climate change into Medium Term Plans (MTPs), and implementing adaptation actions. The mitigation contribution "seeks to abate Kenya's GHG emissions by 30% by 2030." Achievement of Kenya's NDC is subject to international support in the form of finance, investment, technology development and transfer, and capacity development.

- ***Climate Change Act 2016***

The Climate Change Act (No. 11 of 2016) is the first comprehensive legal framework for climate change governance in Kenya. The objective of the Act is to "Enhance climate change resilience and low carbon development for sustainable development of Kenya. "The Act establishes the National Climate Change Council (Section 5), Climate Change Directorate (Section 9), and Climate Change Fund (Section 25).

- ***Kenya Climate Smart Agriculture Strategy (KCSAS) (2017–2026)***

The objective of the Kenya Climate Smart Agriculture Strategy (KCSAS) is to adapt to climate change and build the resilience of agricultural systems, while minimizing

GHG emissions. Planned actions will lead to enhanced food and nutritional security, and improved livelihoods.

- ***Climate Risk Management Framework (2017)***

The Climate Risk Management Framework for Kenya integrates disaster risk reduction, climate change adaptation, and sustainable development, so that they are pursued as mutually supportive rather than stand–alone goals. It promotes an integrated climate risk management approach as a central part of policy and planning at National and County levels.

National Climate Change Framework Policy (2008)

The National Climate Change Framework Policy aims at ensuring the integration of climate change considerations into planning, budgeting, implementation, and decision making at the National and County levels, and across all sectors.

- ***National Climate Finance Policy (2018)***

The National Climate Finance Policy promotes the establishment of legal, institutional, and reporting frameworks for access to, and management of climate finance. The goal of the policy is to further Kenya's national development goals through enhanced mobilization of climate finance that contributes to low carbon climate resilient development goals.

- ***Bottom–Up Economic Transformation Agenda (BETA)***

BETA outlines the government commitments to establish 5 million acres (20,000 km2) agroforestry woodlots in drylands, modernize and commercialize the charcoal value chain, specifically the adoption of modern kilns; decriminalize the charcoal trade, support scaling up of clean cooking technologies, and promote youth–owned and operated briquette–making enterprises where agricultural waste is available in commercially viable quantities (coffee waste, rice husks, maize cobs and coconut husks).

2.2 County Legal and Policy Framework

- ***Kirinyaga County Integrated Development Plan (2023 – 2027)***

County Governments of Kirinyaga have mainstreamed climate change in its CIDP. It addresses the impacts of Climate change through their development activities.

- ***Kirinyaga County Climate Change Policy***

The Kirinyaga County Climate Change Policy aims at ensuring the integration of climate change considerations into planning, budgeting, implementation, and decision–making by Kirinyaga County government across all sectors.

Kirinyaga County Climate Change Act, 2023

The Kirinyaga county climate change Act 2023 establishes the mechanism for coordination of climate actions by establishing county and ward climate change

committees which institutionalizing delivery of climate actions up to the community level. The Act also establishes a county climate change fund to mobilize resources for climate action. This act establishes the requisite resources for delivery of adaptation and mitigation interventions in the county to enhance sustainability.

- ***Kirinyaga County Solid Waste Management Act, 2021***

Kirinyaga county solid waste management Act 2021 establishes the guide towards solid waste management activities in the county to sustainably manage the projected water streams especially with growing population especially in the urban areas. It bestows responsibilities to all waste management stakeholders including generators, transporters, county government, NEMA and the recyclers. It advocates for development of waste resource recovery facilities to create green jobs and minimize greenhouse gases form waste.

PRIORITY CLIMATE CHANGE ACTIONS

3.1 Identification of Strategic Climate Action Priorities in the PCRA

The following were identified as key strategic climate actions for Kirinyaga County.

Table 5: Priority Climate Action for Kirinyaga County

Area of intervention	Activity
Establish a framework to coordinate and implement climate smart agricultural activities in the county.	• Develop a framework for climate smart activities. • • Development of a climate smart agriculture technologies center at Kirinyaga Agriculture Training Center at Kamweti
Integrate pest management (IPM) and good Agricultural Practices (GAP)	• Develop a framework for identification and Implementation of appropriate Pest Management and GAP
Promote Sustainable Land Management (SLM) practices	• Promote SLM practices including installation of cut–off drains, Retention ditches, Use of cover crops and Gabions
Agro forestation	• Planting of fruit trees including Avocado,

	Mangoes, Macadamia and Oranges
Promote use of drought resistant crops/ seedlings	• Acquire drought resistant seedling and crop varieties to prevent crop failure due to prolonged drought
Protection of Infrastructure from effects of flooding	• Development/ Installation of dykes along Sagana, Ragati and Thiba Rivers
Development of County Agro-Industrial Park (CAIP)	• Construction of industrial parks and corresponding utility infrastructure to enhance agro-processing, value addition, food conservation through reduced postharvest loss.
Promotion and diversification of tourism activities/ conservation of natural resources	• Mainstream conservation and protection of natural resources within the county
Increase access to safe domestic water through extended network from water service providers and harnessing water harvesting for human and livestock consumption.	• Purchase and laying of water distribution pipes to bolster supply. • • Purchase and distribution of water storage tanks for household use.
Provision of water storage facilities for water conservation	• Install Bulk Water Storage Facilities for Sagana Township, SAIC and Environs
Area of intervention	**Activity**
Installation of a sustainable solid waste management infrastructure	• Development and installation of material recovery facilities, incineration unit and sanitary landfills
Establish liquid waste management system	• Install sewer lines and connect all urban areas to sewer lines

Improve preparedness for erratic rainfall and develop early warning stations	• Installation and operationalization of Climate Information System • Installation and operationalization of Sub–County weather stations
Conservation of Riparian spaces along rivers	• Enforcing conservation of wetlands & riparian through replacement of eucalyptus with bamboo
Installation of Cabro in Urbans areas to manage storm water	• Installation of Cabro in major urban areas in the County

3.2 Priority County Climate Change Actions

Kirinyaga Climate Change Action Plan (2023–2027) takes cognizance of the impacts of climate change on county socio–economic sectors. Adaptation actions have been prioritized in the county Climate Change Action Plan 2022–2027 because of the devastating impacts of droughts and floods in Kenya, and the negative effects of climate change on vulnerable groups, including children, women, older members of society, persons with disabilities, the youth, and members of minority and marginalized communities. The actions will be undertaken, where possible, in a way that limits GHG emissions.

They will benefit vulnerable groups directly and indirectly through, for example, increased agricultural productivity, and improved access to water. They also provide benefits for women through access to clean cooking, and forest

restoration and agroforestry actions that assure increased access to affordable cooking energy, and water.

3.2.1 Disaster (Drought and Flood) Risk Management

Climate–related disasters, such as drought, landslides and floods, could prevent the achievement of Kirinyaga County development goals. Unfavorable climatic conditions impose serious consequences on the agricultural sector in the county.

This is worsened by over–reliance on rainfall amid weather unpredictability impact agriculture heavily as the county depends on natural rivers as the main source of water for both domestic, industrial and irrigation purposes. Heavy rains result in floods mainly on the lowlands wreaking havoc to farms and infrastructure around areas in Mwea sub County.

3.2.2 Agriculture, Livestock and Fisheries

Climate change has the potential to derail the achievement of County Government Kirinyaga goals on food and nutrition security. Kirinyaga's agro based economy is highly susceptible to climate changes, including temperature rise, changes in precipitations, and extreme climate events. The changes in climate and weather patterns will expose the rain–fed farming systems, especially the arid and semi–arid lands, to more climate related vulnerabilities. This will predispose farming communities to food insecurity and poverty through loss of the productive assets

and the weakening of coping strategies and resilience. This susceptibility is likely to jeopardize attainment of the sector contribution to the County economy. Climate smart agriculture (CSA) has been identified as a viable approach to provide solutions towards increased agriculture sector productivity while addressing impacts of changing climate. Climate smart agriculture (CSA) is an approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. CSA aims to achieve three main objectives are: sustainably increasing agricultural productivity and incomes, adapting and building resilience to climate change and removing greenhouse gas emissions, where possible.

3.2.3 Water

Kirinyaga County Climate Action Plan 2023–2027 addresses one of County largest challenges, which is water accessibility. The decline in access to quality water in the country is exacerbated by climate change, and its associated droughts and reduction of glaciers. Lack of access to quality water has the potential to undermine achievement of government's development goals. The water–scarcity situation in Kenya is made worse by climate change, and compounded by deforestation, low storage capacity, a growing demand for water, many of the rivers are drying up, dams and water pans are silting, and water quality is

deteriorating. Erratic rains due to climate change have affected water supply, with severe impacts on food production.

Kirinyaga County Climate Action Plan 2023–2027 seeks to enhance the resilience of the water sector, by ensuring adequate access to, and efficient use of water for agriculture, manufacturing, domestic use, wildlife, and other uses. This action will be achieved through extension of water pipelines, exploitation of groundwater through drilling of boreholes and equipping with solar powered pumps and spring protection, rehabilitation of existing boreholes, promotion of water harvesting technologies among others. This will only be achieved through partnership with various stakeholders including, National Government, Water Service Providers, Upper Tana Natural Resources Development Projects, Tana

Works Development Agencies, Kenya Climate Smart Agriculture among others.

3.2.4 Forestry and Environment

Sustainable and productive management of land and land resources are enshrined in Chapter 5 of the Constitution of Kenya (2010). The Constitution stipulates, among other things, that the state will work to achieve including sustainable exploitation, utilization of Natural resources and maintain a tree cover of at least 10% of total land area. Kirinyaga County Climate Action Plan 2023–2027 will contribute to the restoration, preservation, and sustainable management of forests,

rehabilitation of degraded land and other ecosystems that play an essential role in Counties 'economy. The county is rich in natural resources with main features being the Mount Kenya, Mt. Kenya rain forest, wildlife, natural rivers and springs, hills. They offer water catchments, biodiversity and conservation functions, and are home to, and provide a variety of goods that support the subsistence.

Kirinyaga Climate Change Action Plan 2023–2027 will contribute to the restoration, preservation, and sustainable management of forests and other ecosystems that play an essential role in County economy and livelihoods of many communities. Deforestation and forest degradation are major problems in the county, releasing large amounts of GHGs. Deforestation and forest degradation are driven mainly by clearance for agriculture, due to rural poverty and rapid population growth; unsustainable utilization of forest products, including timber harvesting, charcoal production, and grazing in forests; and past governance and institutional failures in the forest sector. The negative impacts of deforestation, such as soil erosion and increased flooding, are exacerbated by climate change. Climate change is likely to affect the growth and development of tree species, resulting in reduced biodiversity and capacity to deliver important forest goods and services.

Actions to increase forest cover and prevent deforestation and forest degradation have important benefits, including improved livelihoods of majority of Kirinyaga

County citizens, while enhancing the county's climate resilience. Forests provide ecosystem services that contribute to reduction in the vulnerability of people and wildlife. Forests also provide hydrological ecosystem services, such as regulation of storm waters. Upper watersheds could increase infiltration of rainwater, reduce surface runoff, and control soil loss, thus decreasing the destructive impacts of floodwaters. By storing run–off, forests also act as natural water recharge areas because the stored run–off replenishes stream flows. Any actions to combat deforestation and speed up restoration of degraded lands will contribute to economic growth, poverty reduction, and greater food and nutrition security and, help communities to adapt to climate change. Forests also mitigate the harmful effects of GHG emissions by acting as "sinks" through carbon sequestration

While reducing GHG emissions is critical, mitigation actions that have adaptation and sustainable development benefits are prioritized Kirinyaga Climate Change Action Plan 2023–2027. Building the climate resilience of waste disposal systems and facilities will also be prioritized.

3.2.5 Trade and Tourism

A robust, diversified and climate–resilient trade sector is imperative for Kirinyaga county to attain low carbon climate resilient development. The trade sector depends on products and services developed by other sectors of the economy, and

therefore any adverse climate change impacts of such sectors, will likely impact trade. The agriculture, manufacturing and transportation sectors, which are key cogs for internal and international trade, are highly vulnerable to climate variability and extreme weather events. A successful trade sector will therefore require building resilience across the entire economy of Kirinyaga county. Climate change also impacts biodiversity and wildlife, with subsequent impacts on tourism. Of concern to Kirinyaga county tourism, climate change is projected to shift the distribution of wildlife species, reduce the population sizes of species, and lead to extinction of some other.

3.2.6 Health and Sanitation

The risk of malaria and other vector–borne diseases is projected to increase due to changing climate conditions. Rising temperatures would likely lead to greater incidences of malaria at higher altitudes of the County highlands and potentially increase in areas where malaria already occurs. Transmission intensity is projected to increase along with the length of the transmission season. Communities living at altitudes above 1,100 meters are more vulnerable to malaria due to lack of immunity, lack of preparedness, climate variability, and other factors. Children under five years and pregnant women are the most vulnerable to infection by malaria vulnerable to infection by malaria. There have also been reported cases of cholera in the lowlands especially during drought seasons.

Kirinyaga county climate change action plan 2023–2027 seeks to create a robust and highly responsive healthcare system for both preventive and curative health services to improve the resilience to communities on the health threats that are posed by climate change.

3.2.7 Energy and Transport

Climate change, including temperature, and more such severe and extreme climate events as heavy rains that result in floods, damage energy and transport infrastructure. These impacts increase incidences of delays, disruptions, damages, and failures across land–based, air transportation systems. These, and other climate change impacts have consequences for the design, construction, location, and operations of energy and transport infrastructure. Climate–proofing or proactive adaptation could be cost–effective for energy and transport infrastructure with a long lifespan. Climate–proofing as a means of addressing infrastructure–related climate change impacts is a key recommendation of Kenya's NAP, and is necessary to maximize potential development benefits. Climate proofing of infrastructure requires the factoring in of additional costs associated with the burden of climate change in the design, implementation, and maintenance of infrastructure. Reducing GHG emissions in the energy and transport sectors is required to achieve Kenya's mitigation NDC. The contribution of the country's

energy sector to GHG emissions was expected to increase sharply between 2015 and 2030.

Implementation of Kirinyaga Climate Change Action Plan 2023–2027, transition to clean cooking is a priority action. It presents an opportunity for technological leapfrogging on savings in energy, and reducing GHG emissions and, delivery of health and cost saving benefits compared to the businesses–usual incremental improvements. Clean cooking is an opportunity for investment in innovation and technology development in the biomass energy sub–sector.

DELIVERY MECHANISMS FOR CCAP

4.1 Enabling Factors

4.1.1 Enabling Policy and Regulatory Framework

The process of developing a comprehensive policy and regulatory framework for climate change is well underway in Kirinyaga, as demonstrated by the Kirinyaga County Climate Change Act, 2023, and Kirinyaga Climate Change Policy, 2023. A key element of the County Climate Change Act is the requirement for various regulations to provide further interpretation of certain provisions, and to support operationalization of the administrative aspects of the Act such as reporting requirements. At the County level, support is needed to develop appropriate

legislation, including climate fund regulations, that are informed by the local context, aligned to county systems, and conform to national public finance policies and laws. This legal and policy framework will guide development and utilization of County Climate Change Funds and enable climate finance to address County-specific local issues. The two enabling actions are described below in Table 8.

4.1.2 Mainstreaming in CIDP

The county government has been mandated to mainstream climate change actions in all the sectors so as to build resilience and adaptive capacity so as to be able to contribute to the nationally determined contributions as per the Paris agreement. The just concluded CIDP 2023-2027 has outlined key sector priority areas in responding to climate change. Kirinyaga County is predominantly agriculture with 70% of population deriving their livelihood from crop production and livestock keeping.

4.1.3 Multi-stakeholder Participation Processes

These processes have proved to very useful where there is peer to peer learning. The discussion from various stakeholders have necessitated to collect reliable data for planning as it captures all the stakeholders including the vulnerable and marginalized people. This platform has offered the traditionally excluded people

and technical experts to have a conversation before a decision is made in terms of the required mitigation and adaptation interventions.

4.1.4 County Climate Finance and Resource Mobilization

The priority climate finance and resource mobilization actions implement the County Climate Change Funds. The actions emphasize designing and launching the Climate Change Fund, developing climate finance and resource mobilization strategy, improving access modalities and efficiency of climate finance, and ensuring that climate finance is available for actions in key sectors, including the marginalized and vulnerable groups. The actions will help the County Government to effectively mobilize, manage, and track climate finance actions. A priority is the operationalization of the Climate Change Fund will allocate funding for priority mitigation and adaptation actions. Building the capacity of The Department of Finance and economic Planning as the Sub National Designated Authority (NDA) to the Green Climate Fund (GCF) is a priority action. Capacity is needed to track and report on sources, applications, and impacts of climate finance. Climate finance includes all finance that targets low–carbon or climate–resilient development; and includes domestic budget allocations, public grants and loans from bilateral and multilateral agencies, and private sector investment. Important sources of international climate finance for Kenya include the GCF and the Global Environment Facility (GEF), which are the entities entrusted with the operation of

the Financial Mechanism of the UNFCCC. Other mechanisms under the UNFCCC include the Special Climate Change Fund, Adaptation Fund, and REDD+ mechanism. Tracking of and reporting on climate finance will include an alignment of climate finance (tracked by National Treasury and Planning) and adaptation and mitigation results (tracked by CCD). This will improve analysis, including identifying actions that provide value for money, determining how much climate finance reaches those most in need (such as women, youth and marginalized), and the climate impact of that finance. The Department of Finance and Economic Planning will develop a climate finance resource mobilization strategy, recognizing that action will take place at the County level, with climate finance reporting taking place at the national level. The capacity of the private sector to access climate finance will be built, recognizing the critical role of private sector investment in implementing the priority climate actions. This includes developing bankable projects and accessing funding through Green Bonds. The department of Finance and Economic Planning will work with financial institutions to increase their understanding of climate finance, develop a climate risk index, and develop climate-related funding schemes in high-risk areas. Kirinyaga needs to be well positioned to act on emerging carbon market opportunities and to benefit from results-based payment mechanisms. This action will support engaging in the development of new market mechanisms under the UNFCCC, developing clarity on the treatment of emission reductions in Kenya

created through climate finance and investment, improving Kirinyaga County's capacity to engage in carbon asset activities, strengthening the viability of domestic carbon asset production, and increasing access to international carbon markets.

4.1.5 Climate Change Planning Committee

Pursuant to Kirinyaga county climate change Act 2023, establishes two level of climate change planning committees, the county planning committee and the ward planning committees. The ward climate change committees are elected on the community level to mainstream and include the voice of the common people and especially the marginalized in climate change planning. The county climate change planning committee consist the technocrats in the county level who offer the technical backstopping for climate action in the county.

4.1.6 Climate Information Services and Climate Data Access

The county government will develop a strategy towards public information and access to climate data. Currently, the county government has partnered with KMD to give the public regular and reliable weather forecasts to ease planning and adaptation. It also serves as an early warning system for any disaster. The

county department of Agriculture has partnered with KARLO for information about crop husbandry in relation to the forecasted weather.

4.1.7 Measurement, Reporting and Verification

The Paris Agreement under the UNFCCC sets out an enhanced transparency framework for action and support. Kirinyaga will be expected to provide information on mitigation, adaptation and support received, including:

- Information related to climate change impacts, vulnerabilities and adaptation.
- Information on financial, technology development and transfer, and capacity building needs and support received from developed countries. Kenya's transparency framework is based on the measurement, reporting and verification plus (MRV+) system defined in NCCAP 2013–2017 as "an integrated framework for measuring, monitoring, evaluating, verifying and reporting results of mitigation actions, adaptation actions and the synergies between them.

4.1.8 Institutional Roles and Responsibilities

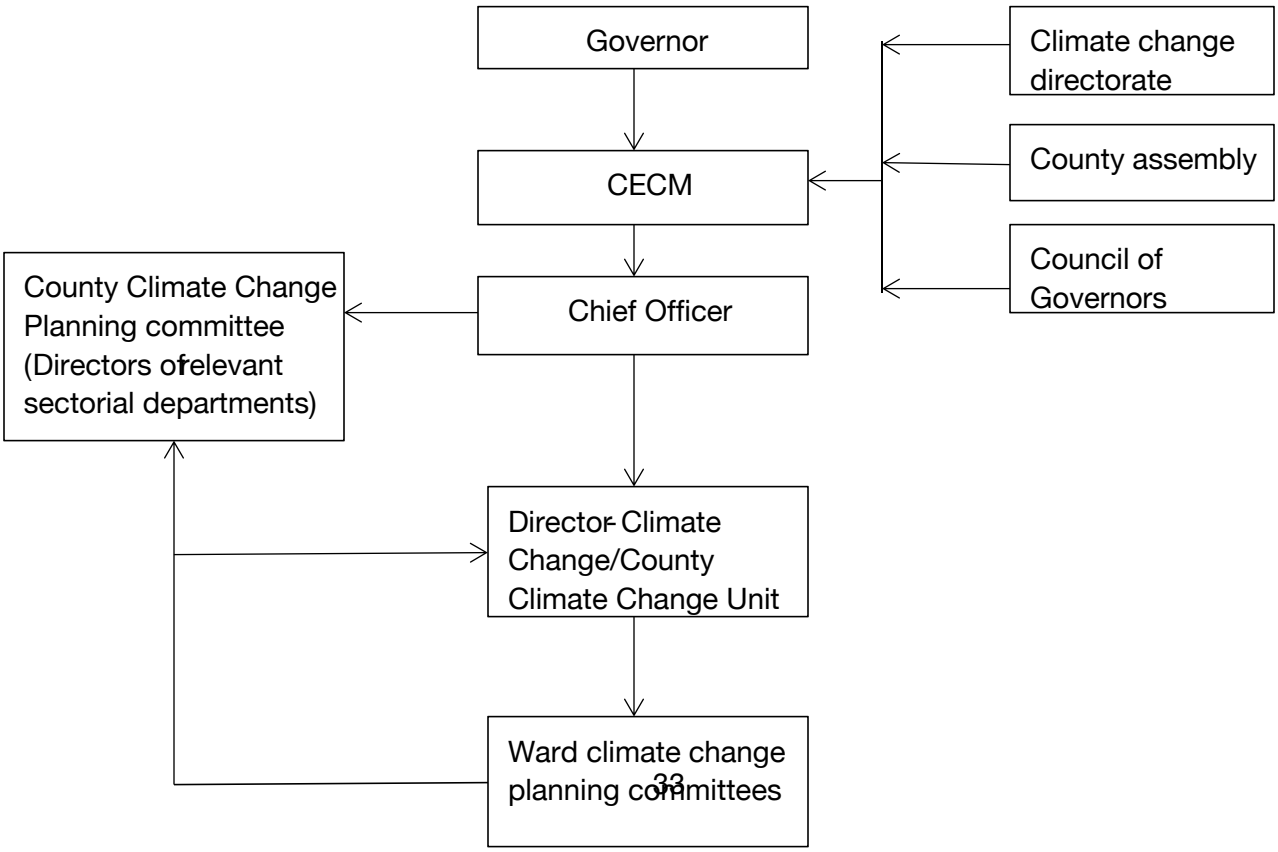

Table 6: Institutional Roles and responsibilities

Institution	Responsibility
County Assembly	• Making laws • Approving Budgets
County Governor	• Head of County Government • Accents to all laws and budgets for implementation

CECM	• In consultation with the County Environment Committee, approve, oversee and review the implementation of county climate change action plan, county climate finance framework and any other climate change policies, plans and strategy. • Approve project proposals presented by both the directorate and ward climate change planning committees for implementation • Oversee, review and make recommendations on the biennial report on implementation of the county climate change action plan and any other reports on climate response and attainment of low carbon climate resilient development to the county assembly. • Advise the county government on legislative, policy and other measures necessary for climate change response and attainment of low carbon climate resilient development. • Formulate a county gender and intergenerational responsive public education and awareness strategy on climate change and the implementation programme. • Offer positive linkages, interactions and synergy between the county, neighboring counties and the national government in climate change response programming and action
Chief Officer	• Chairs county climate change planning committee • Authorized officer in the department • Accounting officer in the department

County Climate change Planning Committee	• to coordinate planning, and implementation of projects and activities for climate change response in the county; • to coordinate implementation of the County Climate Change Action Plan and the County Climate Finance Framework • establish guidelines to be used by Ward Planning Committees in formulating climate response projects for funding by the County Climate Change Fund
	• support Ward Planning Committees in development and implementation of climate response projects • coordinate development and implementation of the County Climate Change Fund Regulations • advise the Executive Committee member on strategies, priority programmes, projects and activities for climate change response in the county • formulate and implement strategic actions to foster climate change education, awareness creation and capacity development in the county • to coordinate research and knowledge management on climate change, its impacts and strategies for responding thereto

	• prepare and disseminate an annual report on climate change response activities in the county • formulate and implement a county monitoring, evaluation and reporting framework for climate change response
County Climate Change Unit	• Provide analytical support on climate change to the various agencies and county government. • Establish and manage a county registry for appropriate mitigation measures for the public and the private sector. • Serve as the county knowledge and information management center for collating, verifying, refining and dissemination of knowledge. • Assist the committee in formulating guidelines and standard documentation for purposes of implementation of this act. • Optimize the county's opportunities to mobilize climate finance. • Conduct civic education to promote the awareness and understanding of the climate change activities amongst the stakeholders. • Conduct research and gap analysis to ensure continuous performance and improvement of the directorate. • Maintain records of all the directorate's documentaries

Ward climate change planning committee	• to coordinate and mobilize communities and other stakeholders in the ward to design and implement climate change response activities • to facilitate research and knowledge management at the ward level on climate change, its impacts and strategies for responding thereto • facilitate public education, awareness creation, and capacity building at the ward level on climate
	change, its impacts and strategies for responding thereto • to coordinate, facilitate and manage community consultations on priority climate change response activities • 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 • facilitate public participation in climate change governance, implementation of agreed climate change response activities, and monitoring of those activities • 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 • oversee implementation of climate change response projects funded by the County Climate Change Fund and report thereon to the director for the time being

	in charge of climate change matters

4.2 Implementation and Co-ordination mechanisms

4.2.1 Directorate of climate change

The directorate will;

a) Provide analytical support on climate change to the various agencies and county government.

b) Establish and manage a county registry for appropriate mitigation measures for the public and the private sector.

c) Serve as the county knowledge and information management center for collating, verifying, refining and dissemination of knowledge.

d) Assist the committee in formulating guidelines and standard documentation for purposes of implementation of this act.

e) Optimize the county's opportunities to mobilize climate finance.

f) Conduct civic education to promote the awareness and understanding of the climate change activities amongst the stakeholders.

g) Conduct research and gap analysis to ensure continuous performance and improvement of the directorate.

h) Maintain records of all the directorate's documentaries

4.2.2 County Climate Change Planning Committee

The role of this committee is;

(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 Committees in development and implementation of climate response projects

(e) coordinate development and implementation of the County Climate Change Fund Regulations

(f) advise the Executive Committee member 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

(i) prepare and disseminate an annual report on climate change response activities in the county

(j) formulate and implement a county monitoring, evaluation and reporting framework for climate change response

4.2.3 Ward climate change Planning Committee

The role of this committee is;

a) to coordinate and mobilize communities and other stakeholders in the ward to design and implement climate change response activities

b) to facilitate research and knowledge management at the ward level on climate change, its impacts and strategies for responding thereto

c) to 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

(a) to 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

(b) facilitate public participation in climate change governance, implementation of agreed climate change response activities, and monitoring of those activities

(c) to 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.

4.3 Implementation Matrix for Priority Climate Actions

The County Climate Change Action Plan (2023–2027) takes cognizance of the impacts of climate change on Kirinyaga's socio-economic sectors. The implementation plan identifies strategic areas where climate action over the next four years is linked to the Bottom up Economic Transformation Agenda, the CIDP and other County Planning documents such as the ADP. While aiding the county in achieving its set climate change related goals, implementation of these projects and programs will also contribute in a way to limit GHG emissions to ensure that

the country achieves its NDC under the Paris Agreement to reduce GHG emissions by 30% by 2030 relative to the business–as–usual scenario of 143 MtCO2e. The implementation matrix below outlines the proposed intervention per sector, the indicators, the targets, means of verification, the estimated budget and the proposed time frame for the execution of these programs and projects.

Table 7: Implementation Matrix

Proposed intervention	Activity	Indicator	Target	Means of Verification	Responsibility	Cost (M)	Time frame
Department of Agriculture, Livestock Production and Fisheries							
Establish a framework to coordinate and implement climate smart agricultural activities in the county.	Develop a framework for climate smart activities. Development of a climate smart agriculture technologies center at Kirinyaga Agriculture Training Center at Kamweti	A legal framework is developed. Climate smart agriculture technologies center established.	1 1	Climate smart agriculture policy An operational tech hub in place	CGK– ALVF	35 20	2022–2027

Integrate pest management (IPM) and good Agricultural Practices (GAP)	Develop a framework for identification and Implementation of appropriate Pest Management and GAP	IPM & GAP recommended and implemented	20	IPM report GAP report	CGK ALVF	30	2023–2027
Promote Sustainable Land Management (SLM) practices	Promote SLM practices including installation of cutoff drains, Retention ditches, Use of cover crops and Gabions	No of SLM interventions implemented	1	Physical verification	CGK ALVF	50	2023–2027
Agro forestation	Planting of fruit trees including	No of fruit seedlings	6,000,000	Procurement of seedling	CGK – ALVF	900	2023–2027

Proposed intervention	**Activity**	**Indicator**	**Target**	**Means of Verification**	**Responsibility**	**Cost (M)**	**Time frame**
	Avocado, Mangoes, Macadamia and	acquired and distributed		Distribution			

	Oranges			list			
Promote use of drought resistant crops/ seedlings	Acquire drought resistant seedling and crop varieties to prevent crop failure due to prolonged drought	No of bags of drought resistant seedling acquired and distributed to farmers	Mwea East and Mwea west	Seedling distribution list	CGK ALVF	200	2023–2027
Public Works							
Protection of Infrastructure from effects of flooding	Development/ Installation of dykes along Thiba, Sagana and Ragati rivers	Dykes constructed	5.6 Km	Dykes in place	CGK – Public Works	210	2023–2027
Department of Trade. Cooperatives, Tourism, Industrialization and Enterprise Development							

Development of County Agro–Industrial Park (CAIP)	Construction of industrial parks and corresponding utility infrastructure to enhance agro–processing, value addition, food conservation through reduced post–harvest loss.	Number of agro–processing industries established	Sagana Climate smart Agro processing park	Completion certificates	CGK– trade, tourism, industrialization and enterprise development, Partners	500	2022–2027
Promotion and diversification of tourism activities/ conservation of	Mainstream conservation and protection of natural resources within the county	Number of sites conserved and protected		Completion certificates Progress reports	CGK– trade, tourism, industrialization and enterprise development, Partners	20	2022–2027

Proposed intervention	Activity	Indicator	Target	Means of Verification	Responsibility	Cost (M)	Time frame
natural resources							
Department of Environment, Water, Energy, Climate Change, Irrigation and Natural Resources							
Water Services							

Increase access to safe domestic water through extended network from water service providers and harnessing water harvesting for human and livestock consumption.	Purchase and laying of water distribution pipes to bolster supply. Purchase and distribution of water storage tanks for household use.	Pipes procured and distributed. Storage tanks procured and distributed.	All wards	Kilometers of laid pipe network Number of storage tanks issued to residents	CGK– DEWNR	100	2022–2027
Reduce irrigation water losses through percolation	Concrete lining of irrigation canals	Kilometers lined with concrete Number of wards covered.	400 4 wards	Physical verification. Project Completion Certificates Progress reports	CGK– DEWNR NIA	200 400	2023–

Provision of water storage facilities for water conservation	Install Bulk Water Storage Facilities for Sagana Township, SAIC and Environs	No. of storage tanks constructed.	Kariti and Kiine wards	Storage tanks constructed and in use	CGK– DEWNR	20	2023–2027
Environmental services							

Proposed intervention	**Activity**	**Indicator**	**Target**	**Means of Verification**	**Responsibility**	**Cost (M)**	**Time frame**

Installation of a sustainable solid waste management infrastructure	Development and installation of material recovery facilities, incineration unit and sanitary landfills	Material recovery Facilities, Operation offices, Baling unit, Storage area, Incineration unit and sanitary landfills constructed at the Sagana Climate Smart Agro–processing Park And Kutus dumping area	Sagana Agro Industrial City	Number of equipment procured. Receipts, delivery notes, invoices Completion certificates	CGK– DEWNR	110	2022–2027

	Acquisition of Waste skips and Skip loader for waste collection and transportation	Waste skips and skip loader procured	All wards	Number of equipment procured. Receipts, delivery notes, invoices	CGK– DEWNR	40	2023–2024
Establish liquid waste management system	Install sewer lines and connect all urban areas to sewer lines	Sewer line in place No of urban areas connected to sewer lines.	1 sewer line	No of operational sewer lines in place	CGK– Environment	500	2023–2027

Proposed intervention	**Activity**	**Indicator**	**Target**	**Means of Verification**	**Responsibility**	**Cost (M)**	**Time frame**
Improve preparedness for erratic rainfall and develop early warning stations	Installation and operationalization of Climate Information System Installation and operationalization of Sub– County weather stations	An operational CIS in place Operational Weather Stations	1 5	Physical verification Reports generated by the CIS Physical verification	CGK – Environment	10 30	2023–2027

				Weather reports generated by the stations			
Conservation of Riparian spaces along rivers	Enforcing conservation of wetlands & riparian through replacement of eucalyptus with bamboo	No. of rivers with riparian areas conserved	6	Physical verification No of bamboo trees planted along rivers	CGK – Environment	50	2023–2027
Lands, Physical Planning And Urban Development							

Installation of Cabro in Urbans areas to manage storm water	Installation of Cabro in major urban areas in the County	No. of towns with Cabro developed	5	Physical verification Cabro Installation report	CGK– Urban Development	100	2023–2027