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MURANG'A COUNTY GOVERNMENT

MURANG'A COUNTY CLIMATE CHANGE ACTION PLAN 2023-2027

FINANCING LOCALLY –LED CLIMATE ACTION (FLLOCA PROJECT)

REPUBLIC OF KENYA

WORLD BANK GROUP

ENVIRONMENT AND CLIMATE CHANGE DEPARTMENT
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Foreword

The manifestations of climate change in the form of rising temperature, variability of precipitation, the risks of more droughts, floods, heat waves, and forest fires have impacts on the economy, environment and communities. Given its geographical location, Topographic formation in the Mountain region, and its population distribution, Murang'a is greatly vulnerable to the impacts of climate change, and has already experienced noticeable adverse effects in recent years. Without concerted National and County action, the challenges the County will face as a result of climate change are expected to intensify in the medium or long term. In response to what has essentially become a global crisis, the government has enacted the Climate Change Act (2016) that provides the policy framework with which systematically addresses the growing threats on community life and its impact on the environment. The Climate Change Act establishes an organizational structure, the Climate Change Commission, and allocates budgetary resources for its important functions. These functions include: The formulation of a framework strategy and program in consultation with the global effort to manage climate change, the main streaming of climate risk reduction into national, sector and County Government's development plans and programs, the recommendation of policies and key development investments in climate-sensitive sectors, and the assessments of vulnerability and facilitation of capacity building.

The national climate change framework strategy has recently been translated into a County Climate Change Action Plan (CCCAP), which prioritizes; Reduction of risks to communities and infrastructure resulting from climate-related disasters such as droughts and floods, Increase in food and nutrition security through enhanced productivity and resilience of the agricultural sector in as low- carbon manner as possible, Enhanced resilience of the Blue Economy and water sector by ensuring access to and efficient use of water for agriculture, manufacturing, domestic, wildlife and other uses, Increased forest cover to 10% of total land area; rehabilitate degraded lands, including range lands; increase resilience of the wildlife and tourism sector, Mainstreaming climate change adaptation into the health sector; and increase the resilience of human settlements, including improved solid waste management in urban areas, Improve energy and resource efficiency in the manufacturing sector, and Climate-proof energy and transport infrastructure; encourage electricity supply based on renewable energy; encourage the transition to clean cooking; and develop sustainable transport systems.

This document assesses the current situation of the County with regard to climate change risk and outlines the CCCAP's strategic direction for 2022 to 2027 as a response to the current situation and projected impact.

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Acknowledgement

The Participatory Vulnerability and Capacity Assessment (PVCA) reports for all thirty-five (35) Wards in Murang'a county together led to development of County Participatory Climate Risk Assessment Report (MCPCRA) From which the Murang'a County Climate Change Action Plan was derived. This Document was prepared with support from various Departments, institutions and individuals. The Murang'a County Government and specifically the Department of Environment and Natural Resource Management provided logistical as well as constituted County Multi-departmental PCRA steering team. To this end we are grateful to the County top management led by the County Governor, His Excellency Dr. Iringa Kang'ata, the CEC Environment and Natural Resources, Hon. Mary Magochi, the Chief Officer, Madam Bridget Irungu and Director Mr. Julius Mwangi and all the county staff who provided their support to the County FLLOCA secretariat and County FLLOCA Technical Working Group during training, field work and preparation of the reports and this Action Plan.

We acknowledge the Ward Members of County Assembly, and the other members of the Ward Climate Change Planning Committees (WCCPC) for their role in providing the bulk of the data and information on climate change in their ward based on the PVCA Tools.

Last but not least we thank the county staff; the County FLLOCA Technical Working Group for spearheading the preparation of the Murang'a County Climate Change Action Plan (MCCCAP), which will guide in mitigation and adaptation of Climate change in the county for the next five years.

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Executive Summary

Murang'a County Climate Change Action Plan (MCCCAP) 2022-2027 is a five-year plan to steer Murang'a climate change action. The Plan derives from the Climate Change Act (Number 11 of 2016), which requires the County Governments to develop Action Plans to guide the main streaming of climate change into their functions and development. MCCCAP 2022-2027 will further the achievement of National development goals by providing mechanisms to realize low carbon climate resilient development. It emphasizes sustainability, while prioritizing adaptation and enhanced climate resilience for vulnerable groups, including women, youth, persons with disabilities, and marginalized and minority communities. Murang'a County Climate Change Action Plan 2022-2027 was developed at a time when significant changes in Murang'a climate were evident. Climate-related disasters, particularly landslides, 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 singled out as severe threats to the well-being of Murang'a 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 a Task force (County Climate Change Steering Committee) that conducted over 700 stakeholder consultations, supported by the Adaptation, and Mitigation. The task force produced Adaptation and Mitigation report which are part of Murang'a County Climate Change Climate Change Action Plan. Priority areas underpin Murang'a County Climate Change Action Plan 2019-2022; 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 Government's Big Four Agenda, and the Sustainable Development Goals (SDGs). Murang'a County Climate Change Action Plan 2019-2022 seeks to increase the number of households and entities benefiting from devolved adaptive services. These actions are also main streamed in Murang'a

County Integrated Development Plan (CIDP), to ensure that they are taken up in Murang'a county government developments

Acronyms

AI	Artificial Insemination
ARD	Agriculture & Rural Development
ASAL	Arid & Semi- Arid Lands
ASL	Above Sea Level
BOG	Board of Governors
CAN	Calcium Ammonium Nitrogen
CBO	Community Based Organization
CCSP	Community Capacity Support Programme
CDF	Constituency Development Fund
CEC	County Executive Committee
CFAs	Community Forest Associations
CHMT	County Health Management Team
CHW	Community Health Worker
CIDP	County Integrated Development Plan
CIGs	Common Interest Groups
CIP	Community Implementation Plan
CMEC	County monitoring and evaluation committee
CMT	County Management Team
CTC	County Technical Committee
DRR	Disaster Risk Reduction
ECLOF	Ecumenical Loan Fund
EDE	Ending Draught Emergencies
EIA	Environmental Impact Assessment
EMCA	Environmental Management & Coordination Act
ESP	Economic Stimulus Programme
FBO	Faith-Based Organization
GHGs	Green House Gases
GIZ	German International Development Agency
GOK	Government of Kenya
HDI	Human Development Index

HMT	Health Management Team
HQS	Headquarters
KCB	Kenya Commercial Bank
KEBS	Kenya Bureau of Standards
KENHA	Kenya National Highway Authority
KeRRA	Kenya Rural Roads Authorities
KFS	Kenya Forest Services
KNBS	Kenya National Bureau of Statistics
KURA	Kenya Urban Roads Authority
KWS	Kenya Wildlife Services
MDGs	Millennium Development Goals
MGCSS	Ministry of Gender, Culture & Social Services
MOHEST	Ministry of Higher Education, Science & Technology
MOLD	Ministry of Livestock Development
MOPHS	Ministry of Public Health & Sanitation
MOPW	Ministry of Public Works
MOR	Ministry of Roads
MOTI	Ministry of Trade & Industry
MOU	Memorandum Of Understanding
MOWI	Ministry of Water & Irrigation
MOYA	Ministry of Youth Affairs
MSMEs	Micro- Small & Medium Enterprise
MSPND & V2030	Ministry of Planning and National Development
MTEF	Medium Term Expenditure Framework
MTP	Medium Term Plan
NAAIP	National Accelerated Agricultural Inputs Access Programme
NAP	National Adaptation Plan
NDMA	National Draught Management Authority
NARIGP	National Agriculture Rural Inclusive Growth Project
NCPD	National Cereals & Produce Board
NEMA	National Environment Management Authority

NGOs	Non-Governmental Organizations
NHIF	National Health Information Fund
NMK	Njaa Marufuku Kenya
PC	Project Committee
PM&E	Participatory Monitoring and Evaluation
PMC	Project Management Committee
PPPs	Public Private Partnerships
PSDA	Private Sector Development In agriculture
SHEP UP	Small Holder, Horticulture Empowerment Promotion Unit Project
SMASSE	Strengthening Mathematics and Science in Secondary Education
SMEs	Small & Medium Enterprise
SP	Sector Programme
SPCR	Social Protection, Culture & Recreation
SWOT	Strengths, Weaknesses, Opportunities and Threats Analysis
UNDP	United Nations Development Programme
UNFCCC	United Nation Framework Convention on Climate Change
WARMA	Water Resource Management Authority
WEDF	Women Enterprise Development Fund
WRA	Women of Reproductive Age-18-49.1
WRUA	Water Resource Users Association
YARD	Youth Action for Rural Development
YEDF	Youth Enterprise Development Fund

Definition of terms

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

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

Climate finance refers to money available for or mobilized by the national government, county government, international agencies, or non-government entities to finance climate change adaptation, mitigation and interventions.

Greenhouse gases (GHGs) are gases that absorb and emit radiant energy within the thermal infra-red 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 tri-fluoride (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. 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.

Hazard: A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation.
Exposure: The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas.

Vulnerability: The conditions determined by physical, social, economic and environmental factors or processes that increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.

Resilience: The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.
Underlying disaster risk drivers: Processes or conditions, often development-related that influence the level of disaster risk by increasing levels of exposure and vulnerability or reducing capacity.

Risk: The potential loss of life, injury, destroyed or damaged assets, which could occur to a system, society or a community in a specific period, determined probabilistically as a function of hazards, exposure, vulnerability and capacity.

Disaster: A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts which exceeds the ability of the affected community or society to cope using its own resources.

Disaster risk reduction: the concept of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

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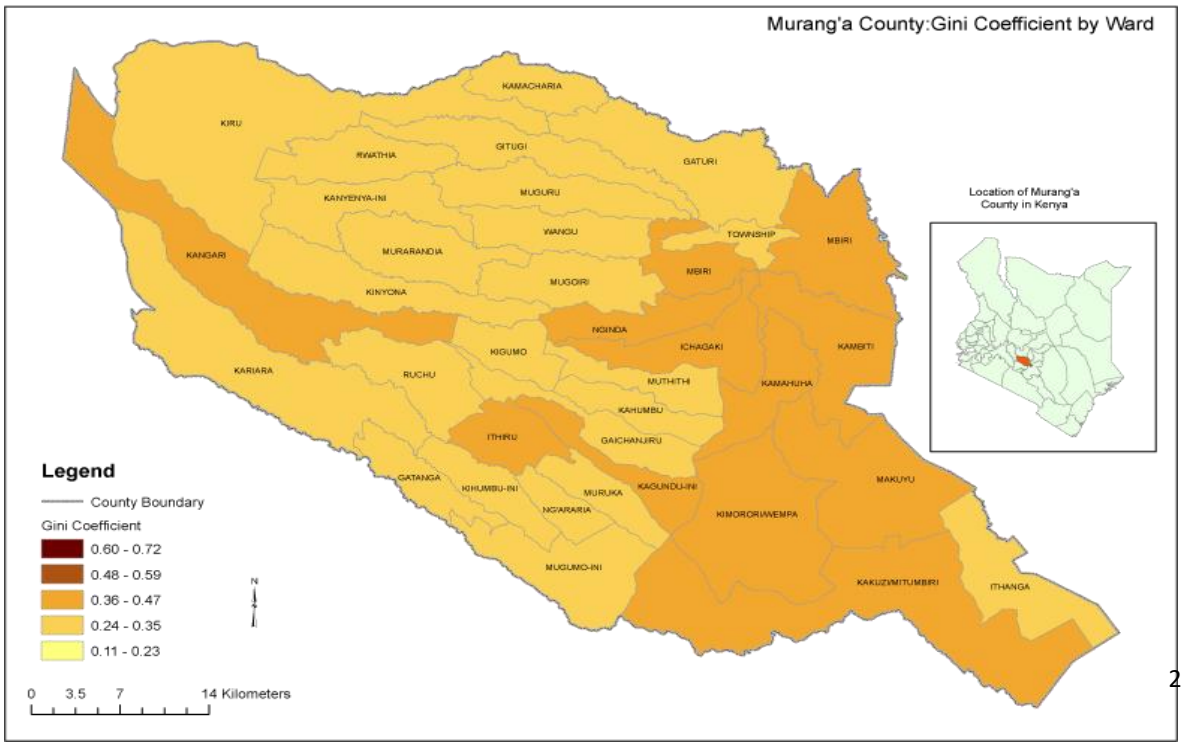
1.0. Background Context

1.1 Introduction & Background

Murang'a County is in the center of the Republic of Kenya. It borders Kiambu Countyto the south, Nyeri County to the north, Nyandarua County to the west and Embu, and Machakos and Kirinyaga counties to the east. Murang'a County occupies a total area of 2,559 km² (Murang'a County Government, 2018). The county's altitude ranges from 914 meters above sea level in the east to 3353 meters above sea level in the west. The highest parts of the county border the Aberdares mountains, which catch rain and are the source of the county's rivers (Murang'a County Government, 2018). Murang'a County's annual temperature ranges between 10 and 25°C. Most of the county experiences an annual average temperature of more than 20°C. The county receives between 750 and 1700 mm of precipitation annually. The eastern part of the county receives an average of less than 750 mm of rainfall annually. The months of March, April, and May are very rainy in Murang'a County, with April historically recording the highest amount of rainfall. The short rainy season usually occurs during the months of October, November, and December. The County has three climatic regions: the western region, is characterized by upper highland humid(UHH) and upper highland per humid (UHP) agro ecological zones and covers the upper Parts of Mathiya, Kangema, Gatanga, and higher Kigumo and Kandara sub-counties.

The central region is characterized by lower highland humid (LHH), upper midland sub humid and humid (UM1& UM2) agro ecological zones covering, Kahuro, Kigumo, and Gatanga and some parts of Mathioya, Kangema and Kiharu sub-counties. The eastern region is characterized by lower midland semi humid LM3, LM4), transitional and semi-arid agro ecological zones. This region covers the lower parts of Ithanga, Kandara, Kiharu and Maragua sub-counties (Murang'a County Government, 2018).

Figure 1: Murang'a County Map and Ward Boundaries



1.1. Purpose and process of the MCCCAP

By conducting a County Climate Change, Murang'a County aims to enhance its resilience to climate change impacts, safeguarding the livelihoods of its inhabitants and ensuring sustainable development in the face of an increasingly uncertain climate future. This process is crucial in enhancing exclusivity of vulnerable groups, including children, women, youth, persons with disabilities, the elderly, and marginalized and minority communities. The process is also crucial in bridging the gap between local knowledge and scientific expertise to develop effective climate adaptation strategies that address the specific vulnerabilities of the county's ago-ecological systems

The Plan seeks in particular to:

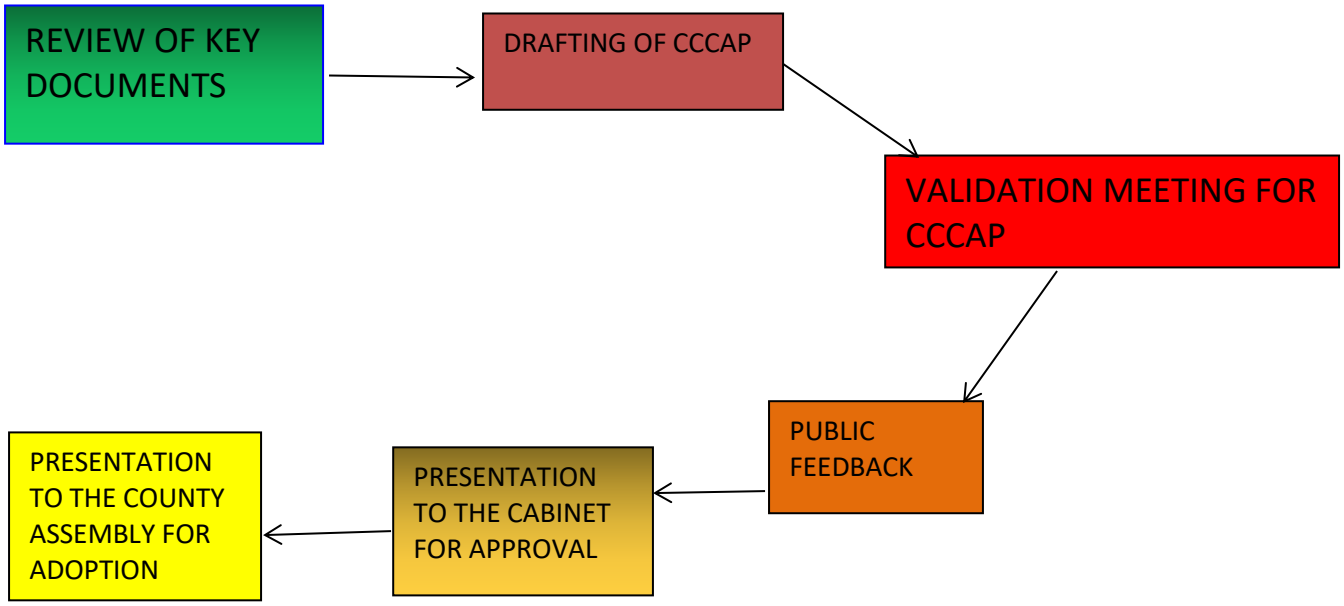
I. Reduce risks to communities and infrastructure resulting from climate-related disasters such as droughts and floods,
II. Increase food and nutrition security through enhanced productivity and resilience of the agricultural sector in as low- carbon manner as possible,
III. Enhance resilience of the Blue Economy and water sector by ensuring access to and efficient use of water for agriculture, manufacturing, domestic, wildlife and other uses,
IV. Increase forest cover to 10% of total land area; rehabilitate degraded lands, including range lands; increase resilience of the wildlife and tourism sector,
V. Mainstream climate change adaptation into the health sector; and increase the resilience of human settlements, including improved solid waste management in urban areas,
VI. Improve energy and resource efficiency in the manufacturing sector, and
VII. Climate-proof energy and transport infrastructure; encourage electricity supply based on renewable energy; encourage the transition to clean cooking; and develop sustainable transport systems.

The Murang'a county Climate Change Action plane was a result of participatory Climate Risk Assessments conducted in all 35 wards across the county.

Table 1: ***Murang'a County Sub Counties and Wards***

Sub-County	Wards
Kangema	Kanyenya-Ini, Muguru, Rwathia
Mathioya	Gitugi, Kiru, Kamacharia
Kiharu	Wangu, Mugoiri, Mbiri, Township, Murarandia, Gaturi
Kigumo	Kahumbu, Muthithi, Kigumo, Kangari, Kinyona
Maragua	Makuyu, Kambiti, Kamahuhu, Ichagaki, Nginda
Kandara	Ng'araria, Muruka, Kagundu-Ini, Gaichanjiru, Ithiru, Ruchu
Gatanga	Mugumo-Ini, Kihumbu-Ini, Gatanga, Kariara
Ithanga	Ithanga, Kakuzi/ Mitubiri, Kimorori/ Wempa

Figure 2; ***County Climate Change Action Plan Process***



1.2. Underlying Climate Resilience Context

Resilience in the context of climate change is defined as the capacity to prepare for, respond to, and recover from the impacts of hazardous climatic events while incurring minimal damage to societal well-being, the economy and the environment. In this context therefore, climate resilience tends to rely on Five capacities or pillars;

- **Threshold capacity**: the capability to prevent damage by constructing a threshold against environmental variation. The objective of building threshold capacity is damage prevention. In flood risk management, examples include building river dikes and increasing flow capacity to set a threshold against high river flows. For water supply, examples include constructing storage reservoirs (water tanks, excavation of water pans, water ponds) to increase the damage threshold by preventing loss of service in the event of droughts.The County's ability to build, operate, and maintain threshold capacity is determined by county's environmental resources and its social, institutional, technical, and economic abilities.

- **Coping capacity:** is a society's capacity to reduce damage if a disturbance exceeds the damage threshold. For flood management, a society's coping capacity is determined by the presence of effective emergency and evacuation plans, the availability of damage reducing measures (e.g. Expansion of drainage tunnels, construction of elevated bridges, etc.). There are nature-based solutions, a communication plan to create risk awareness among inhabitants, and a clear organizational structure and responsible Unit for disaster management. For instance, Early warning information systems. The objective of developing coping capacity is damage reduction, either by reducing flood impacts or by reducing loss of the water supply service (irrigation water and domestic water)
- **Recovery capacity**: society's capability to bounce back to a state equal to, or even better than, before the extreme event. It Refers to a society's capacity to recover to a state that is the same as, equivalent to, or better ('build back better') than, before the emergency.

  For flood control, it is the capacity in a flooded area to reconstruct buildings, infrastructure, and dikes. In case of landslides, it is the capacity to heal the eroded soil through construction of gabions, planting grass strips, afforestation etc. The objective of developing and increasing recovery capacity is to respond quickly and effectively after a disaster. The county's economic capacity to finance the reconstruction determines the recovery success to a large extent. However, institutional ability and technical knowledge are also important.
- **Adaptive capacity:** It is the society's capacity to anticipate uncertain future developments. This includes catastrophic, infrequently occurring disturbances like extreme floods and severe droughts. The time orientation of adaptive capacity lies in the future. Although a system may be functioning well at present, human and environmental developments, from both inside and outside the considered system, can put a system under strain and threaten its future functioning. Examples include climate change, population growth, and urbanization. The acknowledgement that these processes may be influenced but cannot be predicted, engineered, or controlled is

central to the importance of adaptive capacity.

- **Transformative capacity:** Is the capability to create an enabling environment, strengthen stakeholder capacities, and identify and implement catalysing interventions to transition pro actively to a climate-resilient society. It is a society's capacity to transform itself in face of expected catastrophic developments such as human-induced climate change impacts? Similar to adaptive capacity, the time orientation of Transformative capacity lies in the future. The main difference is that adaptation is more associated with small step incremental change in the current system, whereas transformation is regarded as transforming the current system into a system with fundamentally different system characteristics (Kates et al, 2012). Innovation plays an important role in both adaptation and transformation processes,as they require new stakeholder roles, new spatial processes, new guidelines, new user practices, and new knowledge. However, adaptive innovations are often implemented as part of the current system and are mostly applied on a relatively small scale, for instance in pilot projects. Transformative innovation aims to pro actively transform the entire system or a societal sector, such as the water management sector. Evaluating, improving, and learning from pilot projects to make them suitable for up scaling and mainstreaming to a larger scale are important components of Transformative capacity. Na example is developing County Policy and bill on water resources management and utilization.

1.2.1. Impacts of Climate Hazards in the County

Table 2: ***Impacts of Climate Hazards in the 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
Landslide and Mudslide	Crops and livestock loss when swept away Soil degradation (Degradation of agricultural land) Destruction of infrastructure such as power transmission lines and water supplies	• Decreased income • Decreased crop production • Hunger
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, soil erosion)	• Public nuisance, • Air population, water pollution • Bleeding site for invasive insects, depleted quality of soils	• Contraction of vector-instigated infectious illness. • Impoverishment of the quality of air, water and land resources
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

1.2.2 County Climate Hazard Map

Figure 3: Murang'a County Agro-ecological

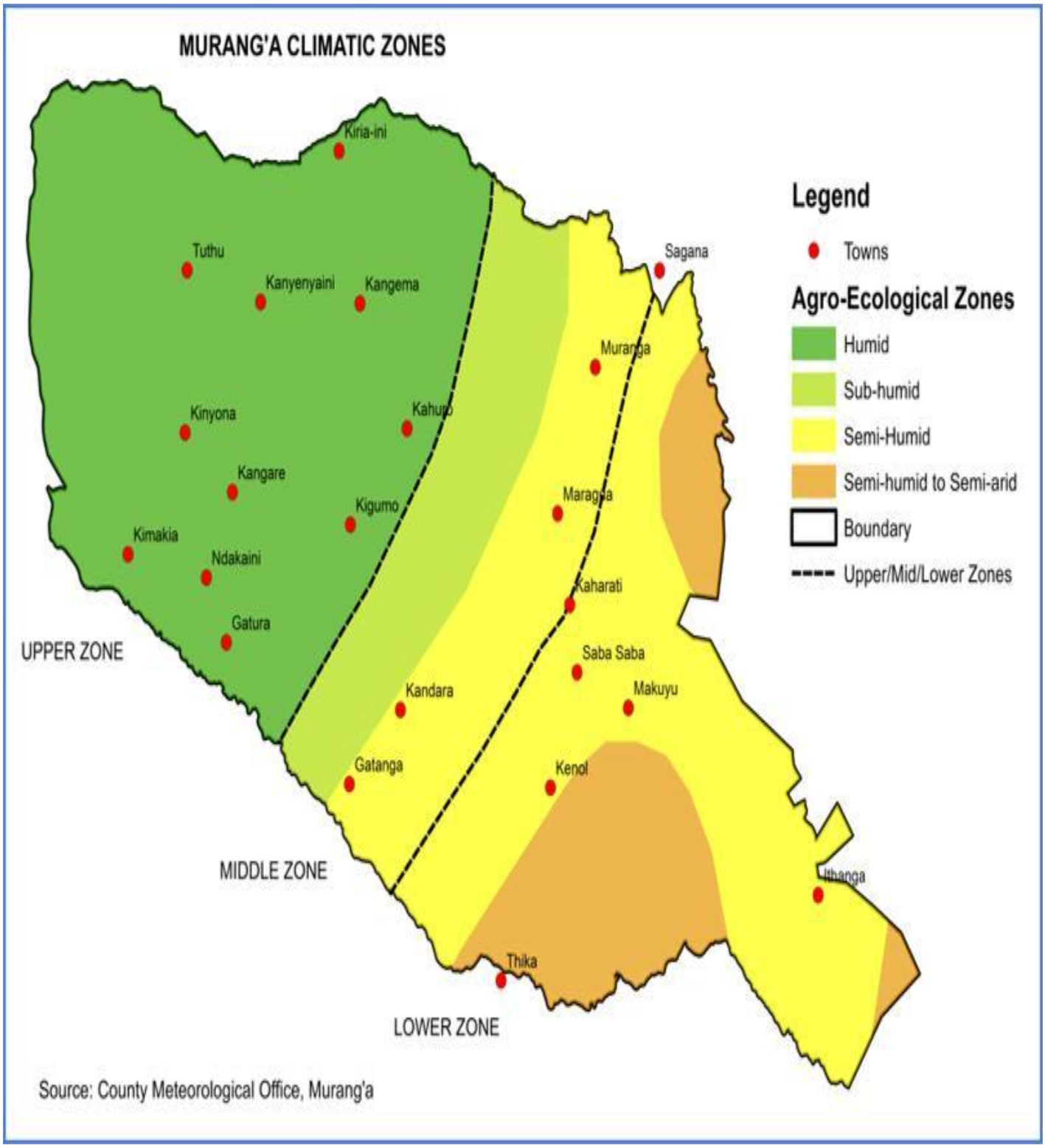


Figure 4: ***Murang'a County Climate Hazard Map***

Lower Zone (LZ 4&3)- Ithanga, Kambiti, Kimorori-wempa, Kakuzi Mitumbiri, Makuyu, Mbiri wards experience prolonged dry seasons (drought) and Flooding during heavy rainfall, Crop and livestock pest and diseased infestation is high especially during high rainfall and Temperatures.

Middle zone: Kamahuha, Gaturi, Mbiri, Township, Wangu, Muguru, Mugoiri, Murarandia, Gitugi, Kamacharia, Muthithi, Kahumbu, Ichagaki, Nginda, ithiru, Gatanga, Kahumbu-ini, Ichagaki, Gaichanjiru, Muruka, Ng'araria, Mugumoini wards

These wards are prone to Crop pest and diseases, Livestock diseases, Flooding, salinity of underground water sources, Human-wildlife conflicts, High temperatures, irregular seasons, Reduced Crops and livestock production

Upper Zone 1&2- Kiru, Kanyenya-ini, Rwathia, Kinyona, Kangari, Ruchu,

Kigumo, Kariara wards These areas are prone to Erratic rains, soil erosion, landslides, Deforestation, Extreme cold,Reduced Crop and Livestock production, Long Cold seasons.

1.2.3 Summary of Differentiated Climate exposure and Vulnerability of key groups and livelihoods in the County.

Table 3 ***Climate exposure and Vulnerability of key groups and livelihoods in the County***

Future Climate Scenario	Impacts	Vulnerable Groups
Flooding	Reduced Family income,	General public
	Hunger and Malnutrition	Women, children
	Outbreak of water borne diseases-Cholera	Children
	Salinity of underground Boreholes and wells Water sources-	General public
	Post-harvest losses	farmers
	Poor market prices of Agricultural commodities, reduced Family income	farmers
	Destruction of infrastructure-Bridges, Roads	School going children, business community
	Soil Erosion	Farmers
	Spillages of sewerages in major towns	Urban Community
Landslides/Mudslides	Decreased income due to crops and livestock loss	Farmers
	Decreased crop production as a result of soil degradation	Farmers
	High Cost of Production caused by Degradation of agricultural land-soil erosion	Farmers
	Destruction of infrastructure such as power transmission lines and water supplies, causing	Upper communities Midland

	economic and social disruptions, displacement of families	
Drought	Decreased Crops and Livestock Production	Farming Community
	High cost of food	All Categories
	Reduced Fodder / dying of Pasture	Livestockist
	Reduced Forests cover	General community
	Women walk long distance in search of Water (domestic)	Women
	Drying-up of Water (livestock) sources	Livestockist
	Dying up of Wetlands	General community
	Water borne diseases or death of livestock	Livestockist
High Temperatures	Prevalence of common and new pests and diseases, High cost of Control, Reduced family income,	Farmers
	Post-harvest losses	farmers
	Poor market prices of Agricultural commodities	Farmers
	Hunger	All
	High cost of food	General community
	Reduced family income	Farmers
Irregular seasons	Loss of income leading to multiple planting	Farmers
Strong winds	Loss of properties, crops and livestock, Death	General community

1.3. Brief Overview of Climate Change Actions in the County

Agriculture is Murang'a County's main economic activity. It plays a crucial role in food and nutrition security and accounts for 57% of the county's employment. Murang'a County's main farming systems are cash crop farming, mixed subsistence farming, livestock keeping, and fish farming. These systems range from large- to small-scale.

Under the National Agricultural and Rural Inclusive Growth Project(NARIGP), four value chain commodities -local chicken, dairy cattle, avocado, and banana- have been prioritized in Murang'a County, based on their economic value and resilience, the number of people engaged in the value chain, and their contribution to food security and income. These four value chains' potentials depend on the agro ecological zones in which they are farmed. Dairy cattle are mainly practiced in the upper highland and midland agro ecological zones due to favourable climatic conditions while local chicken, avocado and banana are mainly farmed in the upper and lower midland agro ecological zones.

An estimated 23% of the county's total population is considered food poor, while 19% of the county's population of children under 5 exhibits stunted growth, and 1% of the county's population of children under 5 is wasted (KDHS, 2014).

Murang'a County faces challenges that limit its agricultural productivity. These challenges include high prices, pests and diseases, post-production losses, poor road networks, and the decreasing availability of land.

Historically, the lower midland agro ecological zone of the county experience more dry spells, moisture stress than the upper highland and midland agro ecological zones. Conversely, the latter zones experience more flood risk and erosion risk than the lower midland agro ecological zones.

Murang'a County's on-farm climate change adaptation strategies include water harvesting, conservation agriculture, the use of drought-tolerant and early-maturing breeds, timely planting and breeding, conserving fodder, the use of certified agricultural inputs, diversifying value chains, and the use of sustainable land management practices such as grass strips, fanya juu, retention ditches, and trash lines.

Murang'a County's off-farm climate change adaptation strategies include the use of early warning systems, weather advisories, extension, training, and credit facilities, proper post-production handling, the use of storage facilities, indigenous knowledge, and gathering market information.

The county has adopted several national policies geared toward adapting to climate change and its associated risks. These policies provide information to farmers, enabling them to plan, make viable economic decisions, and adapt to anticipated climatic risks.

1.3.1. Mainstreaming of NCCAP in County Actions.

Mainstreaming of NCCAP in Murang’a County Actions

Murang’a County's commitment to mainstreaming climate change actions in its development agenda is a proactive response to the global challenge of climate change, aligning with the Paris Agreement's goals. Given its predominantly agricultural economy, the county recognizes the urgent need to build climate resilience in the face of changing weather patterns.

The outlined climate actions in the CIDP 2023-2027 encompass a wide range of initiatives, including improved water access, catchment conservation, sanitation infrastructure, and environmental policy implementation. Murang’a County has encouraged people to invest. These efforts address not only climate change but also critical development needs, such as clean water and sanitation, environmental protection, and sustainable energy.

Murang'a County in Kenya is actively mainstreaming the seven priority areas outlined in the National Climate Change Action Plan into its local strategies and actions to address climate change impacts effectively.

1. **Disaster Risk Management**: The county is investing in early warning systems and disaster preparedness measures. They are also promoting sustainable land use planning to reduce vulnerability to disasters like floods and landslides using media platforms such as Kangema FM.
2. **Food and Nutrition Security**: Murang'a County is supporting farmers in adopting climate-resilient agricultural practices, such as crop diversification and conservation farming. The county provides incentives like subsidized fertilizers and improved seed varieties to enhance food production.
3. **Water and the Blue Economy**: The county is promoting sustainable water management practices, including rainwater harvesting and efficient irrigation systems, to ensure water availability for agriculture. Additionally, they are exploring opportunities for sustainable fisheries and aquaculture.
4. **Forestry, Wildlife, and Tourism**: Murang'a is conserving its forests and wildlife habitats while developing eco- tourism initiatives. This helps preserve biodiversity while generating income and employment opportunities.
5. **Health, Sanitation, and Human Settlements**: The county is improving sanitation facilities and waste management systems to enhance public health. Climate-resilient housing and infrastructure are also being developed.
6. **Manufacturing**: Murang'a is encouraging green manufacturing practices to reduce emissions. They are supporting the establishment of eco- friendly industries that promote resource efficiency.
7. **Energy and Transport**: The county is promoting renewable energy sources like solar and wind power. They are also investing in energy-efficient public transport and encouraging non-motorized transportation.

In summary, Murang'a County is actively integrating these national priorities into its development plans. By focusing on irrigation, incentivizing farmers, and adopting sustainable practices, the county aims to mitigate the impacts of climate change, enhance food security, and promote sustainable economic growth while protecting its natural resources and environment.

1.3.2 Climate Change in Murang'a County CIDP

The establishment of a Kenya Climate Smart Agriculture Strategy (KCSAS) (2017-2026) in Murang'a County is a forward-thinking initiative. It not only promotes economic growth and job creation but also contributes to reducing post-harvest losses, a critical climate action. By incorporating climate-smart agriculture and improving market linkages, it enhances food security and reduces greenhouse gas emissions associated with food wastage.

1. **Agro-forestry and Tree Cover**: Promoting agro-forestry and expanding tree cover through farm forestry aligns with climate goals by sequestering carbon and enhancing food and nutrition security.
2. **Water Scarcity Resilience**: Increasing water connectivity to households and farms, alongside bulk water harvesting and distribution, strengthens the county's resilience to water scarcity – a climate-induced challenge.
3. **Environmental Conservation**: Integrating sustainable waste management and protecting riparian areas and wetlands are vital for reducing pollution, preserving biodiversity, and mitigating climate change. Bamboo growth further aids in carbon sequestration.
4. **Infrastructure and Disaster Mitigation**: Improving drainage systems, incorporating sustainable land management practices, and building resilient infrastructure help prevent flooding hazards and soil erosion during extreme weather events, aligning with climate adaptation goals.

By mainstreaming these initiatives into its development plan, Murang'a County not only enhances its climate resilience but also contributes to national and global climate objectives. This holistic approach demonstrates the county's commitment to sustainable development and its recognition of the critical role local governments play in addressing climate change while improving the well-being of their communities.

1.3.2. Climate Change in CIDP.

Table 5: Main streaming Climate change in CIDP

Development needs	Priorities	Strategies
Markets sheds and collection centres	Market developments	Construct markets and grading sheds in all the wards
Basic amenities in markets	Construction of sanitation blocks	Construction of sanitation blocks in all the markets
Roads infrastructure	Grading of all roads leading to the market areas	Upgrade all feeder roads leading to markets
Efficient markets	Easy access to markets	Open up roads in the rural areas
Agro processing, manufacturing and value addition	Agro-processing, manufacturing of farm produce	Establishment of multi product processing units.

Inclusion of youth and women in agribusiness	Social inclusion	Develop youth and women friendly technologies –e.g. Value addition Integrate gender-responsive CC adaptation and mitigation in agriculture, Livestock, and fisheries plans, programs, and budgets.
Inadequate and unreliable rainfall for crop and fodder production.	Capacity building Water harvesting and Utilization Crops and livestock insurance Promote drought tolerant/resistant crops and fodder varieties. Promote crop insurance. Conserve fodder during plenty season	.
Low soil fertility for crop and fodder production	Soil fertility and acidity management	Promote soil testing and fertility management
Crops and livestock disease and pests	Emerging and existing zoonotic diseases of anthrax, rabies and rift valley fever Emerging crop pests and diseases	Adopt the county one health strategy in control of zoonosis Adopt the national rabies eradication strategy Adopt common approach of providing resources for prevention, early detection and response to zoonotic disease Establishment strategic pest and disease control unit
Inadequate pre and post harvest management and value addition investments.	Low adoption of new technologies Inadequate information Youth involvement	Promote and support of value addition initiatives. Promote on-farm and off farm storage and transport facilities Create awareness on pre and post-harvest losses and management. Promote Cottage industries
Water and irrigation		
Development needs	**Priorities**	**Strategies**
Inadequate and unreliable rainfall for crop and fodder production.	Irrigation infrastructure Capacity building Water harvesting	Invest in irrigation schemes/infrastructure Train farmers on on-farm water harvesting and efficient utilization technologies.

Increased access to irrigation water Flood control Building farmers capacity on water use and management Establish water users' association Enhancing compliance with Environmental, statutory and legal requirement To improve irrigation technology Climate change mitigation	- Feasibility studies to determine the technical and socio-economic viability of projects. - Project planning and design. - Implementation, operationalization and management of irrigation schemes.	- Development of water harvesting and storage infrastructure for irrigation. - Infield irrigation water management. - Rehabilitating and upgrading existing under-utilized irrigation systems. - Enhancing farmer education and awareness, and improving communication and information flow. - Mitigating effects of climate change by harnessing agricultural water resources and storage infrastructure to reduce flood and drought disasters, and environmental damage arising from climatic variations. - Establishment and Legalization of Irrigation Water Users' Associations (IWUAs) - Improving irrigation technology such as the use of solar energy and other renewable energy in pumping. - Enhancing Public-Private Partnerships by encouraging private sector players to invest and participate in irrigation. - Strengthening stakeholder participation in all irrigation projects and initiatives.
		- Enhancing compliance with environmental, statutory and legal requirements - Gender equity and involvement of youth in irrigation development and management.
Water, security and sanitation	Avail piped clean and safe water in the market Centres, lighting	Connect all markets with clean water.
Education, Youth, Sports, Culture, and Social Services		
Development needs	**Priorities**	**Strategies**
Promotion of sports among youths	Infrastructure Development	Rehabilitation and Construction of Sports Stadia
ECD lunch programme	Nutritional improvement	Improve and develop 4K-Clubs in schools- multi-storey kitchen Gardens
Public Health and Sanitation		

Development needs	Priorities	Strategies
Incidence and re-emergence of diseases	Strengthen preventive and promote health services through; malaria control; expanded programs on immunization; integrated management of childhood illness; control and prevention of environment tally related communicable diseases and encouraging improved nutrition	Implement preventive, and curative and rehabilitative services through partners and MCG. • enhance school health program • Pests and vector control • Eradicate OD • Provision of mosquito nets • Encourage health education-through campaigns • Hold world health days • Buildings inspection and certification • Examination and licensing of food handlers • Surveillance of diseases targeted for eradication and elimination. • Treatment of water at household level • Protection of minor water sources • Mainstreaming gender, Disability equity and inclusion
Cooperative development sub sector		
Development needs	**Priorities**	**Strategies**
Cooperative societies	Access to markets-milk, coffee, tea, avocados, French beans, mangoes, bananas	Strengthening existing cooperatives, governance, formation of business model, reviving coffee societies to provide value added products
Land, Housing and Urban Development		
Development needs	**Priorities**	**Strategies**
Solid waste management, clean and conducive environment Inadequate sanitation facilities e.g. public toilets, waste receptors, Poor and/or non-existent Drainage system	Sustainable solid and liquid waste disposal mechanism Storm water drainage in major towns and market centres	Establish solid waste collection and segregation mechanism Designate waste collection sites Construct public pay toilets Mapping of drainage system Design and construct open drainage systems
Substandard dilapidated housing structures for poor population (10,000 households)	Rural Housing program	Introduce use of ABT and support Housing construction

Roads, Transport, Energy, and Public Works		
Development needs	**Priorities**	**Strategies**
Impassable roads.	Upgrading of Impassable roads	Opening of access roads. Grading of access of roads. Gravelling of access roads.
Inadequate Security.	Rehabilitation of existing and installation of new security lights	Installation of Floodlights. Installation of Street lighting.
Poor road Connectivity	Improve Connectivity	Construction & Rehabilitation of footbridges & bridges.
Poor Drainage of roads & urban areas.	Improve drainage	Excavation of Drains De- silting of drains & Culverts Storm water management in urban areas

1.3.3 Other key climate actions/strategies in the County

Table 6: other key climate Actions/strategies in the county

Name of Natural Resource	Dependent Sectors	Status, Level of Utilization & Scenarios for future	Opportunities for optimal utilization	Constraints to optimal utilization	Sustainable Management strategies
Murang'a county has several rivers. the major ones are: River Maragua River Mathioya River kayahwe River Irati River chania	Fisheries Tourism Irrigation Agriculture Disaster management Water sector Energy (Wanjii - Mengen) Mining (sand)	The rivers are mainly used for domestic water and rarely for irrigation. There is a lot of pollution emanating from farming, industrialization amongothers. Deforestation indigenous trees, afforestation of exotictrees in catchment areasfor instance blue gum. Lack of conservation of water, Forestryactivities around thecatchment areas Declining water levels – expected to furtherdecline with expansionof horticulture sector Water quality expectedto decline due toincreased farming activities	Best practices inwaste water management and wetland conservation insome farms Construction ofdams. Establishment of irrigated farming. Recreationa lactivities.	Water levels declined Water quality deteriorated from horticulture (affecting quality of fish,and quality of tourism). Pollution Deforestation of water catchment areas.	Monitoring of water levels andquality Regulate waste water and effluents fromfarms Extension services to coverwaste water treatment management Nutrient enrichment Conservation of water catchment areas

Quarrying	Housing Roads	Quarry stones for housing and road constructions Quarrying usually leadsto land degradation During the rainy seasons they usuallyexperience landslides and consequentlydeaths. .	Mapping of the quarry sites in the county. Adopting new technologies of mining. E.g. useof modern technology and machines. Making quarry sites accessible.	Environmental degradation. Poor technology. Land ownership .	Rehabilitation of quarry sites. They can be rehabilitated and used as water pans, farming, fish-ponds, tourist attraction sites. Formulation of policy to regulate quarrying.

Name of Natural Resource	**Dependent Sectors**	**Status, Level of Utilization Scenarios for future**	**Opportunities for optimal utilization**	**Constraints to optimal utilization**	**Sustainable Management strategies**
Forests (Aberdare forest)	Kenya forest service Agriculture Tourism Wildlife Water Environment Lands	In Murang'a county forests are mainly found in the upper parts of the county. There have been deforestation due to encroachment of forest areas, illegal logging, use of firewood by tea factories ,forest fires.	Formulation and enforcement of policy to safeguard the forests. Establish of man-made forests for logging e.g. Tim sales forest in Nakuru.	Deforestation. Illegal fellingof trees, Forest fires.	Formulate policyto curb illegalfelling of trees. Establishment of man-made forests. Deployment of more forest wardens. Procurementof fire fighting helicopters. Planting exotic trees to minimize logging of indigenous trees.

Water Springs	Water Environment Kenya forest service	In the county there are a number of state.	Springs protection programme county wide. Mapping of all water springs in the county.	Deforestation which leads to drying of springs. Pollution from farming residues	Springs protection. Formulation ofpolicy on springs management.
Wildlife (snakes, monkeys, elephants, velvet monkey	Kenya wildlife service Agriculture	In Murang'a county We usually experience human w ildlifeconflict.	Establishment of game reserves to enhance tourism local and international.	Destruction of agricultural crops Some pose health hazards to humans.	Construction and maintenance of electrical fence/barriers. Formulation of policy to allow conservation ofwildlife. Designating land for wildlife conservation.

2.0. Policy Environment

2.1. The Global Perspective Frameworks on Climate Change

Climate change is a global problem. Kenya and other countries in the globe are active players in international efforts to mitigate the impact of climate change on global economies and livelihoods. The international response to climate change is founded on the ***United Nations Framework Convention on Climate Change (UNFCCC)*** that entered into force in 1994. Kenya signed the UNFCCC on 12th June 1992, and ratified the Convention on 30th August 1994.The ultimate objective of this Convention is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate systems. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

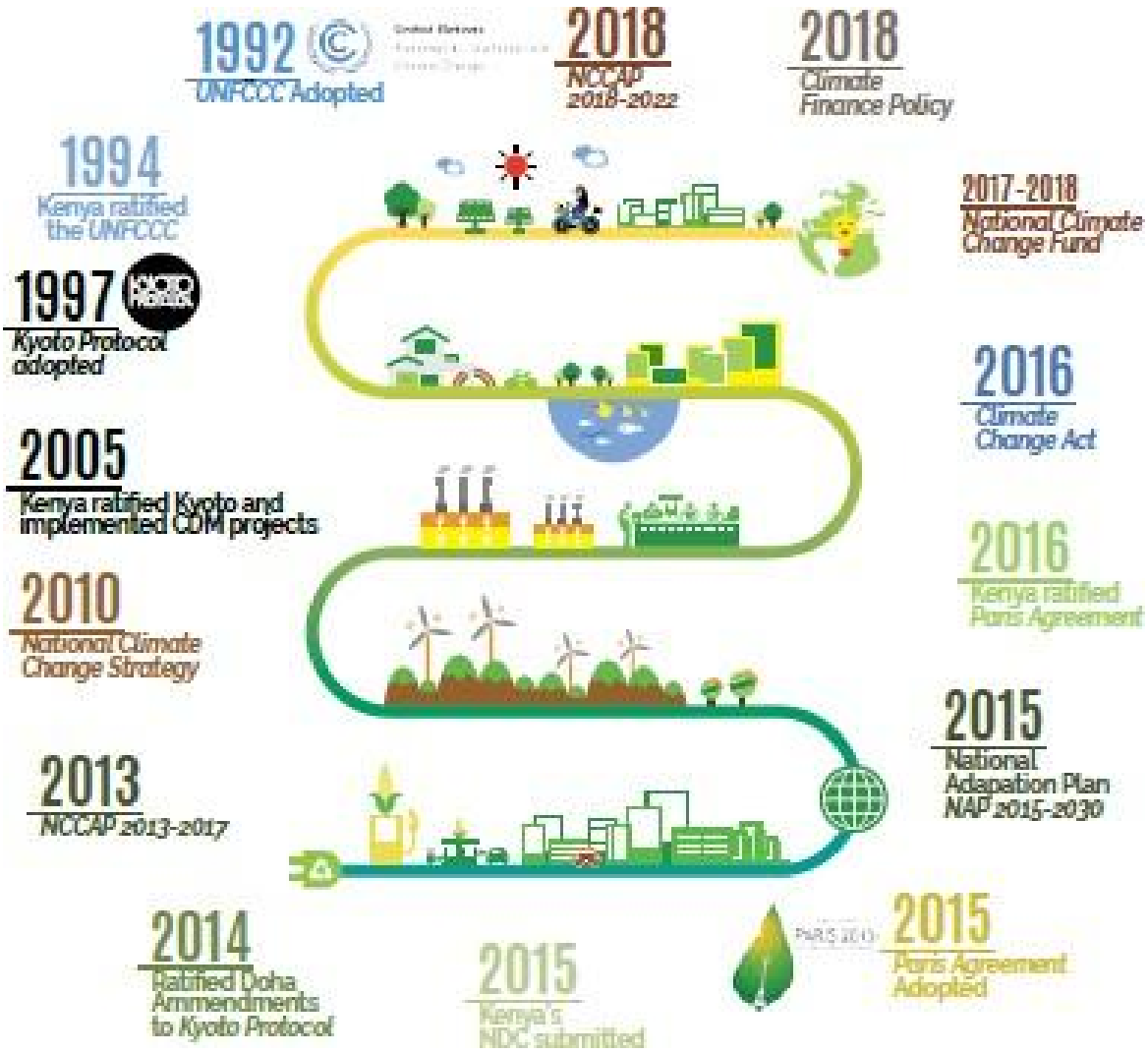
The country participates in meetings of the Conference of the Parties (COP) to the *UNFCCC,* articulating the national interest, and the country's position, during international negotiations. This makes it a key player in the global climate change governance system

Table 7: Global efforts towards mitigation of the impacts of climate change

No	Global Frameworks	Description
1	Kyoto Protocol[1]	• The Kyoto Protocol is an international agreement that commits developed countries, and countries in transition to market economics, to reduce their overall GHG emissions • It created the Clean Development Mechanism (CDM), under which projects of developing countries, which reduced GHG emissions, and contributed to sustainable development, earned credits that could be sold to countries or companies with a commitment to reduce GHG emissions. • The first commitment period started in 2008, and ended in 2012. Parties to the *Kyoto Protocol* adopted an amendment in 2012, which has yet to enter into force. Kenya ratified the *Kyoto Protocol* on 25th February, 2005.
2	Paris Agreement	• Entered into force internationally on 4th November, 2016, thirty days after 5th October, 2016, the date on which the threshold for entry into force was achieved. • As of May 2018, 178 Parties had ratified the Convention, surpassing the threshold for entry of at least 55 Parties to the Convention, accounting for at

No	Global Frameworks	Description
		least an estimated 55% of the total global GHG emissions. • The Paris Agreement was ratified by Kenya on 26th December, 2016, under section 9(1) of the Treaty Making and Ratification Act (Number 45 of 2012), and entered into force for Kenya on 27th January, 2017.
3	The Climate and Clean Air Coalition to Reduce Short-lived Climate Pollutants	• Founded in February 2012, is a voluntary partnership of 60 governments, intergovernmental organizations, businesses, scientific institutions, and civil society organizations that are committed to improving air quality, and protecting the climate, through actions to reduce short-lived climate pollutants. • These pollutants include, emissions of black carbon (soot), methane, tropospheric ozone, and some hydro fluorocarbons. Kenya became a partner of the coalition in 2012.
4	The Sendai Framework for Disaster Risk Reduction 2015-2030	• Is a voluntary agreement that recognizes that the State has the primary role to reduce disaster risk, but that responsibility should be shared with other stakeholders, including local governments, the private sector, and other stakeholders. It aims at the following outcome: "The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries. • Kenya adopted the *Sendai Framework* in 2015.
5	Sustainable Development Goals	• Kenya is committed to the 2030 Agenda for Sustainable Development that was adopted by world leaders, including the President of the Republic of Kenya, in September 2015 at the United Nations (UN) Sustainable Development Summit. • On 1st January, 2016, the 17 Sustainable Development Goals (SDGs) officially came into force. • The *2030 Agenda* includes dedicated goals for climate change (SDG 13), protecting, restoring, and promoting sustainable use of terrestrial ecosystems (SDG 15), and mainstreaming climate change impacts and climate actions across all the SDGs.

Figure 5 ***Global Efforts on Climate Change***



2.1. National Policy Context

2.1.1. The National Perspective

NDC KEY PARAMETERS

The objective of **Kenya's NDC**(Nationally Determined Contribution) is to lower greenhouse gas (GHG) emissions by 32% by 2030, despite the fact that Kenya contributes a mere 0.1% to the total global emissions. Towards this end, the NDC specifies adaptation and mitigation actions and responses.

Conditional NDC: 32% reduction relative to the business-as-usual (BAU) by 2030.

Mitigation Sectors are; in Collaboration or Inter-Sectoral Energy, agriculture, forestry, industry, transport, and waste (Environment)

Adaptation Sectors are; Water, Agriculture, land use, forestry, energy, health, and infrastructure

Kenya's updated NDC will revise sectoral elements of the NDC implementation roadmap; update the sectoral component of the National Climate Change Action Plans (NCCAP) to 2025 and 2030 to guide the Long-Term Strategy (LTS).

The new NDC will also implement NCCAP sector component work plans for adaptation and mitigation; revise resource allocation and mobilization; improve multi-level and inter-sectoral coordination; and strengthen institutional capacities at national and sub-national levels.

Kenya was represented as part of the CGE webinar series on synergies at national level in data collection for reporting under MRV/ETF, SDGs and other international instruments.

KEY PROJECT WORK AREAS

a) Integrated Governance and Gender-mainstreaming

- Examine the legal, policy and institutional frameworks on climate change and gender, focusing on gender trends, structure of decision-making bodies, and gender diversity in participating institutions;
- Develop guidelines on gender integration into NDC planning and implementation processes and reporting; and
- Enhance knowledge and technical capacities to deliver gender-responsive climate change plans and actions.

b) Climate Finance

- Develop an NDC financing strategy;
- Create a training course on climate change budget coding and climate finance tracking;
- Devise climate fund regulations, NDC financing strategy and private sector framework as required under the Climate Change Act 2016; and

- Formulate a resource mobilization strategy to operationalize the Climate Fund.

c) Mitigation through Circular Economy Approaches

- Map economy-wide material and energy flows, including related impacts to identify new and enhanced circular mitigation opportunities.
- Private Sector Engagement
- Develop business plans for circular economy, including policy and regulatory incentives to incentivise private sector investment;
- Conduct regulatory due diligence for the waste sector to promote private sector engagement; and
- Assess legal titles of GHG emission reductions and develop financial model for an Internationally Transferred Mitigation Outcomes (ITMO) projects with the Government of Switzerland.

d) Monitoring and Transparency

- Define indicators for gender integration across NDC sectors for monitoring, reporting and verification (MRV);
- Develop integrated, on-line monitoring, reporting and verification (MRV) tool for GHG inventory reporting, tracking of mitigation and adaptation actions, climate finance andSDG impacts; and
- Improve carbon accounting methodologies for recycling activities.

e) Awareness and Education

- Formulate national gender and intergenerational responsive public education and awareness strategy on climate change and implementation.

<u>COLLABORATION</u>

In Kenya, the NDC Support Programme links with other complementary projects. This includes components of the Low Emissions Climate Resilient Development (LECRD) project funded by the US Agency for International Development (USAID) through UNDP for the development of the climate change fund regulations; with the Capacity Building Initiative on Transparency (CBIT) and the Global NDC Implementation Partners (GNI+) Project; and with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH for the enhancement of Kenya's NDC. Collaboration also exists with the Kenya Private Sector Alliance (KEPSA), Kenya Association of Manufacturers (KAM) and Kenya National Chamber of Commerce and Industry (KNCCI) and other state and non-state actors.

2.1.2 National Legal and Policy Framework

These are the rules, rights and obligations of governments, companies, and citizens set forth in a system of legal documents called a legal framework. Documents in the legal framework include a country's constitution, legislation, policy, regulations and contracts.

Legal and policy frameworks consist of a variety of instruments:

- Treaties- international
- Laws of Kenya or the constitution
- Regulations or Guiding principles on implementation
- Policies
- Agreement or contracts
- Norms/ Ethics/Rules

The 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.

National Policy on Climate Finance

This policy accomplishes several goals. First, it describes the current legal and policy framework for climate financing that is relevant for Kenya, focusing on both domestic and international sources. Second, it outlines the role that climate financing could play in each of Kenya's most important economic sectors (agriculture, forestry, energy, transport, trade,

tourism, manufacturing, water and sanitation, disaster risk management, and research and innovation). Third, it describes the policy interventions the Kenyan government intends to make with respect to climate financing, including to establish a national Climate Change Fund, identify climate financing sources and create a national system for tracking them, enhancing Kenya's carbon trading system, and exploring the possibility of green bonds.

National Climate Change Response Strategy

The National Climate Change Response Strategy outlines its objectives as to: Enhance the understanding of the global climate change regime, negotiation process and develop priorities for Kenya Assess the evidence and impacts of climate change in Kenya, Recommend adaptation and mitigation measures, Develop assessment and capacity building frameworks, Recommend research and technology needs, Develop a conducive and enabling policy, legal and institutional framework, and to Provide a concrete action plan combined with resource mobilization plan.

Actions mentioned in the strategy include:

- Promoting orphan crops, agricultural produce post-harvest processing, storage and value added, breeding of animals from various agro-ecological zones that adapt well to climatic variances and providing special livestock insurance within Adaptation
- Establishing a national climate awareness campaign, and incorporating climate change in school curriculum within Information and awareness building
- Technology development through CDM or other options, accelerating south-south partnerships in technology
- Dedicated climate directorate within the Ministry of Environment and a National Climate Change Steering Committee and a Climate Change Activities Coordinating Committee within the Institutional framework.

The Climate Risk Management Framework for Kenya

The Climate Risk Management Framework for Kenya outlines how the government intends to harmonize its climate change and disaster risk policies. According to the framework, there are ten priority areas that overlap between climate change and disaster risk policies, which can be areas for government intervention. Specifically, the government intends to:

1. Harmonize programs and projects and create a coordination mechanism among the national government (institutional framework);
2. Create an enabling policy and legal framework for integrated climate risk management (policy framework);
3. Build capacity at national and county level for integrated climate risk management (capacity building);
4. Analyse the level of exposure, vulnerability to disasters, and capacity at the local scale (exposure, vulnerability, and capacity);

5. Involve communities at risk, and consider gender and marginalized groups (gender mainstreaming);
6. Mobilize financial resources for climate risk management (resource mobilization);
7. Mainstream climate risk management into sector programs, plans and activities (mainstreaming climate risk management);
8. Design and implement pilot projects for climate risk management at county and national level (pilot projects);
9. Enhance research and dissemination of information about climate risk management (training, research, and outreach);
10. Create platforms for sharing lessons and good practices on integrated climate risk management (learning).

Kenya Climate Smart Agriculture Strategy 2017-2026

The broad objective of the Kenya Climate Smart Agriculture Strategy 2017-2026 (KCSAS) is to adapt to climate change, build the resilience of agricultural systems, and minimize emissions for enhanced food and nutritional security and improved livelihoods. The specific objectives of the KCSAS are to;

I. Enhance the adaptive capacity and resilience of farmers, pastoralist, and fisher-folk to the adverse impacts of climate change,
II. Develop mechanisms that minimize greenhouse gas emissions from agricultural production systems,
III. Create an enabling regulatory and institutional framework, and
IV. Address cross-cutting issues that adversely impact climate smart agriculture.

Four broad strategic areas have been identified for KCSAS;

I. Adaptation and building resilience by addressing vulnerability to changes in rainfall and temperature, extreme weather events, and unsustainable land/water management and utilization,
II. Mitigation of greenhouse gas emissions from key and minor sources in the agriculture sector,
III. Establishment of an enabling policy, legal, and institutional framework for effective implementation of climate smart agriculture,
IV. Minimizing the effects of underlying cross-cutting issues, such as human resource capacity and finance, which would potentially constrain the realization of climate smart agriculture objectives.

National Climate Change Action Plan 2018-2022 (NCCAP)

This plan aims to strengthen the country's path towards sustainable, climate-resilient development while achieving low carbon climate resilient development. It builds on the

previous Action Plan spanning the period 2013-2017. The NCCAP consists in three documents, including an Adaptation Technical Analysis Report (volume II), and a Mitigation Technical Analysis Report (volume III). The Plan seeks in particular to:

I. Reduce risks to communities and infrastructure resulting from climate-related disasters such as droughts and floods,
II. Increase food and nutrition security through enhanced productivity and resilience of the agricultural sector in as low- carbon manner as possible,
III. Enhance resilience of the Blue Economy and water sector by ensuring access to and efficient use of water for agriculture, manufacturing, domestic, wildlife and other uses,
IV. Increase forest cover to 10% of total land area; rehabilitate degraded lands, including range lands; increase resilience of the wildlife and tourism sector,
V. Mainstream climate change adaptation into the health sector; and increase the resilience of human settlements, including improved solid waste management in urban areas,
VI. Improve energy and resource efficiency in the manufacturing sector, and
VII. Climate-proof energy and transport infrastructure; encourage electricity supply based on renewable energy; encourage the transition to clean cooking; and develop sustainable transport systems.

Climate Change Act, 2016

This Act provides a framework for promoting climate resilient low carbon economic development. It aims to (Art 3-2):

1. Mainstream climate change responses into development planning, decision making and implementation;
2. Build resilience and enhance adaptive capacity to the impacts of climate change;
3. Formulate programs and plans to enhance the resilience and adaptive capacity of human and ecological systems to the impacts of climate change;
4. Mainstream and reinforce climate change disaster risk reduction in strategies and actions of public and private entities;
5. Mainstream intergenerational and gender equity in all aspects of climate change responses;
6. Provide incentives and obligations for private sector contributions to achieving low carbon climate resilient development;
7. Promote low carbon technologies to improve efficiency and reduce emissions intensity by facilitating approaches and uptake of technologies that support low carbon, and climate resilient development;
8. Facilitate capacity development for public participation in climate change responses through awareness creation, consultation, representation and access to information;

9. Mobilize and transparently manage public and other financial resources for climate change response;
10. Provide mechanisms for, and facilitate climate change research and development, training and capacity building;
11. Mainstream the principle of sustainable development into the planning for and decision making on climate change response; and
12. Integrate climate change into the exercise of power and functions of all levels of governance, and to enhance cooperative climate change governance between national government and county governments'.

National Environment Policy 2013

The Policy aims to provide a framework for an integrated approach to sustainable management of Kenya's environment and natural resources. In particular, it proposes to strengthen:

- Legal and institutional framework for good governance,
- Integrate environmental management with economic growth, poverty reduction and improving livelihoods,
- Research and capacity development,
- Promote new environment management tools,
- Promote collaboration and cooperation and partnerships in environment management,
- Promote domestication, co-ordination and maximization of benefit from Strategic Multilateral Environment Agreements

The Policy discusses intended climate change-related policy actions, as follows:

- Develop a comprehensive climate change policy,
- Strengthen capacity for national and country level institutions for climate resilience and low carbon development,
- Develop and implement awareness and capacities for implement the climate change action plan,
- Strengthen and enhance an early warning and response system for disaster risk reduction
- Strengthen research capacity,
- Develop a climate financing mechanism,
- Establish a national carbon trading platform, and
- Promote public and community participation in mitigation and adaptation

National Adaptation Plan 2015-2030

This document identifies Kenya's vulnerabilities to the effect of climate change, adaptation actions and implementation strategies.

National Policy for Disaster Management

The policy recognizes that climate change contributes significantly to Kenya's increasing vulnerability to disasters in the last two decades and affects seriously the lives and livelihoods of communities. The policy therefore aims to institutionalize mechanisms to address these disasters and associated vulnerabilities stressing the central role of climate change in any sustainable and integrated National Strategy for Disaster Management.

The policy emphasizes preparedness on the part of the government, communities and other stakeholders and proposes to establish and strengthen Disaster Management institutions, partnerships and networking. It proposes to mainstream Disaster Risk Reduction in the development process and strengthen the resilience of vulnerable groups.

Disaster Risk Management encompasses a full continuum from preparedness, relief and rehabilitation, mitigation and prevention including diversification of vulnerable livelihoods and coping mechanisms. Ministry of State for Special Programmes in the Office of President is appointed as the chief national coordinator.

National Wildlife Strategy 2030

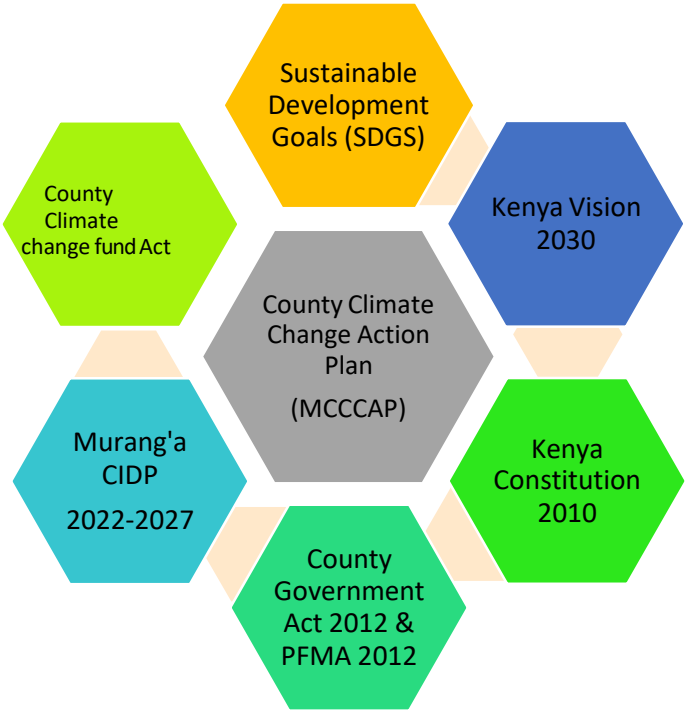
Kenya's National Wildlife Strategy 2030 is based on four pillars:

1. Resilient Ecosystems
2. Engagement by all Kenyans
3. Evidence based Decision Making
4. Sustainability and Governance

It recognizes that climate change places Kenya's wildlife at risk, but also that ecosystem conservation and management can contribute to greater climate resilience by serving as a form of adaptation. It specifically calls for the creation of a National Wildlife Adaptation Strategy, which would determine complementaries between wildlife conservation and climate change adaptation.

2.2. County Enabling Legal & Policy Framework

Figure 6: Enabling policy and legal framework



Others polices include; Murang'a County Agro-ecological Development Act 2022, Murang'a County dairy subsidy regulations 2022, Mango subsidy –minimum guarantee return program bill 2022, coffee policy, public Finance bill,

2.2.1 Murang'a County Integrated Development Plan (2022-2027)

The County mainstreamed climate change in its current CIDP and has identified actions to address the impact of climate change. Adaptation actions have also been prioritized by the county.

2.2.2. Climate Change Fund Act, 2021

To facilitate and coordinate financing of Climate Change Adaptation and Mitigation activities, the County Assembly enacted the Murang'a Climate Change Fund Act, 2021 for the establishment of a Climate Change Fund. It mandates the Murang'a County Government to set aside 2% of its annual development budget for climate change action.

2.2.3. Climate Change Response Strategy (2020-2025)

The strategy outlines the impacts of climate change on the county sectors and recommended actions and responses. These responses include but not limited to: Adaptation and Mitigations Measures; Climate Change Communication, Education and Awareness; Vulnerability Assessment, Impact Monitoring and Capacity Building; Research, Technology Development, Absorption and Diffusion; Climate Change Governance; and Action Plan, Implementation Framework and Resource Mobilization

2.2.4 The Murang'a County Climate Change Action Plan, 2022-2027 (MCCCAP 2022-2027)

Overall Goal MCCCAP 2019-2022 seeks to further Kenya'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. The Plan helps to further Murang'a County development aspirations.

2.2.5 Murang'a County Solid waste management policy 2021

Social lifestyles, waste management practices and production determine how we dispose of our waste. Accumulation of waste has stagnated development of some societies due to their inadequate waste management leading to degradation of environment, proliferation of diseases and ultimately impact on livelihoods. Further, improper waste management poses a threat to climate change and eventually in the achievement of sustainable development. Waste being one of the contributors of greenhouse gases, affects climate change and it is for this reason that as a county, we should develop sustainable waste management technologies and initiatives to curb this growing county challenge.

2.3. 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 Murang'a 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 well-being 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,
- **Cooperative government** - 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 ploughing 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.

2.4. Situational Analysis

Climate change and variability impacts in Murang'a County are evident in many forms that adversely affects community livelihoods across different sectors. Remarkable manifestations include prolonged cold seasons in upper highland zones and some parts of Upper midland zones, increased incidences of frost (mostly associated with dry spells), extended rainy seasons in some areas that result to mudslides and landslides in some areas like Kigumo, Kangema, Mathioya and Gatanga sub-counties. Others areas like Kiharu, Maragua and Ithanga experience prolonged drought, and extreme temperatures. Currently, Rain distribution is becoming erratic, unreliable and unpredictable in most of the seasons and the situation is fore casted to worsen in the near future.

2.4.1 S.W.O. T Analysis

In Planning, SWOT analysis is a strategic planning tool used to identify strengths, weaknesses, opportunities, and threats related to the planning process that might hinder or support an organization's ability to actualize it goals and objectives.

Table 8: S.W.O.T Analysis

TRENGTHS	**WEAKNESSES**
• Qualified and experienced personnel, • Inter departmental cohesiveness, • Well organized climate change unit • Teamwork • Great departmental structure, • Temperatures in Murang'a are sufficiently warm year round,	• High retirement rate of trained and experienced officers, • Lack of succession Strategies- Inadequate personnel. • Inadequate resources- transport, airtime, stationery, Limited working resources etc. • Limited funding at the county level • Poor working environment- sanitation, overcrowding, inadequate office space. • Delayed procurement process.
OPPORTUNITIES	**THREATS**
• Increased interests among the people, • government, and non-governmental agencies on matter regarding climate change. • Availability of both local and international stakeholders who are willing to collaborate • Unexploited resources- land and human capita • Seasons of high rainfall & temperatures	• Climatic changes and unpredictable weather patterns due to Global warming • Project implementation Sabotages due to personal interest of some stakeholders, • Political interference and regime changes,

2.4.2. PESTEL Analysis

The PESTEL Analysis is a dynamic tool in the Planning and Management Process. It helps in identification and in the analysis of the political, environmental, social, technological, environmental and legal factors that may affect the implementation of the action plan, hence assist in formulation measures to mitigate impacts of these factors.

Table 9: ***PESTEL Analysis***

Political
➢ Political goodwill from the current governor ➢ Interference by politicians on planned activities or programs ➢ Lack of continuity of the already existing projects and activities when other leaders come in. ➢ Political stability in the region and the country at large
Economic
➢ Late disbursement of funds from the national government ➢ Insufficient budgetary allocations ➢ Depreciation of the local currency relative to the Dollar ➢ High interest rates adversely affect the cost of borrowing and availability of credit.
Social
➢ Negative attitudes among the people on climate change actions ➢ Lack of sufficient awareness on matters climate change among the people ➢ An increase in lifestyle diseases and NCDS in the County ➢ An increase in cases of drug abuse and alcoholism ➢ Improved access to health and family planning services ➢ Improved literacy level
Technological
➢ High cost of acquiring and adopting new technologies ➢ Low adoption of technology ➢ Improved mobile network and electricity connectivity in the region ➢ Increased adoption of smart phone technologies ➢ Improved internet connectivity in the region
Environmental
➢ Environmental ➢ Global warming and climate change ➢ Unreliable rainfall and erratic weather affect productivity. ➢ Environmental degradation.
Legal
➢ Litigations that can stall planned developments ➢ Inadequate policy and legal framework

3.0. Priority Climate Change Actions

3.1. Identification of strategic climate action priorities in the PCRA

Table 10: Strategic Climate Action Priorities in the PCRA

Water, Irrigation, Environment and Natural Resources, Environment, Natural Resources & Climate Change		
Development needs	**Priorities**	**Strategies**
Environmental management and protection	Proper waste management mechanisms Prevention of noise and air pollution	Hold stakeholders Forums to address; (Lease/procure waste collection vehicles, Mounting of litter bins, Construction of refuse chambers, Improvement of waste disposal sites, Provision of waste collection tools, Acquisition of noise meters) Development of solid waste management laws
Natural Resources Conservation and Management	To increase farm forest cover To rehabilitate degraded sites	Afforestation in case of drought and landslides recovery programmes (Establishment of tree nurseries, Procure and distribute tree seedlings) Planting tree to reduce air pollution and cool urban areas Rehabilitation of degraded quarries Water catchment areas protection (identify, establish a development plans and fence)
Climate change resilience building	Promotion of clean energy Integrate climate change measures into county policies strategies and planning	Promotion of energy saving jikos in collaboration with GiZ Development of climate change Laws
environmental education and awareness	Capacity building on environmental issues	Improve forecasting and timely warning of extreme weather events Create emergency neighbourhood assistance networks Sensitization of the public on environmental issues
Reduced risks of men and women and other vulnerable groups (children, elderly and	Ensure Climate change adaptation and disaster risk reduction are practiced by	Conduct County-level vulnerability and risk assessment

persons with disability, etc.) from climate and disaster	communities and sectors at all local levels. Improve Health and social protection delivery systems responsiveness to climate change risks. Promote and adopt CC–adaptive human settlements and services developed,	Develop and implement knowledge management on CC and disaster risks. Develop a long term plan for adaptation of highly CC vulnerable population and climate refugees
Climate change-resilient, eco-efficient and environment-friendly industries and services, and sustainable towns and cities promoted, developed, and sustained	Create enabling environment for the development of climate-smart industries and services. Eco-efficient production adopted by industries Ecological solid waste management implemented towards climate change mitigation and adaptation	Provide a stable enabling policy for the development and implementation of climate-smart industries and services Implement policies that provide incentives to business practices that incorporate eco- efficiency within their core business operation Develop knowledge products on climate-smart best practices Intensify waste segregation at source, discard recovery, composting, and recycling.
Inadequate and unreliable rainfall for crop and fodder production.	Irrigation infrastructure Capacity building Water harvesting	Invest in irrigation schemes/infrastructure
Increased access to irrigation water Flood control Building farmers capacity on water use and management Establish water user's association Enhancing compliance with Environmental, statutory and legal requirement To improve irrigation technology Climate change mitigation	- Feasibility studies to determine the technical and socio-economic viability of projects. - Project planning and design. - Implementation, operationalization and management of irrigation schemes.	- Development of water harvesting and storage infrastructure for irrigation. - Infield irrigation water management. - Rehabilitating and upgrading existing under-utilized irrigation systems. - Enhancing farmer education and awareness, and improving communication and information flow. - Mitigating effects of climate change by harnessing agricultural water resources and storage infrastructure to reduce flood and drought disasters. (water pans and ponds installation and desilting)

		- Establishment and Legalization of Irrigation Water Users' Associations (IWUAs) - Improving irrigation technology such as the use of solar energy and other renewable energy in pumping. - Enhancing Public-Private Partnerships by encouraging private sector players to invest and participate in irrigation. - Strengthening stakeholder participation in all irrigation projects and initiatives. - Enhancing compliance with environmental, statutory and legal requirements - Gender equity and involvement of youth in irrigation development and management.
Basic amenities in markets	Construction of sanitation blocks	Construction of sanitation blocks in all the markets
Water, security and sanitation	Avail piped clean and safe water in the market Centres, lighting	Connect all markets with clean water.
Department of Agriculture, Livestock and Fisheries		
Development needs	Priorities	Strategies
Markets sheds and collection Centres	Market developments	Establishment of Organic produce market stands
Efficient markets	Easy access to markets	Creation of market linkages FORUM to Improve Contractual Marketing
Agro processing, Manufacturing and value addition Inclusion of youth and women in agribusiness	Agro-processing, manufacturing of farm produce Social inclusion	Capacity Building on Value addition and establishment of cottage industries in high potential areas. (Yoghurt making, Mango puree and Tomato source) Develop youth and women friendly Production and marketing technologies (grading and branding)
Inadequate and unreliable rainfall for crop and fodder production.	Capacity building Water harvesting and Utilization Crops and livestock insurance	Promote adaption of drought tolerant crops and fodder varieties. Promote crop insurance. Capacity building fodder Conservation during plenty season.

		Conduct training on adaptation and disaster risk reduction for farming communities; Train farmers on on-farm water harvesting and efficient utilization technologies. Establish field schools to demonstrate best adaptation practices in agriculture, Livestock and fisheries, Integrate CC in formal and non-formal or customized training programs on agriculture and fisheries
Low soil fertility for crop and fodder production	Soil fertility and acidity management	Promote soil testing and fertility management –Composting.
Crops and livestock disease and pests	Emerging and existing zoonotic diseases of anthrax, rabies and rift valley fever Emerging crop pests and diseases	Adopt the county one health strategy in control of zoonosis Adopt the national rabies eradication strategy Adopt common approach of providing resources for prevention, early detection and response to zoonotic disease Establishment strategic pest and disease control unit
Inadequate pre and post harvest management and value additioninvestments.	Low adoption of new technologies Inadequate information Youth involvement	Promote and support of value addition initiatives. Promote on-farm and off farm storage and transport facilities Create awareness on pre and post-harvest losses and management. Promote Cottage industries
Public Health and Sanitation		
Development needs	Priorities	Strategies
Incidence and re-emergence of diseases	control and prevention of environmentally related communicable diseases and encouraging improved nutrition to combat non-communicable diseases	Implement community based public health surveillance system for CC-sensitive diseases. Improve system for health emergency preparedness and response for climate and disaster risks. Improve system for post-disaster health management

		Implement preventive, curative and rehabilitative services through partners and MCG. enhance school health Program-Sanitation Pests and vector control Encourage health education - through campaigns Hold world health days Surveillance of diseases targeted for eradication and elimination. Treatment of water at household level Protection of major water sources Promote Mainstreaming gender, Disability equity and inclusion
Education, Youth, Sports, Culture, and Social Services		
Development needs	Priorities	Strategies
ECD lunch program	Nutritional improvement	Improve and develop 4K-Clubs in schools- multi-storey kitchen gardens
Cooperative development sub sector		
Development needs	Priorities	Strategies
Cooperative societies	Access to markets-milk, coffee, tea, avocados, French beans, mangoes, bananas	Strengthening existing cooperatives, capacity build in leadership, governance, and formation of business models. Formation of one ward one marketing co-operative for the best performing Value Chains. (enterprises)
Land, Housing and Urban Development		
Development needs	Priorities	Strategies
Solid waste management clean and conducive environment Inadequate sanitation facilities e.g. public toilets, waste receptors, waste disposal sites Liquid waste management, and Poor and/or non-existent Drainage system	Sustainable solid and liquid waste disposal mechanism Storm water drainage in major towns and market centres	Establishment of County Stakeholders Forum to address (solid waste collection and segregation mechanism, Designate waste collection sites, Construct public pay toilets) Mapping of drainage system, Design and construct open drainage systems
Roads, Transport, Energy, and Public Works		
Development needs	Priorities	Strategies
Impassable roads.	Upgrading of Impassable roads	Opening of access roads. Grading of access of roads. Gravelling of access roads.
Poor road Connectivity	Improve Connectivity	Construction & Rehabilitation of footbridges & bridges.

Poor Drainage of roads & urban areas.	Improve drainage	Excavation of Drains Desilting of drains & Culverts Storm water management in urban areas

3.1.1. Mainstreaming in CIDP

Table 11: ***Climate Change implementation in CIDP***

Policy	Year	Policy Objective(s)	Intervention (s)	Challenges
National Climate Change Action Plan	2013-2017	Increasing forest Cover and rehabilitating degraded lands.	Conservation and management of riparian areas. Forest rehabilitation, Riverine protection, spring protection. Construction of dams and water pans in the lowlands.	Funding is limited at the county level, Which compromises their agenda. Inadequate personnel. Financially challenging for farmers to adapt to these strategies. Lack of education/ awareness by some farmers. Limited by the cost of technologies like solar energy, inadequate personnel, and inadequate financing
National Climate Change Framework Policy	2016	Integrated planning, budgeting, decision-making and implementation. Raising public awareness on climate change. Researching in sustainable resource management	Development and dissemination of climate-smart agriculture. Offering Extension Services	
National Climate Change Response Strategy	2010	Assess the impacts of climate change. Recommend research and Technology to mitigate effects.	Offering early warning systems	
Kenya Climate Smart Agriculture Strategy	2017-2026	Enhance farmers' ability to adapt to climate change	Promoting soil and water conservation, conservation agriculture, use of drought	

			Tolerant crops, etc.	
Kenya Climate Smart Agriculture Implementation Framework	2018-2027	Fortify Agricultural systems against climate change. Reduce greenhouse gas emissions	Using renewable Energy sources. Helping farmers adapt to climate change.	
National Forest	2014	Policy Managing forests through An ecosystem approach. Conserving soil, Water biodiversity, and environmental stability. Increasing the forest cover while rehabilitating degraded sites	Supporting forestry research, education, training, and Technology transfer for sustainable development. Promoting public, Private and community participation and Partnership in Forest development. Ensuring that Forests are Protected and managed.	
Agriculture Sector productive, commercial, and competitive at all levels.	2010-2020	Development Strategy Helping agricultural enterprises to be highly	Developing three prioritized value chains: French beans, bananas, and dairy cow. Linking farmers to markets and providing farmers With market information.	

3.3. Cross Cutting Issues

The MCCCAP recognizes that certain activities cut across strategic priorities and sectors. These include gender and development, technology transfer, research and development, information, education and communication (IEC), and capacity building, which should be integrated in all strategic six priorities. Capacity development, while cross-cutting, is in itself a strategic priority to provide emphasis on the need to focus on the issue at the national, local and community levels.

3.3.1 Gender Mainstreaming

The term “gender” refers to socially ascribed roles, responsibilities and opportunities associated with women and men, as well as the hidden power structures that govern relationships between them. Gender is “. A term used to emphasize that sex inequality is not caused by the anatomic and physiological differences that characterize men and women, but rather by the unequal and inequitable treatment socially accorded to them” (Riquer 1993).

Agriculture, fishery, and forestry continue to compose 18 percent of the economy and serve as the foundations for the country’s agro-industrial and agro-services sectors. Agriculture is the main livelihood base for 35 percent of the country’s labour force, while some 60 percent of the country’s coastal population relies on marine resources for a living. The World Bank calculates that 85 percent of the

country's gross national product comes from sectors at risk from rising temperatures and weather variability (Garcia Rincón and Virtucio 2008).

- Women comprise 25% of those employed in agriculture based on the 2006 statistics of the Bureau of Agricultural Statistics. However, majority of these women also form part of unpaid family labor.
- Women dominate the planting and harvesting activities, especially in the production of staple crops (Maize and Beans),
- Women also participate in land clearing and harrowing activities, often spending longer periods of time than the men,
- Despite the unpaid character of their labour, they are left in charge of finance related activities, i.e. the accessing of production capital and marketing the farm's produce,
- At the household level, women's reproductive activities span an average of 1 to 3 hours each for the following activities: preparation of food and tools for the farm workers, foraging for food, gathering of wood for fuel, raising livestock and poultry, fetching water and engaging in non-farm income generating activities,
- Despite all these roles, women have lesser control of the land, with only 18% as title holders among land owners,
- While women have high participation in decision making, these are being made under conditions of scarce resources and with little access to services, i.e. only around 33% of women in agriculture have access to farm animals, only 19% have access to seeds, only 13% have access to calamity assistance and pest management, 17% have access to social services, and less than half have access to water and electricity,
- Few rural women have access to capacity building services, i.e. only 45% have access to communication, 29% have access to women's organizations, and only 18% have access to training and calamity insurance.

The observed impacts of climate change are exacerbated by the fact that (Peralta 2008):

- Women manage, control and own lesser resources – especially land – than men. Thus, when harvests collapse either because of floods or droughts, women have fewer assets to sell to cope with the situation.
- Women are the main borrowers in agricultural households because they have greater access to micro-credit and are under stronger pressure to bridge resource gaps. Hence, more women than men fall into chronic indebtedness related to climate-induced crop failures.
- When food shortages arise from poor harvests linked to weather problems, women are the last to eat in their households, prioritizing the food needs of male household members and children over their own.
- Women's vulnerability to different climate-related events arise from their **roles**, **location of these roles**, and **their positions and capacities to influence how decisions are made**, **how rules are changed,** and **how resources are allocated**.

Women's exposure to climate-related risks is a result of;

a) Area of residence of poor women, especially in lower Murang'a (Ithanga) and upland areas (Tea growing Zones),
b) Nature of productive work (livelihoods/ employment), location of these activities,
c) Natural resource degradation, and Looming water scarcity in the next decades.

Women's sensitivity to climate change is a function of their childbearing/lactation and other reproductive roles and their productive roles.

Within the NCCAP, the gender is a cross-cutting issue and will be particularly highlighted in the following areas:

1. **Research and Development:** To improve the understanding of gender and climate change, the plan will ensure the following:
    a) Conduct gender impact analyses to identify gender-specific needs and protection measures related to floods, droughts and other climate change-related disasters particularly those that enhance food security along the framework of sustainable agriculture and organic farming; and
    b) Conduct gendered vulnerability and adaptation assessments, which require that the assessments integrate gender analyses to identify specific vulnerabilities of men and women.
2. **Planning and Policy Making**: Gender mainstreaming is done at all levels of planning and programming for climate change adaptation and mitigation as well as in disaster risk reduction management, and financial instruments and mechanisms.
3. **Knowledge and Capacity Development**: The CCCAP recognizes that planned activities on capacity and knowledge development must enhance the roles and status of women as participants and agents of change, build on their strengths and experiences, knowledge and coping capacity, and ensure women's access to information.
4. **Enhancing Women's Participation in Climate Change Adaptation**: Actions on food security, green jobs, and integrated ecosystem-based management should be able to strengthen women's participation, ensure poor women's access to livelihood opportunities, and ensure women's access to assets.

4.0. Delivery Mechanisms for CCAP

4.1. Enabling Factors

4.1.1 Enabling Policy and regulation

The enabling policy and regulatory framework for the delivery mechanisms of Murang'a County's Climate Change Action Plan is instrumental in addressing environmental challenges. The Murang'a County Climate Change Fund Act of 2021 provides a financial mechanism to support climate mitigation and adaptation projects. This act establishes a dedicated fund to finance initiatives that reduce greenhouse gas emissions and enhance resilience to climate impacts. It ensures transparency and accountability in fund management. Additionally, the Murang'a County Solid Waste Management Policy of 2021 plays a crucial role in environmental sustainability. It promotes responsible waste management practices, emphasizing recycling and waste reduction to mitigate climate change. The policy encourages community participation and sets guidelines for proper waste disposal and recycling infrastructure development. These policies collectively form a comprehensive framework for addressing climate change in Murang'a County. They facilitate resource allocation and waste management strategies, aligning with the county's broader climate action plan to combat climate change while fostering sustainable development.

4.1.2. Mainstreaming in the CIDP

The mandate given to the county government to mainstream climate change actions across all sectors in Murang'a County is pivotal in strengthening resilience and adaptive capacity to align with the goals of the Paris Agreement. The recently completed County Integrated Development Plan (CIDP) for 2023-2027 underscores the significance of addressing climate change.

In a predominantly agrarian region like Murang'a County, where 75% of the population relies on crop cultivation and livestock keeping, climate change poses substantial challenges. The CIDP identifies key sector priorities to tackle these issues effectively. These priorities likely include initiatives such as promoting climate-resilient farming practices, investing in efficient irrigation systems, and establishing early warning systems for weather-related disasters. By integrating climate action into the CIDP, Murang'a County aims to safeguard its agricultural backbone, improve food security, and contribute to the national climate goals stipulated in the Paris Agreement. This approach ensures a sustainable and climate-resilient future for its inhabitants.

4.1.3. Multi-stakeholder participation processes

Peer-to-peer learning processes have demonstrated their effectiveness in fostering knowledge exchange. Engaging various stakeholders in discussions is essential for collecting reliable data for inclusive planning, encompassing vulnerable and marginalized communities. This platform facilitates meaningful conversations between youths and women, minority and vulnerable groups as well as technical experts, enabling comprehensive decision-making regarding necessary mitigation and adaptation strategies. It ensures that the voices of all stakeholders are heard, enhancing the quality and inclusivity of climate-related interventions.

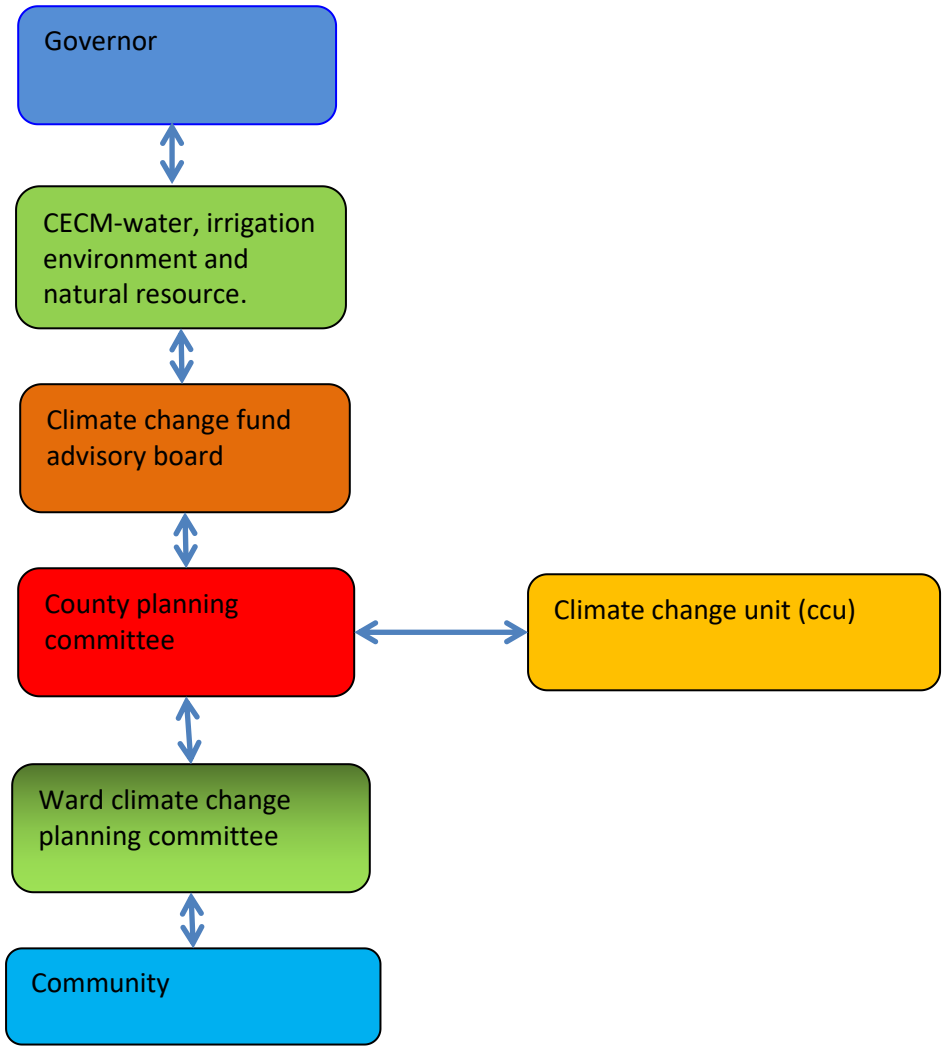
4.1.4 Finance - County Climate Change Fund

Prioritizing climate finance and resource mobilization actions, particularly through the establishment of the County Climate Change Funds, is a pivotal step in Murang'a' climate action plan. These actions, such as

launching the Climate Change Fund, developing a climate finance strategy, and enhancing access modalities, will empower the county to effectively mobilize, manage, and monitor climate finance.
The operationalization of the Climate Change Fund is of utmost importance as it will allocate funds for critical mitigation and adaptation projects. 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 equally crucial. This capacity will enable Muranga to track and report on climate finance sources, applications, and impacts accurately.

Climate finance encompasses various funding sources, both domestic and international, including the GCF and Global Environment Facility (GEF). Tracking and reporting on climate finance, alongside adaptation and mitigation results, will improve analysis, transparency, and the targeting of resources to marginalized groups. Empowering the private sector to access climate finance and develop bankable projects is essential, as it plays a significant role in implementing climate actions. Muranga involvement in emerging carbon markets and results-based payment mechanisms will position it to benefit from carbon asset activities and international carbon markets, strengthening its resilience and contributing to global climate goals. These comprehensive actions underscore Murang'a County's commitment to effective climate finance management and sustainable development.Muranga county climate change fund act set aside 2%of county development fund towards climate change fund.2023/24 70M has been set aside for climate change activities.

4.1.5. Governance - County Government Structures



4.1.6 Governance - Climate Change Planning Committees

The Murang'a County Climate Change Fund Act of 2021 establishes a two-tiered climate change planning structure: county and ward planning committees. Ward committees are community-elected to ensure grass roots representation, particularly for marginalized groups, in climate planning. County planning committees comprise county-level technocrats, providing technical expertise and support for climate action in the region. This approach promotes inclusive and effective climate planning at both local and county levels.
Climate Information Services & Climate Data Access.

4.1.7 Climate Information Services & Climate Data Access

The county government's commitment to developing a strategy for public information and access to climate data is commendable. Collaborating with the Kenya Meteorological Department (KMD) to provide regular and reliable weather forecasts is a crucial step in enhancing preparedness and adaptation efforts. These forecasts not only assist in everyday planning but also serve as an early warning system for potential disasters, helping to protect lives and property.

Furthermore, the partnership between the county's Department of Environment and Kangema FM for broadcasting early warning information related to climate change based on forecasted weather is a proactive approach. It empowers local communities with knowledge about climate-related risks and prepares them to respond effectively. Ensuring that such information reaches the public is vital in building resilience and fostering a climate-conscious community, ultimately contributing to the county's climate goals and the well-being of its residents

4.1.8 Resilience Planning Tools

Resilience planning tools for climate change in Murang'a County, encompass a range of strategies and initiatives aimed at mitigating and adapting to the adverse effects of climate change. These tools include:

1. Climate Risk Assessment: Conducting comprehensive assessments to identify specific climate-related risks and vulnerabilities in the county, such as droughts, floods, and temperature extremes.
2. Early Warning Systems: Murang'a County collaborates with meteorological and hydrological departments to develop monitoring systems that provide timely alerts and information to residents and authorities regarding impending climate-related hazards.

3. Ecosystem Restoration: Implementing reforestation and afforestation programs to conserve watersheds, prevent soil erosion, and enhance biodiversity, which in turn bolsters resilience.

4. Infrastructure Resilience: Upgrading and retrofitting critical infrastructure like roads, bridges, and drainage systems to withstand climate-induced Stressors.

5. Agricultural Adaptation: Promoting climate-smart agricultural practices, including crop diversification, soil conservation, and water-efficient techniques.

6. Community Education: Conducting awareness campaigns and training programs to educate residents about climate change, its impacts, and how to prepare for and respond to climate-related challenges.

7. Policy Frameworks: Developing and implementing climate-resilient policies and regulations that guide land use, urban planning, and disaster response.

8. Green Energy Transition: Encouraging the adoption of renewable energy sources to reduce carbon emissions and enhance energy security.

9. Collaboration and Partnerships: Engaging with national and international organizations, NGOs, and neighbouring counties to access resources and expertise for effective climate resilience planning.

10. Monitoring and Evaluation: Establishing mechanisms for continuous assessment and adjustment of resilience measures to ensure they remain effective and relevant.

11. Incorporating these tools into a comprehensive climate resilience strategy can help Murang'a County better prepare for and adapt to the challenges posed by climate change while protecting its communities and ecosystems.

4.1.9. Measurement, Reporting and Verification

The Paris Agreement's enhanced transparency framework is essential for monitoring and ensuring accountability in climate action. The County, like all parties, must provide comprehensive information on mitigation and adaptation efforts, as well as support received, aligning with the agreement's principles.

Firstly, disclosing climate change impacts, vulnerabilities, and adaptation strategies is crucial for crafting effective policies and strategies tailored to the county's unique challenges and needs.
Secondly, transparency regarding financial, technology, and capacity-building support from developed countries is vital for tracking progress and ensuring that commitments are met. It also fosters trust and equitable cooperation among nations.

Kenya's adoption of the MRV+ system, as outlined in its National Climate Change Action Plan (NCCAP) for 2013-2017, underscores the country's commitment to a robust framework for measuring, reporting, and verifying results. This integrated approach is essential for transparent and effective climate governance, enabling and Kenya as a whole to contribute meaningfully to global climate goals while addressing local climate challenges.

Murang’a County will use the existing national measurement, reporting and verification framework and contextualise it to actions in this CCAP. The County is developing a County Information System to compile, analyse and report on the progress of climate change.

4.1.10 Institutional Roles and Responsibilities (Can be summarized in a table)

Table 12: 4.1.10 *Institutions Roles and Responsibilities*

Institution	Responsibility
County Assembly	• Making laws • Approving Budgets • Oversight role
County Governor	• Head of executive arm 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, neighbouring 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 centre 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 main streaming 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 Coordination Mechanisms/matrix

4.2.1. Directorate of Climate Change

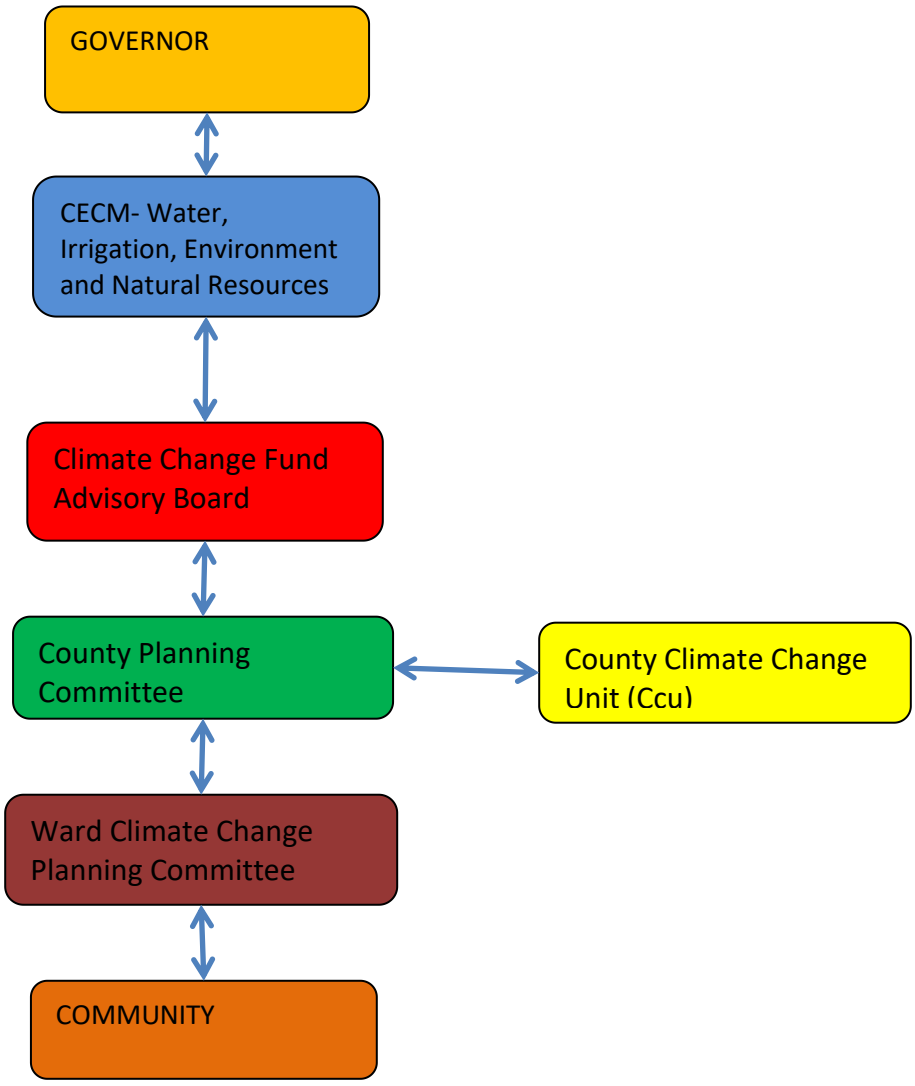
The Climate Change Directorate (CCD)is a department of the Ministry of Environment and Natural Resources of Kenya. The department is involved in coordination, development and implementation of adaptation and mitigation policies, strategies and plans on climate smart agriculture (CSA) to enhance adaptation and mitigation actions in the country. Key guiding principles of the department are the polluter pay principle and the precautionary principle among others.

Climate change adversely affects the economic growth of Kenya. Kenya is most vulnerable to climate change impacts due to the high climate sensitivity coupled with low adaptive capacity and high levels of poverty. The government in its effort to reduce vulnerability and enhance resilience set up the Climate Change Directorate to coordinate climate change actions

The Objective of CCD is to promote climate change mitigation and adaptation plans to ensure a low-carbon resilient economy. The Directorate is a member of the Climate Smart Agriculture Multi-Stakeholder Platform involved in Coordination and policy development.

- The platform provides a coordination platform to know and understand what is being done by different stakeholders in the country and enable effective policy guidance. It also assists in;
- Developing specific climate smart agriculture policies, legislations, strategies, plans.
- Dissemination of climate smart agriculture knowledge and technologies,
- Developing capacities of key actors involved in climate smart agriculture implementation
- Mobilizing actors and facilitating dialogue on climate smart agriculture issues/actions?
- Monitoring, evaluation and audit of climate smart agriculture aspects to enhance accountability
- Coordination of CSA actions

Figure 7: **Implementation and Coordination Mechanisms**



4.2.2. County Climate Change Planning Committee

The County Government will fast-track the roll-out of this CCCAP by putting in place the requisite enabling environment, including the institutional structures proposed in the Climate Change Act (2021), and other relevant policies and frameworks. In the implementation of the institutional arrangements, it will be important to put in place transitional arrangements to tap from the knowledge, information and lessons acquired over the years by the current coordinating institutions. The implementation of the different actions in the CCCAP will require the involvement and contribution of all the stakeholders across the different sectors and levels. Their specific roles are summarized below

- **County Climate Change Unit (CCCU)** shall be the lead agency on climate change matters in the county, integrate and mainstream climate change actions, interventions and duties into County Integrated Development Plans (CIDPs); submit a report on the implementation progress of climate change actions to the County Executive Committee for deliberation and onward submission to the County Assembly for review and debate.
- **Climate change committees.** This will be comprised of representatives from county departments and will coordinate and supervise climate change matters in the county as provided for in the county climate Change Act 2019 and the County Climate Change Response Strategy.
- **National Government Sectoral Agencies** will capacity and support the County to implement climate change climate change activities action plans and other implementation projects; and designate a unit with adequate staff and financial resources to coordinate the main streaming of the NCCAP and other climate change statutory functions and mandates into sectoral strategies for implementation. The government sectoral agencies will report annually to the National Climate Change Council on the status and progress of all assigned climate change duties and functions.
- **The National Environment Management Authority** will, on behalf of the Council, is responsible for monitoring and enforcing compliance of climate change interventions.
- **The Kenya Institute of Curriculum Development** will, integrate climate change into various disciplines and subjects of the national education curricula at all levels; and advise public agencies responsible for regulating universities and tertiary institutions curricula on the integration of climate change into their curricula.
- **The National Drought Management Authority** will continue to coordinate drought management and disaster risk reduction actions under the Ending Drought Emergencies programme in the 23 (ASAL) counties. They will be expected to report annually to the National Climate Change Council on the status and progress of climate change adaptation and resilience in the ASALs.
- **Private sector:** The private sector has been impacted by climate variability and has suffered negative impacts of droughts and flood risks. They include: operational, supply chain and raw materials risk, water and energy supply priorities, financial and market risks, agriculture, food security and rural development, ecosystem threats, poor infrastructure, unreliable weather information and public health. In addition to climate proofing for investment, the private sector players should invest in adaptation and helping communities to reduce

climate risks. The private sector can play a role in provision of financial resources for adaptation through investments, financial risk management, and the charitable provision of resources through foundations or corporate social responsibility. This sector also plays an enormous role in awareness raising and information building hence the need for their engagement in adaptation.

- **Media:** The media can provide vital information at times of emergency — from warning of imminent floods to explaining how to deal with disease outbreaks. As such it is expected that the media will be involved in the dissemination of this CCCAP and disseminating its progress against the key indicators measuring Kenya's adaptive capacity. Indeed, strategic actions that improve climate change journalism can themselves be forms of adaptation because accurate, timely and relevant information is a critical component of resilience.[18]
- **Academia and research institutions:** This group of actors plays a key role in building the country's adaptive capacity. They will provide the evidence for knowledge based decision making by the national and county governments, private sector, development partners and civil society amongst others. This will be done through research conducted on different aspects of climate change adaptation and resilience, including improving the understanding of climate change attribution in Kenya and providing information on the appropriate mix of adaptation actions in order to avoid maladaptation.
- **Public Benefit Organizations:** These include non-governmental organizations, civil society organizations and faith-based organizations, amongst others. They have been involved in climate change adaptation and mitigation activities in Kenya, and the UNFCCC acknowledges the role of civil society in Paragraph 1(i) Article 4 in the areas of education, training and public awareness related to climate change. The Convention further encourages Parties to support the widest participation of civil society in the climate change process with an emphasis on the above areas. In Kenya, the civil society is known to be a powerful agent of change through public awareness creation, policy research and analysis, and advocacy on key socio-economic issues including climate change. They also undertake vulnerability assessments, baseline studies and research; advocacy, capacity building and awareness creation; policy development and promotion of good governance; information sharing; gender main streaming in climate change; monitoring and early warning systems; livelihood support; promotion of improved technologies and efficient use of energy; humanitarian support; and promotion of use of indigenous knowledge. They are expected to play similar roles in the implementation the NAP.
- **Public**: The public will play a role in the planning, implementation and monitoring of adaptation interventions in order to enhance their adaptive capacity and resilience to climate shocks.

4.2.3. County Climate Change Technical Working Group

This comprises of the Financial Locally led Climate Change Action (FLLoCA) Project Secretariat (County Coordinator, Environmental Safeguard Officer, Social Safeguard Officer, Monitoring and Evaluation officer (M&E), and the Project Accountant.

4.2.4. Ward Climate Change Planning Committee

The Committee comprises of Seven Members; Youths (Male & Female), Representative of CBO active on Climate Change Actions (Male and Female), representative of Business Community (Male and Female), and a Representative vulnerable group one person (male or female) Technical Staff from Key department from all 35 wards. A ward administrator or his/her Representative shall be the secretary and EX-Official members.

Table 13: 4.2.3 Murang'a County Action Plan Implementation Matrix 2023-2027

Sector/ Department	Climate Change Adaptation Strategy	Immediate Output	Outputs	Activities	Cost	Timeline
Water, Irrigation, Environment and Natural Resources	Administration Services	Improved service delivery	9 administrative units	**Purchase of office equipment, inter-sectoral management meeting, reporting, Conferencing and other official activities**	**10,000,000**	2024-2027
	Environment management and protection	Proper waste management mechanisms Prevention of noise and air pollution	**Reduced Accumulation of Wastes**	**Hold stakeholders Forums to address;** **(**Lease/procure waste collection vehicles, Mounting of litter bins, Construction of refuse chambers, Improvement of waste disposal sites, Provision of waste collection tools, Acquisition of noise meters)	**4,800,000**	2024-2027
				Development of solid waste management laws/Bill	**3,000,000**	2024-2025
	Natural Resources Conservation and Management	Increased farm forest cover	Increased percentage (%) forest cover	**Afforestation in the case of drought and landslides recovery programmes** (Establishment of tree nurseries, Procure and distribute tree seedlings)	**35,000,000**	2024-2027
				Planting tree to reduce air pollution and cool urban areas	**5,000,000**	2024-2025

	Rehabilitation of degraded sites	Rehabilitated Quarries and other waste and wetlands, lands	Economic productive sites	**Facilitate formulation of regulations and policy on quarrying. (especially sand harvesting)**	**2,000,000**	2025-2026
				Promote Rehabilitation of degraded quarries,-	**10,000,000**	2026
			Improved and Protected water catchment areas	**Water catchment areas protection** (identify, establish development plans and fencing)	**15,000,000**	2026
	Climate change Resilience Building	Promotion of clean energy		**Promotion of energy saving jikos in collaboration with GiZ, capacity building and Demos**	**5,000,000**	2025-2027
	Integrate climate change measures into county policies strategies and Planning	Improved inter-sectoral collaboration in climate change mitigations	Improved collaboration in mitigation of climate change impacts	**Development and enforcement of climate change laws-**	**3,000,000**	2027-2027
	Develop Environmental education and Awareness FORUM	Improved knowledge On environmental Conservation and related issues	Increased community awareness	**Sensitization/capacity build public on environmental issues**	**1,000,000**	2024-2027
				Improve weather forecasting and timely warning to the Public of extreme weather events	**2,000,000**	2024-2027
				Create emergency neighbourhood assistance networks eg. Dial code	**1,000,000**	2024

	Reduced risks of men and women And other Vulnerable Groups (children, Elderly and Persons with disability, etc.) From climate and disaster	Improved Climate change adaptation and disaster risk reduction practices by communities and sectors at all local levels.		**Conduct County-level vulnerability and risk assessment**	**5,000,000**	2024
		Improve Health and social protection delivery systems		**Develop and implement knowledge management on CC and disaster risks Reduction**	**2,500,000**	2025
		Improved Responsiveness to climate change risks.		**Develop a long term plan for adaptation of highly CC vulnerable population and climate refugees.**	**5,000,000**	2027
	Climate change-resilient, eco-efficient and environment-Friendly industries and services, and Sustainable towns and cities promoted, developed, and Sustained	Create enabling environment for the development of climate-smart industries and services.	Eco-efficient production adopted by industries	**Provide a stable enabling policy for the development and implementation of climate-smart industries and services.**	**5,000,000**	2026-2027
				Implement policies that provide incentives to business practices that incorporate eco-efficiency within their core business operation.	**2,000,000**	2026
				Develop knowledge products on climate-smart best practices-brochures and fliers	**1,000,000**	2025
			Ecological solid waste management implemented towards climate change	**Intensify waste segregation at source, discard recovery, composting, and recycling.**	**15,000,000**	2026

			mitigation and adaptation			
	Water resources sustainably managed and equitable access ensured.	Water governance restructured towards a climate and gender-responsive water sector. Irrigation infrastructure Capacity building Water harvesting Inadequate and unreliable rainfall for crop and fodder production.	Enabling policies for WRM and CCA created.	**Streamline water governance structures**	**2,000,000**	2024
			CC adaptation and vulnerability reduction measures implemented.	**Complete the profiling of watersheds and river basins**	**5,000,000**	2024
				Conduct gendered vulnerability and risk assessment of water resources and infrastructures. (Development of water harvesting and storage infrastructure for irrigation- Water pans,	**70,000,000**	2024-2027
				Develop and implement CCA plans for priority watersheds and river Basins	**2,000,000**	2024
				Rehabilitate degraded watersheds and river basins and protect existing ones.	**10,000,000**	2025-2027
				Review and develop financing plan for water sector climate change action plan.	**1,000,000**	2024
				Mitigating effects of climate change by harnessing agricultural water resources and storage infrastructure to reduce flood and drought disasters. (water pans and ponds installation and desilting)	**15,000,000**	2024-2027

		Sustainability of water supply and access to safe and affordable water ensured.	Water supply and demand management of water improved.	**Conduct water supply and demand analysis under various hydrologic conditions and estimate scenarios**	**2,000,000**	2024
				Review and modify, as appropriate, management processes of existing water supply systems and users to consider potential impacts of climate change.	**1,500,000**	2024-2025
				Implement water harvesting technologies	**2,000,000**	2025
			Quality of surface and Ground water improved	**Implement the Clean Water Act and the County Septage and Sewerage Program (Enhancing compliance with environmental, statutory and legal requirements)**	**1,000,000**	2026
				Improve sanitation infrastructures.- public utilities	**5,000,000**	2025-2027
			Equitable access of men and women to sustainable water supply improved	Increase safe water coverage in waterless Wards Centers. **(Rehabilitating and upgrading existing under-utilized irrigation systems)**	**35,000,000**	2025-2027
				Implement time-limited groundwater abstraction licenses to provide flexibility to respond to extreme climate conditions. (Drilling boreholes for use in dry seasons)	**350,000,000**	2025-2027

		Knowledge and capacity for climate change adaptation in the water sector enhanced	Knowledge and capacity for WRM and adaptation planning improved	Develop the capacity of relevant government agencies on WRM and adaptation planning. **Establishment and Legalization of Irrigation Water Users' Associations (IWUAs)**	**7,000,000**	2024-2025
				Improve and update water resources database and information system.	**2,000,000**	2024-2026
				Develop a gender-responsive R&D agenda for water and Climate Change **(Enhancing Public-Private Partnerships or stakeholder participation by encouraging private sector players to invest and participate in irrigation.)**	**3,500,000**	2025
				Develop gender-responsive knowledge products on water and climate change **(Gender equity and involvement of youth in irrigation development and management).**	**3,500,000**	2025
				Implement Information and Education Campaign(IEC) County wide in partnership with private sector, academia, and civil society Organization **(Enhancing farmer education and awareness, and improving communication and information flow)**	**2,000,000**	2026

		To improvetechnology Climate mitigation irrigationchange	Feasibility studies determine technical socio-economic viability projects. To the and of	**Improving irrigation technology such as the use of solar energy and other renewable energy in pumping.**	**17,500,000**	2026-2027
Total					**634,300.000**	
Agriculture, Livestock, and Fisheries	Ensured Food availability, stability, access, and safety Amidst Increasing Climate Change And Disaster risks. (Flooding, Landslides, Drought and High temperatures, and Frost)	Enhanced Climate Change resilience of agriculture, Livestock and fisheries production and distribution/Marketing systems.	Enhanced knowledge on the vulnerability of agriculture, Livestock and fisheries to the Impacts of climate change.	**Promote adaptation of drought tolerant crops and fodder varieties.**	**35,000,000**	2024-2027
				Capacity building Water harvesting and Utilization	**10,000,000**	2025
				Promote Crops and livestock Insurance	**1,000,000**	2024
				Capacity building fodder Conservation during plenty season	**17,500,000**	2024
				Train farmers on on-farm water harvesting and efficient utilization technologies. And Domos	**17,500,000**	2024
				Establish field schools to demonstrate best adaptation practices in agriculture, Livestock and fisheries,	**70,000,000**	2025-2027
				Integrate CC in formal and non-formal or customized training programs on agriculture and fisheries	**3,500,000**	2025

			Climate-sensitive agriculture, Livestock and fisheries policies, plans and programs formulated	**Conduct training on adaptation and disaster risk reduction for farming communities**;	**5,000,000**	2024
				Integrate and harmonize in County Agriculture, Livestock and fisheries policies and plans, including the CIDP	**3,500,000**	2026
				Scale up implementation of best practices- e.g. Conservation Agriculture Demos,	**35,000,000**	2026-2027
				Monitor and evaluate implementation of CCAP in Agriculture	**35,000,000**	2024-2027 quarterly
		Enhanced resilience of Agriculturists, and fishing communities from climate change	Enhanced Capacity for CCA of government, farming and fishing communities and industry	**Build the capacity of farming and fishing communities on adaptation and DRR**	**3,500,000**	2024
				Integrate CCA and DRR in agriculture and fishery curricula and training Program	**1,000,000**	2026
			Enhanced social protection for farming communities	**Implement risk transfer and social protection mechanisms for Agriculture**	**2,000,000**	2027
	Total				**239,500,000**	
Public Health and Sanitation	Reduction of Incidence and	Control and Prevention of environmentally		**Implement community based public health surveillance system for CC-sensitive diseases.**	**3,500,000**	2024

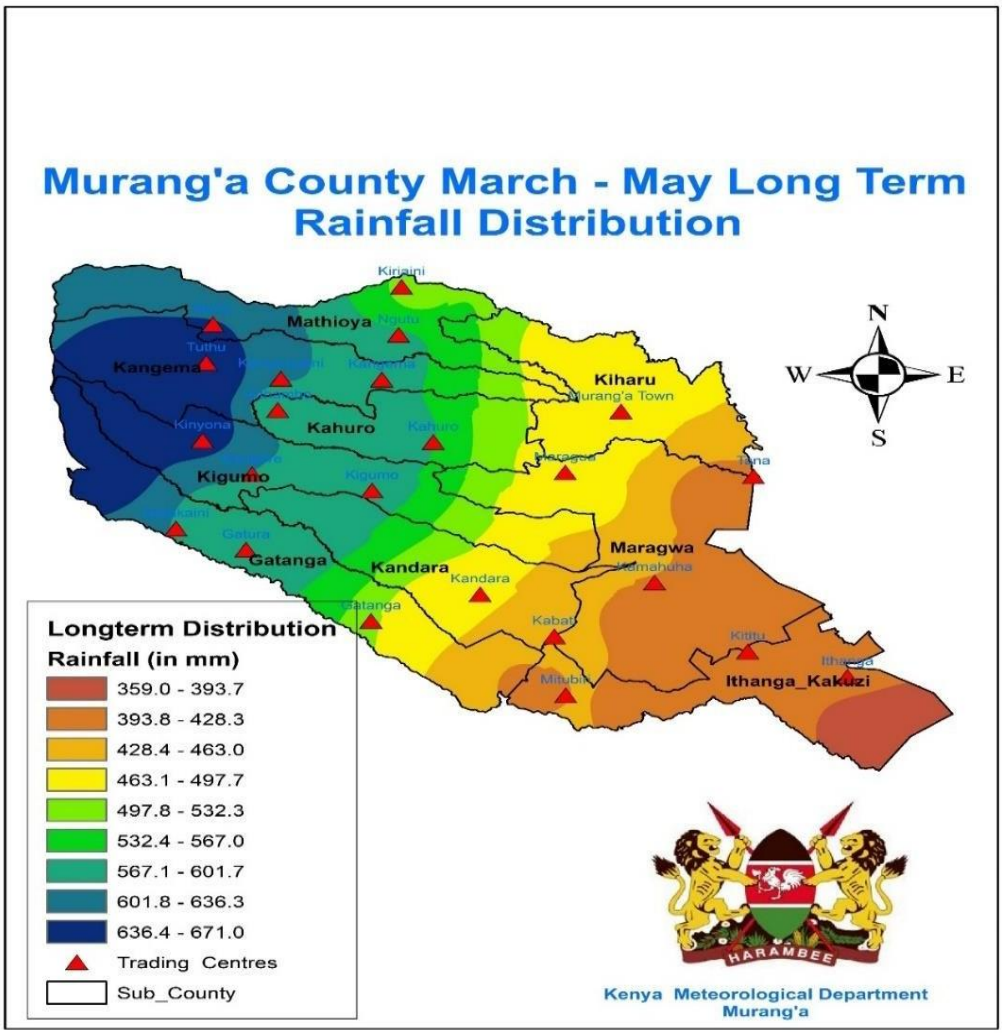
	re-emergence of Diseases	related communicable diseases and Encouraging improved nutrition to combat non-communicable diseases		**Improve system for health emergency preparedness and response for climate and disaster risks.**	**17,500,000**	2025
				Improve system for post-disaster health management	**3,500,000**	2025
				Implement preventive, curative and rehabilitative services through partners and MCG	**5,000,000**	2025-2026
				enhance school health Program-Sanitation	**12,500,000**	2024-2025
				Pests and vector control	**700,000**	2025-2026
				Hold world health days	**700,000**	2024-2027
				Surveillance of diseases targeted for eradication and elimination	**350,000**	2025
				Promote water treatment at household level	**350,000**	2026
				Protection of major water sources	**350,000**	2027
				Promote Main streaming gender, Disability equity and inclusion	**700,000**	2024-2027
Total					**46,150,000**	
Education, youth, Gender, culture, and Social Services	Enhanced knowledge and capacity of women and men	Capacity for CC adaptation, mitigation and disaster risk reduction at the local	CC resource centers identified and established	**Establish network on CC resources in all regions**	**7,000,000**	2024-2026

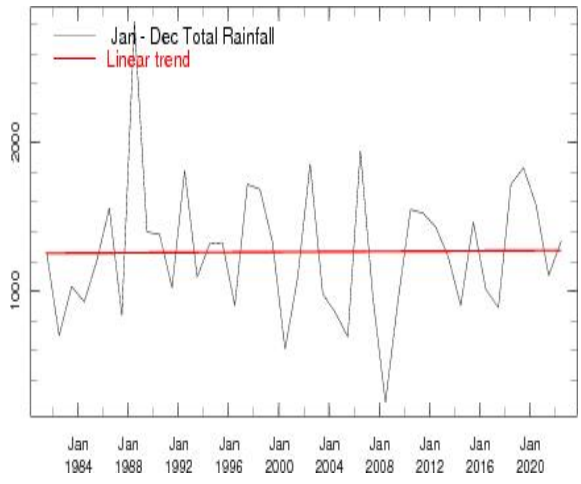
	to address climate change	and community level enhanced	Formal and non-formal capacity development program for climate change science, adaptation and mitigation developed	**Develop and implement gendered and accessible CC adaptation and mitigation special or customized technical training programs (Inter-Sectoral)**	**3,500,000**	2024-2027
	Enhanced ECD lunch program	Nutritional improvement	High Enrolment rate	**Improve and develop 4K-Clubs in schools- multi-storey kitchen gardens for ECD**	**3,500,000**	2024-2027
			Improved skill in vegetable and fruits production for all	**Capacity Build teachers, learners and parents on kitchen gardening**	**7,000,000**	2024-2027
				Procurement of Demo Materials	**5,000,000**	2024
	Total				**26,000,000**	
Co-operative development	Develop Business model Cooperative societies	Capacity for cooperative performance improved	Increased accessibility to markets-milk, coffee, tea, avocadoes, French beans, mangoes, bananas etc.	**Strengthening existing cooperatives, capacity build in leadership, governance, and formation of business models.**	**17,500,000**	2024
				Formation of one ward one marketing co-operative for the best performing Value Chains. (enterprises)	**3,500,000**	2024-2026
	Total				**21,000,000**	

Lands Housing and Urban development	Enhance Solid waste management clean and conducive environment	Sustainable solid and liquid waste disposal mechanism Improved	Clean and conducive environment	**Establishment of County Stakeholders Forum** to address (solid waste collection and segregation mechanism, Designate waste collection sites, Construct public pay toilets)	**10,000,000**	2024
		Storm water drainage in major towns and market centres controlled	Reduced water logging in land meant for development	**Mapping of drainage system, Design and excavate and construct open drainage Tunnels**	**17,500,000**	2024-2026
	Total				**27,500,000**	
Roads Transport, and public Works	Environmentally sustainable transport	Reduced number of Impassable roads.	Upgraded Impassable roads	**Opening of access roads.** **Grading of access roads.** **Gravelling of access roads.**	**10,000,000**	2024-2027
		Improved road Connectivity	Improved Connectivity	**Construction & Rehabilitation of footbridges & bridges.**	**15,000,000**	2026
		Improved Drainage along roads & urban areas.	Improved drainage	**Excavation of Drains** **Desilting of drains & Culverts** **Storm water management in urban Areas**	**7,000,000**	2025-2027
	TOTAL				**32,000,000**	
	TOTALS				**1,060,450,000**	

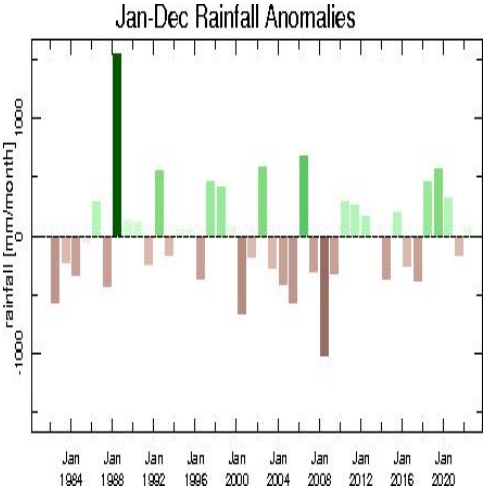
Environmentally sustainable transport concept is centred on transportation systems and activities that meet social, economic and environmental objectives (UNCRD 2010). It includes all the key facets of transport, such as: • Vehicle emission control, standards and I/M • Cleaner fuels • Strengthening road side monitoring and assessment • Land-use planning • Public transport planning and travel demand management • Environment and people-friendly infrastructure development • Road safety and maintenance • Traffic noise management • Public health • Social equity and gender perspectives • Strengthening roadside air quality monitoring and assessment • Strengthening knowledge base, awareness, and public Participation

Annexes





Annual Distribution Gaichanjiru ward and



Annual rainfall anomalies Gaichanjiru Ward

Challenges and Opportunities

lack of Water in Ithanga

Ithanga Ward lack of Water at Drought Worsen

Murang'a Women- Nutrition and health project,

Murang'a women embrace Rice farming- Diversification

Lower Murang’a Dry Periods

Reduced Water level and Drying up of River Mathioya