NAKURU COUNTY

COUNTY OF UNLIMITED OPPORTUNITIES

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NAKURU COUNTY CLIMATE CHANGE ACTION PLAN

2023-2027

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Foreword from the Governor Nakuru County

It is my pleasure to sign off Nakuru County's Climate Action Plan (NCCAP) that is going to strengthen the county's policy and planning framework in mitigating impacts of climate change. Through the development of the Participatory Ward Climate Actions Plans (PWCAP) and the review of the Nakuru County Climate Action Plan 2018-2022, Nakuru has once more shown its position as a leading County in Kenya in addressing the impacts of climate change.

In recent times, several sectors in Nakuru County economy including water, agriculture, livestock production, fisheries, tourism, transport, manufacturing, and energy have been affected by various negative impacts of climate change. Some of the examples include the Solai Dam tragedy in which many lives were lost in addition to the loss and destruction of property and livelihoods. We have also witnessed extensive destruction of infrastructure including roads, water reservoirs and buildings due to floods in various parts of the county.

Droughts and famine affecting communities particularly in the county's semi-arid areas have become more frequent. Prolonged droughts coupled with unpredictable rainfall patterns have affected agricultural and livestock production negatively thus affecting the livelihoods of many people. Climate change has also led to reduced water availability and productivity resulting in displacement of communities and widespread suffering by the population. Associated effects emanating from some to the effects such as increased health issues associated with poor sanitation due to limited water availability, reduced land productivity leading to famine in several areas. The situation is worsened by increasing environmental degradation due to deforestation, poor land use practices, increased demand for agricultural land, pollution and effects of climate change.

Without commitment and voluntary action by the affected groups, climate change will derail the development agenda of Nakuru County and hamper its contribution to the National Government's Four Development Agenda and the realization of the country's Vision 2030 and the Governor' manifesto. Many of the negative impacts of climate change can be addressed by actions either targeting to help our people and the economy adapt to climate change impacts or through long-term strategies to mitigate climate change impacts. On the other hand, climate change offers many opportunities particularly for development agencies and the private sector. Such opportunities include the development and adoption of clean energy, research on and production of appropriate crop varieties, insurance against climate change impacts among

others. This action plan will go a long way in helping the county government address the impacts climate change for the benefit of our people.

It is important to note that climate change does not respect county or even country boundaries. In this respect, my government will work closely with the national government and the neighbouring counties as we implement this plan. I wish to reiterate that Nakuru County Government is committed to ensuring that this action plan is implemented. Towards this end, we will integrate the climate change adaptation and mitigation activities proposed in the document into the County Integrated Development Plan (CIDP) and in the county budgeting and other planning processes. We shall also continue to invest without reservation in the implementation of outlined actions and establishment of the governance structures recommended by the plan. My office will work closely with the County Assembly to develop appropriate legislative instruments to operationalize the plan implementation.

The Nakuru County NCCAP will strengthen the existing; plans, policies and strategy framework both at national and sub national levels. Some of these documents at the County level include the Nakuru County Climate Change Act, 2021; the Nakuru Climate Change Fund Regulations; Nakuru Climate Change Action Plan, 2018-2022; Nakuru County Climate Change Policy; Nakuru County Water and Sanitation Act, 2021; Nakuru County Waste Management Act, 2021; and the Nakuru County waste management policy; as well as ongoing Climate actions such as the rehabilitation, greening and beautification of County recreational parks, solid waste disposal sites, tree growing programmes, establishment of new green parks and climate smart Agriculture among others within the County.

It is evident that climate action planning can only be effectively tackled through a bottom-up collaborative approach, and that the national government cannot do on its own. The climate crisis also demands a unified approach from National government, County government, development partners and private sector actors. The processes must be inclusive and participatory to ensure all voices are heard, especially those of the vulnerable groups in our communities. The development of Nakuru County's CAP has been a great achievement, thanks to a collaborative effort from all our stakeholders, who worked together to set very ambitious, yet practical, targets and actions to mitigate and adapt to the impacts of climate change while improving access to energy. Nakuru is indeed a county of unlimited opportunities, and we can only realise these targets if we continue working together.

I acknowledge the support from the National government, especially from the Climate Change Directorate; the Ministry of Energy; Ministry of Environment and Forestry, Ministry of National Treasury and Economic planning; the Council of Governors; Kenya National Bureau of Statistics; Kenya Power and Lighting Company; Slum Dwellers International (SDI), Arid lands Information Networks (ALIN), World Wildlife Fund (WWF), Deutsche Gesellschaft für Internationale Zusammenarbeit(GIZ)'s Covenant of Mayors Sub Saharan Africa (CoM SSA) and Nationally Determined Contribution (NDC) projects, Stockholm Environment Institute (SEI), Muungano Wa Wanavijiji, Sustainable Energy Access Forum Kenya (SEAF-K), amongst others.

My profound appreciation also goes to all departments and stakeholders who have participated in one way or the other, especially the World Bank through Financing Locally Led Climate Action (FLLoCA) project who have funded and offered technical guidance on the countywide

PCRA process. Finally, I highly appreciate the Nakuru County department of Water, Environment, Energy, Climate Change and Natural Resources, who has shown so much dedication and has played a lead role in this process.

H. E. Susan Kihika

Governor, Nakuru County

Foreword from the CECM – Water, Environment, Energy, Climate Change and Natural Resources

The realization of the development of the low-level community led County Participatory Climate Action Plan (NCPCAP) and the Sustainable Energy Access and Climate Action Plan (CAP) 2022 has made it possible for the review of the county Climate Action Plan 2023-2027. This is a joint effort from the County Government of Nakuru, representatives from the national and sub national government with other non-government actors. I wish to extend my appreciation to some of the key stakeholders who primarily contributed to the realization of the plans. These include Ministry of Environment and Forestry, Ministry of Treasury and Economic planning; the Council of Governors; Slum Dwellers International (SDI), Arid lands Information Networks (ALIN), World Wildlife Fund (WWF), Deutsche Gesellschaft für Internationale Zusammenarbeit(GIZ)'s Covenant of Mayors Sub Saharan Africa (CoM SSA) and Nationally Determined Contribution (NDC) projects, Stockholm Environment Institute (SEI), Muungano Wa Wanavijiji, Sustainable Energy Access Forum Kenya (SEAF-K), amongst others.

In addition to the Nakuru County NCPCAP and the CAP being data driven processes and evidence based, this plan is a culmination of a highly participatory processes, involving enhanced buy-in, ownership and technical capacity. All the County Executive Committee members, chief officers, directors, and the climate change champions drawn from all departments, as well as technical staff within the county played a very critical role in shaping this plan. The main departments involved were the Department of Water, Environment, Energy, Climate Change and Natural Resources; Agriculture, Livestock and Fisheries, Health Service, Finance and Economic Planning; Public Service and administration, Gender, Infrastructure, Lands, Housing and Physical Planning and urban development, public service training and devolution Kenya Meteorological Department National social development department the involvement of all the respective departments, not only increased the buy-in and potential for implementation by different stakeholder groups, but also increased knowledge and awareness on climate change and the importance of climate planning within the county.

With the capacity gained through the FLLoCA's PCRA and CAP processes, the county will be able to monitor and report on the progress of implementation of the climate plan, using both national and international level reporting platforms such as the JRC (Joint Research Centre) reporting platform taking advantage of the county being a member of the CoM SSA Network which is an arm of the Global Covenant of mayors' chapter CoM SSA which supports sub Saharan member countries in taking climate action.

Now that the NCCAP has been developed, the best way to measure success is to implement the actions identified to meet respective sectoral targets that were set by the county to mitigate and adapt to the impacts of climate change. This, again, will require all county departments to work together by assigning budget line items to successfully implement the actions relevant to their sectors. The county, however, cannot implement all these actions on its own, and calls for

technical and financial support from national and international organisations to enhance and fast-track implementation. This plan has also been developed at an opportune time when the Nakuru County Integrated Development Plan (CIDP), 2023–2027, is currently being updated. This creates a unique opportunity to integrate the CAP and NCCAP actions into the CIDP. Implementation of the NCCAP will also be enhanced by the existence of the Nakuru County Climate Change Fund regulations, which was created in 2022. With the NCCAP in place, and with the current commitments and dedication of the County Government of Nakuru and its citizens, its partners and benefactors, we can build a climate resilient Nakuru for all.

Dr. Nelson Maara

Nakuru County Executive Committee Member

Water, Environment, Energy, climate change and Natural Resources

Foreword from the CO – Environment, Energy, Climate Change and Natural Resources

I take this opportunity with great pleasure to be part of the team that has developed this NCCAP 2023-2027. The major contributing sectors to GHG emissions in the County. This aims at reducing carbon footprint, by focusing more on mitigation measures, enhancing adaptive capacity and building resilience for her citizenry. The process has strengthened the previous rigorous, participatory CAP that delved on major and critical sectors that highly contributes to GHGs emission. Total GHG emissions for Nakuru County in 2019 were estimated at 1 642 867 tCO2e. This estimate includes emissions from the stationary energy, transportation, and waste sectors. This is equivalent to approximately 0.8 tCO2e per person. For comparison, national emissions for Kenya in 2010 were 17 000 000 tCO2e when considering only the stationary energy, transport, and waste sectors (Republic of Kenya, 2015). This is equivalent to approximately 0.4 tCO2e per person. However, emissions per person in Nakuru County in 2019 were only about one sixth of the global average (World Bank, 2022a). The total GHG emissions in Nakuru County for 2019 are equivalent to 37 000 cars travelling from Nakuru city centre to Nairobi city centre and back every day for a year.

The largest contributing sector was stationary energy, contributing 43% of emissions, followed by transportation (33%) and waste (24%). In Nakuru County, the stationary energy sector accounted for 703 860 tCO2e (43% of total GHG emissions) in 2019. The largest proportion of emissions in the stationary energy sector come from energy use in residential buildings (37%). This is followed by energy use in manufacturing and construction (30%) and in energy industries or charcoal production (23%). The remaining emissions in the stationary energy sector come primarily from energy use in commercial and institutional buildings (8%), while less than 1% come from energy use in agriculture, forestry, and fishing activities.

Similarly, prominent hazards affecting the County include floods, droughts, rainstorms, and water-borne diseases. These current and future hazards affect all citizens and all sectors (especially agriculture, livestock and fisheries, water, forestry, and tourism sectors) in the County. The most vulnerable members of Nakuru County, women, girls, children, the elderly, and people with disabilities, are disproportionately affected by these hazards. We as the people of Nakuru County need to come together towards a climate neutral future for our beloved County and implement these climate actions so that the NCCAP. Pivotal in investment decision making. The plan needs integration into the sectoral and county's integrated planning framework; only then can we ensure that our NCCAP becomes a living guide for all of us.

My profound appreciation goes to Slum Dwellers International (SDI), Arid lands Information Networks (ALIN), World Wildlife Fund (WWF), Deutsche Gesellschaft für Internationale Zusammenarbeit(GIZ)'s Covenant of Mayors Sub Saharan Africa (CoM SSA) project, Stockholm Environment Institute (SEI), Muungano Wa Wanavijiji, Sustainable Energy Access Forum Kenya (SEAF-K), the Governor's office Nakuru county, all the Directorates in

Nakuru county and the FLLoCA team that supported the PCRA process and reporting both in material and kind in form of expertise in working with the County to develop their NCCAP.

I am proud that Nakuru County has joined the forerunners among cities and governments committed to taking climate action, in Kenya and in Sub-Saharan Africa through putting in place the necessary planning framework and institutional arrangements.

I urge all citizens of Nakuru to pay special attention to the locals at the grassroot level, by communicating in a language in which they can understand. I also encourage all residents of Nakuru County to be climate change ambassadors in their homes and different walks of life, as we can only overcome change crisis through joined efforts; no action is too small or too big.

The County Government of Nakuru is committed to mainstreaming climate action and building climate resilience for our people a thriving county. Going forward.

Kennedy Mungai

Nakuru County Officer

Environment, Energy, Climate Change and Natural Resources

Acknowledgement

This Plan was developed by stakeholders on Climate change in Nakuru County Led by Nakuru County Government. The stakeholders included National government, especially from the Climate Change Directorate; the Ministry of Energy; Ministry of Environment and Forestry, Ministry of Treasury and Economic planning; Ministry of Treasury and Economic planning the Council of Governors; Kenya National Bureau of Statistics; Kenya Power and Lighting Company; Slum Dwellers International (SDI), Arid lands Information Networks (ALIN), World Wildlife Fund (WWF), Deutsche Gesellschaft für Internationale Zusammenarbeit(GIZ)'s Covenant of Mayors Sub Saharan Africa (CoM SSA) and Nationally Determined Contribution (NDC) projects, Stockholm Environment Institute (SEI), Muungano Wa Wanavijiji, Sustainable Energy Access Forum Kenya (SEAF-K), amongst others. Many other individuals either participated in the process by providing information, reviewing various versions of this document or by providing logistical support in the process.

The document was compiled by a technical team of consultants including Dr. Nelson Maara (County *Executive Committee Member Water, Environment, Energy, Climate Change and Natural Resources)*; Kennedy Mungai *(Chief Officer Environment, Energy, Climate Change and Natural Resources*); Grace Karanja (County *Director Environment, Energy, Climate Change and Natural Resources)*; Environment and Climate Change Officers, Kilion Nyambuga, (*Slum Dwellers International);* Bod Aston, *(ALIN);* Abel Omanga, *(CoM SSA).*

Financial support for this process was provided by the World Bank through Financing Locally Led Climate Action (FLLoCA) project. We are very grateful for this support.

List of Abbreviations

CBO	Community Based Organization
CDM	Clean Development Mechanism
CECM	County Executive Committee Member
CO	Chief Officer
CFA	Community Forest Association
CIDP	County Integrated Development Plan
CSO	Civil Society Organization
CSR	Corporate Social Responsibility
DVS	District Veterinary Services
EAC	East African Community
EIA	Environmental Impact Assessment
EMCA	Environment Management and Coordination Act
GBM	Green Belt Movement
GDP	Gross Domestic Product
GHG	Green House Gas
Gok	Government of Kenya
INDC	Intended Nationally Determined Contribution
ICT	Information and Communication Technology
ILBM	Integrated Lake Basin Management
KALRO	Kenya Agricultural and Livestock Research organization
KEFRI	Kenya Forestry Research Institute
KENGEN	Kenya Electricity Generating Company
KEPSA	Kenya Private Sector Alliance
KFS	Kenya Forest Service
KWS	Kenya Wildlife Service
LANAWRUA	Lake Naivasha Waster Resource Users Association
MENR	Ministry of Environment and natural Resources
MET	Meteorological
MoALF	Ministry of Agriculture, livestock, and Fisheries
NACOFA	National Alliance of Community Forest Associations
NAP	National Adaptation Plan
NCCAP	National Climate Change Action Plan
NCCRS	National Climate Change Response Strategy
NEMA	National Environment Management Authority
NMK	National Museums of Kenya
NGO	Non-Governmental Organization
OPM	Office of the Prime Minister
PES	Payment for Ecosystem Services
PFM	Public Finance Management
REDD	Reducing Emissions from Deforestation and Forest Degradation
SDG	Sustainable Development Goal
SEA	Strategic Environmental Assessment
SMS	Short Message Service
SGR	Standard Gauge Railway
UNFCC	United Nations Framework Convention on Climate Change
US	United States
WHO	World Health Organization
WRA	Water Resources Authority

WRUA	Water Resource Users Association
WWF	World Wide Fund for Nature

Operationalisation of terms

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

Mitigation: will be used to refer to, interventions to reduce anthropogenic contribution to the climate change problem. It includes strategies and measures to reduce greenhouse gas emissions and/or to enhance greenhouse gas sinks. Examples of mitigation measures are, renewable energy technologies, waste minimization processes and mass transport of people and goods among others.

Hazard: refers to "a dangerous phenomenon, substance, human activity, or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

Impacts: will refer to the effects on natural and human systems of extreme weather and climate events and of climate change. Impacts generally refer to effects on lives, livelihoods, health status, ecosystems, economic, social, and cultural assets, services (including environmental), and infrastructure due to the interaction of climate changes or hazardous climate events occurring within a specific time and the vulnerability of an exposed society or system. Impacts are also referred to as, consequences and outcomes of climate change or hazards related to climate change.

Vulnerability: is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity.

Resilience: is the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change.

Executive Summary

The Nakuru County Climate Action Plan (NCCAP) is the key document that defines strategies, plans, and actions for sustainable development and low greenhouse gas (GHG) emissions and taking adaptation action. It includes measure to address climate change adaptation and mitigation action in response to current and future climate change impacts in the region. The NCCAP is a strategic and operational plan used to identify the best areas of action and opportunities to achieve the local government's GHG emissions reduction targets and build climate resilience. It builds on the Participatory County Climate Change Risk and Vulnerability Assessment (PCCCRVA) process, which identified the most relevant climate hazards and their effects, vulnerabilities, and target actions of the county. It also includes PCRA county plan which aggregates all the ward Participatory Ward Climate Action plans (PWCAP). The NCCAP defines concrete measures for to translate the long-term strategy into action as the PCCAP details the specific actions at ward level.

There is irrefutable evidence that climate change has negative impacts on nearly all sectors of Nakuru County socio-economic, and environmental sectors. However, the negative impacts of climate change are most visible in the agricultural and livestock production, water, environment, and infrastructure and transport sectors. There are also some opportunities provided by climate change particularly in the energy, conservation, and infrastructure sectors. This action plan was formulated in a very participatory process by Nakuru County stakeholders to guide the actions necessary to address climate change impacts and take advantages of any emerging opportunities.

It is anchored in relevant international, national, and county policy and legal frameworks. Relevant climate change issues affecting each sector were identified by the stakeholders and actions either addressing the impacts or those that can mitigate the impacts were agreed upon during stakeholder fora. If implemented as intended, the result will be a county with **"a low carbon, climate resilient economy that sustains the livelihoods of its citizens while contributing to the national development agenda"** The action plan has eight objectives around Food Security, Water Security, Environmental Conservation, of Climate Change Adaptation and Mitigation Actions, Enhanced Food Security, Green Energy, Climate Change Resilient Infrastructure, Knowledge Management and Capacity Building, Sustainable Financing for Climate Change Actions and Governance and Coordination.

As required by the Climate Change Act 2016, implementation of the action plan will be led by the County Government supported by all relevant stakeholders. However, successful implementation of the plan calls for increased financial commitments from the county governments, development partners and other stakeholders. To facilitate implementation, the plan links planned activities for each objective to appropriate stakeholders. This will promote mainstreaming of the plan activities into the county government and other stakeholders' relevant budgetary processes.

The plan is established upon existing relevant international, national, and county level legal and policy instruments including the national government's Big Four Agenda, Sustainable Development Goals (SDGs), Vision 2030, constitution, National Climate change Response Strategy 2010, Climate change Action Plan 2013-2017, Climate Change Action Plan 2018 - 2022, the Climate Change Act 2016 and Climate Adaptation Plan 2017. The action plan will

inform other county planning processes including the County Integrated Development plans, County spatial plan, and the county budgetary process.

This action plan is guided by the **vision "Nakuru County has a low carbon, climate resilient economy that sustains the livelihoods of its citizens while contributing to the national development agenda"** The **goal** of the plan is to **"Mainstream climate change adaptation and mitigation strategies in the economic production and development activities to improve the living standards of Nakuru County residents.**". This goal will be achieved through eight strategic objectives namely: The goal may need to be redone as what is stated is a strategic objective

1. Enhanced Food security.
2. Enhanced Water security.
3. Ecosystem conservation for sustainable economic development.
4. Green energy production and use.
5. Climate change resilient infrastructure.
6. Knowledge management and capacity building of community, stakeholders and county officials.
7. Sustainable financing for climate change action.
8. Governance and coordination of climate change adaptation and mitigation.

The activities necessary to achieve each of these objectives, the stakeholders and actors have been identified and monitoring indicators suggested. In addition, the activities have been prioritized. The plan includes a Monitoring and Evaluation (M&E) framework which will need to be revised at five-year intervals in accordance with the climate change Act 2016.

SUMMARY OF THE PLAN

A. Climate Change Mitigation in Nakuru County

Climate change mitigation refers to efforts to limit our contribution to causing climate change by altering and reducing the activities that lead to Greenhouse Gas (GHG) emissions. The mitigation component of the Nakuru County Climate Action Plan (NCCAP) comprised three stages: the Baseline Emissions Inventory (BEI), mitigation vision and target setting, and mitigation action planning (Figure 1). Three sectors were considered in each of these stages: stationary energy (i.e., energy use in buildings and facilities), transport and waste.

Figure 1.1-1. Stages for the mitigation pillar within the Nakuru County CAP

B. The Nakuru County Baseline Emission Inventory

The first step in developing the mitigation pillar was to conduct a Baseline Emissions Inventory (BEI). The purpose of the BEI was to identify the activities in Nakuru County that are the primary sources of GHG emissions, thereby contributing to climate change on a global scale. The BEI for Nakuru County was produced following the Global Protocol for Community-scale Greenhouse Gas Emission Inventories (GPC), an international standard for GHG emission inventories in cities. The Nakuru County BEI uses a combination of local data, where available, and downscaled national and regional (proxy) data for Kenya and East Africa and covers a continuous 12-month period from January 2019 to December 2019 and estimates all emissions from the stationary energy, transportation, and waste sectors as a result of activities within the County's geographical boundary.

The BEI revealed that the total GHG emissions for Nakuru County in 2019 were 1 642 867 tCO2e. This is equivalent to approximately 0.8 tCO2e per person. The total emissions for Nakuru County are equivalent to 37 000 cars driving from Nakuru city centre to Nairobi city centre and back every day for a year. For comparison, national emissions for Kenya in 2010 were 17 000 000 tCO2e when considering only the stationary energy, transport and waste sectors (Republic of Kenya, 2015), which is equivalent to approximately 0.4 tCO2e per person. The largest contributing sector to Nakuru County's emissions, as estimated in the BEI, is stationary energy (43%), followed by transport (33%) and waste (24%). Table 2 shows the breakdown of emissions by sector and scope.

Table 1.1-1 Summary of GHG emissions in Nakuru County by sector (tCO2e)

Sector	Scope :1 emissions	Scope: 2 emissions	Total emissions	Proportion of total emissions
Stationary Energy	669 273	34 587	703 860	42.8%
Transport	544 749	-	544 749	33.2%
Waste	394 258	-	394 258	24.0%
TOTAL	1 608 280	34 587	1 642 867	

Error! Reference source not found. Further disaggregates the GHG emissions in the County by sub-sector. Energy industries refers to emissions from charcoal production. Emissions from energy use in commercial and institutional buildings, energy use for agriculture, forestry and fishing activities, and biological treatment of waste (e.g. composting) are included under 'Other'.

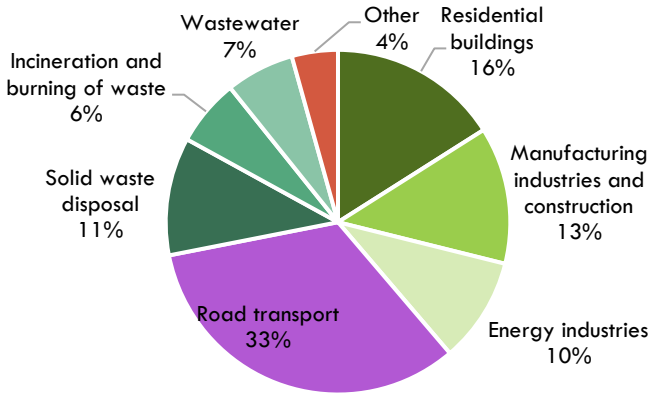

Figure 1.1-2. Breakdown by sub-sector of GHG emissions in Nakuru County

C. Business as Usual Scenario

Based on the GHG emissions for 2019 reported in Nakuru County's BEI, a 'business-as-usual' (BAU) scenario was developed to estimate the growth of GHG emissions in the county until 2030. This scenario aims to illustrate how GHG emissions are likely to change over the next decade in Nakuru County in the absence of additional climate change mitigation actions and policies. The BAU scenario for Nakuru County estimates that GHG emissions will increase from 1 642 867 tCO2e in 2019 to 2 718 694 tCO2e in 2030, an overall increase of 65% in 11 years. (**Error! Reference source not found.**).

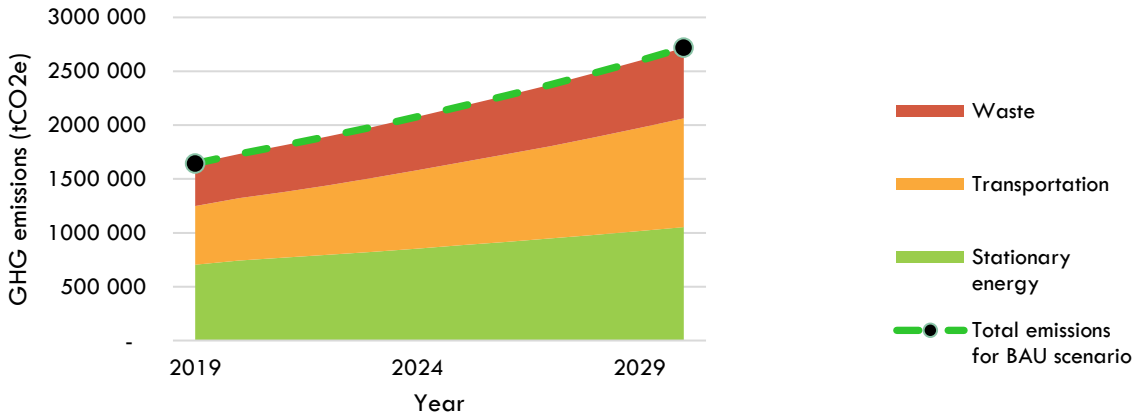

Figure 1.1-3 Business-as-usual scenario showing the estimated growth in GHG emission in Nakuru County in the absence of additional climate change mitigation actions by 2030.

D. Mitigation Vision and Targets

Using the BEI and BAU scenario, a set of draft targets were developed to align with Kenya's national mitigation targets, outlined in the country's Nationally Determined Contribution (NDC). These suggested targets were then discussed and finalised during in-person participatory workshops with participants from various Nakuru County Government departments, the Nakuru and Naivasha Municipalities and civil society organisations. Nakuru County set the following vision to guide mitigation efforts across sectors:

"A low carbon County that supports sustainable development by 2030."

Nakuru County set an overall emission reduction target as follows:
Nakuru County seeks to reduce GHG emissions by 33% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions of at least 6% compared to the BAU scenario from domestic resources, while the remaining 27% is conditional on external support.

In addition to the overall mitigation target for Nakuru County, targets for each sector were set as shown below. The overall and unconditional targets for each sector are aligned with the national mitigation targets outlined in Kenya's NDC.

Table 1.1-2 Sectoral GHG emission reduction targets for Nakuru County

Sector	Baseline emissions in 2019 (tCO2e)	BAU emissions in 2030 (tCO2e)	Overall sector target by 2030	Unconditional sector target by 2030
Stationary energy	703 860	1 053 480	57.5% off BAU	12% off BAU
Transport	544 749	1 009 769	17.6% off BAU	2.7% off BAU
Waste	394 258	655 444	16.4% off BAU	2.2% off BAU
Total	1 642 867	2 718 694	33% off BAU	6% off BAU

E. Nakuru Mitigation Actions

A total of 20 actions were identified across the three sectors. Of these, 14 actions were prioritised, based on technical, political and financial feasibility, co-benefits and synergies with existing priorities in the County. The prioritised actions per sector are shown on Table 3.

Table 1.1-3 Priority actions for GHG emission reduction in Nakuru County and rationale for prioritisation

Priority actions per sector
Stationary energy sector
• Develop and enforce an Energy Act and Regulations on energy efficiency within Nakuru County by 2027
• Undertake regular energy audits on 2 000 buildings and facilities within the County
• Install energy—efficient lighting in commercial, institutional, and residential buildings
• Develop small-scale biogas production facilities to promote clean cooking in Nakuru County in partnership with the private sector
• Create 3 energy centres to disseminate information and raise awareness on sustainable energy
Transportation sector
• Construct and/or upgrade 10 km of non-motorised transport (NMT) routes in urban centres
• Create green open spaces in the County's urban centres, including NMT corridors
• Improve parking facilities on the edge of urban centres to reduce congestion
• Expand the public transport system to include bus mass transport along major transit routes.
Waste sector
• Upgrade three existing waste disposal sites in Nakuru County by improving access roads, fencing, and zoning of the tipping areas
• Establish a resource recovery centre in Nakuru County to increase waste recovery
• Organize annual public awareness raising campaigns and incentives to increase household level waste segregation
• Increase briquette production from organic waste and fecal sludge to contribute to waste recovery.
• Increase the extent of the sewer network and the capacity of the wastewater treatment infrastructure to service 60% of the population of Nakuru County.

F. Climate Change Adaptation in Nakuru County

Climate change adaptation is the process of adjusting to actual or expected climate change and its effects. Adaptation actions are undertaken in anticipation of the adverse effects of climate change and aim to prevent or minimize the damage the impacts of climate change can cause and/or take advantage of opportunities that may arise. The development of the adaptation plan includes four steps: i) undertaking a Risk and Vulnerability Assessment (RVA); ii) Setting an overarching adaptation vision; iii) setting adaptation targets for key sectors for adaptation; and iv) developing adaptation actions that contribute to achieving the sector targets.

Figure 1.1-4 Stages for the adaptation pillar within the Nakuru County CAP

i. The Nakuru County Participatory Risk and Vulnerability Assessment

The objective of Nakuru County's PRVA was to identify the most significant **climate hazards** currently affecting the County and to understand which **key sectors** and **population groups** in the County are most affected by these hazards. The RVA also aimed to assess how these hazards are likely to change in intensity, frequency, and time scale in the future because of climate change. Data informing the development of the RVA were gathered through three separate methodologies, namely: i) primary data collection through community focus discussions; ii) secondary data collection; and iii) stakeholder consultations and participatory, multi-stakeholder workshops.

The RVA revealed that Nakuru County faces several climate hazards, particularly: drought, rainstorms, flash/surface floods, river floods, and waterborne diseases. These results are consistent with the hazards described in the Nakuru County Climate Change Action Plan (NCCCAP, 2018), as well as the Kenya National Adaptation Plan (NAP, 2015). These hazards are likely to intensify with climate change as temperatures are projected to rise in the County and rainfall is likely to become more erratic.

The RVA identified the sectors most affected by current and future climate hazards as: i) Environment, biodiversity, and forestry; ii) Water supply and sanitation; iii) Land use planning; and iv) Food and agriculture. These are consistent with priority sectors identified through the NCCCAP (2018) and the NAP (2015). It was also found that the most vulnerable groups to climate hazards in Nakuru County are women and girls, and low-income households.

ii. Nakuru County climate change adaptation Validation

Following the completion and validation of the Nakuru County RVA, consultations were held with stakeholders from various departments and stakeholders to prioritise sectors for adaptation, set an overarching adaptation vision and sector-specific targets for the key sectors and subsequently identify and prioritise actions that will enable the County to achieve its climate adaptation vision. This process took the form of a participatory workshops with representatives from several County departments, including Agriculture, livestock and fisheries, Environment, Health, Resource Mobilisation, Water and Sanitation, Tourism, Roads, Transport and Public Works, private and other non-governmental stakeholders among others. During the workshop, the following overarching adaptation vision for Nakuru County (base year 2021) was adopted:

A climate resilient County with sustainable ecosystems and livelihoods by the year 2030.

Based on the results of the RVA, NAP (2015) and NCCCAP (2018), workshop participants identified the following sectors as priority sectors which are most vulnerable to the impacts of climate change in the County: Agriculture, livestock, and fisheries; Water; Forestry; Tourism. One adaptation target was set for each priority sector, except for the Water sector for which two targets were set (one for access to water and one for sanitation). A total of 15 adaptation actions were then developed to contribute to achieving the sectoral targets (three actions per target). Of the 15 actions, one action was prioritised per sector target (five actions in total), based on a set of prioritisation criteria which included alignment with Kenya's 2nd National Climate Change Action Plan (NCCAP) 2018-2022 and several sector-specific plans. The final adaptation targets, priority actions per sector, and rationale for prioritisation are summarised on Table 4.

Table 1.1-4 Nakuru County Climate Change adaptation targets and priority actions identified by stakeholders during participatory workshops

Sector	Target	Priority action identified by stakeholders
Agriculture, livestock and fisheries	By 2030, ensure that at least 70% of crop, livestock and fishery farmers and other stakeholders are using climate-resilient practices including water harvesting techniques and nature-based enterprises (e.g., Agroforestry).	Desilt 60 water pans and construct 25 new water pans in Naivasha and Rongai sub-Counties by 2030 to promote water harvesting, conservation and utilisation for domestic and agricultural use in Nakuru County.
Water	By 2030, increase access to clean water to 80% of the population.	Map all community water sources in Nakuru County by 2030, including springs, boreholes, pans, dams and shallow wells.
	By 2030, increase access to sanitation to 100% of the population.	Support all rural villages in Nakuru County with achieving "Open Defecation Free (ODF)" status by 2030, including follow-ups, claims, verification, certification, and celebration of ODF villages.
Forestry	By 2030, increase tree cover in Nakuru County to 75,000 ha.	Rehabilitate open public green spaces in Nyayo Garden, Lion Garden, Naivasha People's Park and others, and reforest areas in gazetted forests with a focus on indigenous trees and the restoration of indigenous ecosystems.

Sector	Target	Priority action identified by stakeholders
Tourism	By 2030, ensure that the Nakuru County tourism sector promotes ecotourism and sustainability in 80% of its tourism destinations.	Conduct sensitization and capacity-building on sustainable tourism activities with vulnerable groups (including youth, women and indigenous communities) across Nakuru County's 55 wards by 2030.

INTRODUCTION

1.1 What is Climate Change?

Climate change refers to the long term (typically decades or longer) shift in global temperature, precipitation, wind patterns and other measures of climate that can be verified statistically. **Climate change** may be due to natural processes or the persistent anthropogenic changes in the composition of the atmosphere or land use. Natural processes that contribute to climate change include variations in solar radiation, earth's orbit, continental tectonic movements, the reflectivity of the earth's surface, and natural release of greenhouse gases. Man's contribution to climate change is mainly through the increased release of greenhouse gases including carbon dioxide, methane nitrous oxide, and fluorinated gases. These gases trap warmth in the Earth's atmosphere and stop it from leaving the atmosphere – just like greenhouses stops heat from escaping into the surrounding air. Carbon dioxide is primarily produced and released to the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, and wood products. Deforestation and soil degradation add carbon dioxide to the atmosphere, while forest regrowth takes it out of the atmosphere. Methane is emitted during the production and transport of oil, coal, and natural gas. Methane emissions also result from livestock and agricultural practices and the anaerobic decay of organic waste in municipal solid waste landfills. Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste, while fluorinated gases are emitted from a variety of industrial processes and commercial and household.

Climate change has had many negative impacts on all spheres of human socio, environmental, political and economic development. For example, climate change has led to many incidences of severe weather events leading to injuries and fatalities to man, loss of property and damage to essential infrastructures. Environmental degradation linked to climate change has also led to displacement and forced migrations in many areas in Kenya. There are many instances where climate change has resulted in the escalation of intercommunity conflicts as different communities compete for decreasing water and pasture resources for their livestock. For example, competition for water and pasture in the Kenyan, Tana Delta is largely to blame for the ethnic conflict between pastoral and farming communities in 2012 (Odhengo *et al*. 2014). Conflicts over water and pasture have also been reported in Northern Kenya (Mobjörk & van Baalen, 2016). Climate change has impacted negatively on food and water supply leading to malnutrition and other health complications. Climate change has led to changes in disease vector ecology leading to increased incidences of diseases in man, livestock, crops and wildlife, resulting in increased strains in human medicine, livestock, crop production and wildlife conservation.

Other climate change related terms, which will be used in this document include: adaptation, mitigation, hazard, impacts, vulnerability and resilience and each is described in the link below: http://climate-adapt.eea.europa.eu/help/glossary/index_html/#linkActionPlan .

1.2 County Context

Nakuru County is among the 47 counties of the Republic of Kenya that came into existence with the enactment of Kenyan Constitution in 2010. The county is cosmopolitan, comprising a populace of different ethnicities and nationalities (KNBS, 2019). The dominant communities include Kikuyu and Kalenjin. Other communities present in the county include Luo, Luhya, Maasai, Kamba, and Meru, among others (Nakuru County, 2018).

1.3 Demography

As per the 2019 National Population and Housing Census, the county's population was approximately 2.16 million in 2019, made up of 1,077 million males, 1,084 million females, and 95 intersexes. Approximately 33% of people in the county are aged 18-35, indicating a predominantly youthful population (KNBS, 2019). Furthermore, 54.2% live in rural areas, and 45.8% live in urban areas. The population growth rate is approximately 3% per year (Nakuru County, 2021).

The county is divided into eleven administrative sub-counties namely: Nakuru Town East, Nakuru Town West, Naivasha, Molo, Njoro, Kuresoi North, Kuresoi South, Rongai, Bahati, Subukia and Gilgil as shown in Figure 5. These 11 sub-counties are further divided into 31 Divisions, 121 Locations, and 265 sub-locations.

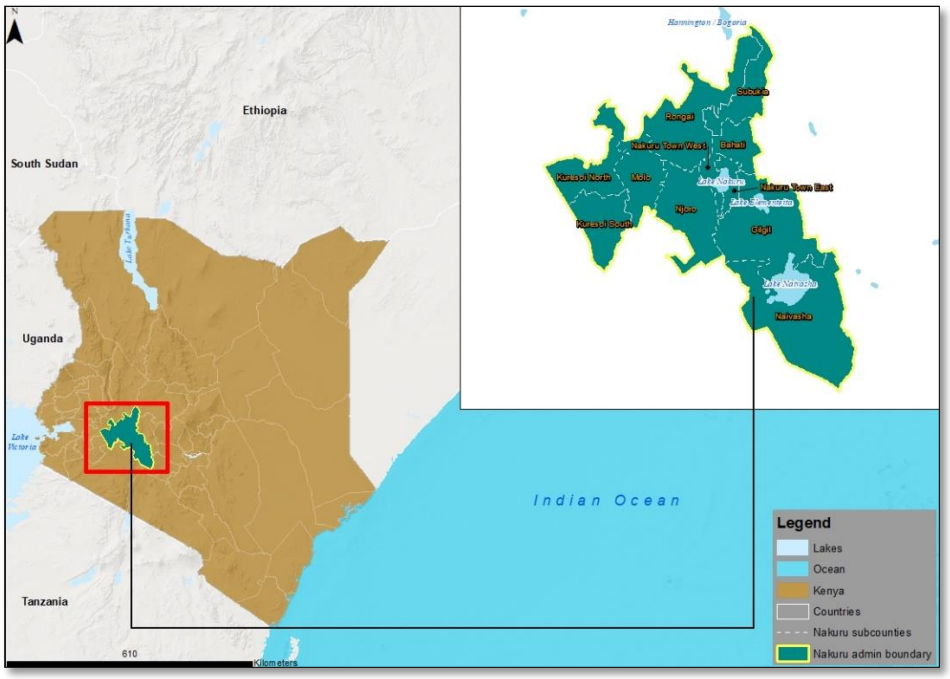

Figure 1.3-1 A map of Nakuru County and its Sub Counties (based on KNBS 2019 census data)

Error! Reference source not found.le 5 depicts the population of the different sub counties, land surface area, population density and household size, in comparison to county and national level. This shows that the most populated subcounty is Naivasha, and the subcounty with the highest population density is Nakuru Town West with 2,764 persons per km^2.

Table 1.3-1 Summary of Nakuru County and subcounty demographics compared to Kenyan demographics

Sub-county	Total population	Male population	Female population	Total number of households	Number of Conventional households	Number of Group Quarters	Land area,Sq. Km	Density, Persons Per Sq. Km	Household size
KENYA	**47564296**	**23548056**	**24014716**	**12143913**	**12043016**	**100897**	**580895**	**82**	**3.9**
NAKURU	**2162202**	**1077272**	**1084835**	**616046**	**598237**	**17809**	**7505**	**288**	**3.5**
NAIVASHA	355383	179222	176132	117633	111493	6140	1958	181	3.0
NJORO	238773	118361	120408	61271	61156	115	699	341	3.9
NAKURU NORTH	218050	106155	111880	61728	61582	146	387	563	3.5
RONGAI	199906	99976	99922	52348	52248	100	988	202	3.8
NAKURU WEST	198661	101797	96854	64481	64429	52	72	2764	3.1
NAKURU EAST	193926	92956	100960	61398	60066	1332	231	840	3.2
GILGIL	185209	92955	92247	58920	49405	9515	1075	172	3.1
KURESOI NORTH	175074	87472	87599	40359	40168	191	618	283	4.3
MOLO	156732	78129	78598	41462	41439	23	483	324	3.8
KURESOI SOUTH	155324	78204	77117	34627	34543	84	591	263	4.5
SUBUKIA	85164	42045	43118	21819	21708	111	402	212	3.9

(Source: KNBS, 2019b)

1.4 Geography

The county covers an area of approximately 7,498.8 km² with its capital being Nakuru Town. The main topographical features in Nakuru County are the Mau Escarpment covering the western part of the county, the Rift Valley floor, Ol-Doinyo Eburru volcano complex, Akira Plains and Menengai Crater. The county has an elaborate drainage and relief system with various inland lakes on the floor of the Rift Valley where nearly all the permanent rivers and streams in the county drain into. These rivers include Njoro and Makalia which drain into Lake Nakuru, Malewa which drains into Lake Naivasha, and the Molo River which drains into Lake Baringo, among others. The topography in Naivasha and Gilgil sub-counties is characterized by mountain ranges and savannah vegetation that supports various species of wildlife.

The Mau Escarpment has an average altitude of 2,400 m above sea level and contains most of the county's forests. Nakuru County has about 680 km^2 of gazetted forests as well as three national parks: Lake Nakuru, Hell's Gate, and Longonot. The county also has a number of private wildlife conservancies with large flocks of birds (notably flamingos) endangered rhinos, Rothchild's giraffes and hippos among other wild mammalian species. Underground hot springs in Olkaria are an important source of geothermal power that serve not only the county but also provide power supply to the national grid. The county typically receives rainfall twice a year from March to May and from October to December with a distribution ranging from 550 to 1900 mm/year depending on altitude and location (Nakuru County, 2018).

Nakuru County has large natural water resources including four major lakes (Nakuru, Naivasha, Solai, and Elementaita), shallow wells, springs, dams, pans, and boreholes. However, most of these water resources, particularly the lakes, are not available for domestic, industrial or irrigation purposes. Boreholes have been sunk to boost water supply but the county is still water deficient. During the implementation of the first County Integrated Development Plan 2013–2017, water coverage within Nakuru increased from 58% to 63%. In terms of water quality, Nakuru County regularly experiences contamination of water sources due to open defecation and overflowing sewage into open water.

1.5 Economy

Nakuru County's Gross Domestic Product (GDP) for 2019 was estimated at 613 billion Kenyan shillings (KES) (approximately USD 5.7 billion), accounting for 6.9% of Kenya's GDP (KNBS, 2019, 2020c). About 29.1% of the population lives under the poverty line of USD 2 a day, which is slightly below the national poverty level of 36.1% (KIPPRA, 2019). Furthermore, informal settlements are increasing in the county due to rapid urbanisation and failure of the formal sector to supply adequate houses especially for the low-income segment of society (KIHBS, 2016). An estimated 82.5% of households in Nakuru County own a mobile phone. Approximately 16% have access to the internet, 57% have access to television, and 91% have access to radio (KIHBS, 2016).

The main economic activities within Nakuru County are agribusiness, financial services, geothermal power generation and tourism (Nakuru County, 2018). The county's economy is mostly built around agriculture, which accounts for approximately 60% of total economic activity (Nakuru County, 2020). Both subsistence and large-scale commercial farming is practiced with flower farms as major employers in the county. The main food crops produced in the county include maize, Irish potato, wheat, and beans, and the main livestock types are dairy cattle, local poultry and wool sheep (Government of Kenya, 2016).

Nakuru County offers some of the most significant power generation capacity both in the country and in Africa, as it is home to one of the largest geothermal plants on the continent. According to the 2015–2016 Kenya Integrated Household Budget Survey (KIHBS), electricity is the main source of energy for lighting in the county at 55%. However, most of the Nakuru County residents, especially those in rural areas and informal settlements of the rapidly expanding urban centres, rely mainly on biomass energy for cooking (firewood and charcoal).

1.6 Infrastructure

The entire road network in Nakuru County is approximately 12,491 km, with paved roads accounting for 993.7 km, gravel roads accounting for 4,500 km, and earth roads accounting for 6,998 km. The road infrastructure can be described as 20% good, 35% fair and 45% poor (Nakuru County, 2018). Some roads, especially in agriculturally rich areas such as Kuresoi North and South, Molo, Njoro Subukia, Naivasha and Gilgil are in poor condition, leading to delays in the transport of agricultural produce to market, and causing losses for farmers for perishable goods. A railway line traverses through the county to Uganda, and is used to transport cargo mainly from the port of Mombasa to the Malaba border. The proposed Standard Gauge Railway (SGR) will pass through Mai Mahiu (Naivasha) as it joins Narok County all the way to the Malaba border.

A snapshot of key demographic, economic and geographic indicators in Nakuru County have been outlined in Table 6.

Table 1.6-1. Nakuru County demographic, economic and geographic indicators

Sector	Description
1. Geography	
Location:	The county is located between longitudes 35.41 º East or 35 º 24' 36" East and 36.6 ºEast or 36 º36' 0" East and latitude 0.23 º North or 0 º13' 48" North and 1.16 º South or 1º 9`36" South. Nakuru is among the 14 counties within the Rift Valley region.
Environmental and climate change challenges	Environmental degradation in Nakuru County is mainly because of inappropriate farming methods, poor solid and liquid waste disposal, soil erosion, inadequate sanitary facilities, massive felling of trees for firewood, encroachment of forest reserves, timber and clearing land for agriculture.
Land area (2019)	Nakuru County covers a land area of 7,505 km^2, compared to a national land area of 580,895.4 km^2 (making up about 1.3% of total land area in Kenya).
2. Demography	
Population (2019)	2,162,202 people, with 49.8% (1,077 million) males, 50.2% (1,084 million) females, less than 0.1% (95) intersexes. The national population of Kenya is 47,564,296 (KNBS, 2020).
Household size (2019)	3.5 persons per household in Nakuru county, compared to a national average of 3.9 (KNBS, 2020) The most populated households are found in Kuresoi South, with an average household size of 4.5 persons.
Population density (2019)	288 persons/km^2 in Nakuru County, compared to 82 people/km^2 in Kenya. Nakuru Town West has a very high population density of 2,764 persons/km^2 due to its very small land area of 72 km^2.
Number of households (2019)	616,723 households in Nakuru County, with an average household size of 3.5 persons (KNBS, 2019a), compared to 12,143,913 households in Kenya, with an average household size of 3.9 persons. The subcounty with the highest number of households is Naivasha (117,633) and the lowest is Subukia (21,819).
3. Governance and leadership	
County capital:	The county's capital is Nakuru City.
Number of subcounties and wards	There are 11 subcounties, 31 divisions, 121 locations, 265 sublocations. Subcounties include: Nakuru Town East, Nakuru Town West, Naivasha, Molo, Njoro, Kuresoi North, Kuresoi South, Rongai, Bahati, Subukia and Gilgil.
Urban areas	There is an urban population of 1,047,080 (48.4% of county population) comprising of 49.4% males and 50.6% females. There are 339,787 households covering a total land surface area of 949 km^2 and a population density of 1,103 persons per km^2. The major urban centres are: Nakuru, Naivasha, Mai Mahiu, Molo, Njoro, Gilgil, Subukia,

Sector	Description
	Olenguruone, Bahati, Rongai, Salgaa, Dundori and Mau Narok (County Government of Nakuru, 2018).
Rural areas	The rural population of 1,115,122 people (51.6% of county population) comprises of 50.2% males and 49.8% females. There are 276,259 households (44.8% of households in the county) covering a total surface area of 6,556 km^2 (87.3% of total land area in county) and the population density is 170 persons per km^2.
Informal settlements	The major informal settlements are in Nakuru Town East (Bondeni, Manyani, and Lakeview), Nakuru Town West (Ronda, Kaptembwo, and Gituima), Gilgil (Kampi Somali, Maina, and Makaburi), Naivasha (Lakeview, Kihoto), Molo (Casino, Kasarani), and Njoro (Industrial area, Juakali, Jewathu, Bondeni).
4. Economy	
GDP	The county's Gross Domestic Product (GDP) for 2019 was estimated at KES 613 billion (at current prices), accounting for 6.9% of Kenya's GDP.
Unemployment levels	According to the Kenya Integrated Household Budget Survey (KIHBS) report 2015-16, approximately 22.9% of the labour force remains unemployed. Of these, 46% of the unemployed are female and 54% are male.
Main economic activities/industries:	The major economic activities within Nakuru County are: agribusiness, financial services, and tourism. Nakuru County's economy is built around agriculture, which accounts for approximately 60% of total economic activity (County Government of Nakuru, 2018).
Tourist attractions:	The National Parks are the major tourist attractions in the county. These are: Lake Nakuru National Park, Hells Gate National Park and Mt. Longonot National Park. Other tourist sites include: Menengai Crater, Subukia Shrine, Lord Egerton Castle, Lake Naivasha, Lake Elementaita, Hyrax Hill prehistoric site, Ol-doinyo Eburru volcano and Mau Forest (County Government of Nakuru, 2018).

1.7 Evidence of Climate Change: A global Outlook

The Earth's climate has changed over time, a phenomenon attributable primarily to anthropogenic causes. Globally, there is numerous evidence denoting the changes in climate, and a majority of these are associated with global warming (US Global Change Research Program, 2009). Amongst the evidence of global climate change, the increase in global temperatures has been experienced for quite a long period. It is estimated that the average temperature of the planet Earth has risen with approximately 1.1^0C since the late 19^{th} century (Riebeek, 2010). This change is mainly attributed to the emissions of greenhouse gases in the atmosphere, including carbon dioxide, nitrous oxide, and methane, which blanket the ozone layer.

The globe has also seen the emergence, resurgence, and redistribution of infectious diseases due to the increasing temperatures. Infectious diseases particularly those transmitted by insects have become highly sensitive to the warming and unstable climate (Tian *et al.*, 2015a). Malaria, dengue, cholera, Hantavirus, salmonellosis, and giardiasis are some of the new and resurgent infectious diseases whose increased outbreaks have become more evident globally due to high temperatures and flooding (Chretien *et al.*, 2014; Yu *et al.*, 2015; Tian *et al.*, 2015b). Also, climate change has occasioned extended growing seasons, altered flowering phenology, breeding and migration of birds (Cotton, 2003). Biological invasions have also been on the increase due to global climate change (Hulme, 2017).

Climate change has increased ocean and sea temperatures. The increased global warming has led the oceans to absorb as much heat from the surface to 700-meter depths, with about 2300 feet of oceans being increasingly warmer by 0.302^0F since the year 1967 (Levitus *et al.*, 2009).

Akin to oceanic warming is the sea level rise orchestrated by global warming. Church and White (2006) noted that the global sea levels rose by approximately 8 inches in the last century, with the last two decades recording the highest rate of increase; nearly double that of the previous century. Increases in sea levels are often very dangerous to populations inhabiting such areas vulnerable to sea level rises as they stand a chance of submergence.

(a) Flooding *(b) livestock deaths due to drought*

Contrasting impacts of climate change

Sources(a) http://inafrica24.com/modernity/el-nino-weather-pattern-africa-2016/

(b) https://350africa.org/8-ways-climate-change-is-already-affecting-africa/

Global climate change has also seen glaciers retreating all over the world. Some of the regions most affected by glacial retreat include the Himalayas, Alps, Andes, Rockies, Alaska among other mountains (Global Climate Change, 2018). In Africa, snow cap has been progressively shrinking in Mount Kilimanjaro, a phenomenon directly attributable to climate change. In addition, Kwok and Rothrock (2009) and Polyak *et al.* (2009) recorded that the extent, as well as thickness of the Arctic Sea ice has been rapidly declining over the past decades, and this is directly associated with the changes in global climate. Akin to this, the ice sheets both in Greenland and Antarctic have also been actively decreasing in mass, with the data from NASA projecting an estimated 150-250- cubic kilometres loss of ice per year in Greenland between the year 2002 and 2006. Besides the above, global climate change has also resulted in extreme weather events, involving extremes of temperatures, rainfall, humidity, among others. These weather extremes have not only led to flooding of several regions but have also occasioned losses of lives and properties; enhanced drought and desertification; negatively affected agricultural productivity, and escalated food insecurity and famine. Kunkel *et al.* (2012 and 2013) noted that increasing numbers of intense rainfall have been experienced in the United States in the past decades.

1.8 Evidence of Climate Change in Kenya

In Kenya, climate change has been manifested in several ways, both direct and indirect. One of the most striking current evidence of climate change is the unpredictability and irregularity of rains. This has not only hampered the agricultural sector but has also affected the hydroelectric power generation (Sood *et al*., 2017). Due to the low rainfall amounts received in Kenya, several reservoirs with capacities to drive hydroelectric power have been negatively affected (Mukheibir, 2017). There have been remarkable drops in volumes of such reservoirs and dams (Carr, 2017), thus raising the costs of per unit production of electricity, with the

ultimate increases in prices heaped on the Kenyan consumers. At the moment, the costs of electricity are very high, a factor directly attributable to the adverse effects of climate change on rainfall regimes.

Besides the challenges in hydroelectric power generation in Kenya, the irregularity and unpredictability of rains, the downpours are sometimes very intense causing extensive flooding, damage to infrastructures, loss of lives and properties. These, alongside posing major health and safety risks, also work in synergy to devastatingly derail the Kenyan economy. In the recent past, the Kenyan economy as reflected by gross domestic product (GDP) has variably fluctuated, with significantly higher proportions of the causes being partially or directly attributed to the effects of climate change.

Apart from irregular rainfall patterns, extreme weather conditions in Kenya are also attributable to the changes in climate. Historic weather records claim that since the year 1960 (Figure 6) to date, there has been slow but consistent increases in both minimum and maximum temperatures, at night and daytime respectively.

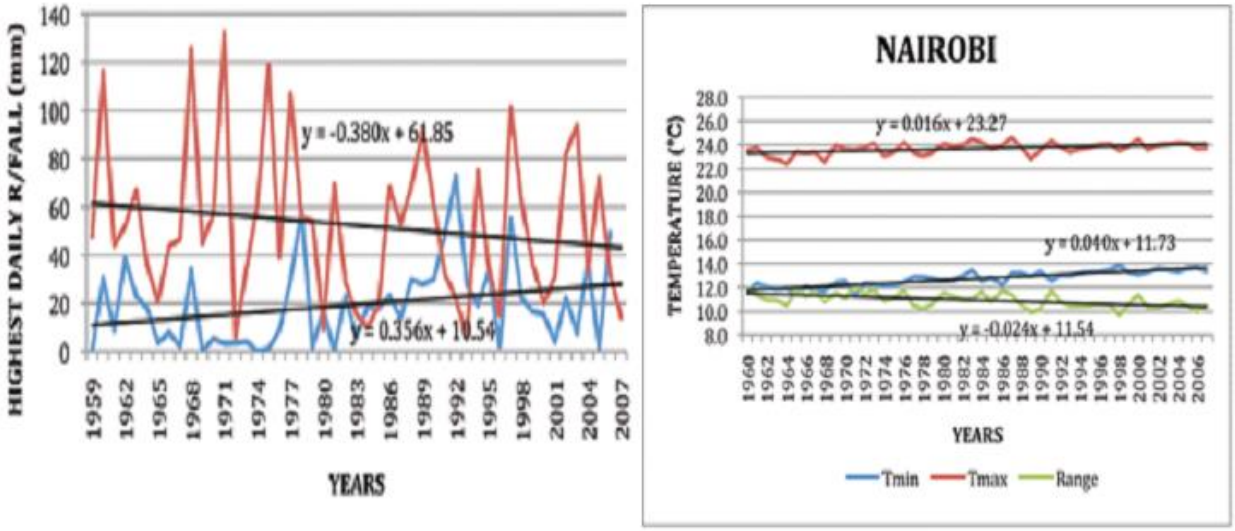

Figure 1.8-1. Trends in Kenya's weather patterns from 1960. Source: GoK (2010).

In Kenya, it is projected that the minimum temperatures have increased by 0.7-2^{0}C since early 1960's, signifying 65% increase (GoK, 2010). Similarly, maximum (daytime) temperatures have been projected to have risen by 0.2-1.3^{0}C, demonstrating 85% increase. These fluctuations in temperatures have contributed to the drops in sea levels, lakes, dams, streams, rivers among other water bodies due to their direct impacts in enhancing surface moisture evaporation. Kenyan coastline, despite being sensitive to sea level rise, is key habitat to a myriad of species, coral reefs, as well as mangroves; and it is estimated that increases in sea levels due to climate change may pose serious risks to these life forms, alongside causing human population displacements in Mombasa. In other parts of Kenya like Western regions, torrential rains due to climate change have led to the loss of human lives, displacements of individuals, flooding as well as damage to properties (Okumu, 2017). All these contribute towards increasing the costs of living. Climate change also affects the environmental conditions, with associated incidents that deter tourism activities, involving infectious diseases, wildfires, increased wildlife mortality, as well as water-borne diseases (GoK, 2013).

The extremes of weather conditions have also led to pronounced aridity and desertification in several parts of Kenya, with constricted forage availability, water scarcity among other shared natural resources. This has seen escalated losses amongst the Kenyan pastoralists, with far-reaching effects and conflicts evidenced amongst the shared resources with the wildlife (Waila *et al*., 2018). Relevant to animals and wildlife, Kenyan pastoral ranges have been steadily shrinking, and ecological wildlife ranges increasingly invaded and constricted by the adverse and prolonged droughts, contributing to, among others, national economic frustrations. Kenya's rangelands support millions of pastoralists and agro-pastoralists, and reduction in such rangelands due to effects of climate change pose major threats to these pastoralists (Ouma *et al*., 2018). The extreme cases of droughts experienced in Kenya have seen many major rivers drop significantly in volumes while seasonal ones completely drying up, thus escalating agricultural losses. For instance, in the year 2009, an estimated 10 million citizens were left hunger-stricken following the devastating crop failures occasioned by the prolonged drought.

1.9 Evidence of Climate Change in Nakuru County

In Lake Nakuru, the number of flamingos has been fluctuating due to changes in water levels, a phenomenon directly and strongly attributable to effects climate change manifest through global warming (Kiprutto *et al.*, 2012; Kameri-Mbote, 2016). The continued migration of flamingos from Lake Nakuru has derailed tourism and eco-tourism activities in this pristine Ramsar Site (Thampy, 2002); threatening the local livelihoods, and eroding the County's and the country's economic well-being.

The dwindling and unpredictable rainfall in Nakuru County, as occasioned by climate change, has also seen major challenges in agricultural productivity in the region. Agricultural yields have consistently dropped due to, among others, high production costs as a result of unpredictable rainfall, extreme weather conditions, and the associated alien crop pests and diseases.

Climate change has occasioned the spread of new pests and diseases in several parts of Kenya, and specifically, in Nakuru, the emergence of agricultural pests and pathogens like armyworms and *Tuta absoluta* has escalated economic costs of their management (Martins *et al*., 2017). The increased prevalence of such pests as armyworms has posed major threats to both vegetable and cereal productions in the region, raising the costs of agricultural production in the region, with more adverse effects being heaped on the County's economy. For example, in 2016, the county lost approximately 30% of crops to pest invasions. It is estimated that in 2017 maize production in 70,000 acres was curtailed by armyworm invasion (Damary, 2018).

Nakuru County has hosted many people who have been displaced by the extremes of weather. This has led to increased population pressure in the county, with increased land degradation, deforestation, as well as the escalated abstraction of water upstream. These have compounding effects in derailing the county's economic potential.

Climate change has been associated with increased unpredictability and irregularity of rainfall, some very torrential. The increase in heavy rains and flooding can exceed the carrying capacity of stormwater drainage and sewerage systems in the region (Mbote, 2016) resulting in their collapse; storm overflows as well as seepage from such facilities into the water bodies (GoK, 2010; Koros *et al*., 2016). This, besides the high potentials in occasioning eutrophication, also

results to dirty and unsafe water for human consumption following the possibility of introducing pathogens that can potentially cause disease outbreaks (Mbaka & Mwaniki, 2015). Extreme rainfall received during certain periods can also damage the major infrastructure facilities involving roads, dams, bridges, and culverts, thereby perplexing transport and local trading activities (Okumu, 2017; Plate 3). This hinders economic growth. For instance, the region is a horticultural hub and drought or damage to such infrastructure due to heavy rains could impair the normalcy in horticultural industry operations, resulting in significant adverse effects in the industry.

Nakuru County also boasts of the intensive livestock production potentials. However, the livestock sector is occasionally impacted negatively by irregular and unpredictable rainfall in the region arising from climate change. Shorter lengths of rainy seasons, as well as increasing frequencies of droughts, have seen adverse negative impacts on the crop (Ogeto *et al*., 2013) and dairy productivity. A socio-economic survey on the severity of climate change on livestock production pointed to an estimated 78.3% interviewees being severely affected, with approximately 73.6% of the respondents highlighting adverse and significant drops in sheep productivity due to climate change (koros *et al*., 2016). Although poultry farming was perceived a temporary strategy to effectively cope with climate change in the region (Ngeno *et al*., 2014), this can also be hampered by the increased incidences of disease outbreaks (Mbaka & Mwaniki, 2015), and high operational costs for medication and maintenance, as occasioned by other synergistic but climate-related factors in the region.

A recent climate change vulnerability assessment of Naivasha basin showed that there has been an increase in the temperatures from 1960 to 2010. However, this increase has not been uniform. For example, the minimum daily temperature increased by 3.5 C while the maximum temperature increase was only 0.6 C during the same period. Climate change has led to continued increases in the average number of dry days in the region from 25 to 80 days in a period between the years 1970 to the years of 1990's. In the region, climate change has also led to 14-15 days increase in the number of dry days during the March-May log rains period (Koros *et al.,* 2016). There is an increased number of cloudless nights (dry days) during the periods of low temperatures. This suggests an increase in risks of heavy frosts in the upper catchment areas in the region. Also, the increasing frequency of warm nights in the region suggests a significant decrease in the risks of frost in the region's lower catchments (Koros *et al.,* 2016).

Impacts of fluctuating lake water levels on infrastructure at Lake Nakuru National Park.

Source : http://kecobat.blogspot.co.ke/2014/11/

NAKURU COUNTY CLIMATE CHANGE ACTION PLAN FORMULATION PROCESS

1.10 Introduction

This action plan was formulated in a highly participatory and consultative process which drew upon views and perspectives of as many stakeholders as possible. The purpose of participatory approach was to have a meaningful involvement of all the stakeholders, who either participated or will be impacted on by the implementation of the action plan recommendations. The process followed is summarized in Figure 2.2-1.

1.11 Desktop Studies

This included the review of existing international, national and county level legal and policy instruments in relation to the development of county-level climate change Action plan. The documents reviewed included relevant International and regional climate change policy frameworks, national policy documents (Vision 2030, The Constitution, National climate change Response Strategy, National Climate Change Action Plan 2013-2017, National Climate change Action Plan (2018-2022), Climate change act 2016, Climate adaptation Plan 2017), Nakuru County Integrated Development Plan (CIDP) 2013-2017, Nakuru Integrated Development Plan (CIDP) 2018-2022, Draft Nakuru Integrated Development Plan (CIDP) 2023-2027, SEACAP 2022-2027, CEP 2022-2027, Climate Vulnerability and Ecosystem Assessment for Nakuru County, Naivasha Sub-County Climate Change Vulnerability Report 2022, and Nakuru County annual development Plans and budgetary process among others.

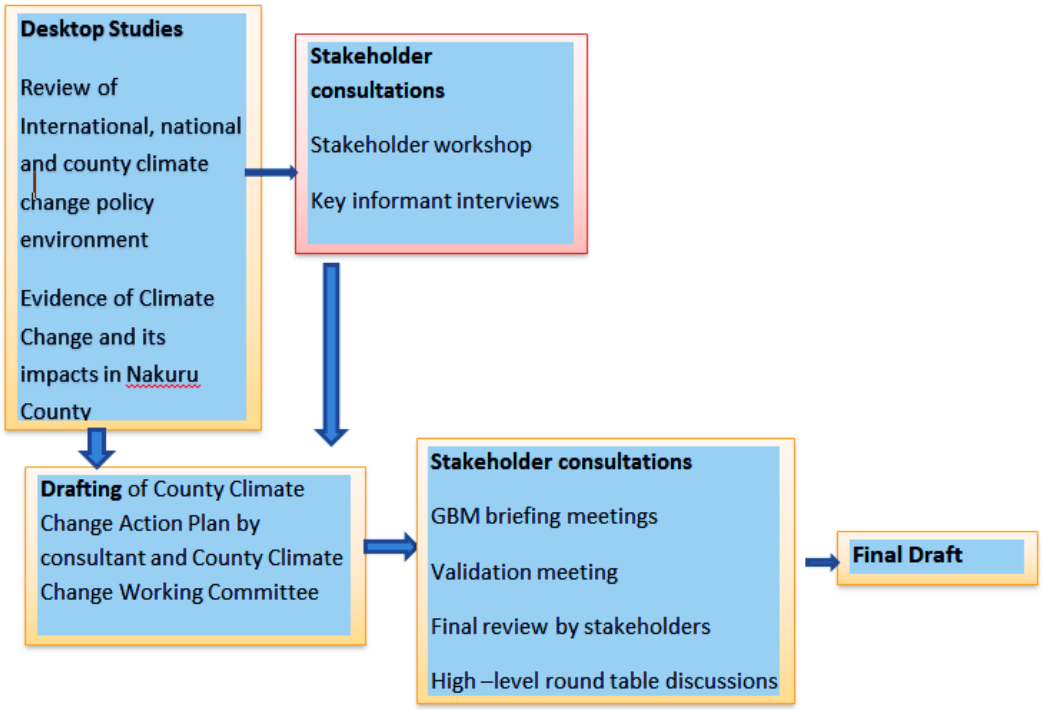

Figure 1.11-1. Schematic diagram summarizing Nakuru County Climate Adaptation Plan formulation process.

1.12 Multi-Stakeholder Consultations

On 1st and 2nd February 2018, a multi-stakeholder workshop was conducted at Nakuru involving diverse stakeholders (Appendix 1). The workshop aimed at building the capacity of the participants on climate change matters with a focus on the

- The definition of climate change and the context within which it is discussed.
- Evidence of and impacts of climate change in Nakuru County
- The need for adaptation and mitigation against climate change

The workshop also aimed at obtaining sector-based information from the stakeholders on

- Evidence of climate change in Nakuru County
- Local Impacts and climate change in different sectors of Nakuru County Economy
- Climate change actions (both adaptation and mitigation) being carried out in Nakuru County and the stakeholders involved.
- The stakeholders working on climate change adaptation and mitigations actions.
- Other potential climate adaptation and mitigation actions and other stakeholders with the potential to engage.

Stakeholders extensively deliberated on the information obtained per sector and agreed on the actions that can be implemented to combat the problem of climate change in Nakuru County. They also prioritized the actions based their perception of the severity of the climate change impact on the sector. This information helped the formulation of a vision, mission, and strategic objectives for Nakuru County Climate Change Adaptation Plan.

Participants during Nakuru County Climate change Action Plan meeting at Stem Hotel, Nakuru (1 – 2 February 2018)

In addition to multi-stakeholders' workshop, a series of Key Informant Interviews that targeted National Government officers with a mandate on environment and climate change matters, county government officers with responsibilities in sectors that are vulnerable to climate

change and officers working for conservation and climate change fields. Private sector players working in the field of climate change were interviewed. The findings of these consultations further enriched the information on Nakuru County climate change evidence and its impacts in various sectors. The consultations also helped sharpen the action plan's strategic objectives and related activities leading to the production of an agreed County Climate Change Action Plan outlines climate adaptation and mitigation actions, the roles, and responsibilities of different institutions and a proposed county climate change management coordination structure among others. The plan was subjected to validation by stakeholders on 19th June 2018. The above multi-stakeholders' consultations were followed by high-level roundtable discussions that brought together the County policymakers (the governor, the County Executive members, the Chief Officers, and relevant directors) to deliberate on the proposed action plan.

PLANNING FOR CLIMATE CHANGE: INTERNATIONAL, NATIONAL AND COUNTY POLICY AND LEGAL FRAMEWORKS

1.13 Introduction

Kenya has made massive strides towards developing relevant policies and plans to guide the country's fight against climate change, both at the national and the county level. 3.1-1 and 3.1-2 provide an overview of the climate change mitigation and adaptation policy and regulatory framework at the national and county level, respectively. The development of the NCCAP is anchored in Kenya and Nakuru County's existing climate action initiatives and ambitions. The findings contained in this PCRA builds on these policy documents, particularly on the 2020 updated Nationally Determined Contribution (NDC); the National Climate Change Action Plan, 2018-2022, the National Adaptation Plan, 2015 – 2030; the Nakuru Country Climate Change Action Plan, 2018-2022; and the Nakuru County Clean Energy Policy (2016) and Action Plan (2016).

The country has put in motion efforts to ensure that there are mechanisms to mainstream climate change in the development agenda. To achieve this Kenya has been working with the rest of the global community to address the impacts of climate change and to reduce Green House Gas (GHG) emissions that are to blame for much of the global warming problem. Within the country, the Kenyan government has been working with stakeholders to plan her response to dealing with climate change and has also been actively developing various national policies and strategies to combat it. However, following devolution as per the country's constitution, the lead player in some of the sectors impacted on by climate change is the county government. In this chapter, the relevant international, regional, national, county, and local level and climate change policy environment is examined with emphasis on mainstreaming of climate change at the county level.

1.13.1 National and County-Level Policy Framework Related to the CAP

Table 1.13-1 National-level policy and regulatory framework

Policy documents	Climate change Mitigation and Adaptation provisions
Nationally Determined Contribution (NDC), 2020	The updated NDC sets out an ambitious contribution for Kenya to climate change mitigation. In this document, Kenya commits to *abate GHG emissions by 32% by 2030 relative to the BAU scenario of 143 $MtCO_2e$. Kenya intends to bear 21% of the mitigation cost from domestic sources, while 79% of this is subject to international support in the form of finance, technology development and transfer, and capacity building.* The updated NDC also sets out contributions of mainstreaming climate change mitigation and adaptation into Medium Term Plans and implementing mitigation and adaptation actions. In the NDC, Kenya commits to:

Policy documents	Climate change Mitigation and Adaptation provisions
	• Increase renewables in the electricity generation mix of the national grid; • Enhance energy and resource efficiency across the different sectors; • Make progress towards achieving tree cover of at least 10% of the land area of Kenya; • Make efforts towards achieving land degradation neutrality; • Scale up Nature Based Solutions (NBS) for mitigation; • Enhance REDD+ activities; • Implement clean, efficient and sustainable energy technologies to reduce over-reliance on fossil and non-sustainable biomass fuels; • Implement low-carbon and efficient transportation systems; • Promote climate smart agriculture (CSA), in line with the Kenya CSA Strategy with an emphasis on efficient livestock management systems; • Implement sustainable waste management systems; and • Harness the mitigation benefits of the sustainable blue economy, including coastal carbon Payment for Ecosystem Services. The commitments related to climate change adaptation include: • Enhancing the adaptive capacity and climate resilience across all the sectors of the economy and the two levels of government – national and county governments; • Exploring innovative livelihood strategies for enhancing climate resilience of local communities through financing of locally led climate change actions; • Enhancing the risk-based approach to climate change adaptation through the development and application of comprehensive climate risk management tools that would help in addressing and adaptively managing climate risks; • Addressing residual climate change impacts, loss and damage especially in the productive sectors of the economy; • Enhancing generation, packaging and widespread uptake and use of climate information on decision-making and planning across sectors and counties with robust early warning systems (EWS); • Enhancing the uptake of adaptation technology especially by women, youth and other vulnerable groups, incorporating scientific and indigenous knowledge;

Policy documents	Climate change Mitigation and Adaptation provisions
	• Enabling institutional strengthening of the community-driven development (CDD), the Climate Change Units and related institutions across sectors and counties as well as non-state actor institutions; and • Strengthening tools for adaptation monitoring, evaluation, and learning (MEL) at the national and county levels, including non-state actors
National Adaptation Plan 2015–2030	• The 2016 NAP is designed to operationalise the NCCAP 2013–2017 and support adaptation strategies in the country. The NAP is the basis for the adaptation component of Kenya's first NDC.
Second National Climate Change Action Plan (NCCAP) 2018-2022	• The plan guides Kenya on the priority climate change adaptation and mitigation actions that help define Kenya's low-carbon, climate-resilient development pathway and lead to the achievement of Kenya's NDC targets. • Counties will align their Strategic Plans and County Integrated Development Plans (CIDPs) to the Vision 2030 national development blueprint, the MTP III, and the NCCAP 2018-2022 through a consultative process.
Constitution of Kenya, 2010	• Kenya's Constitution provides the basis for action on climate change by guaranteeing citizens a clean and healthy environment, which is a fundamental right under the Bill of Rights. • Provides for the devolved system of governance (counties) which ensures participation of communities and equitable national resource distribution to address socio-economic disparities.
Vision 2030, 2008	• Under the social strategy, Kenya aims to be a nation that has a clean, secure, and sustainable environment by 2030 by harmonising environment-related laws for better environmental planning and governance. • Kenya will also enhance disaster preparedness in all disaster-prone areas and improve the capacity for adaptation to climate change.
Vision 2030 Third Medium Term Plan (MTP III) 2018-2022	Thematic area: Climate Change and Disaster Risk Management (DRM). • To mitigate drought, the government will strengthen the Integrated Early Warning Systems and National Drought Emergency Fund. • The government will promote a low-carbon, climate-resilient and green growth development. • This will be achieved through strengthening climate change governance and coordination, climate change monitoring, reporting and verification, capacity building

Policy documents	Climate change Mitigation and Adaptation provisions
	and public awareness, and formulation and implementation of the Green Economy Strategy and the National Climate Change Action Plan.
Climate Change Act, 2016	• The Act provides a framework for mainstreaming climate change across sectors. • It facilitates the formulation of a five-year National Climate Change Action Plan (NCCAP) that addresses all sectors of the economy and provides mechanisms for mainstreaming climate change into all sectors and the County Integrated Development Plans (CIDPs).
Environmental Management and Co-ordination (Amendment), 2015	• Article 56 A on guidelines on climate change: The Cabinet Secretary shall, in consultation with relevant lead agencies, issue guidelines and prescribe measures on climate change.
National Climate Change Response Strategy, 2010	• The mission is to strengthen and focus nationwide actions towards climate change adaptation and GHG emission mitigation.
Kenya Climate-Smart Agriculture Strategy (CSA) 2017 - 2026	• The strategy is to adapt to climate change, and build resilience of agricultural systems while minimising emissions for enhanced food and nutritional security and improved livelihoods. • The strategy was subjected to wider stakeholder consultations that brought together all the 47 counties. • Nakuru County does not have a county CSA strategy. However, the CSA strategy has provision for the county agriculture sector Ministries, Departments, and Agencies (MDAs) to spearhead the implementation of the identified strategies in the counties.
Draft Climate Change Policy, 2018	• This policy was developed to facilitate a coordinated, coherent, and effective response to the local, national and global challenges and opportunities that climate change presents.
Sector Plan for Drought Risk Management and Ending Drought Emergencies 2013-2017	• The plan sets 2030 drought risk mitigation targets defined in Kenya's NDC.
National Disaster Risk Management Policy, 2018	• The policy lays down strategies for ensuring that the government commits itself to the enhancement of research in disasters and the formulation of risk reduction strategies.
Green Economy Strategy and Implementation Plan (GESIP), 2016-2030	• This strategy is expected to strengthen the resilience of economic, social, and environmental systems to the adverse effects of external shock.

Policy documents	Climate change Mitigation and Adaptation provisions

	• GESIP is linked with the NCCAP 2013-2017, and the National Climate Change Act 2016.
	• Strategies under the thematic area on sustainable infrastructure are to:
	  ○ Enhance sustainable mobility;
	  ○ Increase the share of renewable energy in the energy mix; and
	  ○ Enhance disaster risk reduction measures.
	• Other relevant thematic areas include sustainable natural resource management and promoting resource efficiency

National Spatial Plan 2015-2045	• The National Spatial Plan supports the mainstreaming of climate change into the national and county planning processes.
The Value Added Tax (Amendment) Act, 2014	• The Act offers an exemption from value-added tax (VAT) and import duties for supplies imported or bought for the construction of a power-generating plant or for geothermal exploration. Kenya is expanding geothermal projects to generate clean energy and cut GHG emissions.
Public Finance Management (Climate Change Fund) Regulations, 2018	• The regulations provide financing mechanisms to priority climate change actions and interventions, and empowers counties to develop climate finance policy frameworks.
The Public Finance Management (National Drought Emergency Fund) Regulations, 2018	• The regulations are meant to guide the operations of the National Drought Emergency Fund which is to be established to improve the effectiveness and efficiency of drought risk management systems in the country as well as to provide a common basket of emergency funds for drought risk management.
National Policy on Climate Finance (draft), 2016	• The policy recognises that climate finance is an important enabling aspect of efforts to address climate change. It prepares the country to tap into external and internal climate finances to support mitigation and adaptation activities. It highlights that significant financial resources from the public and private sectors are expected to be channelled towards climate activities.
The Kenya National Green Climate Fund (GCF) Strategy, 2017	• The strategy strengthens national capacity to effectively and efficiently plan for, access, manage, deploy and monitor climate financing, through the GCF. • It recognises that the country must boost the mobilisation of adequate and predictable financial resources from domestic and international sources. Notably, county governments are critical co-financiers and can take the role of executing entities and/or implementing entities of

Policy documents	Climate change Mitigation and Adaptation provisions
	low-carbon and climate-resilient initiatives (The National Treasury, 2017).
Climate Change Indicator Development Guidebook, 2018	The guidebook identifies climate change indicators at national and county level.
National Food and Nutrition Security Policy (FNSP), 2011	• The policy acknowledges that the current food crisis is fueled by new driving forces such as climate change; and adaptation interventions that enhance farming communities' resilience to climate change induced effects are critical for the realization of the principal objectives of FNSP. • It promotes the integration of climate change adaptation in development programmes and policies. • It improves forecasting of climate change and supports communities to respond to new opportunities and challenges. • However, it doesn't detail how to engage the counties to realize the FNSP.
Kenya Youth Agribusiness Strategy 2017–2021	• The strategy positions youth at the forefront of agricultural growth and transformation. • It has identified strategic issues which include Strategic Issue 10: Negative impacts of climate change and weak environmental governance (Ministry of Agriculture Livestock & Fisheries and the Council of Governors, 2017). • The MoEF in consultation with the county governments and development partners have developed the strategy with a view to increasing meaning and sustainable youth participation in the agricultural sector.
National Urban Development Policy	The policy seeks to create a framework for sustainable urban development in the country and addresses environment and climate change and other themes relevant to urban development. It recommends the following actions to address climate change: • Promote better quality housing that is adaptive to climate change; • Institutionalise the development of green urban landscapes with networks of open spaces and parks; • Enhance climate change resilience through infrastructure design and flood protection; • Promote technological innovation for climate change adaptation and mitigation; and • Expand access to information about climate change through research, education, periodic vulnerability

Policy documents	Climate change Mitigation and Adaptation provisions
	assessments, and impact monitoring at national, county and urban levels.
Integrated National Transport Policy, 2010	• This policy provides for transport solutions relevant to climate change mitigation.
National Sustainable Waste Management Policy, 2020	• The policy sets out the goal *"to protect public health and the environment, as well as drive job and wealth creation, by creating an enabling environment for sustainable, integrated waste management and the minimisation of waste generation, to contribute to a circular economy."* In addition to this goal, the policy contains objectives, principles and priorities for minimizing waste and supporting the circular economy in Kenya.

Table 1.13-2 County-level policy and regulatory framework

Policy documents	Mitigation and adaptation provisions

Draft Nakuru County Climate Change Action Plan 2018-2022	Provides the following vision: *Nakuru County has a low-carbon, climate-resilient economy that sustains the livelihoods of its citizens while contributing to the national development agenda*
	• Anticipated to be achieved through eight strategic objectives, namely:
	  ○ Food security;
	  ○ Water security;
	  ○ Ecosystem conservation for sustainable economic development.
	  ○ Green energy production and use;
	  ○ Climate change resilient infrastructure.
	  ○ Knowledge management and capacity building of community, stakeholders, and county officials;
	  ○ Sustainable financing for climate change action; and
	  ○ Governance and coordination of climate change adaptation and mitigation.

Second County Integrated Development Plan (CIDP) 2018-2022	• Provides a strategic focus and programme implementation frameworks and support to tackle climate change, provide policy advice and tools.
Nakuru County Climate Change Fund Bill (at time of writing it was at the 2nd Reading at the County Assembly), 2020	• The Bill provides for mobilisation of local climate finance and leveraging of international climate finance for county-led climate actions.

Policy documents	Mitigation and adaptation provisions
Nakuru County Climate Change Bill, 2020	• The Nakuru Climate Change Act is aimed at putting in place a framework and mechanisms for mobilisation and facilitation of county government, communities and stakeholders to respond effectively to climate change. The response mechanisms will be through appropriate adaptation and mitigation measures and action.
The Nakuru County Charcoal Bill, 2014	• Mitigation: To support energy-efficient technologies and gradual exit from the use of charcoal and control of tree harvesting for charcoal production. • Establishment of County Environmental Committee
Nakuru County Waste Management Bill, 2019	• Mitigation: To facilitate appropriate waste management and utilisation to generate clean energy
The Nakuru County Agricultural Training and Mechanization Service Bill, 2019	• Establishment of the Agricultural Development Fund • Mitigation: Aim to reduce inappropriate land preparation technologies like burning.
The Nakuru County Urban Agriculture Promotion and Regulation Bill, 2015	• Mitigation: To include urban agriculture in the county as a way of maximising space, introducing green spaces, and using organic waste.
Nakuru County Clean Energy Policy	• The policy provides an overarching framework for the county's plans, programmes and initiatives relating to sustainable clean energy supply and use by 2022. The overall objective of the policy is to ensure an affordable, competitive, sustainable and reliable supply of energy to meet county development needs at least cost, while protecting and conserving the environment. The policy seeks to enhance access to electricity for households and small businesses and access to clean cooking solutions for households and institutions.
Nakuru Public Health and Sanitation Act, 2017	• This Act is the legal framework relating to health matters in Nakuru County, including dealing with infectious diseases, housing and sanitation, and the management of solid and liquid wastes. It is important in the management of climate change challenges due to the link between emerging diseases and climate change.

1.13.2 Key Players in the Climate Change Sector of Kenya

At the national level, the key institution for climate change mitigation and adaptation planning and implementation is the National Climate Change Secretariat (NCCS), which coordinates with the National Climate Change Action Plan Task Force and other national stakeholders as detailed in **Error! Reference source not found.**9.

Table 1.13-3.National-level stakeholders

Institution	Role
Ministry of Environment and Natural Resources	National Focal Point for the UNFCCC
Ministry of Devolution and Planning	Ensure the integration of climate change in the MTPs
National Environmental Management Authority (NEMA)	National Implementing Entity (NIE) for the Adaptation Fund and the GCF
National Treasury	National Designated Authority for the GCF
Ministry of Transport, Infrastructure, Housing and Urban Development	Member of the National Climate Change Action Plan Task Force
Ministry of Agriculture and Irrigation	Member of the National Climate Change Action Plan Task Force
Ministry of Water and Sanitation	Member of the National Climate Change Action Plan Task Force
Ministry of Energy	Member of the National Climate Change Action Plan Task Force
National Drought Management Authority (NDMA)	• Exercise overall coordination over all matters relating to drought management in Kenya; • Oversees adaptation and resilience-building in the arid and semi-arid lands (ASALs); • The secretariat of the Common Programme Framework in Ending Drought Emergencies in Kenya.

In Nakuru County, County-based mitigation and adaptation stakeholders are mainly departments within the Nakuru County Government in charge of County Integrated Development Plans (CIDPs), climate change, and the management of specific sectors. These include the Department of Water, Environment, Energy and Natural Resources; the Department of Agriculture, Livestock, and Fisheries; and the Department of Roads, Public Works and

Transport. The County Executive Committee including Subcounty Administration and Chiefs, and County Assembly are also relevant to climate change action planning.

Community-based initiatives include several CBOs such as the Sustainable Community Development Services (SCODE) working with local communities (e.g. distribution of solar home systems and clean cooking equipment, access to water, forestry programmes, etc). Relevant associations for specific sectors include the Nakuru County Water Resource User Associations (WRUAs) and Community Forest Associations (CFAs) and several conservation organisations, including WWF, the Green Belt Movement, and Kenya Wildlife Services. There are also private sector players such as the M-KOPA and Water & Sanitation Services Co. Ltd. (NAWASCO) as well as the state-owned power generation agency, KenGen.

The following section outlines the Nakuru County climate change mitigation and adaptation targets developed through the CAP development process.

1.14 Relevant International and Regional Climate Change Policy Frameworks

At the international Scene, Kenya demonstrated its commitment to tackling climate change by ratifying the United Nations Framework Convention on Climate Change (UNFCCC), the main international agreement on climate action, in 1994. Kenya ratified the Kyoto Protocol (http://unfccc.int/kyoto_protocol/items/6034.php) that compels countries to act on climate change in 2005. The convention recognized that there was a problem at a time when there was no scientific evidence for the problem (http://unfccc.int/essential_background/convention/items/6036.php). It also sets out to stabilize greenhouse gas concentrations "at a level that would prevent dangerous anthropogenic (human- induced) interference with the climate system." The convention requires developed countries to cut down their emissions and to support developing countries to tackle climate change challenges. In addition, the convention kicked off formal consideration of adaptation to climate change. Kenya annually participates in the Conference of the Parties to the UNFCCC and Conference of the Parties to the Kyoto Protocol, articulating the national interest and position during international negotiations. County governments work with the national government to explore ways of benefiting from the mechanisms of Kyoto Protocol (**http://unfccc.int/kyoto_protocol/mechanisms/joint_implementation/items/1674.php**) namely clean development mechanism to finance their climate response agenda**.** At the regional level, Kenya participated in the development of East African Community (EAC) Climate Change Policy, Master Plan, and Strategy. In 2015 all the 191 UN member states adopted and committed to deliver on 17 Sustainable Development Goals (SDGs goals with 169 targets by the year 2030. The Goals build on the successes of the Millennium Development Goals, while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. Goal 13 focuses on taking "urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy". The realization of all the other goals will largely depend on effective tackling the impacts climate change. Kenya has also signed onto the Paris Agreement and through this has assumed specific responsibility to mitigate and adapt to climate change as its contribution to global climate change efforts.

1.15 National Climate Change Policy Environment

1.15.1 The Kenyan Constitution

Vision 2030 – the long-term development blueprint for the country – aims to transform Kenya into "a newly industrializing, middle-income country, providing a high quality of life to all its citizens in a clean and secure environment." Emphasis was placed on infrastructure; Science, Technology, and Innovation; Public Sector Reforms; Tourism; Agriculture; Trade; Manufacturing; ICT (Information Communication & Technology) without the recognizing that climate change can derail the realization of the goals. Vision 2030 projects of interest in Nakuru County include SGR (with major investments particularly in Naivasha) and geothermal power production.

1.15.2 Vision 2030

Although the Kenyan constitution does not specifically deal with climate change, it does so indirectly by Articles 42 and 70. Under article 42, the constitution gives every person the right to "a clean and healthy environment" while Article 70 empowers any person whose right to a right to a clean and healthy environment is violated to seek legal redress. As such any person who contributes to making the environment unhealthy can be sued for it. Article 360 (1b) of the Kenyan constitution requires that the state should work towards a 10% forest cover. County governments can use these constitutional provisions in the formulation of county-specific policies and strategies.

1.15.3 Big Four Agenda (2018)

The Kenyan Big 4 Agenda (2018) establishes Kenya Government's priorities areas for the period 2018 to 2022. These include ensuring **food security**, **affordable housing**, **increased manufacturing,** and **affordable healthcare**. Sector plans and budgets are expected to be aligned to help deliver on the for-priority areas. However, most of Kenya's (and Nakuru County in particular) productive sectors are vulnerable to the impacts of climate change implying that the realization of the planned activities in each of these priority areas will depend how well climate change impacts are addressed. This action plan focuses on addressing climate change impacts in Nakuru County. The plan's implementation will provide a conducive environment for the county to realize the Big 4 Agenda in Nakuru County.

1.15.4 County Government Act, 2012

This Act of Parliament requires that counties produce a ten-year spatial plan to guide development. Some of the actions recommended in this plan can be implemented in the formulation of the Nakuru County Spatial plan. These activities include the mapping of wetlands and riparian habitat boundaries. Such actions will contribute to the county's climate change adaptation and mitigation strategies.

1.15.5 The National Climate Change Planning Journey

1.15.5.1 National Climate change Response Strategy 2010

The National Climate Change Response Strategy (NCCRS) 2010 was developed to help Kenya deal with the negative impacts of climate change and to maximize the positive impacts of climate change. The strategy was developed through a consultative process and its vision is a "prosperous, and climate resilient Kenya." Its mission is to strengthen nationwide focused actions towards adapting to and mitigating the changing climate. The strategy aimed to develop

sectoral and cross-sectoral priorities for climate change adaptation and mitigation in the terms of short, medium and long-term actions.

The strategy recognized that agriculture, tourism, infrastructure, health, natural resources especially biodiversity are the sectors that are most vulnerable to climate change. However, for agriculture emphasis, particularly budgetary, is on irrigated agriculture, which can be mal adaptation especially when downstream communities and ecosystems are not factored into the overall project planning. This can lead to increased vulnerability to such downstream communities. The strategy did not address the challenges faced by the livestock sector in a changing climate because of not being very explicit particularly in the action plan and the budgeting section. All large-scale irrigation projects are supposed to be subjected to detailed SEAs/EIAs so that environmental impacts are identified, and mitigation measures are put in place. Care should be taken that irrigation projects do not deny water to downstream human communities, biodiversity and indeed ecosystems. Ecosystem-based adaptation measures like Natural Resource Management planning particularly in pastoral communalities should have been encouraged to deal with issues of overgrazing and consequent habitat degradation as has been witnessed in many pastoral communities in the country. The forestry and wildlife sector seem to be well taken care of. However, planning for tourism sector seems to lay a lot of emphasis on the infrastructure and does not address biodiversity conservation.

Strategy recognized that the Kenyan environmental policies in place by 2010 had not mainstreamed climate change. It also took note of the prevailing international climate change policy instruments available by 2010 and Kenya's participation in the global climate change agenda. The strategy pointed out the international, national, and local mechanisms to finance recommended actions. However, much of the funds identified were not definite. The strategy was formulated in an inclusive and participatory process that mainstreamed gender and vulnerable groups and identified research needs and vulnerable sectors. However, the process took place before the current constitution was promulgated. That means that the elaborate institutional and governance structure recommended by the strategy may not be acceptable or applicable at the county level.

1.15.5.2 Climate change Action Plan 2013-2017

National Climate Change Action Plan was formulated in 2012 and launched in 2013, just before county governments became effective. The National Climate Change Action Plan (NCCAP) was the product of a participatory process involving the public sector, the private sector, academia and civil society, under the leadership of the Ministry of Environment and Mineral Resources during the year 2012. It sets a 'low carbon' climate resilient development pathway in order to steer the National Climate Change Response Strategy (GoK, 2010), and meet Kenya's international obligations. The action plan recognizes county governments and rightly identifies that climate change mandate is a mandate of both national and county governments and even allocates the county governments their respective responsibilities. Although the county government formation was a constitutional reality by 2012 when the action plan was formulated, it was not clear by then how these governments will turn out to be. They were also not party to the formulation process.

The action plan recommended the formulation of a national climate change policy and enactment of the necessary legal instruments to implement the provisions of the act. It was

recommended that a national climate change council headed by the Office of The President be established. This served to highlight the importance of taking climate change matters seriously in Kenya to realize her development Agenda. Borrowing from this, implementing county climate change action plans need to be accorded the highest level of political goodwill.

1.15.5.3 The National Climate Change Framework Policy (2018)

The National Climate Change Framework Policy provides a clear and concise articulation of overall response priorities to climate variability and change. It focuses on the interlinkages between sustainable development and climate change. Its objectives revolve around enhancing adaptive capacity and resilience to climate change and promote low carbon development for the sustainable development of Kenya. The policy framework's guiding principles that are; to guide the implementation of this policy include common but differentiated responsibilities and respective capabilities, the right to a clean and healthy environment as enshrined in the Constitution, the right to sustainable development, partnership among stakeholders including women and youth, cooperation between the two levels of government, equity and social inclusion, prioritization of special needs groups, avoidance of maladaptation, integrity and transparency and cost-effectiveness in delivery .

The policy recognizes that the economy, being dependent on natural resource base, is vulnerable to climate change variability and change. Climate change is, therefore, a threat to the realization of Vision 2030. This recognition gives an opportunity to both the national government and county governments to ensure that while implementing the Vision 2030 agenda they are mainstreaming climate change adaptation and mitigation measures. Counties need to base their responses to climate change on their unique vulnerabilities and also take advantage of any unique opportunities that might arise from climate change.

As policy statements are not legally binding, it will be necessary for the national and county governments to enforce the policy provisions using Climate change Act 2016. It is also possible for county governments to domesticate the framework through the development of county climate change action plans that can be implemented through the county's legislative arm, developing the necessary legal frameworks.

The framework recognizes that devolution is central to inclusive governance and indeed mentions county or county governments forty times. The framework also highlights the need to mainstream climate change at both the national and county government.

1.15.5.4 Climate change Act 2016

The Climate Change Act 2016), provides the regulatory framework for enhanced response to climate change through mechanisms and measures to achieve low carbon climate resilient development. The Act acknowledges the interlinkages between sustainable development and climate change and is aligned with the constitution and Sustainable Development Goals. Objects and purpose of the Act include enhancement of climate change resilience and low carbon development for the sustainable development of Kenya as the key focus.

The fact that the Act applies in all sectors of the economy and is to be applied by both national and county governments creates a good ground for integration of climate change actions into decision making, and implementation of functions by sector ministries, state corporations and county governments.

Specifically, the purpose of the Act is to:

a. Mainstream climate change responses into development planning, decision making and implementation
b. Build resilience and enhance adaptive capacity to the impacts of climate change;
c. Formulate programmes and plans to enhance the resilience and adaptive capacity of human and ecological systems to the impacts of climate change;
d. Mainstream and reinforce climate change disaster risk reduction in strategies and actions of public and private entities;
e. Mainstream intergenerational and gender equity in all aspects of climate change responses;
f. Provide incentives and obligations for private sector contributions to achieving low carbon climate resilient development;
g. 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;
h. Facilitate capacity development for public participation in climate change responses through awareness creation, consultation, representation and access to information;
i. Mobilize and transparently manage public and other financial resources for climate change response;
j. Provide mechanisms for, and facilitate climate change research and development, training and capacity building;
k. Mainstream the principle of sustainable development into the planning for and decision making on climate change response; and
l. 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".

1.15.5.5 Climate Adaptation Plan 2017

The National Adaptation Plan (NAP 2015-2030) sets out Kenya's national circumstances, focusing on current and future climate trends, and describes the country's vulnerability to climate change. Priority actions are identified in 20 planning sectors for the short, medium and long term. This builds on the premise that all the coutry's socioeconomic sectors are vulnerable to climate change impacts, although the manifestation of these impacts may vary from one sector to the other. NAP has mainstreamed devolution in the Adaptation plan, and identified relevant areas where of linkages with the counties and ministry of devolution in the national government. Further the NAP emphasizes that County Governments should integrate and mainstream climate change actions, interventions and duties into County Integrated Development Plans (CIDPs); and designate a County Executive Committee member to coordinate climate change affairs; submit a report on the implementation progress of climate change actions to the County Assembly for review and debate, with a copy to the Climate Change Directorate for information.

1.15.5.6 Nationally determined contribution

The NAP is the basis for the adaptation component of Kenya's Nationally Determined Contribution (NDC) that was submitted to the United Nations Framework Convention on Climate Change (UNFCCC).

1.15.5.7 National Climate Finance Policy (2018)

The *National Climate Finance Policy* (2018) establishes the legal, institutional and reporting frameworks to access and manage climate finance in Kenya. The goal of the policy is to further Kenya's national development goals through enhanced mobilisation of climate finance that contributes to low carbon climate resilient development goals.

1.15.5.8 National Climate Action plan 2018-2022

The second NCCAP (2018-2022) aims to further Kenya's development goals by providing mechanisms and measures to achieve low carbon climate resilient development in a manner that prioritises adaptation.

It seeks to:

- Align climate change actions with the Government's development agenda, including the Big Four;
- Provide a framework for mainstreaming climate change into sector functions at the national and county level;
- Encourage participation of private sector and non-state actors in climate change actions; and
- Serve as the implementation plan for Kenya's National Adaptation Plan 2015-2030 (NAP) and Nationally Determined Contribution (NDC) for the five-year period 2018-2022.

Consultations during the National Climate Change Action Plan 2018-2022 formulation process placed Nakuru in the Mount Kenya and Aberdares Counties Trade and Investment Block which includes Embu, Kiambu, Kirinyaga, Laikipia, Meru, Murang'a, Nakuru, Nyandarua, Nyeri, Tharaka-Nithi counties. According to consultations, counties in this block need to institute climate change adaptation and mitigation actions to address various issues as listed in Table 1. These priority actions informed the formulation of the Nakuru climate Change Action Plan 2018-2022.

Table 1.15-1.Adaptation and mitigation strategies recommended for Mount Kenya and Aberdares Counties Trade and Investment Block

Issue	Priority Actions
Industrialization	▪ Water recycling ▪ Subsidies for drip irrigation ▪ Zoning of industrial areas (undertaken by County Governments)
Infrastructure	▪ Green building technologies and regulations ▪ Climate proofing of infrastructure – such as concrete poles for powerlines ▪ Water harvesting / Capture of road run-off – e.g., Isiolo-Moyale road ▪ Regulations for water harvesting - roof tops ▪ Invest in riverbank conservation and on-farm soil and water conservation to prevent silt runoff from poor farming methods that impact effectiveness of dams ▪ Discourage open canals for irrigation ▪ Enforce existing regulations – such as Environmental Impact Assessment

Issue	Priority Actions
Information and Communications Technology (ICT)	▪ Early warning systems, information centres for farmers, introduction of digital data programs, packaging of Climate Information Services (CIS) for farmers ▪ Explore tax and fiscal incentives for use ICT to reduce greenhouse gas (GHG) emissions ▪ Invest in electronic waste management through partnerships
Gender	▪ Promote gender-friendly water conservation measures ▪ Promote gender-friendly agroforestry – fruit and fodder trees ▪ Provide livelihood options/diversification for women and men, both on- and off-farm and options that extend across seasons ▪ Address land ownership issues ▪ Invest in high-value crops ▪ Consider how to involve both genders in climate change action ▪ Empower women through information; improve women's access to training; improve women's input to decision making ▪ Consider gender-based budgeting
Agribusiness	▪ Use of climate data and information from Kenya Meteorological Department (KMD) – increase coverage of meteorological stations and awareness creation/training ▪ Conservation of water catchment areas ▪ Technology innovations such as climate-smart agriculture, hydroponics, dairy goats, pest and disease resistant crops ▪ Promote urban agriculture
Tourism	▪ Promote REDD+ and purchase of credit credits ▪ Develop clear boundaries between human habitats and wildlife ▪ Broaden tour packages and products ▪ Promote ecotourism
Health	▪ Promote family planning methods ▪ Promote forestry and afforestation ▪ Disaster management and preparation ▪ Research the link between health and climate change
Forestry	▪ Counties have surpassed or working toward 10% tree cover ▪ Ensure trees are growing in secure places that can be protected/ enclosed to ensure accountability such as schools and public areas ▪ Tree planning – support for seedlings, consider partnerships, e.g., Finlays. ▪ School greening programmes; twin program officers with schools so that children work alongside environmental officers to plant trees, form environmental clubs in primary schools, provide County awards for best survival percentage of tree seedlings, provide water so that schools can maintain trees, hold an environment day. ▪ On-farm forestry by issuing farmers with seedlings; recruit farmers to plant trees, work with Association of Small-scale Farmers (¼ hectare); provide incentives to farmers for tree planting, monitor and track progress; work in partnerships, such as tea factories

Issue	Priority Actions
	▪ Provision of seedlings from Kenya Forest Service (KFS) and Kenya Forestry Research Institute (KEFRI) ▪ Promote youth-based planting of certified seedlings. ▪ Ensure contractors for tree planting maintain trees for at least 6 months and report on survival rate. ▪ Provide water tanks. ▪ Partner with CBOs to promote tree planting. ▪ Rehabilitate rivers and conservation of riparian areas

Source: National Climate change Action Plan 2018-2022

1.16 Other Relevant National Policy and Legal Instruments

a) **Environmental Management and Coordination Act** (No. 8 of 1999 and Amendment 2015). The Act is the Principle instrument of Government for the management of the environment. It provides for the relevant institutional framework for the coordination of environment management including the establishment of the National Environment Management Authority (NEMA), which is the Designated National Authority (DNA) for Clean Development Mechanism (CDM) and the National Implementing Entity (NIE) for the Adaptation Fund

b) **Water Act (No. 43 of 2016)** – establishes National Water Harvesting and Storage Authority. Part V of the Act establishes a Water Sector Trust Fund and empowers it to work with relevant institutions develop incentive programmes for water resources management including disaster management, climate change adaptation and mitigation.

c) **Forest Act 2016** gives effect to Article 69 of the Constitution with regard to forest resources; to provide for the development and sustainable management, including conservation and rational utilization of all forest resources for the socio-economic development of the country and for connected purposes.

d) **Urban Areas and Cities Act 2016** provides for the, classification, governance and management of urban areas and cities; for the criteria of establishing urban areas, also provides for the principle of governance and participation of residents and for connected purposes.

e) **Health Act (No. 21 of 2017**) – This act contains a section on environmental health and climate change (Part VII, sections 68 and 69) that is relevant to climate change.

f) **Energy Bill (2017)** – Part 3, section 43; Part 4, section 74 (i), and Part 9 address climate change-related issues

g) **National Urban Development Policy (NUDP)** seeks to create a framework for sustainable urban development in the country and addresses environment and climate change and other themes relevant to urban development. The policy proposes that county headquarters and other deserving urban centers within counties be upgraded to municipal status. It is important that such developments be informed by a well thought out plan to deal with climate change impacts. To achieve this, the policy recommends that the National and County governments, and urban

- Promote better quality housing that is adaptive to climate change; ·

- Institutionalize the development of green urban landscapes with networks of open spaces and parks; ·
- Enhance climate change resilience through infrastructure design and flood protection;
- Promote technological innovation for climate change adaptation and mitigation; and,
- Expand access to information about climate change through research, education, periodic vulnerability assessments, and impact monitoring at national, county and urban levels.
- **The Integrated National Transport Policy (2010)** policy provides for transport solutions that have relevant to climate change mitigation.

- **The National Disaster Management Policy, 2012** institutionalizes disaster management and mainstreams disaster risk reduction in the country's development initiatives. The policy aims to increase and sustain resilience of vulnerable communities to hazards. **A Draft Kenya's Disaster Risk Financing Strategy (2018-2022)** has also been developed.

- **Green Economy Strategy and Implementation Plan (GESIP) 2016 – 2030.:** The Green Economy Strategy and Implementation Plan (GESIP) 2016-2030 provides the overall policy framework to facilitate a transition to a green economy and outlines the need to mainstream and align green economy initiatives across the economic, social and environmental spheres. It aims to enhance low-carbon, resource efficient, equitable and inclusive socio-economic transformation. Its five thematic areas include promoting sustainable infrastructure; building resilience; sustainable natural resource management; promoting resource efficiency and social inclusion and sustainable livelihoods.

- **The Agriculture Sector Development Strategy 2010-2020** is the overall national policy document for the agricultural sector. The strategy promotes sustainable food production and agroforestry. There are also broad implications for the forestry sector, which the strategy elaborates.

- **The National Forest Programme (2016–2030)** is the first cross-sectoral and multi-stakeholder national framework for developing and coordinating forest development aimed at meeting the needs of Kenyans from 2016 to 2030. The framework aims at sustainable forest management and has the overall goal: "To develop and sustainably manage, conserve, restore and utilise forests and allied resources for socio-economic growth and climate resilience."

- **Climate Risk Management Framework (2017**). The framework was developed in a participatory manner with technical experts and stakeholders working on disaster risk reduction and climate change adaptation. It recognizes that Kenya faces various forms of disasters, but focuses on hydro meteorological disasters given their magnitude, socio-economic and environmental impact, and frequency of occurrence.

1.17 Recommendations to County Governments

Based on the review of national climate change and related policies above, there is the need for Nakuru County Government, and indeed other county governments to prioritize climate change actions. This can be achieved if the county government:

1. Takes leadership on climate change matters in their respective counties.
2. demonstrates political goodwill by strategically positioning climate change agenda both in the county executive and legislative arms.
3. Uses the development of **county climate change action plans** to domesticate the national climate change policies, plans and strategies including the **Big 4 Agenda** to the respective counties.
4. Ensures that the process of development of county climate change action plans is as inclusive as possible.
5. Mainstream ecosystem conservation into the county policy and planning processes.
6. Mainstream climate change in all government departments, economic sectors, programmes and policies including County Integrated Development Plans (CIDPS).
7. Works with the national government, the private sector, and other relevant stakeholders to develop sustainable mechanisms to finance climate change adaptation and mitigation strategies.
8. Enacts enabling legal instruments to facilitate the implementation of national and county climate change policies and plans.
9. Invests in capacity building, innovation and, technology transfer, and networks with research institutions to ensure adequate local capacity on climate change matters.
10. Ensure the needs of the vulnerable groups including indigenous communities, women, children, the elderly, youth, the disabled among other are taken into account in the county climate change agenda.

1.18 3The County Policy Environment

1.18.1 Nakuru County Integrated Development Plan (2013-2017)

Nakuru County Integrated Development Plan (2013-2017) was formulated in a Participatory Process that involved all sectors of both the national and county governments. - There was also local community consultation through sub-county consultation forums. The County Assembly also played a leading role through the County Assembly Committee on trade and planning. Adequate stakeholder consultation and participation provided an opportunity to articulate and mainstream some Climate Change elements in the CIDP. According to the document, it is evident that climate change in the county is a reality that manifests in a rise in average temperatures, shifts in rainfall pattern and subsequent long-term shift in the normal weather patterns. The document acknowledged the need for mainstreaming environment issues in development planning and identified the following measures/actions for realizing this that include the following:

- Ensuring Environmental Impact Assessment (EIA) requirement in the implementation of all projects and programmes that are likely to have effects on the environment, social settings and climate change as envisaged in EMCA ’99.

- Protection of wetland and forest reserves and ensuring community participation in the management of forest reserves and other ecologically sensitive areas is important.
- Tree planting.
- Enforcing both local environmental laws and adherence to internationally agreed regulations on environmental sustainability.

The major shortcoming of Nakuru CIDP for the period 2013 – 2017 is that climate change was not linked to sector issues including insufficient food production, poor and dilapidated physical infrastructure, environmental and forest degradation, and inadequate water per capita. Due to this, climate change adaptation and mitigation measures were not given prominence in the interventions. Failure to link the poor state of physical infrastructure such as roads to climate change explains why climate proofing of infrastructure as an adaptation measure is not provided for.

1.18.2 Draft Nakuru County Integrated Development Plan (2018-2022)

Nakuru County Integrated Development Plan (2018-2022) was being developed during this plan formulation period. The draft 2018-2022 CIDP takes the lessons from the 2013-2017. It is premised on the priorities of MTP III 2018-2022 of Kenya's Vision 2030 that, among other areas, has a focus on mainstreaming climate change adaptation and mitigation. Just like its predecessor, this draft was developed in a participatory manner. In relation to climate change action plan, this draft has taken bold steps to mainstream climate change in the county's development agenda. First, it recognizes that climate change is a key driver of environmental degradation. It negatively affects many sectors in Nakuru County including agriculture, livestock, forestry and water. The plan recognizes climate change mitigation and adaptation activities that were underway by 2018. The draft CIDP lays a lot of emphasis on building resilience and enhancing adaptive capacity to climate change impacts, mainstreaming climate change at all sectors of the county government and promotion of research in climate change. Unlike the 2013-2017 CIDP, this second CIDP has allocated specific budgetary allocation for climate change actions. For example, the budget for climate change mitigation and adaptation including tree planting is 0.1 billion Kenya Shillings per year. In addition, the CIDP allocates a budget of Ksh 70 million for developing and implementing this action plan.

1.18.3 Draft Nakuru County Spatial Development Plan (2015-2025)

This plan identifies programs and projects on land use and development in the county for the period 2015-2025. It designates urban areas, delineates sensitive areas that require conservation, and at the same time integrates those sectors that have special natural resource and environmental characteristics. It stipulates the direction for the county economy, agriculture, human settlements, transport and infrastructure. The spatial plan was formulated based on challenges and opportunities that face the County. Key problems identified includes; deforestation; soil degradation; flooding and landslides; population pressure; decreasing land productivity; lack of value addition on agricultural products; inadequate marketing facilities; land fragmentation into uneconomical units; unplanned urban areas; urban sprawl into agricultural productive areas; informal settlements; and inadequate infrastructural facilities. Most of these challenges are also relevant in planning for climate change challenges. Opportunities are presented through the county's strategic location and the major international

transit road corridor, its rich in cultural heritage, abundance of human resources, arable agricultural land, and its great potential for green energy production.

1.18.4 Nakuru County Annual Development Plans and Budgetary Process

Each County is required by the constitution, Article 220 (2), to prepare annual development plans to guide development in the county. This constitutional requirement is actualized by the 2012 Public Finance Management Act (PFM) 2012) 126. The 2015/2016 annual plan was Nakuru's first, and it focused on the following Strategic Objectives:

i. Infrastructure development (Roads, Electricity, ICT and Telecommunications, Sewerage Systems, Water Supply, etc.).
ii. Investing in agricultural transformation and food security.
iii. Investing in quality, affordable and accessible (i.e., preventative, curative and rehabilitation health care services).
iv. Promote trade and industrial development including the revival of the collapsed industries.
v. Investing in Education, focusing on the rehabilitation and equipping of youth polytechnics, technical institutions, as well as middle-level colleges and social development of the communities through social programs.
vi. Enhancing governance, transparency, and accountability in the delivery of public service.

Review of the 2015/2016 plan (County Government of Nakuru, 2015) reveals that there was no mention of climate change in the plan. The strategic objectives for the 2016/2017 (County Government of Nakuru, 2016) remained similar to those of 2015/2016. However, there was a remote reference to climate change through the mention of activities to promote crop varieties adaptable to new climate conditions. The county development priorities seem to have changed slightly in the 2017/2018 (County Government of Nakuru, 2017) period with the following focus.

i. Creating an enabling environment for business and private sector participation in county development.
ii. Development of County Physical and Social Infrastructure facilities including feeder roads, water, ICT, to stimulate growth.
iii. Provision of health services through investing in quality and affordable health services.
iv. Promotion of value addition for agricultural produce, food security, and environmental conservation.
v. Promotion of equitable socio-economic development for county stability.
vi. Enhancing governance, transparency, and accountability in the delivery of public goods and services by promoting citizen participation in governance.

The fourth area of focus gives an opportunity to mainstream climate change. Unlike the two previous annual plans, plan mentioned "**climate change"** three times. The plan also summarised activities of previous annual development plans with a bearing on climate change actions. It is, therefore, clear that the level of climate change awareness in the county has been growing gradually. As outlined in Chapter 1, there is strong evidence that climate change is impacting the socio-economic development of the county. It is, therefore, necessary to ensure that the county budgetary process mainstreams climate change actions. This can only be achieved through awareness creation and capacity building on matters of climate change among county planners and other stakeholders.

1.18.5 Nakuru County Clean Energy Policy

Nakuru County Clean Energy Policy provides an overarching framework for the County's plans, programmes and initiatives relating to sustainable clean energy supply and use by 2022. The overall objective of the policy is to ensure affordable, competitive, sustainable and reliable supply of energy to meet county development needs at least cost, while protecting and conserving the environment. The policy has identified improved access to energy as a key element in meeting its goals under this policy. The policy seeks to enhance access to electricity for households and small businesses and access to clean cooking solutions for households and institutions. These issues will be addressed by the activities proposed in this action plan.

1.18.6 The Nakuru County Fire and Rescue Services Act, 2016

This Act of the County Assembly of Nakuru makes provision for fire and rescue services and provided for the legal mechanisms to establish a Fire and Rescue Services Authority. Once operational, this authority will be key in dealing with some of the disasters that are associated with climate change including fires, flooding and collapse of infrastructure.

1.18.7 Nakuru Public Health and Sanitation Act 2017

This act the legal framework relating to health matters in Nakuru County including dealing with infectious diseases housing and sanitation and management of solid and liquid wastes. This act is important in the management of climate change challenges due to the link of emerging diseases and climate change.

CLIMATE CHANGE IN NAKURU COUNTY: SECTOR BASED SITUATION ANALYSIS

1.19 Introduction

As discussed in Chapter 1, there is irrefutable evidence that the climate of Nakuru County has been changing. For example, the mean temperature has increased by (1ºC) and 0(~0.5ºC during the first wet season and second wet seasons, respectively (MoALF, 2016) and is projected to continue rising in the foreseeable future. Rainfall patterns and rainfall amounts have also been changing. In many areas, rainfall patterns have become unpredictable and therefore unreliable. In this chapter, an analysis of the effects and impacts of climate change on various sectors in Nakuru County and the interventions being implemented by various stakeholders are presented.

1.20 Key Findings of the PCRA Pre-Assessment Phase for Nakuru County

The hazards identified across Nakuru County include landslides, drought/dry spells, excess rainfall, changing rainfall patterns, increasing temperature, floods, hailstones, frost/extreme cold, and strong winds. Increasing temperature is a major concern in Gilgil, Naivasha, and Njoro sub-counties. Common across the board was changing rainfall patterns, while drought/ dry spell is mainly experienced in Molo, Naivasha, Nakuru Town, and Njoro. Excess rainfall was a major problem in Nakuru Town, Njoro, and Subukia, while the strong wind was identified as a problem in Njoro, Nakuru Town, Gilgil, Naivasha, and Rongai, respectively. In addition, farmers in the Njoro sub-county experience most of the identified climate change-related hazards

Table 2 Summary of the Ward Action Plan

GILGIL SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Eburru Mbaruk	Drought	– Reforestation/ Afforestation programs, awareness creation and drilling of boreholes – Rainwater harvesting, Establishment of water pans	5000H/H	Mbaruk Oljorai Eburu	Community, KFS, WCCPC CGN
	Flood	– Re-afforestation construction of water pans other infrastructures such as drainage systems	3000H/H		Community County Govt, NGOs, National Govt
	Land degradation	– Planting of tree/fruits seedlings such as guavas, loquats, bananas along the buffer zones – Establish tree/fruits seedlings nurseries to raise 200,000 seedlings each	2no.		County Government, Community, KWS, KFS CFA, Rhino Ark, Conservancies owners
		– Installation of gabions Agricultural extension services – Tree planting and conservation initiatives	5000 H/H		MOALF, CGN, Community KFS
		– Re-afforestation and Afforestation – Training community on Proper land use Sustainable farming practices			Community, MOALF, KFS CGN
	Strong winds	– Initiate Tree planting initiatives – Generation of wind power			Community, KENGEN CGN
Elementaita	Drought	– Drought resistant crops e.g sweet potatoes, 'Katumani' maize	5000 HH	Miti Mingi Ndibai Kiambogo Kiptangwanyi	KALRO, CGN MOALF
		– Promotion of various irrigation methods	50 Acres		KALRO, CGN MOALF
		– Increase water access			KALRO, CGN MOALF
	Flood	– Afforestation and reforestation especially along riparian areas – Construction of gabions public education on importance of riparian areas	50km	Miti Mingi Kiambogo Kiptangwanyi	WRA, Nakuru County Government, Ministry of Environment and Forestry Community Based Associations
	Frost	– Adaptable crops - traditional irish potatoes and Katumani Maize, njahe, sweet potatoes	2000 farmers	Miti Mingi Kiambogo Kiptangwanyi	KALRO County Government of Nakuru
	Land degradation	– Planting of fruit trees in game reserve and Conservation of forest habitats especially for monkeys – Public education on wildlife conservation protection of water points and	2500HH	Elementaita Miti Mingi Kiambogo Kiptangwanyi	KWS, Ministry of Tourism County Government of Nakuru

GILGIL SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
		– provision of water points for the wild animals.			
		– Smart agricultural practices such as paddocking, planting of grass e.g boma grass – Intercropping and crop rotation especially with leguminous crops – Training of farmers	5000HH	Thugunoi Kasambara Miti Mingi Kiambogo Kiptangwanyi	Nakuru County Government KALRO, MOALF
Gilgil	Drought	– Drought resistant crops e.g Cassava, green peas, Katumani maize, sweet potatoes – Agroforestry to include drought resistant fodder trees such as caliandra – Training on Water harvesting techniques such as pan liners, water tanks and smart agriculture e.g.kitchen gardening in every household – Drilling of 2 No. of boreholes Establishment of irrigation schemes at Kikopey and Kariandusi.	5000 H/H	Kariandusi Kikopey	Farmers Associations and cooperatives, MOALF CGN
Gilgil	Flood	– Construction of 3 No of water pans in Kikopey and Ngomongo – Relocation from wetlands	3000 H/H	Kikopey Ngomomgo	CGN, Central Rift Water Works Agency, NEMA
	Land degradation	– Planting of fruit tree seedlings e.g. guavas and Loquat along the conservancy buffer zones – Enhancing patrols – Awareness creation on wild animal behavior	5000 H/H	Kikopey Kariandusi Ngomomgo	KWS, Community CGN
Malewa West	Land degradation	– Reafforestation – Establish tree nurseries in public schools to raise 200,000 assorted tree seedlings	200,000 assorted tree seedlings	Kirima Ngathengera NYS	Community, CFAs, County Government, KFS KEPHIS, NGOs
		– Planting of fruit tree seedlings such as guavas, loquats, along the Eburu forest buffer zone to deter monkey from human settlements – Establish tree nurseries in Public School to raise 200,000 assorted tree seedlings	200,000 assorted tree seedlings	Ngatamaiyu	CFA, KFS, KEFRI, County Government, KWS, NGOs
Murindat	Flood	– Construction and maintenance of drainage systems. – Construction of water pans.	4000 H/H	Langa langa Karunga	CGN, NGOs
	Pollution	– Creation of zones and engagement of private service providers – Regular clean-up exercises	8000 H/H	Mbegi Langlanga Karunga Gitare	Residents/Traders, CGN NEMA
	Strong winds	– Afforestation and reafforestation Creation of awareness on the need to plant trees within their homes to act as wind breakers	2000HH	Miti Mingi Kiambogo Kiptangwanyi	Department of Meteorology KFS, CGN

BAHATI SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Kiamaina	Drought	– Planting of Katumani variety to combat drought; – Construction of dams	200HH	Kagoto area and scode.	CFAs, CGN, CBO's, NGOAs,
Dundori	Drought	– Drought-resistant crops like katumani maize – construction of 2 dams – Construction of 4 water pans – Desilting of the existing dams, – Afforestation, Rainwater harvesting by schools and homeowners	Farmers in Ndunduri 5500 Households	Mwiteithia, Ndundori centre area	CFAs, CGN, CBO's, NGOAs, Community, Central rift valley water development agencies
	Flood	– Construction of gabions and terraces along the flood path Planting trees, Stormwater drainage construction, Establishment and equipping 15 tree nurseries	2000	Githioro	CGN,NGOs,NGAOs, WRUA's, CBO's, Community members
Bahati	Drought	– Purchase of certified 10,000 tree seedlings in the short term – Establishment and equipping of tree nurseries in schools and other enclosed community – Best landuse management Sensitization of community on – promotion of water harvesting and provision of water tanks where applicable	2,000	Bahati Ward (Karunga, Chania)	Farmers Government
	Flood	– Drought resistant crops – construction of 5 dams – Construction of 10 water pans – Construction of proper drainage channels – Desilting of the existing dam at Karunga – Integrated solid waste management	3000HHs	Bahati Ward (Bahati market, Munyaka estate, Mile Kumi area0	Government Farmers, CBOs
	Land degradation	– Creating awareness among the community on proper solid waste management i.e reuse, waste reduction, and recycling, Provision of more waste skips at the market areas, – Conducting clean-us with schools and community to create awareness and sensitization on waste disposal and management Use organic manure – Agroforestry ensure compliance in the extraction of natural resources such quarrying Crop rotation	3000	Bibilioni, Bahati centre, Karunga, Muringa, Maili kumi.	CGN, CBOS Government MCA
Kabatini	Flood	– Planning and construction of drainage infrastructure storm water drainage – Construction of water pans.	5,500 Famers in Kabatini	West acres area in Thayu area and Kiungeuini	C.G.N, NGAO's NGO's, CBO's Community

BAHATI SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Lanet/Umoja	Flood	– Increase capacity of storm water drainage systems	5000	Ndege Ndimu Sublocation	NGO's NGAO'S C.G.N
		– Adopt integrated solid waste management	6000	Meroroni area	
	Land degradation	– Establish 1 tree seedlings of 50,000 seedlings in each of the 5 locations in Lanet/Umoja Ward	2000 HH	Ndegendimu	C.G.N, NGAO'S Community, NDMA KFS, KEFRI, NGAO'S Community
Kiamaina	Flood	– Construction of gabions, – Increase capacity of storm water drains, – relocation of people to a safer place, – construction of dikes, – excavation of trenches	2000	Kiamaina	CGN, NGOs, NGAOs
	Pollution	– Disease resistant livestock, Fast maturing livestock, vaccination	1500	Karunga	Community, Central rift valley water development agencies
Kabatini	Land degradation	– land restoration crop rotation, diversification of crops – afforestation (on farm),	5,500 HHs	Kwa Amos	KFS, CFA, C.G.N NGAO's, NGO's CBO's, Community
Lanet/Umoja		–			
	Land degradation	– Sensitizing the community on effects of land degradation	2000 HH	Ndegendimu	C.G.N, NGAO'S Community, NDMA KFS, KEFRI, NGAO'S Community
	Land degradation	– Build capacity of 2,000 farmers on climate smart livestock farming	2000 HH	Ndegendimu	CGN, NGAO'S Community, NDMA KFS, KEFRI, NGAO'S Community

SUBUKIA SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Subukia	Drought	Increase in ground vegetation, Planting trees	Farmers in Subukia 5500	Tetu, Arash, Munanda, Kahiga, Kirengero, Kwa Mathenge	Farmers NGAO,CBOs, CGN

SUBUKIA SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
	Land degradation	Use organic manure Agroforestry Crop rotation Construction of proper drainage channels	Farmers in Subukia 5500	Subukia centre, Tetu, Kahiga, Arash, Kirengero and Munanda	CGN CBOS Government MCA
Kabazi	Drought	Drilling boreholes Water pans Water harvesting Tree planting in water catchment Drought-resistant crops, protection of water sources and rehabilitation of water harvesting facilities.	1000 Households	Ndungiri, Solai Ol-Bonata, Gitura, Upper kabazi, Ndungiri, lower Solai	National government, CGN,NGOs, Research institutions
	Flood	Construction and rehabilitation of water harvesting facilities, improvement of drainage systems, creation of spongy natural ground, afforestation	1200 Households	Lower Kabazi	National government, CGN,NGOs, Research institutions
	Land degradation	Afforestation, Use of organic manure, Crop rotation Improve storm water drainage Water drainage Creating awareness	200	Upper Kabazi, Solai centre, Ndungiri, Olbanita	CGN CBOS Government MCA
Weseges	Land degradation	Improvement of drainage systems Building gabions, Increase in Vegetation Planting trees Claiming of grabbed resources Capacity building Siltation of dams	5000 Households	Kiboronjo	National government, CGN,NGOs, Research institution

NAIVASHA SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Biashara	Drought	- Establish 10 tree nurseries each covering 1/4 acre land in different locations	10	Biashara Ward	KFS, CGN, Community
	Flood	- Upgrade and increase drainage system	20 km	Kinamba centre Gituamba	County Government, Well Wishers, Donors

NAIVASHA SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
		- Build capacity and increase awareness on waste management from the source			
	Land degradation	- Beckoning of protected Wildlife habitats	12km	NYS, Nyondia and Gituamba	KWS, Community, CG
	Pollution	- Build capacity of 10,000 households on integrated solid waste management	10,000	Biashara Ward	CGN, Community groups i.e. youth, women
	Drought	- Plant drought-adapted trees species (10,000 seedlings)	10,000	Karagita Beach Schools Public Lands	CGN, NG, NGOs
	Flood	- Desilting of drainages - Increase the volume of the stormwater drain systems	20 km	Karagita Karagita Mirera	CGN, NG, NGOs
	Land degradation	- Build capacity on proper solid integrated waste management	5,000 people	Karagita Mwicingiri Nyamathi Mirera Karai	CGN, GOK, NGOs, PWSPs
Hells Gate	Land degradation	- Beckoning of protected Wildlife habitats and riparian land - Build capacity on resolutions on HWC	5,000 people	Mwicingiri mirera Nyamathi Oasis & ASTU Camp area Karai Mirera Nyakio	KWS, GOK CGN, NGOs
	Drought	- Tree growing through adapting a tree method.	2300 HH	Kayole Kihoto	KFS, CGN, KEFRI
	Flood	- Construction, rehabilitation and maintenance of drainage	23,000 HH	Kihoto Unity Lakeview estate Manera	County government, GOs
Lake View	Pollution	- Proper Management of dumpsite and waste	100 HH	Kayole Unity Mountain View Estate	CGN, NGOs

NAIVASHA SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Maiella	Drought	- Drilling, equipping and solarization of 3 boreholes - Construction of 3 water pans - Growing 60,000 indigenous trees per year using adopt a tree method	40,000 HH	Kipkonyo Ngondi Maiella Centre Ndabibi Moi Ndabi Kongoni Ngondi	NGOs, County Government, World Vision, CDF, Flower Farms, GOK, KFS
	Flood	- Construct gabions to regulate flows	20,000 HH	Kipkonyo Ngondi Maiella Centre Ndabibi Moi Ndabi Sero Kongoni	NGOs, County Government, World Vision CDF, Flower Farms
	Land degradation	- Beckoning of protected Wildlife habitats and riparian land - Build capacity on resolutions on HWC	10,000 HH	Kipkonyo Ngondi Maiella Centre Ndabibi Moi Ndabi Sero Kongoni	KWS, GOK, CGN, NGOs
	Pollution	- Sensitization and training on integrated waste management	5000 HH	Kipkonyo Ngondi Maiella Centre Ndabibi Moi Ndabi Sero Kongoni	NGOs, County Government, World Vision CDF, Flower Farms
Maimahiu	Deforestation	- Establishment of 4 tree nurseries in the Ward	10,000 HH	Old Kijabe Forest	NGOs, CGN, Community, CBOs
	Drought	- Provide 200 (5000 ltrs) water tanks to vulnerable communities	200 HH	Gichugu area	NGOs, CGN, Community, CBOs
	Forest Fire	- Training on forest fire fighting creating fire cut lines - Offer source of energy for cooking, enforcement	5000 HH	Old Kijabe Forest	NGOs, CGN, Community, CBOs

NAIVASHA SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
	Land degradation	- Conduct awareness on environmental pollution, prevention and control	10,000 HH	Maai Mahiu Town	NGOs, CGN Ministry of Education, CBOs
	Land degradation	- Sensitizing land owners and quarry owners on proper land use practices and engagements, enforcement and compliance	500HH	Gichugu Gathima Namcha	NGOs, CGN, NG Community, Civil Society
Naivasha East	Drought	- Training farmers on alternative agricultural practices that are more resilient	10,000 HH	Kinungi Ihindu Maraiguchu	C.G.N, Agricultural companies, Agro Vets
	Flood	- Installation of culverts and prioritize construction of drainage systems first before roads and Maintenance of drainages by the youth	200 Water puns	Kinungi Nyakairu Nyaingoya	C.G.N, NGO's, WRA, National government
	Land degradation	- Grow 1,000,000 fruit and indigenous seedlings	1,000 HH	Kinungi Nyakairu Nyaingoya	C.G.N, NGAO's NGO's, community, KFS
Olkaria	Pollution	- Installation of quality sensors, - Sensitization of communities on air pollution	5,000 HH	Olkaria Chiefs Camps	CGN, NGOs, GoK, Development partners
	Deforestation	- reforestation	30,000 tree seedlings learning institutions and public land	Ol karia ward	CGN, NGOs KFS, GoK
	Drought	- Training of farmers on improved agricultural practices and water harvesting techniques	3000 HH	Narasha	CGN, GoK
	Flood	- Increase drainage system capacity	3,000 HH	Kwa Muhia Kamere	CGN, NGOs GoK, Development Partners
Viwandani	Flood	- Improve the volume of stormwater drainage system - Desilt the existing stormwater drainage systems	2,500 HH	Kabati Site and Service Naivasha CBD Industrial area Council Estate	CGN, NG, NGOs CSOs, CBOs, Waste Service Provider
	Land degradation	- Provide modern waste management equipment like skip and skip loaders - Training community members on integrated waste management practices	5,000 HH 5000 people	Markets Naivasha CBD Kabati Site & Service Council Estate Industrial Area Hope Well Naivasha CBD	CGN, NG, NGOs

NAIVASHA SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
	Land degradation	- Increase forest cover by tree planting of 5,000 tree seedlings by adopt a tree method - Construction and installation of 15 gabions in Mukuru valley and Kabati	5,000 HH	kabati site & service Naivasha CBD and along the highway Council estate Mukuru valley	CGN, NG, NGOs
	Strong winds	- Growing wind breaking trees (5000)	500 HH	along the highway Naivasha CBD	CGN, NG, NGOs KENGEN

Nakuru Town West					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
London	Pollution	– Tree nurseries – Planting of trees – Waste recovery – Enforcement and compliance	10,000 assorted tree species	Schools and health facilities within the ward	Community, CBO's, NGO's, CGN, NGAO's
		– Enforcement and compliance on waste management	Manufacturing - industries	Industrial area, Community	CGN, NGAO's NEMA, Community
		– Promote waste Recovery at source	5 No. organised CBO's	mololine estate,Gioto dumpsite	CGN, CBO'S,community waste recyclers, NEMA
		– Enforcement and compliance against pollution of water bodies	1 No. Water body	London Ward	CGN, NGAO's, NAWASSCO, Community
	Drought	– Promote water harvesting technologies targeting roof and surface run-off harvesting	10,000 HHs	Entire Ward	Community, CBO's, NGO's, CGN, NGAO's

	Forest Fire	– Routine maintenance and installation of fire breaks with Mexican Green Ash species	Between forest sub-compartments (100 hectares)	Menengai Forest	KFS, CFA'S, CGN
		– Adoption of clean energy sources	10000HH's	London ward	Practical Action, CGN, Community
		– Promote sustainable forest management	100 Hectares	Menengai Forest	KFS, Menengai CFA'S, CGN
	Land degradation	– Promote climate smart Agriculture – Capacity development on smart agriculture	200 Farmers	Individual farmers; Institutions (Kenya Prisons)	CGN, KALRO
		– Rehabilitation and restoration of degraded lands	Nakuru -sigor road	Nakuru- sigor road	KFS, CFA'S, CGN
Kaptembwo	Flood	– Unclogging of drainages, – Maintenance and covering of drainage systems, – Promote Solid waste recovery at CBO level	Kaptembwo Ward	Muslim Primary to River Ndarugo Stretch	CGN, NGO's, Community, CBO's
Rhoda	Flood	– Construction and maintenance of storm water drainage	Main roads in Mbugua Village	Mbugua and Mbugua village	CGN, Development Partners, Community
		– Conservation and protection of an Encroached wetland in Mbugua and Mbugua Villlage	Encroached wetland in Mbugua and Mbugua Villlage	Mbugua and Mbugua village	CGN, WRUA's, WRA, KFS, Community
Shaabab	Flood	– Unclogging and maintenance of drainages, – Construction of gabions	2km stretch - Pivot Area and Weavers market	Pivot Area and Weavers Mkt	CGN, Community, CBO's, NGO's
Barut	Flood	– Installation of retainer nets – Construction of contour gabions	15km stretch	Along River Ndarugu	CGN, KURA, Community, CBO's, Rotaract

		– Rehabilitation and restoration of riparian land	15km stretch	Along R.Ndarugu	CGN, WRA, WRUA's, CBO's, Community
Barut	Land degradation	– Establish Tree nurseries – Grow indegenous tree species that provide food for wildlife	10,000 trees	Mwariki- B village, institutions	CGN, KWS, Schools, Land Commission, Community, CBO's
		– Rehabilitation and restoration of degraded land/quarries	4 No. Quarries sites	Kwa Ndingi ,Soimet quarries	CGN, Private owners of the quarries, Community members
Kaptembwo	Land degradation	– Rehabilitation and restoration of degraded land/quarries	1 No. Kasisi Quarry	Kipsigis,Tugen Farm	CGN, Private owners of the quarry, Community
Kapkures	Land degradation	– Rehabilitation and restoration of degraded land/quarries	3 No. Sand harvesting sites	Mogoon, Ingobor and Lalwet sand harvesting sites	CGN, Private owners of sites, Community
	Pollution	– Capacity development of communities on livestock management techniques – Increase access on AI	1,000 farmers	Kapkures and Lalwet villages	CGN, KALRO, Community
Shaabab	Pollution	– Regular inspection,enforcement and compliance of garages – Implement Development Control codes	5 No. Industries and 20 No. Garages	Bedi investment, Githima Tanners Industry, Spin Knit industry, Menengai Oil Refinery	CGN, NEMA, NGO'S, Business Owners
		– Establish Tree nurseries – Grow indegenous tree species that provide food for wildlife	10,000 Assorted Trees species	Jualako Round about, Eveready, Open spaces, Social hall l	CGN, KFS, City Board, WCCPCs, CBO's, Community
Rhoda	Pollution	– Promote waste recovery at source – Capacity development on waste management	2 No. waste service providers, CBO's	Gamu, kwanza and Pembe mbili Village	CGN, Waste service providers, Community, CBO's

Shaabab	Pollution	– Promote waste recovery at source – Capacity development on waste management	1 No Waste Compactor truck	Markets,	CGN, Waste Service Providers, Community, CBO's

Nakuru Town East					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Biashara	Pollution	– Tree nurseries – Growing of trees	1,000,000No. assorted tree species	Road medians, roundabouts, highways and open spaces, schools and institutions	CGN, NGO's, CBO's, NEMA, Community
		– Promotion of non motorized transport	5km	Mburu gishua road. Kenyatta lane.	CGN, NGO's, CBO's, NEMA, Community
		– Introduction of zero carbon city transportation	1 No. Electric bus	Mashambani stage	CGN, NGO's, CBO's, NEMA, Community
		– Introduce of car free day	thrice a week	Kenyatta Avenue	CGN, NGO's, CBO's, NEMA, Traders
		– Introduce designated parking areas	2 parking lots	mashambani fire depot	CGN, NGO's, CBO's, NEMA, Traders
		– Promote off site sanitation solutions	5 residential areas	Club Road Section 58	CGN, NGO's, CBO's, NEMA, Traders, Community
	Flood	– Increase capacity, rehabilitation and maintenance of storm water drainage	10,000Km of storm water drains	Entire Biashara ward.	CGN, NGO's, CBO's, Community

Nakuru Town East					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
		– Installation of retainer nets on drainages	700 culverts	entire biashara	CGN, NGO's, CBO's, Community
		– Adoption of sponge installation of porous walkways	2km of Non motorized transport	Mburu Gichua Road Government Road	CGN, NGO's, CBO's, Community
Flamingo	Flood	– Increase capacity of storm water drains and regular maintenance	200km of storm drains	Pangani Estate Racecourse flamingo	CGN, NGO's, CBO's, Community
		– Installation of retainer nets on drainages	50 culverts	Pangani Estate Racecourse flamingo	CGN, NGO's, CBO's, Community
		– Capacity building by creation of awareness/sensitization on water harvesting techniques to reduce water run off	500hh	Pangani Estate Racecourse flamingo	CGN, NGO's, CBO's, Community
	Land degradation	– Containment of animals inside the park , – Creating alternative livelihoods for the people	Baboons	Kimathi ,pangani ,Racecourse	CGN, K.W.S
		– Tree planting /growing in degraded lands	growing of 1million no assorted tree species	entire ward	CGN, CBOs, NGOs, Community, KFS, KEFRI
	Pollution	– Clearing of bushes – storm water drains	all storm water drains and bushes in flamingo ward	entire ward	CGN, CBOs, NGOs, Community,
Kivumbini	Flood	– Planning, designing and construction of storm water drainages – Maintenance, and Rehabilitation of storm water drainages	5,000hh	Manyani Kivumbini 4 estate	CGN, NGO's, CBO's, Community
		– Introduce Water Harvesting techniques to attain potable water	3,000hh	Kivumbini 1-4	CGN, NGO's, CBO's, Community, National water harvesting authority, Community
		– Establish of 10 No. tree nurseries to help in establishing water breakers	10 learning institutions	Kivumbini secondary , Nakuru primary, st theresa primary	CGN, KFS, CBO's, NGO's, Community

Nakuru Town East					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
		– Purchase and installation of 10 No water storage tanks (5000 litres)	10 learning institutions	Public schools in Kivumbini ward	CGN, National water harvesting authority, Community, NGO's, CBO's
		– Purchase and distribution of 20,000 certified tree seeds	10 learning institutions	Public schools in kivumbini ward	CGN, KFS, CBO's, NGO's, Community, KEFRI
Kivumbini	Land degradation	– Building gabions to stablise the eroded areas ad trap silt	5 gabions	Manyani near south cemetery	CGN, Community, NGo's CBOs
	Pollution	– Installation of 1No. Solid waste waste recovery resource center	3,000hh	Makuti estate	CGN, NGO's, CBO's, Community
		– Capacity building -creation of education and awareness	3,000hh	residents of kivumbini ward	CGN, NGO's, CBO's, Community
Menengai East	Flood	develop water sinks eg wettlands and groundwater recharge areas	500km storm water drains	Lower teachers, Kiratina, Dafra, Kasa Media	County Government
		establishment 3No. of tree nurseries to establish water breakers on waterways	3No tree nurseries	Kirima Menengai Secondary School	County Government CBOs Development Patner
		Capacity Building by giving them education and creation of awareness	500hh	kirima teachers mawanga	County Governemnt CBOs Development Patner
Menengai East	Land degradation	– Building gabions to stablize gullies and trap silt	500 gabions	Teachers mawanga	CGN, CBOs, NGOs, Community, KFS, KEFRI, CFA
		– Tree nurseries – Tree planting /growing	growing of 1million no assorted tree species	Entire ward	CGN, CBOs, NGOs, Community, KFS, KEFRI, CFA
		– Installation of 2 No. solid waste waste resource recovery centers	2 No Resource recovery Centres	Mawanga Kiratina	CGN, CBOs, NGOs, Community, KFS, KEFRI, CFA

Nakuru Town East					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Nakuru Town East	Drought	Afforestation	Schools. (500 schools) Faith based organizations (200)	Mwariki. Muguga. Mzee wa nyama.	CGN, CBOs, NGOs, Community, KFS, KEFRI, CFA
	Flood	– Increase capacity of storm water drains.	Entire ward.	Pipeline. Mzee wa nyama. Free area.	CGN, CBOs, NGOs, Community, KFS, KEFRI, CFA
		– Building Gabions.	10 No gabions	Imperial	CGN, CBOs, NGOs, Community, KFS, KEFRI, CFA
		– Capacity building by creation of awareness/sensitization on water harvesting techniques to reduce water runoff	3,000hh	mzee wa nyama mwariki JB	CGN, National water harvesting authority, Community, NGO's, CBO's
	Land degradation	– Tree nurseries – Planting trees	Growing of 1million no assorted tree species	Mzee wa nyama JB .	CGN, CBOs, NGOs, Community, KFS, KEFRI
		– Introduce Water Harvesting techniques to attain potable water	3000hh	mzee wa nyama mwariki JB	CGN, National water harvesting authority, Community, NGO's, CBO's
Nakuru Town East	Strong winds	– Tree growing to act as wind breakers	Growing of 1million no assorted tree species	Mzee wanyama	CGN, CBOs, NGOs, Community, KFS, KEFRI

NJORO SUB-COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Kihingo	Drought	- Planting more trees, Construction of large water pans - Encouraging the community to harvest rainwater through the construction of water pans - Build capacity of farmers on cover crops and fodder grass	2,000 HH	Subuku, Kihingo and Stoombili	C.G.N, NGAO, NGO, CFAs and Community
	Flood	- Planting more trees, Construction of large water pans - Encouraging the community to harvest rainwater	2,000 HH	Subuku, Kihingo and Stoombili	C.G.N, NGAO, NGO, CFAs and Community
	Frost	- Planting deciduous tree and vine varieties that bloom later in the spring. - Planting citrus trees on slopes facing away from the sun	1,500 HH	Kanyati, Bagaria and subuku areas	C.G.N, NGAO, NGO and Community
Lare	Drought	- Provision of drought resistant crops like maize, peas, beans and potatoes - Educate people on the importance of rainwater harvesting - Planting more trees and combating deforestation - Promoting drip irrigation	8,000 HH	Kilo, karagoe and St..Francis sub locations	C.G.N, NGAO, NGO and Community
	Land degradation	- Establish 2 tree nurseries - Create awareness of contour and strip farming	5,000 HH	Pwani and Muthiga sub locations	C.G.N, NGAO, NGO , KWS and Community
	Flood	- Create awareness of integrated solid waste management - Construction of accommodative drainages	8,000HH	Kampyament, milimani, Kianjoya and	C.G.N (water dept and agriculture dept), NGAO, NGO and Community

NJORO SUB-COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
		- Build capacity of communities on water harvesting technologies		mugumo villages	
Mau Narok	Drought	- Protection and conservation of mau water catchment - Urban areas introduction of cover crops and fodder grass - Enforcement of forest protection laws	Farmers in Mau Narok ward	Metta, mwisho wa lami , Mau town, Tipis, Mau Nark	C.G.N, NGAO, NGO and Community
Mau Narok	Flood	Create awareness of proper solid waste management practices in Urban areas	2000 HH	Metta, mwisho wa lami , Mau town	C.G.N, and KURA
Mauche	Pollution	- Rehabilitation of likia and siryat quarry - Education and awareness on waste management practices to avoid dumping waste into the rivers	2000 HH	Likia and Siryat locations Chemosit, Tachasis and Sururu villages	CGN, NGOs, World Bank
	Land degradation	- Establish 2 tree nurseries - Create awareness of contour and strip farming	5,000HH	Tebeswet, Kimugul, Taita and kaptich locations Likia and Logoman Forests Siryat	CGN, NGOs, World Bank
Mauche	Drought	- Build capacity of farmers on drip irrigation - Equip the existing boreholes(pumps, solarization and piping) - Provide drought resistant crops(maize, beans, potatoes and peas)	5,000HH	All households at Mauche ward	CGN, NGOs, World Bank

NJORO SUB-COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
	Flood	- Create awareness of integrated solid waste management - Construction of accommodative drainages - Build capacity of communities on water harvesting technologies -	5,000 HH	Siryat, Ewaat and taita Kusumek, Teret and Kamasai locations Logoman forest	CGN, NGOs, World Bank
Nessuit	Drought	- Build capacity of farmers on drip irrigation - Equip the existing boreholes(pumps, solarization and piping) - Provide drought resistant crops(maize, beans, potatoes and peas)	2000HH	Nessuit	C.G.N, NGAO, NGO and Community
Nessuit	Flood	- Create awareness of integrated solid waste management - Construction of accommodative drainages	2600 HH	All the roads Nessuit ward, tree seedlings in every village	C.G.N, NGAO, NGO and Community
Njoro	Flood	- Create awareness of integrated solid waste management	2000 HH	All the roads Njoro	C.G.N, NGAO, NGO and Community
	Pollution	- Create awareness on safe disposal of waste - Build capacity of farmers on climate-smart agriculture	2000 HH	Njoro ward	C.G.N, NGO, Egerton University
	Drought	- Build capacity of farmers on drip irrigation - Increase urban and peri-urban tree cover	2000 HH	Njoro town, piave and pwani farmers beaston	C.G.N, KFS NGAO, NGO and Community

NJORO SUB-COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Nessuit	Strong winds	- Support communities to grow deciduous tree, vine varieties and citrus trees to act as windbreakers	2000 HH	Kanyati, Bagaria and subuku areas, Njoro town	C.G.N, NGAO, NGO and KFS, CFAs Community
	Flood	- Create awareness of proper solid waste management practices in Urban areas	2600HH	All the roads Nessuit ward, tree seedlings in every village Metta, mwisho wa lami , Mau	C.G.N, NGAO, NGO and Community, KURA
Nessuit	Forest Fire	- Provision of enough seedlings - Awareness creation on forest conservation	2,000 HH	Nessuit forest	C.G.N, NGAO, KFS, CFA NGO and Community
	Drought	- Equip the existing boreholes (pumps, solarization and piping) - Provide drought resistant crops (maize, beans, potatoes and peas)	2000HH	Nessuit	C.G.N, NGAO, NGO and Community

MOLO SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Elburgon	Drought	Tree planting	Establishment of 4 No.tree nurseries with a capacity to propagate 200,000 tree seedlings per year		
Elburgon	Drought	Drought resistant crop varieties	500 farmer households		KALRO CGN NGOs National Government
Elburgon	Drought	Training and capacity development on Water harvesting and conservation techniques	6000HH	Elburgon	WRA CGN NEMA NGOs
Elburgon	Flood	Cleaning of water bodies rivers, to allow free water flow	2 rivers and their tributaries	River Muro River Mau	Farmers Individuals Schools Institutions CBOs CFAs Tree Nursery associations KFS NEMA WRA NGAO CGN
	Forest Fire	Educate community on measures to reduce forest fires	2000 HH	Elburgon	KFS CGN NGOs
	Forest Fire	Establish alterntive livelihoods to prevent charcoal and forest product dependence	2000 HH	Elburgon town	Community CGN National Government Development partners

MOLO SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Elburgon	Land degradation	Gabions building on gullies	100NO eroded areas	along rivers Mau and Muro	Farmers WRA NEMA CGN Development partners
	Land degradation	Planting trees (bamboo species and indiginours vegetative cover along river banks)	40,000 seedlings	along rivers Mau and Muro	Farmers WRA NEMA CGN Development partners
	Land degradation	sustainable farming practices and riparian conservation	5000HH	along rivers Mau and Muro	Farmers WRA NEMA CGN Development partners KALRO INSTITUTIONS such as Egerton university
	Pollution	Capacity development on Waste recycling/recovery	5 No, organized CBOs	Mukinyai Ndimu Kapsita Baraka Salama	Community WRA NEMA CGN Development partners NGAO
Marioshoni	Flood		1000 farmer households in Marioshoni General community	Kichaki Lawina Omoptica Ndoswa Mawe mbili Kapsimendet Kapkein Chaimoto Kaprop	Farmers Government KALRO KFS

MOLO SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
	Land degradation	Fencing of kiptunga forest zonation of forest land	Kiptunga forest	Kiptunga Cha Segut Daraja Kapkerang Burbux Molem Kapkein Kaptimom kapkein	farmers KFS KALRO CGN
Marioshoni	Land degradation	planting of 100000 Building gabions Making terraces sensitisation of 1000 households on Planting cover crops.	100000 tree seedlings PA	Lawina Kamonoswo Kapocholola Ndiswa Daraja Segut Molem Kapkein Taragonik kaptimom	farmers KFS KALRO NEMA CGN National government
	Pollution	Supply of certified seeds to 1000 households Knowledge on pest management for 15 most vulnerable villages.	Agricultural land in Mariashoni 1000 15 most affected villages	Kiptunga CheSegut Daraja Kapkerang Burbux Molem Kapkein Kaptimom kapkein	NATIONAL GOVERNMENT KALRO CGN NGOs

MOLO SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Molo	Deforestation	Reaforestation	1,000,000 tree seedlings at Molo Forest	Molo forest	County Government KFS community Molo CFA
Molo	Deforestation	promote intensive farming technics such zero grazing that are less land demanding, poultry farming,	1000 households	Molo forest Tayari springs	County Government KFS community Molo CFA WRA MOLO WRUA
	Land degradation	Involving KWS in wildlife control and training on information sharing and basic management of human wildlife conflict	100 HH living around Molo forest	Molo Forest Milimani	KFS Government Community CFA NGOs
	Pollution	Promote sustainable landuse such as organic farming, enforcement and compliance	500 HH along riparian	Munju River Nguzu River Mto Polisi Tayari Springs	County Government KFS WRA NEMA MOLO WRUA Community
	Pollution	sensitization on best environmental practices			
Molo	Pollution	construction of gabions and trenches in slopy areas	100 eroded gullies	Munju River Nguzu River Mto Polisi Tayari Springs	County Government KFS WRA NEMA MOLO WRUA Community
	Pollution	set aside area for waste resource recovery	5 Acres	Molo Town	county government NEMA flower farms

MOLO SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
	Pollution	Sensitization on sustainable waste water and solid waste management practices	2000HH	Michatha Michira Kenyatta Milimani Tayari Everbest Munju KCC	Industries community county government NEMA flower farms NGOs
	Pollution	Onsite sanitation solutions	500 households	Molo Town	NARUWASCO CRVWWDA CGN Development partners
TURI	Flood	Implement the riparian rehabilitation to contain overflows	Farmers and residents in Turi	Kiambiriria location Turi location Chandera location	Residents Government NGOs CFAs KFS
	Land degradation	Restoration and rehabilitation of riparian areas. Establishment of 5No.tree nurseries Training on cover crop species Control soil erosion Control quarrying activities Proper waste disposal	Establishment of one tree nursery in each of the farms below. Kiambiriria farms Ngwatanero farms Muchorwe farms Minonga farms Turi farmers	Turi location Kiambiriria location Chandera location	KFS CFA NEMA CGN

MOLO SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
	Pollution	Onsite sanitation solutions	NARUWASCO Central RIft Water Works Development Agengy	Kiambiriria location Turi location Chandera location	Government NARUWASCO
TURI	Pollution	Training on sustainable agricultural practices	1000HH	Kiambiriria location Turi location Chandera location	County government National government NGOs

KURESOI NORTH					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Kamara	Air Pollution	Build capacity of 5000 farmers to adopt organic farming	5000 farmers	Ketigoi Muchorwe, Koige and Kamara areas	C.G.N NGAO'S NGO's FBO, WRUA CFA

	Deforestation	Capacity build and create Awareness on use of briquettes, biogas,energy saving jikos as an alternative source of cooking energy on alternative of fuel	1,500 HH	Haraka, Koige and Milimani areas	C.G.N NGAO'S NGO's FBO, WRUA CFA
Kamara	Deforestation	Reforestation	12,000 trees	Haraka, Koige and Milimani areas	C.G.N NGAO'S NGO's FBO, CFA
	Deforestation	Undertake green energy projects like use of briquettes, biogas,energy saving jikos as an alternative source of cooking energy	1,500 HH	Haraka, Koige and Milimani areas	C.G.N NGAO'S NGO's FBO, CFA
	Drought	Dril, equip and solarize 3 boreholes	3 boreholes	Ketigoi Muchorwe, Koige areas	C.G.N NGAO'S NGO's
	Drought	Rehabilitate 4 water pans	4 water pans	Ketigoi Muchorwe, Koige areas	C.G.N NGAO'S NGO's
	Forest Fire	Enforcement, monitoring and compliance	Forest neighborhoods	Haraka, Pele,Milimani, Kipsinendet areas	C.G.N Community, KFS KWS NEMA

Kamara	Forest Fire	Create awareness on modern honey harvesting method like use of personal protective equipment	2000 bee farmers	Haraka, Pele,Milimani, Kipsinendet areas	C.G.N NGAO'S NGO's CBO' S Community, KFS KWS
	Forest Fire	Build community based alternative livelihood to reduce charcoal burning	5 forest zones	Haraka, Pele,Milimani, Kipsinendet areas	C.G.N NGAO'S NGO's CBO' S Community, KFS KWS
	Land degradation	Create Awareness to stop encroachment of wildlife habitat	2000 HH	Haraka, Pele,Milimani, Kipsinendet areas	C.G.N NGAO'S NGO's CBO' S Community, KFS KWS
	Land degradation	Sensitise and promote the establishment of Forestry and wildlife community based scouts	5 forest zones	Haraka, Pele,Milimani, Kipsinendet areas	C.G.N

Kamara	Land degradation	Build gabions	4 areas	Jogoo, Koige and Ketigoi areas Around Baraka area	C.G.N NGAO'S NGO's CBO' S Community
	Land degradation	Create Awareness and sensitization on climate smart agriculture	2000 farmers	Jogoo, Koige and Ketigoi areas Around Baraka area	C.G.N NGAO'S NGO's CBO' S Community
	Land degradation	Afforestation in riparian areas and eroded areas	8,000 trees	Jogoo, Koige and Ketigoi areas Around Baraka area	C.G.N NGAO'S NGO's FBO, WRUA CFA
Kiptororo	Air Pollution	Build capacity of 4000 farmers to adopt organic farming	4000 farmers	Githima Sitoton and Bochege areas	C.G.N NGAO'S NGO's FBO, WRUA CFA
	Air Pollution	Build capacity of 4000 farmers on safety measures and preventive measures to the threats	4000 farmers	Githima Sitoton and Bochege areas	C.G.N NGAO'S NGO's NEMA KALR1

	Land degradation	Afforestation in riparian areas and eroded areas	10,000 trees	Chorwa, Githima, lemechonik, Tiloa, Ndoinet Kongoi, Roret and Mkulima	C.G.N NGAO'S NGO's FBO, WRUA CFA KFS
	Pollution	Capacity build on alternative water sources such as rain water harvesting to secure potable water	1500 HH	Githima Sitoton and Bochege areas	C.G.N NGAO'S NGO's WRUA
Kiptororo	Pollution	Build capacity of 4000 farmers to adopt organic farming	4000 farmers	Githima Sitoton and Bochege areas	C.G.N NGAO'S NGO's WRUA
Nyota	Air Pollution	Build capacity of 3500 farmers to adopt organic farming	3500 farmers	Langwenda, Seguton, Karirikania,Chesingele, Tulwet	C.G.N NGAO'S NGO's FBO, WRUA CFA
	Deforestation	Build capacity,undertake Awareness and sensitization of use of briquettes, biogas,energy saving jikos as an alternative source of cooking energy on alternative of fuel	2,500HH	Kiptulwo, Mwahe ,karirikania, Mawingu ,Murunduku	C.G.N NGAO'S NGO's FBO, WRUA CFA

Nyota	Deforestation	Reafforestation	20,000 trees	Kiptulwo, Mwahe ,karirikania, Mawingu ,Murunduku	C.G.N NGAO'S NGO's FBO, CFA KFS
	Deforestation	Undertake green energy projects like use of briquettes, biogas,energy saving jikos as an alternative source of cooking energy	2,500HH	Kiptulwo, Mwahe ,karirikania, Mawingu ,Murunduku	C.G.N NGAO'S NGO's FBO, CFA KFS
	Drought	Drill, equip and solarize 5 boreholes	5 boreholes	Chesirikwa, Bondet, Githiriga,Matunda, Umoja	C.G.N NGAO'S NGO's W
	Drought	Rehabilitate 4 water pans	4 water pans	Chesirikwa, Bondet, Githiriga, Matunda,	C.G.N NGAO'S NGO's
Nyota	Land degradation	Building gabions	7 areas	Kiptulwo, Mwahe ,karirikania, Mawingu ,Murunduku, Bondet, Githiriga,	C.G.N NGAO'S NGO's CBO' S Community

	Land degradation	Build capacity of 3500 farmers on climate smart agriculture	3500 farmers	Kiptulwo, Mwahe ,karirikania, Mawingu ,Murunduku, Bondet, Githiriga,	C.G.N NGAO'S NGO's CBO' S Community
	Land degradation	Afforestation in riparian areas and eroded areas	12,000 trees	Kiptulwo, Mwahe ,karirikania, Mawingu ,Murunduku, Bondet, Githiriga,	C.G.N NGAO'S NGO's FBO, WRUA CFA
Sirikwa	Air Pollution	Build capacity of 7000 farmers to adopt organic farming	7000 farmers	Kiptenden,Kangawa , Kagonda	C.G.N NGAO'S NGO's Community
	Air Pollution	Enforcement and compliance	Flower farms in Kiptenden,Kangawa , Kagonda	Kiptenden,Kangawa , Kagonda	C.G.N NEMA
Sirikwa	Deforestation	Capacity building, Awareness and sensitization of use of briquettes, biogas,energy saving jikos as an alternative source of cooking energy on alternative of fuel	10,000 HH	Entire ward	C.G.N NGAO'S NGO's FBO, WRUA CFA
	Deforestation	Reforestation	15,000 trees	Muitiriria and Tombo areas	C.G.N NGAO'S NGO's FBO, CFA

	Deforestation	Undertake green energy projects like use of briquettes, biogas,energy saving jikos as an alternative source of cooking energy	1000 HH	Muitiriria and Tombo areas	C.G.N NGAO'S NGO's FBO, CFA
	Drought	Procure and install drip irrigation for 1500 vulnerable farmers, youth and women groups	1500 vulnerable families	Nyakinyua sub-location	C.G.N NGAO'S NGO's WRUA
Sirikwa	Drought	Pipe and supply water close to livestock watering points and distribution centres	8 watering points	Nyakinyua sub-location	C.G.N NGAO'S NGO's WRUA
	Drought	Dril, equip and solarize 3 boreholes	3 Boreholes	Set Kotes, Ngenia and Muthenji	C.G.N NGAO'S NGO's
	Drought	Create Awareness on alternative water sources like storage tanks and roof water harvesting	10,000 HH	Entire ward	C.G.N NGAO'S NGO's FBO, WRUA CFA National water harvesting authority
	Pollution	Capacity build on alternative water sources such as rain water harvesting to secure potable water	2000 HH	Nyakinyua sub-location	C.G.N NGAO'S NGO's WRUA

Sirikwa	Pollution	Capacity build on best use of herbicides and pestcides and organic farming	7000 farmers	Sirikwa ward	C.G.N NGAO'S NGO's FBO, WRUA CFA

RONGAI SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Menengai West	Air Pollution	-Enforcement and compliance of existing regulations and standards -Sensitization of the community on dangers of geothermal emissions -Increase tree cover by planting more trees around geothermal	200HH	Olrongai	Community NGOs NEMA County government CBOs GDC
	Flood	-Adequate gabions construction -Proper installation of drainage system -Effective enforcement on urban planning	300HH	Kiamunyi Olive inn	Community County government
Mosop	Drought	-Drought resistant crops(millet and sorghum) -Water harvesting storage -Establishment of tree nurseries	1500 HH	Sumeek Boror	Community WCCPC CGN KFS CBOs NGOs

RONGAI SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
	Flood	-Improvement of proper drainage system -Development of sewerage system -Regular maintenance of existing drainage system Introduce cover vegetation like nippier grass in the uplands -Construction of water pans installed with dam liners - Integrated solid waste management	3500HH	Boror Ngata	Community Government NGOs Community Government NGOs
	Pollution	-Compliance to the recommended standards and regulations of EMCA	3000HH	Boror Sumeek Ngata	Community NEMA County Government Flower farms Factories
Soin	Drought	-Reducing deforestation by finding alternative sources of energy(solar, electricity, biogas) -Construction of water pans -Tree growing -Provision of water tanks for water harvesting to vulnerable households -Drilling of boreholes -Pans for water harvesting	500HH 1 water pan per location	Majani mingi Athinai Lomolo Makutano	Community NGOs County government WRUA CBOs

RONGAI SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Visoi	Drought	Plating of trees	3000HH	Kware Muricho Along Molo River	Farmers County government WCCPC County government NGOs NEMA
	Flood	-Building of gabions -Conservation of riparian -Integrated solid waste management			
	Pollution	-Compliance to the set standards and regulations -Integrated solid waste management			
Solai	Deforestation	Establishment of tree nurseries Alternative sources of energy eg biogas, energy saving cooking stoves Provision of adequate funding for increasing tree cover	50HH Settlement of Solai ward	Emarangishu, Nyamamithi, Kiriko	Community County government CBOs
	Land degradation	-Awareness creation on ways to prevent soil erosion -Afforestation in riparian areas and eroded areas		Maji tamu,Solai	Community, NGOs CBOs FBOs, CGN,
	Flood	-Construction of water pans -Gabions construction	4 per Location 1500HH	Arus,Sandai	

RONGAI SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
	Drought	-Reducing deforestation by finding alternative sources of energy (solar, electricity, biogas) -Alternative sources of livelihoods(poultry farming, rabbit rearing)	500HH	Ngetdaptich,Chemasis	Community Government KELCOP NGOs CBOs Ministry of agriculture

KURESOI SOUTH SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
Kiptagich	Pollution	-Capacity build EENR on enforcement on pollution measures	1 officer	Kiptagich	CGN,NGOs,NEMA
	Deforestation	-Grow 10000 indigenous trees.	10,000No. Trees	Emiitik forest	Farmers; CGN; KFS; NGOs;KEFRI;CFA
	Land degradation	Grow10,000 indigenous trees along Cheptuech river	10,000No. Trees	Cheptuech	Farmers; CGN; KFS; NGOs;KEFRI;CFA
	Land degradation	-Build capacity to farmers on agroforestry, and soil conservation	1000No. Farmers	Kiptagich	CGN,CBO,NGOs,KFs
	Land degradation	-Adopt natural regeneration model,Rehabilitate and restore degraded landscapes	Entire Ward	Kiptagich	CGN; National Government; MET,NGOs,Community
Amalo	Drought	-Drilling and equipping of. boreholes	3No	Saptet, Sigowet, Longet	CGN, NDMAWRA,WRUAs
	Drought	-Construct waterpoints and water troughs along River Amalo and Ambusket	2 water troughs and 2 water points	Kitoben and Motito areas	CGN,NGOs CBOcommunity,WRA,WRUAs
	Drought	-Rehabilitate River Amalo and Ambusket banks by growing 10,000 indigenous trees	10,000No trees	Keboet Village; Kaplamai	CBOs; FBOs; KFS; KEFRI;CGN; NGOs
	Frost	-Provide Frost resistant seedlings and Subsidize	1000 farmers	Kaplamai, Amalo, Saptet	Farmers; CGN,NGOs,CBO,

KURESOI SOUTH SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
		organic frost agricultural inputs to 1000 farmers			
Amalo	Frost	-Conduct a research on what can be done to help the communities cope	1 research	Kamplamboi, Kaplamai, Gorofa and Amalo	CGN; National Government; MET
	Drought	-Establishment of tree nurseries with 20,000 tree seedling capacity	2No. tree nurseries	Daraja Mbili; Saosa	CBOs; FBOs; KFS; CGN; NGOs,community
	Landslide	-Grow 10000 indegenous trees in landslide prone areas .	10,000 trees	Gorofa, Kaplamai	Farmers; CGN,community,NGOs,CBO,Institutions
	Landslide	-Construction of 20 gabions to rehabilitate hotspot gullies	20 gabions to rehabilitate hotspot gullies	Gorofa, Kaplamai	CGN,Farmers;,community,NGOs,CBO,Institutions
	Pollution	-Sensitization on better solid waste management practices, /waste recovery at souce	5000 people	Amalo Olenguruone market and trading centre	CGN,CBOs,community.
Keringet	Drought	Drilling and equipping boreholes	3No.	Siwot, Kirandich and Ogiek- Sotiki	CGN,CBOs ,NGOs
	Drought	-Construct waterpoints and water troughs along River Chepkulo and River Danger	20No water troughs and 2 water points	Danger area	CGN,NGOs,CBO,community,WRA WRUA
	Drought	Desilting of Maziwa and Kapkores dams	2No. dams	Maziwa and Kapkores	CGN.NGOs,Community,CBOs
	Drought	-_Rehabilitate River Chepkulo and River Danger banks by growing 10,000 indigenous trees	10,000No. trees	Chebaraa, Kirandich	CBOs; FBOs; KFS; CGN;KEFRI; NGOs,WRUAs,WRA
	Land degradation	-Grow 10000 indegenous trees in Bararget forest	10,000No. Trees	Bararget	CBOs; FBOs; KFS; CGN;KEFRI; NGOs;CFAs
	Land degradation	Build capacity to farmers on agroforestry	1000No. Farmers	Keringet	CGN
	Frost	-Provide Frost resistant seedlings and Subsidize organic frost agricultural inputs farmers	1000No. farmers	Tendulet; Siwot	Farmers; CGN,NGOs,CBos
Tinet	Drought	-Drilling and equipping of boreholes	3No.	Sotiki; Kapkembu; Tegat Negoi- Kapkeet	CGN,CBOs,NGO,NARUWASCO

KURESOI SOUTH SUB COUNTY					
WARD	**HAZARD**	**ACTION**	**TARGET**	**WHERE**	**WHO**
	Drought	-Construct waterpoints and water troughs along River Kamwaura and River Cheram	20No. water troughs and 20 water points(springs)	Cheram, Kamwaura	CGN,NGOs,Community,NARUWASCO
	Drought	-Rehabilitate River Kamwaura and River Cheram banks by growing 10,000 indigenous trees	10,000No. trees	Cheram, Kamwaura	Farmers; CGN; KFS; NGOs;KEFRI;CFA
	Drought	Establishment of tree nurseries with 20,000 tree seedling capacity	20No. tree nurseries	Sotiki; Tegat Negoi-Kapkeet	Farmers; CGN; KFS; NGOs;KEFRI;CFAs
	Drought	-Rehabilitate River Kamwaura and River Cheram banks by growing 10,000 indigenous trees	10,000 trees	Cheram, Kamwaura	Farmers; CGN; KFS; NGOs;KEFRI;CFA
	Drought	-Establishment of tree nurseries with 20,000 tree seedling capacity	20No. tree nurseries	Sotiki; Tegat Negoi-Kapkeet	Farmers; CGN; KFS; NGOs;KEFRI;CFA
	Frost	-Provide Frost resistant seedlings and Subsidize organic frost agricultural inputs to 1000 farmers	1000 farmers	Kapkembu; Taita	Farmers; CGN

1.20.1 Mitigation: Key findings of the Nakuru County Baseline Emissions Inventory

The purpose of the Baseline Emissions Inventory (BEI) was to identify the activities in Nakuru County that are the primary sources of GHG emissions, thereby contributing to climate change on a global scale. If produced consistently, the emissions inventory can be used to track how emissions change over time and to identify and monitor the impact of appropriate mitigation interventions and low-emission targets.

The BEI for Nakuru County was developed in accordance with requirements of the Global Protocol for Community-scale Greenhouse Gas Emission Inventories (GPC), an international standard for cities, using a Proxy Data Tool developed for ICLEI Africa, which was built on the City Inventory Reporting and Information System (CIRIS) tool for GHG inventories for sub-national governments. The GHG inventory for Nakuru County uses a combination of local data, where available, and downscaled national and regional (proxy) data for Kenya and East Africa. The BEI includes GHG emissions from three sectors[1]: stationary energy, transportation, and waste. The **Nakuru County BEI covers a continuous 12-month period from January 2019 to December 2019** and estimates all emissions from the stationary energy, transportation, and waste sectors because of activities within the County's geographical boundary.

1.20.2 Overview of GHG emissions in Nakuru County

Total GHG emissions for Nakuru County in 2019 were estimated at 1 642 867 tCO_2e. This estimate includes emissions from the stationary energy, transportation, and waste sectors. This is equivalent to approximately 0.8 tCO_2e per person. For comparison, national emissions for Kenya in 2010 were 17 000 000 tCO_2e when considering only the stationary energy, transport and waste sectors (Republic of Kenya, 2015). This is equivalent to approximately 0.4 tCO_2e per person. However, emission per person in Nakuru County in 2019 were only about one sixth of the global average (World Bank, 2022).

The total GHG emissions in Nakuru County for 2019 are equivalent to 37 000 cars travelling from Nakuru city centre to Nairobi city centre and back every day for a year.

Table 1.20-3 Summary of GHG emissions by sector for Nakuru County (tCO2e)

Sector		Total by scope			Total GHG emission
		Scope 1	Scope 2	Scope 3	
Stationary Energy	Energy use	669 273	34 587	NE[2]	703 860
Transportation	All transportation	544 749	0	NE	544 749
Waste	Generated in the region	394 258	-	NO[3]	394 258

[1] Under the BASIC reporting level of the GPC, reporting emissions from the stationary energy, transport and waste sectors is mandatory. Under the BASIC+ reporting level, emissions from agriculture, forestry and other land use (AFOLU) and industrial processes and product use (IPPU) can be optionally included.

[2] NE = Not estimated

[3] NO = Not occurring

TOTAL	1 608 280	34 587	NE	1 642 867

1.20.3 Emissions for Nakuru County under a 'business as usual' scenario

A business as usual (BAU) scenario has been developed for Nakuru County to estimate how GHG emissions will change until 2030 in the absence of additional climate mitigation action. The BAU scenario uses emissions estimated in the BEI as a starting point and projects emissions to 2030 based on assumptions about how drivers of GHG emissions, including population and GDP, will change over the coming decade.

Under the BAU scenario, GHG emissions from Nakuru County are expected to increase by 65% in 11 years (approximately 4.7% per year) from 1 642 867 tCO_2e in 2019 to 2 718 694 tCO_2e in 2030 if no emissions reduction actions are taken (**Error! Reference source not found.**). Proportionally, the largest expected growth is in the emissions is from the transportation sector, which is expected to increase from 33% of total emissions in 2019 to 37% in 2030.

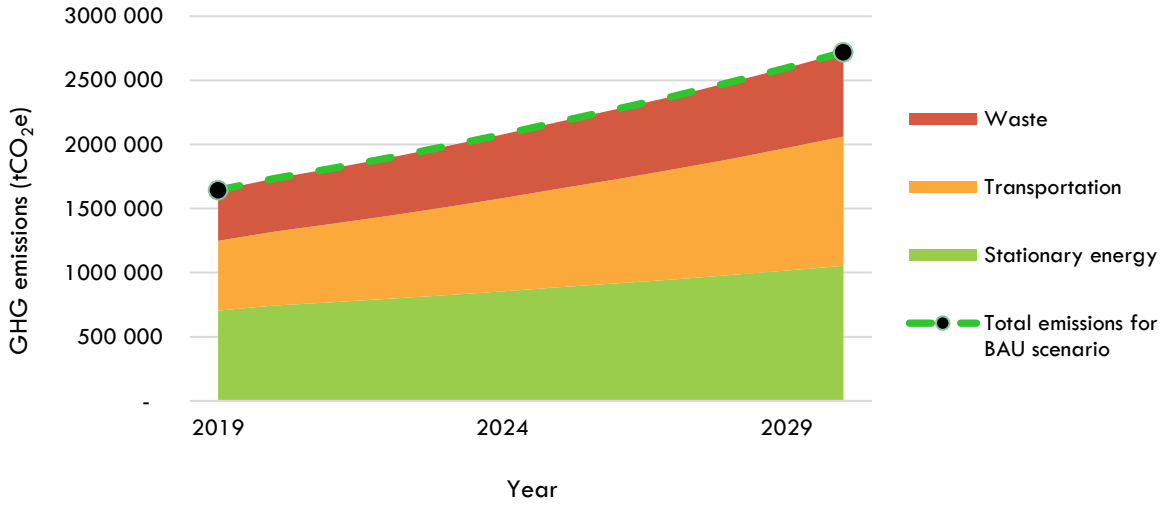

Figure 1.20-1 Estimated GHG emissions for Nakuru County from 2019 to 2030 under a business-as-usual scenario

In alignment with Kenya's national climate change mitigation targets, the mitigation target setting process for Nakuru County uses the BAU scenario as a basis for developing targets for 2030.

1.20.4 GHG emissions by sector and sub-sector in Nakuru County

The total GHG emissions for Nakuru County in 2019 (that is, emissions from stationary energy, transportation, and waste) are estimated at 1.6 million tCO_2e. **The largest contributing sector was stationary energy, contributing 43% of emissions, followed by transportation (33%) and waste (24%),** as shown in **Error! Reference source not found.**6.

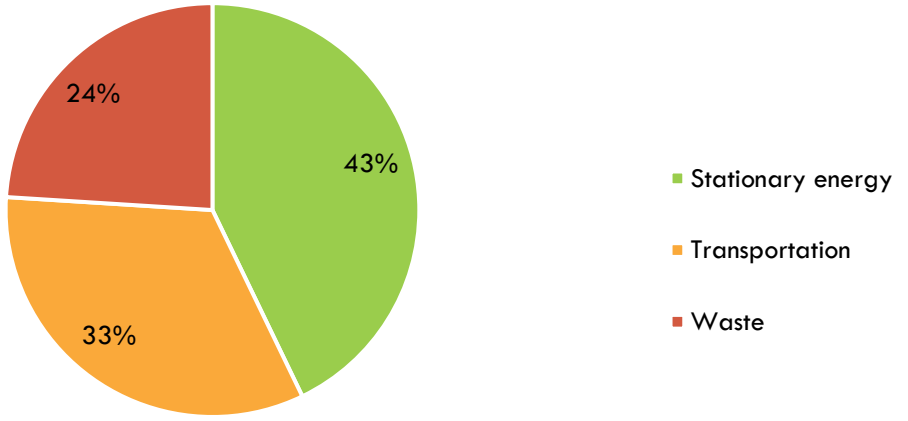

Figure 1.20-2 Sector contributions to GHG emissions in Nakuru County

In Nakuru County, the stationary energy sector accounted for 703 860 tCO_2e (43% of total GHG emissions) in 2019. The largest proportion of emissions in the stationary energy sector come from energy use in residential buildings (37%). This is followed by energy use in manufacturing and construction (30%) and in energy industries or charcoal production (23%). The remaining emissions in the stationary energy sector come primarily from energy use in commercial and institutional buildings (8%), while less than 1% come from energy use in agriculture, forestry and fishing activities (**Error! Reference source not found.**8**Error! Reference source not found.**).

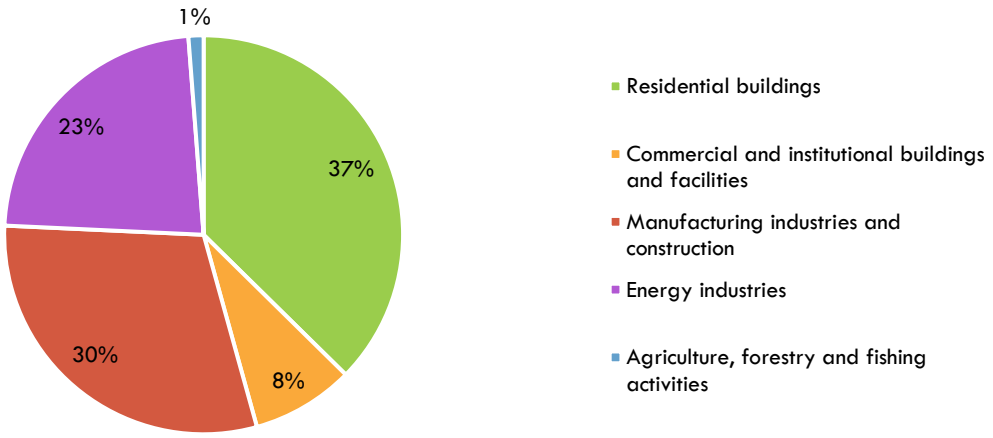

Figure 1.20-3 Sub-sector contributions to stationary energy GHG emissions in Nakuru County

The transportation sector accounted for 544 749 tCO_2e (33% of total GHG emissions) in 2019. Transport sector emissions included in the BEI are all a result of fossil fuel use for road

transport (43% petrol and 57% diesel), including public and private passenger vehicles as well as freight transport (**Error! Reference source not found.**9).

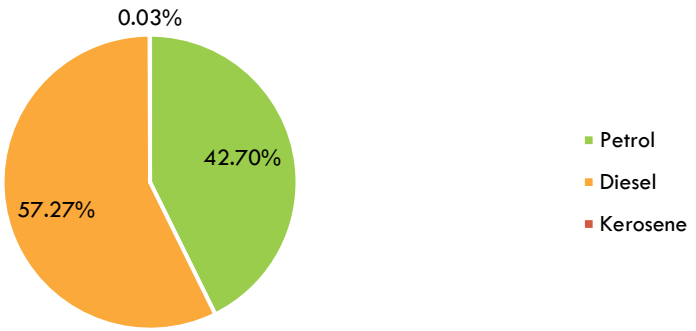

Figure 1.20-4 Emissions from the transportation sector in Nakuru County by fuel

The waste sector in Nakuru County was responsible for 394 258 tCO_2e (24% of the County's total GHG emissions) in 2019, all of which arise from solid waste and wastewater treated in the region**.** The disposal of solid waste in landfills and dumps accounts for the largest portion of waste emissions at 46%, while wastewater accounts for 27% of waste emissions. Incineration and burned waste accounts for a further 26% of the emissions. Biological treatment of waste accounts for 1% of emissions (**Error! Reference source not found.**).

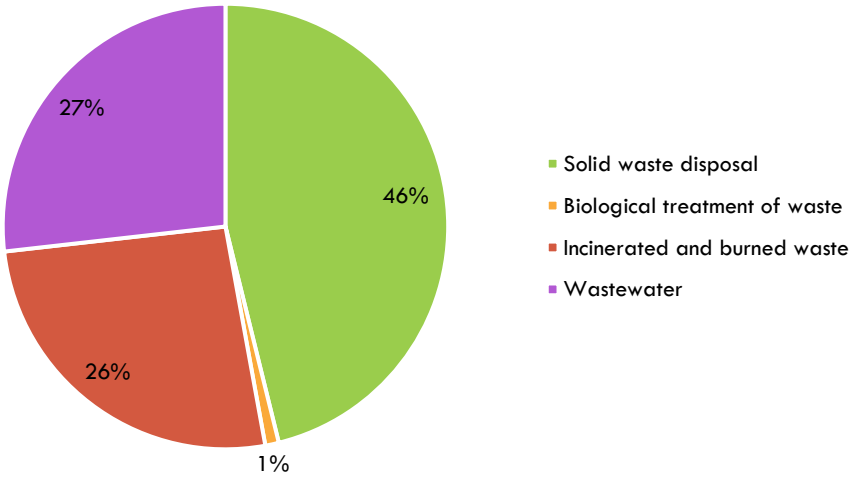

Figure 1.20-5 Sub-sector contributions to waste sector GHG emissions in Nakuru County

1.20.5 GHG emissions by gas for Nakuru County

Emissions of the three most common GHGs (Scope 1 emissions) are included in the BEI – carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Scope 2 emissions (i.e. emissions from electricity consumption) are only reported in CO_2e due to the grid emission factor being expressed as $kgCO_2e/kWh$ and are therefore not disaggregated by gas. Similarly, emissions resulting from charcoal production are only reported in total CO_2e due to the emission factor being expressed as $kgCO_2e/tonne$. For scope 1 emissions, carbon dioxide (CO_2)

contributes 64% of total emissions, followed by methane (CH_4) at 30% and nitrous oxide (N_2O) at 6%.

Biogenic CO_2 emissions (shown as CO_2(b)) for each sector are shown in 4.2-6 However, CO_2(b) emissions are not included in the total GHG emissions reported from the inventory for Nakuru County. Biogenic CO_2 emissions are those emissions that result from biomass materials that naturally sequester CO_2, including fuels produced by living organisms or biological processes (for example through forestry or agriculture), but not fossilized or from fossil sources. This includes CO_2 emissions from the combustion of wood fuel and charcoal, as well as the combustion of biogenic materials during waste treatment. While CO_2 emitted from any source contributes to the greenhouse effect, following international protocols, these emissions are not included in the overall total for the GHG inventory. This is because they are offset by the growth of biomass or accounted under land use and land use change (Greenhouse Gas Protocol, 2015). It is estimated that 3 442 776 tCO2(b) were emitted in Nakuru County in 2019 – double the total GHG emissions included in the inventory. 99% of these emissions are linked to the combustion of charcoal and wood in the stationary energy sector, especially in residential buildings. The remaining 1% of biogenic CO2 emissions result from solid waste disposal. Reducing the use of unsustainable biomass fuels and thereby reducing biogenic CO2 emissions can contribute positively to climate change mitigation.

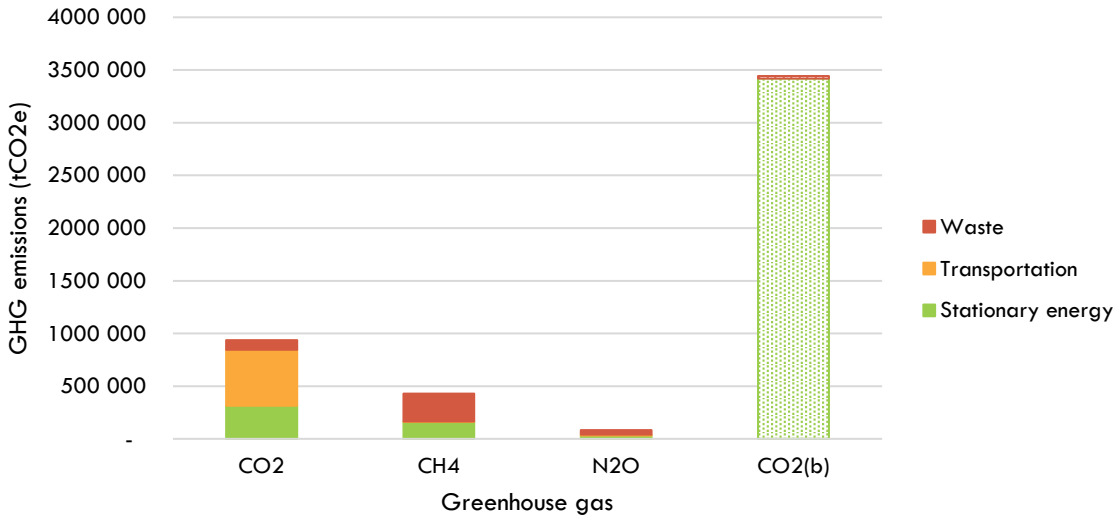

Figure 1.20-6 Emissions by sector for each greenhouse gas in Nakuru County

1.21 Adaptation: Key findings of the Nakuru Participatory County Risk and Vulnerability Assessment

The Risk and Vulnerability Assessment (RVA) serves as a reference to assist local governments in their decision-making with regards to climate change adaptation and to support the development of their adaptation targets and action plans. The RVA identifies the most significant climate hazards currently affecting local communities, as well as the extent to which economic sectors and vulnerable population groups are impacted by these hazards. It also assesses how these hazards are likely to change in intensity, frequency, and over what timescale, as well as how these changes will likely impact key sectors and population groups

in the future. Finally, the RVA explores the resilience of the local population by identifying which factors support or challenge adaptive capacity.

Data informing the development of the RVA were gathered through three separate methodologies, namely: i) secondary data collection; ii) primary data collection; and iii) stakeholder consultations and multi-stakeholder workshops.

i) **Secondary data collection**: This included scanning secondary databases such as the Climate Information Platform, reviewing policy and academic documents relevant to climate change in Nakuru County, and consulting key stakeholders (including the county and national government agencies) to develop a detailed situational analysis as well as build datasets. More specifically, this phase involved compiling historical and projected climate trends for Nakuru using: (i) satellite climate data retrieved from the archives of the Kenya Meteorological Department (KMD) as well as from the Nakuru meteorological station through the Climate Information Platform (CIP); (ii) the Nakuru County Climate Risk Profile for Nakuru County 2016 from the Ministry of Agriculture; (iii) key relevant documents such as the National Climate Change Action Plan 2018-2022, the Kenya National Adaptation Plan 2015-2030, the Nationally Determined Contribution 2020, and the draft Nakuru County Climate Change Action Plan from the Ministry of Environment (Climate Change Unit) and from the Kenya Climate Working Group.

ii) **Primary data collection**: Primary data were mainly collected through household surveys using questionnaires based on a representative household sample drawn from the eleven sub counties of Nakuru. These data were used to ground-truth the secondary data, as well as contextualize some of the national-level climate impacts and vulnerability data to the county context. The total sample size was 420 households of a total household population of 616,046 based on 2019 census results (**Error! Reference source not found.**) (KNBS, 2019). During the survey, 235 men and 185 women, mostly between 35-44 years old, were interviewed, with 67% of households headed by men.

iii) **Stakeholder consultations and multi-stakeholder workshops**: Primary and secondary data were complemented by two participatory workshops (held on 19 and 21 January 2021, respectively) to provide insights on policy and technical elements of the assessments. In addition to supporting the RVA assessment through policy and technical outputs, the two workshops were intended to create awareness and promote co-ownership of the climate change adaptation planning process in Nakuru. While the policy workshop was undertaken virtually, the technical workshop was executed physically and virtually (hybrid workshop) in Nakuru with key technical teams working in groups to provide risk and vulnerability data guided by specified RVA matrices.

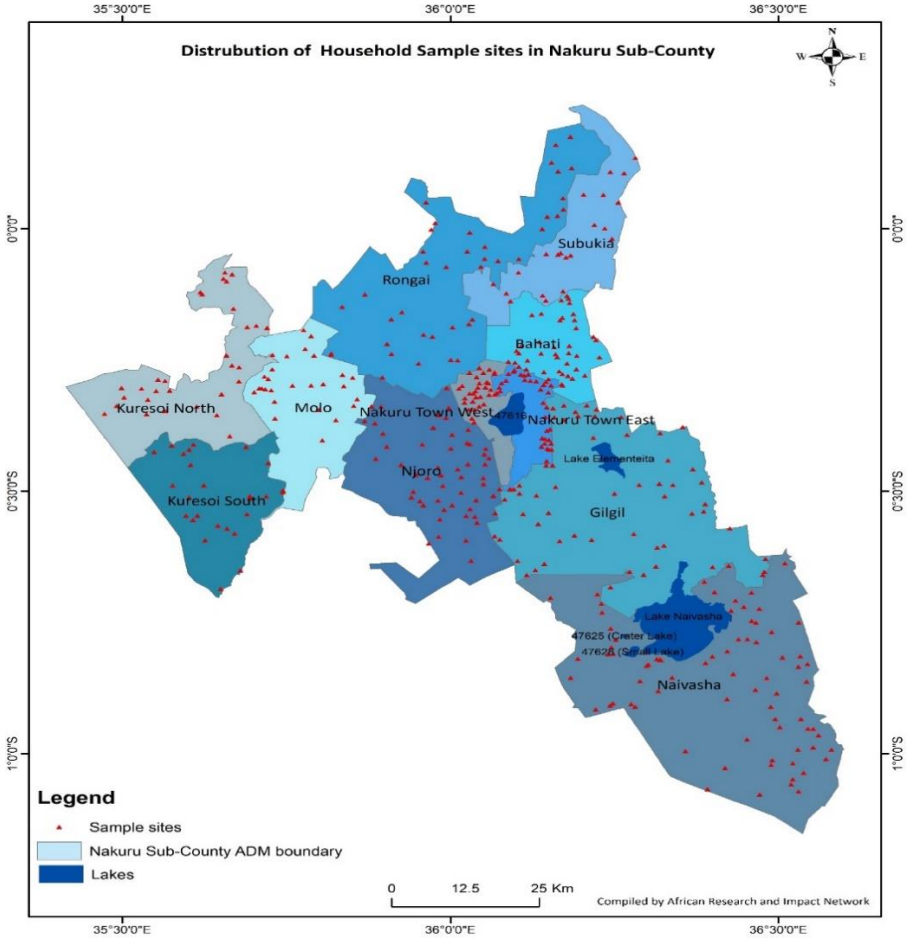

Figure 1.21-1 Household random distribution sample sites in Nakuru subcounty

1.21.1 Historical and projected climate change in Nakuru County

Kenya's climate ranges from tropical (along the coast) to arid (in the mountain regions). The average temperature across the country is 24°C and the mean annual precipitation is 669 mm. The rainy season in Kenya usually begins in March and decreases in May to June. Since 1960, Kenya's mean annual temperature has increased by 1.0°C, at an average rate of 0.21°C per decade. The rate of increase has been most rapid in March to May (0.29°C per decade) and slowest in June to September (0.19°C per decade). Observations of rainfall over Kenya since 1960 do not show statistically significant trends, as trends in the extreme indices based on daily rainfall data are mixed (World Bank, 2021). According to the global climate model CMIP5 (RCP 8.5), mean annual temperature in Kenya is expected to increase by 1.0°–2.8°C by 2060 and annual rainfall is expected to increase between October and December as well as between March and May.

According to the Nakuru County Climate Risk Profile (2016), Nakuru experiences a bimodal rainfall pattern, receiving heavy rainfall from March to June and low rainfall from September to November. On average, dry spells are longer around the second wet season ranging from 35 to 80 days in any given year. Around the first wet season, the dry spell ranges between 25 to 60 consecutive days every year. Satellite data for rainfall (from Chirps) and temperature (from ERA-5) from the Nakuru Meteorological station analysed using the ORIGIN-Pro software also show that the climate is shifting at the county level. Since 1981, the county has experienced a

moderate (1.0°C) increase in mean temperature accompanied by increased heat stress, especially in the first wet season, with an associated reduction in the crop cycle.

The Climate Systems Analysis Group (CSAG) from the University of Cape Town (UCT) has developed the Climate Information Platform (CIP) which provides climate-related information at downscaled levels. Utilising data collected from weather stations located in towns across the African continent (including the Nakuru weather station), the CIP runs a series of climate models which collectively provide a database of historical climate patterns as well as future projections for regions and districts throughout the world. With regards to temperature, these climate models all agree that warming within the Nakuru County will almost certainly occur and that there will be an overall increase in average monthly temperatures by between 1.0°–2.5°C by 2060 (**Error! Reference source not found.**). The data also indicate that there will be an increase in heat wave duration, especially in January and February. This is calculated relative the historical period 1980-2000 under RCP 8.5.

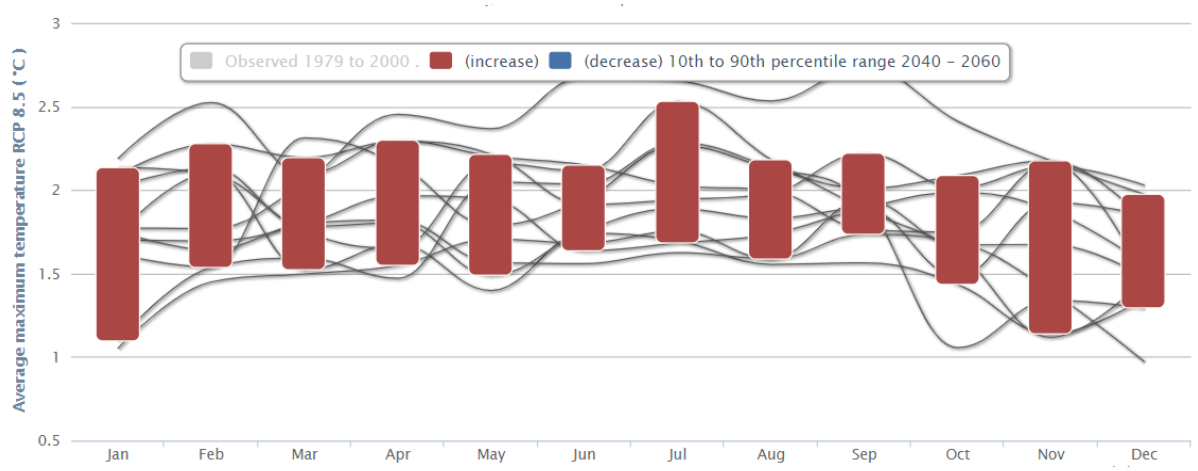

Figure 1.21-2 Average predicted maximum monthly temperature in Nakuru for the period 2040-2060

In terms of rainfall, the climate models all agree that shifts in the historical rainfall patterns will also almost certainly occur (**Error! Reference source not found.**). However, the models do not agree on the direction of change and as such there is uncertainty as to whether there will be an overall increase or a decrease in annual rainfall in Nakuru County. This is calculated relative to the historical period 1980-2000 under RCP 8.5. The solid red bars indicate a range of potential decreases in rainfall for each month, whilst the solid blue bars indicate a range of potential increases in rainfall for each month. Where both blue and red bars are present for one month, it indicates there is uncertainty for that month and that the rainfall could either increase or decrease for that month.

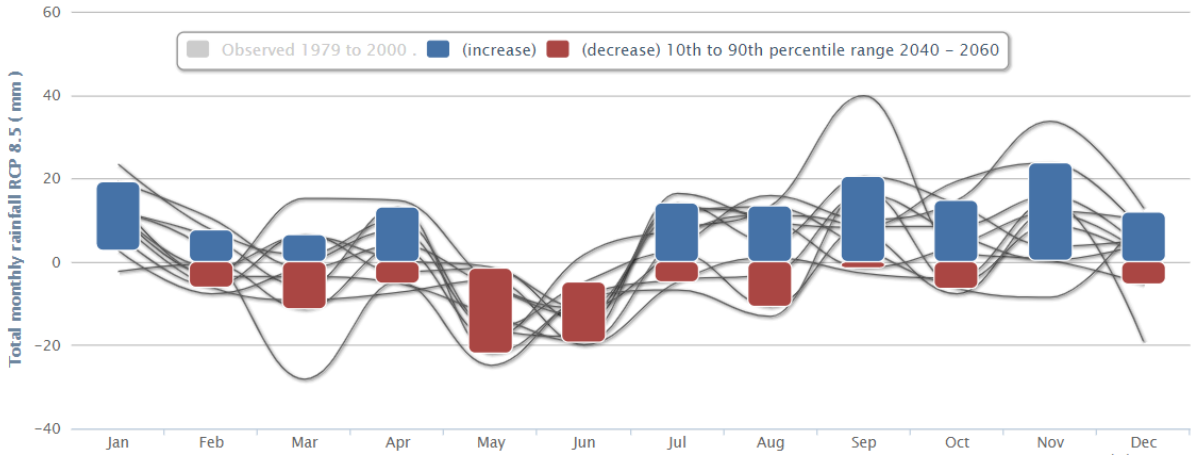

Figure 1.21-3 Total predicted monthly rainfall in Nakuru for the period 2040-2060

1.21.2 Current and future climate hazards

The National Climate Change Action Plan (NCCAP) 2018–2022 indicates that rising temperatures, uncertain changes in rainfall patterns, stronger storm surges and greater risk of extreme weather events such as droughts, floods and landslides are all significant climate risks facing Kenya. Based on data from the participatory workshops, the household survey, interviews, and results presented in the

Nakuru County Climate Change Action Plan (NCCCAP) 2018–2022, there are 21 climate hazards currently affecting Nakuru County: rainstorms, fog, hail, severe wind, lightning/thunderstorms, extreme winter conditions, cold waves, extreme cold days, heat waves, extreme hot days, droughts, forest fires, land fires, flash/surface floods, river floods, groundwater floods, permanent inundation, landslides, rock falls, subsistence, waterborne diseases, and vector-borne diseases.

Further risk mapping indicated that the five hazards that have the most significant impact on Nakuru County are **droughts**, **rainstorms**, **flash/surface floods**, **river floods**, and **waterborne diseases**. According to the findings of the RVA, these hazards are likely to intensify with climate change as temperatures are projected to rise in the County and rainfall is likely to become more erratic. Current and future impacts of these hazards on the population of Nakuru County include increase in crop failure, malnutrition, fluctuation in the water levels of rivers and lakes, depletion of aquifers, soil erosion and degradation, water pollution, loss of biodiversity, and destruction of infrastructure such as roads.

1.21.3 Economic sectors and population groups vulnerable to the impacts of climate hazards

The NCCAP 2018-2022 identified several key sectors as relevant for the Mount Kenya and Aberdares Counties Trade and Investment Block, of which Nakuru County is a part. These include industry, infrastructure, information, and communications technology (ICT), agribusiness, tourism, health, and forestry. The National Adaptation Plan (2015) lists agriculture, livestock, water, environment, infrastructure, sustainable livelihoods, energy, and tourism as priority sectors. At the county level, the NCCCAP 2018–2022 identifies the sectors of agriculture, livestock and fisheries, water, wildlife and tourism, forestry, transport and

infrastructure, health, energy, mining, manufacturing, and trade as being key to promoting a low-carbon and climate-resilient economy and livelihoods in Nakuru County.

The RVA found that the sectors most affected by current climate hazards are: **food and agriculture**; **water supply and sanitation**; **environment, biodiversity and forestry**; and **land use planning**. Stakeholders provided a rationale for the selection of these sectors by describing how climate hazards which already affect Nakuru County could further impact these particular sectors in the future if no action is taken (**Error! Reference source not found.**).

Regarding vulnerable population groups, households, and communities in Nakuru are impacted differently by climate hazards depending on the magnitude of the climate hazard, and their adaptive capacity. The household survey conducted found that the following groups are vulnerable to climate hazards: women and girls; the less educated; indigenous populations; marginalised groups; persons with disabilities; persons with chronic diseases; low-income households; persons living in sub-standard housing; and unemployed persons. Of these groups, **women and girls**, and **low-income households** are the most vulnerable. Evidence shows that in most African settings such as Nakuru County, women spend long hours on farms, hence are most susceptible to heat stress. Similarly, as the primary caregivers, women are widely responsible for daily household livelihoods and spend more time at home with children thus are more exposed to risks such as floods and hunger. Low-income households are less endowed with assets that could build their long-term adaptive capacity and thus can only cope with daily (relatively moderate) climate risks and become highly vulnerable to severe events such as floods and landslides. Overall, the differentiated impacts could help in tailoring adaptation actions towards these vulnerable social groups.

1.22 Sector based Climate change impacts

1.22.1 Agriculture, livestock, and Fisheries sector

1.22.1.1 Crop production sub-sector

Climatic related hazards relevant to crop production in the county include prolonged dry spells, frost, intense precipitation, flooding, and heat stress (Koros *et al*. 2016). Increase in temperatures has led to crops having shorter cycles. Increased temperatures are associated with the increase in disease and pest incidences. This means that strategies to deal with this problem must be designed to build resilience among farmers in the county. Rainfall has become both unpredictable and unreliable. Intense rainfall in the highlands has in many instances led to flooding in the lower areas. This leads to flooding in the lower areas and if there are crops on the farms, it may result in loss of crops and livelihoods. Unpredictable rains have been particularly a serious problem for farmers since planning for planting and harvesting times become a major challenge.

According to participants in the stakeholder consultation, there is sufficient evidence that climate change is having negative impacts on crop production in Nakuru County. The evidence includes:

1) Unpredictable rainfall patterns/seasons.

2) Prolonged dry spells leading to loss of crops.
3) During the years 2009, 2014, 2017 there were increased incidences of frost that destroyed crops leading to and reduced agricultural productivity.
4) In 2017, there was unusually high rainfall from July to November, which led to rotting of crops and increased incidences of pest infestation. Excessive rainfall, when made worse by poor farming methods leads to excessive soil erosion.
5) The food shortage, nutrition deficiencies and malnutrition among the residents due to depressed agricultural production has resulted in.

Some participants pointed out that other factors, which contribute to reduced food production in the county include impacts of:

1) **Deforestation.** This is made worse by the increasing human population that leads to local community members encroaching on forests and clearing them to meet the rising food demand.
2) **Mono-cropping.** This reduces the adaptive capacity of many farmers because if a crop is affected by drought or early rains, then a farmer has no alternative.
3) **Poor farming methods**- (reliance on inorganic fertilizers and pesticides etc.). Inorganic fertilizers contribute Green House Gas emissions making climate change problem worse.

Many stakeholders are involved in agricultural production in the county. These include the farmers themselves, County government, research institutions (including KALRO and Egerton University), and KFS who are involved in the promotion of agroforestry and establishment of on-farm woodlots. Some of the climate adaptation activities that are being promoted include:

1) Adoption of drought-resistant crops
2) Agroforestry, reafforestation, and woodlots establishment.
3) Establishment of sustainable farming methods e.g. smart agriculture.
4) Sustainable Irrigation methods.
5) Water harvesting technique.
6) Use of organic manure.
7) Value addition.

There is the need for enhanced activities to enable farmers to adapt to the impacts of climate change. This also calls for enhanced capacity of key stakeholders including extension officers on climate change matters. There is also the need for increased investments in research on appropriate crop varieties and livestock breeds that can withstand the impacts of climate change. Unpredictable rainfall patterns also lead to severe agricultural losses, thus, the need to provide farmers with timely meteorological data for timely planting and harvesting. Local farmers have a rich indigenous knowledge of traditional crops and traditional coping strategies. Such knowledge needs to be tapped to help the county adapt to climate change. There is, therefore, a need to adopt best practices to help farmers adapt to climate change that includes:

- Drip irrigation and smart agriculture.
- Use of appropriate Indigenous knowledge.
- Enhanced adoption of certified seeds.
- Organic farming.
- Conservation farming.

1.22.1.2 Livestock production subsector

Livestock production is an important economic and socio activity in Nakuru County. The main livestock kept include cattle, poultry, sheep, and goats. During the stakeholder's consultations, it was clear that climate change has impacted negatively on livestock production. The key climate change hazards that impact on dairy cattle production are floods, prolonged droughts, and high temperatures.

In dairy farming, flooding encourages disease and pest outbreaks, parasitic infections, poor pasture germination, damages to storage facilities, difficulties in linking with markets, high production costs, and low market activities. During drought periods, the main impacts revolve around breeding challenges, increased disease and pest prevalence, food scarcity, increased labour costs, increased costs of milk storage due to the perishability of mild in hot weather. Overall, drought leads to increased production costs, high prices of dairy products and reduced market activities.

Current coping strategies include:

- Adoption of zero grazing.
- Adoption of manageable and drought resistant breeds.
- Growing of drought-resistant fodder crops.
- Enhance water harvesting and conservation techniques.
- Timely and periodical culling.
- Destocking.

The ministry of agriculture and environment, KALRO, veterinary department, Health Department and the private sector players (e.g. Private feed and livestock drugs distributors), water service providers are all working together to help livestock farmers adapt to the impacts of climate change.

The county government and other stakeholders need to invest more in:

- Enhancement of appropriate, climate-smart technologies.
- Sensitization, awareness creation, and capacity enhancement.
- Introduce alternative economic initiative for vulnerable communities particularly pastoralists who have been hit hardest by the impacts of climate change.
- There is need to invest in value addition.
- Research

1.22.1.3 Fisheries production subsector

Fisheries production is practiced at Lake Naivasha, private and community-owned water reservoirs and fish ponds (MoAFL, 2016). According to Nakuru CIDP of 2013-2017 (County Government of Nakuru, 2014), there were at least 50 fishing boats on Lake Naivasha by 2013 and at least 1500 operational fish ponds by 2013. The main challenges in fisheries production include the destruction of fish habitats especially through pollution, overharvesting of fish, extinction of some fish species, and the introduction of exotic fish species. The main climatic hazards that affect fisheries production in the county revolve around environmental degradation at the catchment level resulting from loss of vegetation cover. This leads to soil erosion and consequent siltation of water reservoirs. Prolonged droughts and increased temperatures lead to excessive evaporation thus interfering with fish habitat and fish production. Climate change, therefore, leads to depressed fisheries production thus interfering with diets of affected families and depressed incomes for fishers' families.

To cope with the impacts of climate change changes, stakeholders are undertaking the following activities:

1. Adoption of modern fish farming technologies.
2. Enforcement of pollution control measures and standards.
3. Awareness creation, sensitization, and capacity building.
4. Value addition and creation of enabling markets.

The potential interventions that these stakeholders in fisheries production need to invest in include improved coordination, harmonization and enforcement of existing laws and policies and also in branding and marketing of fisheries products from the county.

Fishermen at Karagita landing beach, Lake Naivasha

Source : https://www.the-star.co.ke, September 19, 2016

1.22.2 Water Sector

Nakuru County is endowed with natural water resources including four major lakes (Nakuru, Naivasha, Solai, and Elementaita), shallow wells, springs, dams, pans, and boreholes. Much of theses water, particularly, from the lakes, is not available for domestic, industrial or irrigation purposes. Boreholes have been sunk to boost water supply but the county is still water deficient, and climate change is making the situation worse. According to the participants during the consultative workshop, some of the climate-related evidence/impacts in the county include:

1. **Over-abstraction of water:** Climatic hazards including frequent prolonged droughts, coupled with increased demand for water in other sectors and an increasing human population have led to water demand in the county outstripping supply.
2. **Depletion of aquifers:** This might be explained by the declining rainfall, reduced forest cover and over abstraction. This has very negative impacts on communities including drying of boreholes and natural springs. For example, the drying up of bores at Egerton University in 2010 was blamed on climate change.

3. **Fluctuating water levels in the lakes:** The levels of water at lakes Naivasha, Nakuru, and Elementaita and other rift valley lakes have been fluctuating a lot. This is probably due to **r**educed forest cover, reduced rainfall, over-abstraction, and siltation.
4. **Soil erosion:** Due to poor farming methods, land tenure, overgrazing, and deforestation.
5. **Flooding and storm water:** Flash floods due to excessive rainfall, deforestation, and poor drainage systems.
6. Many rivers/streams and wetlands also have either dried up, or water levels have decreased. For example, River Dundori and Olbanita Swamp. Besides, River Nderit, which was draining into Lake Nakuru dried up between 2014-2017.
7. Siltation in the lower Engashura Bahati Sub-county during the 2012-2017 period due to deforestation in the water catchment area.
8. **The El-Niño in 2015** in which above normal rainfall in October 2015 to Feb 2016 led to substantial losses in agricultural production.
9. **Illegal water abstraction** by hotels/flower farms to meet the rising demands.
10. **Air pollution:** The issue of air pollution was cited as a serious problem in Nakuru Town area. It was noted that pollution has made harvesting of rainwater, an ideal climate change adaptation challenge for local the community, . In fact, it was further noted that there was an incident where harvested rainwater was black.

Water availability is limited further by pollution of water sources from agricultural enterprises. For example, discharge of agricultural effluents has negatively impacted on River Kuresoi.

To help the residents and stakeholders adaptation to the impacts of climate change on water, there is the need to:

- Conduct studies to understand groundwater potential.
- Enforce relevant water policies and legislations.
- Encourage Water catchment restoration.
- Increase forest cover using appropriate trees.
- Restore lakes and river riparian zones and conduct regular monitoring.
- Legislate and enforce water management laws, as well as develop appropriate policies.
- Provide incentives for ecosystem conservation.
- Encourage water users to recycle and reuse.
- Show commitment to conserving ecosystems particularly water catchment areas and riparian vegetation.

1.22.3 Wildlife and tourism sectors

Nakuru County has a rich wildlife heritage. It has three national parks including Lake Nakuru, Hells Gate, and Longonot. The county also has a number of private wildlife conservancies, which include Marura, Oserian, and Kedong in Naivasha Sub-County and Kigio and Soysambu in Gilgil Sub-County. Its lakes, particularly Lake Nakuru, but, also the others, are known for their large flocks of birds, notably the flamingos. Lake Nakuru National Park is also known as a home of the endangered Rhino, and Rotchilds Giraffe among other wild mammalian species. Lake Naivasha is also known for large herds of Hippopotamus. The forests that dot the county are also rich in wildlife. Some of the climatic change related wildlife issues noted in Nakuru County include:

- **Fluctuating lake levels** in Lakes Nakuru, Naivasha, and Elementaita. This has made the flamingos, especially in Lake Nakuru to migrate to other water bodies, denying the county revenue from tourism. A recent study by Wambui (2016) demonstrated that the mean annual precipitation at Lake Nakuru between 2009 and 2014 led to an increase in the lake's surface area by about 72%. The associated chemical changes in the lake's water led to reduced food availability for lesser flamingos leading to their low population size by 2014. In the same study, it was projected that the temperatures, precipitation, and evaporation will continue to increase gradually during this century and will continue impacting negatively on the wild animal population in the lake.
- Mass deaths of flamingos at Lake Nakuru in 2017.
- **Increased wildlife-human conflict.** Due to drought and resultant water scarcity, wild animals wander into human habitation and farmlands in search of food and water.
- **Drying of rivers** feeding Lake Nakuru including Rivers Njoro, Makalia, Larmudiac, and Enderit.
- Increased incidences of wildlife diseases, e.g. anthrax.
- The Spread of invasive species.
- Increasing poaching levels probably due to the need for supplementary protein from bushmeat particularly zebras, gazelles and buffaloes (Mwangi & Wambui, 2017).
- **Water scarcity** due to frequent droughts leading to drying of water sources.
- **I**ncreased conflicts between herders and farmers.

The issues listed above lead to loss of biodiversity. To help wildlife and the associated services, such as tourism to withstand the impacts of climate change, there is the need for increased investment in:

- Water catchment and habitat restoration including reforestation and afforestation.
- Reclamation of riparian habitats.
- Water harvesting in conservation areas.
- Research and monitoring of wildlife numbers and disease surveillance.
- Vaccination of livestock sharing habitat with wild animals to reduce pathogen burden.
- Law enforcement to prohibit encroachment in conservation areas.
- Translocation of problematic animals in extreme situations.
- Community awareness program.
- Compensation mechanisms.
- Enforcement of laws, e.g., EMCA.
- Monitoring of biodiversity including the periodic census of wildlife.
- Information sharing.

Wildlife conservation is a mandate of the national Government through Kenya Wildlife Service (KWS). However, other stakeholders, particularly the county government have a major stake. Other key stakeholders currently involved include WRA, KFS, CFAs, IMARISHA Naivasha, WRUAs and CSOs such as WWF, Green Belt Movement (GBM), Nature Kenya, and private sector players. Other stakeholders who can play a key role, especially in the disease surveillance and monitoring include the national government's Department of Veterinary Services and research institutions.

1.22.4 Forestry sector impacts

Nakuru has about 680 Km^2 gazetted forests including Eburru, Sururu, Likia, Logman, Teret, Marioshoni, Kiptunga, Baraget and Molo to the west of Nakuru Town and Dundori, Bahati and Menengai to the East. The forests to the west of Nakuru are part of the Mau complex. There

are also a number of un-gazetted forests including Mbogoini, Solai, Bahati, Subukia, and Eburru. In addition, there are private forests although these constitute less than 1 % of the total forest cover in the county. These forests are important due to the goods and services they provide, including timber, poles, charcoal, firewood, and bamboos, in addition to providing employment in the timber industry. Forest conservation in water catchment areas is critical for regulation of water supply and control of soil erosion. Forests are also important carbon sinks that help regulate climate. According to the stakeholders who participated in consultations, some of the impacts of climate change of the forest sector in Nakuru County:

- **Increased forest encroachment.** This is evident from the increase in illegal structures in forests, increased cases of illegal logging due to limited livelihood options as a result of climate change, firewood collection, charcoal burning, and cultivation. To address this, it is important to devise strategies to reduce poverty, increase forest patrols, encourage agroforestry to reduce pressure on forest products, and fencing of forest reserves to control entry.
- **Overgrazing:** Climate change leads to livestock feed scarcity. This leads to local communities relying on forests for pasture which leads to unregulated livestock grazing, and subsequently soil erosion resulting in gullies. It is important to design grazing zones to minimize this impact.
- **Habitat loss** due to increased logging and forest encroachment for agricultural purposes.
- **Loss of biodiversity** in forests. To understand the extent of this problem, stakeholders have been investing in biodiversity monitoring and ecosystem restoration. There is the need for enhanced collaboration and information sharing among the stakeholders to reduce duplication of efforts.
- **Forest fires.** During prolonged drought periods, there are increased incidences of forest fires leading to habitat loss, vegetation destruction, and loss of biodiversity. To contain them, Kenya Wildlife Service and CFAs have been maintaining fire breaks. Going forward, it is important to create awareness among the local community and engage them in the prevention and control of forest fires. Besides, there is the need to invest in fire preparedness.
- Increased incidences of diseases and pests infestations in forests Flooding in lowlands due to forest destruction.
- Change in micro-climatic conditions.
- Declining forest cover.
- Degradation of cultural sites in forests.
- Invasive species.

Stakeholders engaged in forestry activities include: County Government, forest aadjacent communities, Kenya Forest Service, Community based organizations (CBOs), Community Forest Associations (CFAs), Conservation NGOs (WWF, GBM, and Nature Kenya). However, many other stakeholders are engaged in CSR activities that target tree planting and habitat restoration. This includes banks and other private sector institutions. There is need to engage these institutions further and explore the option of payment for Ecosystem Services to finance conservation activities.

1.22.5 Transport and infrastructure

An efficient transport system is critical for the socio-economic development. By 2013, Nakuru County was served by 912 km, 1101, and 2327 km of Bitumen, gravel and earth surface roads respectively). It was also served by a 192 km railway line (Nakuru County CIDP, 2013. The on-going construction of Standard Gauge Railway (SGR) is to benefit the county greatly with major investments planned for Naivasha and Nakuru towns. Transport infrastructure is prone to impacts of climate change including the destruction of infrastructure like roads and bridges during extreme weather events. This can have dire consequences for a county and even the national economy. For example, is estimated that the 1997-98 El Niño floods damaged transport infrastructure costing at least Ksh 62 billion (GoK, 2010). Higher temperatures can also cause pavements to soften and expand, creating rutting and potholes, as well as warping of rail tracks, requiring track repairs or speed restrictions to avoid derailments. Some of the evidence/impacts of climate change in Nakuru County that stakeholders in Nakuru pointed out during the consultations included:

- **Fog and mist** that hamper visibility on the Naivasha Kinungi road leading to accidents.
- **Flash floods:** This has negatively affected Nakuru and Naivasha towns. This is made worse by unsustainable solid waste management that leads to blockage of drainage systems. To solve the problem, there is the need to clear drainage and dispose of solid waste properly according to EMCA regulations. Flash floods also lead to the destruction of transport and other infrastructure.
- Heavy traffic of the Nairobi – Eldoret Highway during heavy downpour and floods
- Impacts of climate change are made worse by **habitat destruction**, in particular, the destruction of vegetation and the consequent habitat loss. This translates into Loss of carbon sinks, making the county less resilient to climate change impacts. The habitat also becomes prone to soil erosion.
- **Unsustainable infrastructure development** practices leading to soil erosion and poor water percolation.
- The Improved transport system, coupled with the increasing vehicle population that had led to **increased emissions of greenhouse gases**.
- Increased building construction costs due to the need for air conditioners and need to climate- proof buildings. Use of air conditioners increases energy use and therefore increase carbon emissions.

One of the most tragic climate related impacts witnessed in Nakuru County is the Solai Dam Tragedy. This man-made dam within the vast Patel Coffee Estates located in Solai, Nakuru County broke its banks on 9th May 20187 as a result of unprecedented heavy rainfall. At least 47 people died while others were injured. The incident occasioned massive destruction of property and unprecedented displacement of people. Climate proofing of such infrastructure is necessary.

Floods wash away part of Maai Mahiu Road, motorists stranded

Source: Daily Nation, WEDNESDAY MARCH 14 2018. HTTPS://WWW.NATION.CO.KE/NEWS/MOTORISTS-FLOODS-WASH-AWAY-MAAI-MAHIU-ROAD/1056-4340808-B0CLM/INDEX.HTML

Source: Kipsang Joseph, Standard Newspaper 11 May 2018

Impacts of unusually heavy rainfall on Solai Dam, Nakuru County

1.22.6 Health sector

Climate change affects the socio and environmental determinants of health including clean air, safe drinking water sufficient food, and secure shelter (WHO, 2017). Climate change can result in increased deaths from malnutrition, malaria, diarrhoea, and heat stress particularly in areas with weak health infrastructure. According to Kenya's National Climate Change Response Strategy of 2010, Kenyan, and by extension, Nakuru County health sector is vulnerable to impacts of climate change, which is noticed through increased incidences of vector-borne diseases such as malaria, increased mortality due to climatic hazards, and overstretching of health infrastructure. Some of the health-related climate change impacts that have been noted by stakeholders in Nakuru County include:

- **Floods**: People are swept away and infections like cholera breakout. For example, contamination of water sources in areas due to open defecation and also due to overflowing of sewage into open water led to a cholera outbreak in Kapchawea area in 2017.
- Food scarcity leads to increased incidences of **Malnutrition,** a health hazard.
- Climate change impacts result in high morbidity and mortality due to disease outbreaks, food scarcity, and breakdown of infrastructure including houses.
- Inaccessibility of health services due to the damage of transport infrastructure and health facilities makes the health situation worse.
- **Increased generation of geothermal electricity** as a strategy to produce "green energy." This is a national government initiative implemented through the state-owned power generation agency, Kenya Electricity Generating Company (KENGEN). Although this initiative is commendable, it has had undesirable impacts including increased noise and respiratory diseases from geothermal activities.

To address health issues arising from climate change, stakeholders have been engaged in:

- Health education and conducting medical / health outreaches.
- Intensifying vaccination and immunization efforts as a way of encouraging preventive services.
- Rehabilitation of health facilities services.
- Investing in community health workers, disease surveillance, and research.
- Disease surveillance.

However, more investments are needed in research, and awareness creation is required on the link between climate change and increased disease incidences. Additionally, stakeholders need to enhance networking and collaboration if they are to help the residents of Nakuru County to adapt to the impacts of climate change on their health status. Some of the diseases that are linked to climate change are zoonotic, and the stakeholders, therefore, need to adopt the one health, which encourages collaboration between human health and veterinary medicine practitioners.

1.22.7 Energy Sector

Most of the Nakuru County residents, especially those in rural areas and informal settlements of the rapidly expanding urban centres rely mainly on biomass energy (firewood and charcoal). This is due to poverty and the high cost of electricity that is blamed on unreliable rain, a climatic hazard. This results in increased carbon footprint and respiratory complications. To solve this problem, the national government has increased the generation of geothermal electricity as a strategy to produce "green energy," and it now contributes 30% of Kenyan electricity needs. According to the draft National Climate Change Action Plan 2018 – 2022, the government intends to increase geothermal power production in order to reduce dependence on fossil fuels and biomass energy, that contributes to increased greenhouse gas emissions. In addition, increased geothermal power production will lead to increased green energy production – a strategy that the government intends to employ to reduce electricity cost for manufacturers leading to enhanced capacity to manufacture more goods, and create more employment opportunities. Increased green energy production will contribute to three of the Big Four Agenda – health, manufacturing and employment creation. Most of the power is generated at Hells Gate National Park- a site with important biodiversity conservation that needs to be conserved. This has had some negative implications on biodiversity conservation particularly when Environmental safeguards recommended in the Environmental Management Plans of Project Environmental Impact Assessments are not adequately adhered to.

Interventions promoted by stakeholders in the energy sector include promotion of:

- Improved cooking stoves.
- Use of briquettes.
- Uptake of biogas but there is lack of technical expertise.

There is need to devote more resources in:

- Setting standards to increase the efficiency of cooking stoves.
- Awareness creation.
- Strategies to increase uptake of use of biogas.

Incentive schemes like Clean Development Mechanisms (CDM) and REDD+ can contribute to financing such activities.

Solid waste management and sewage treatment plants generate GHG emissions through the production of methane. However, use of landfills for solid waste management would enable gas methane capture for electricity generation a low carbon development opportunity.

Olkaria IV Geothermal power plant .

Source: https://www.voanews.com/a/kenya-kengen-electric-power/4262323.html

A trader transporting charcoal from the Mau complex at Mathangauta in Njoro, Nakuru County.-

Source: Daily nation, December 19 2013

HTTPS://WWW.NATION.CO.KE/COUNTIES/NYERI/DEFORESTATION-CAUSING-FLOODING/1954190-2118364-S3DMITZ/INDEX.HTML

1.22.8 Mining sector

According to the Nakuru County CIDP for the period 2013-2017, the major on-going mining activities in Nakuru County is that of Diatomite at Kariandusi near Lake Elementaita, harvesting of sand for construction, quarrying, and the harnessing of underground hot water for geothermal power generation. Some of the environmental hazards associated with these activities include unsustainable harvesting of sand and stones causing injuries, death, and sinking of houses. Sand mining and quarrying can be impacted negatively by climate change linked hazards including flooding leading to increased mining costs and increased risk to workers. Mining also leads to habitat destruction, which reduces the adaptive capacities of local communities. As pointed out earlier, geothermal power production has its own environmental changes.

1.22.9 Manufacturing and Trade Sector

Many of the industries found in Nakuru County are agro-based. As such, any climatic hazard that affects crop and animal production will affect the manufacturing sector. There are also many county residents who are dependent on wholesale and retail trade, hotels and restaurants, and the informal sector like the Juakali sector for their livelihoods mainly in Nakuru town and other urban centres. Climate change can also interfere with the availability of raw materials at the sources and through disruption of raw materials to processing plants. Extreme weather-related events impact negatively on the reliability of water and power supply and damage to road infrastructure through droughts rains, and ensuing floods (KEPSA, 2014). Climate change can also impact on the distribution of finished products to markets thus reducing sales. During the stakeholder meeting, it was pointed out that manufacturing results in air, water, and soil pollution. This is associated with health hazards like increased incidences of respiratory diseases. In addition, buildings and other infrastructure are corroded by acid rain, and the ecosystem becomes contaminated. Pollutions can also interfere with livestock and crop production. To minimize these impacts, manufacturing sector players are engaged in tree (indigenous) planting through their CSR initiatives and also improving their water management processes.

To reduce the vulnerability of this sector and other players to the impacts of climate change, industries need to invest more in:

1. **Increased generation of geothermal electricity** as a strategy to produce "green energy." This is a national government initiative implemented through the state-owned power generation agency, KENGEN. Although this initiative is commendable, it has had undesirable impacts including increased noise and respiratory diseases from geothermal activities.
2. Promotion of the green and cleaner energy, awareness on efficient technology and innovation, and green economy.
3. Apply the "Polluter pays principle" and integrated waste management, enforce policies for efficient waste management, enhance technical capacity of the regulating authorities, and promote urban forestry to reduce the impacts of industries on the ecosystem health.

1.23 Factors that affect adaptive capacity in Nakuru County

The RVA found that factors that could support the adaptive capacity of Nakuru in the future include: agricultural and livestock insurance and safety net schemes; improved technology to handle post-harvest losses; mainstreaming and promotion of climate-smart agriculture and livestock development; improved communication systems related to climate-smart agriculture extension and agroecological issues; domestication of the National Water Master Plan to ensure dams, dykes, lakes, and rivers are protected; and improvement in public awareness of climate health risks.

Finally, the RVA found that factors that could challenge the adaptive capacity of Nakuru include: conflict over land-use policies in the agriculture-livestock sectors; increased demand for water in other sectors and an increasing human population; incoherent and insensitive policies to deal with the over-abstraction of water and other water management issues; limited data on the current and future water situation; overexploitation of wildlife habitats due to the absence of laws to support wildlife benefits to the population; loss of indigenous forest knowledge and practices that protected certain areas for community benefits; and insufficient funds to support research on climate-related diseases – especially those in the tropics – hence, increased endemism.

Table 1.23-1 Analysis of priority sectors from the technical workshop

Priority sector for adaptation actions	Sector description	Impact of climate hazards on the sector	Projected impact of climate hazards under BAU scenario
Food and agriculture	• The food and agriculture sector include agriculture, livestock, and fisheries in the context of Nakuru County. • The agricultural sector is the backbone of the county's economy and is important to address food security. • Most of the land in the county is agricultural.	• The effects of climate change in Nakuru County have led to increasing forest fires, decreasing agricultural productivity, increasing urban sprawl, surging of lakes, and increasing migration and conflict as a result of porous borders and the fight for resources. • The temperature increase has been a key cause of the decreased productivity of most agricultural products. Some crops such as wheat have been negatively affected due to meteorological droughts and the associated increase in crop pathogens. • In addition to droughts, flooding also leads to loss of crops and livestock as well as incidence of pests and diseases, locusts, fall armyworm, livestock diseases and East Coast fever.	• Increasing vector-borne, waterborne, and airborne diseases will affect farming in the future. It is anticipated that it will be difficult to continue with farming practices due to various diseases. • Increasing extreme precipitation is likely to cause soil saturation and affect crop productivity generally. • Increasing frequency of drought is likely to lower wheat production and other key crops in the country.
Water supply and sanitation	• Water for agriculture and food production contributes substantially to the county's economy and is highly vulnerable to climate change impacts. Water contributes to producing food, employment (directly and indirectly), foreign exchange (revenue),	• Changing rainfall patterns impacts water supplies negatively due to erratic and unpredictable patterns. This leads to post-harvest losses and affects the cropping calendar -the majority of crops are rain fed.	• If unchecked, the sector could be adversely affected, leading to conflict, rural-urban migration, and crop-livestock farmer conflicts in the search for pasture.

Priority sector for adaptation actions	Sector description	Impact of climate hazards on the sector	Projected impact of climate hazards under BAU scenario
	and provides raw materials for industries.		
Environment, biodiversity and forestry	• The environment, biodiversity and forestry sector include both the forestry, wildlife and tourism sectors in the context of Nakuru County.	• Changing rainfall patterns negatively impacts water levels in the lakes and rivers. This affects the biodiversity of the county relying on these water sources, and therefore the tourism sector. • Droughts, water scarcity and heat waves increase the prevalence of disease and wildlife deaths. • Forest fires lead to loss of biodiversity and habitats.	• It is expected that rainfall will become more erratic and temperature will rise under a BAU scenario, leading to increased negative impacts on forest, river and lake health, and biodiversity levels. • Losses in biodiversity could negatively impact tourism.
Land use planning	• The land sector guides resource use and management in the entire county. Properly planned and integrated land-use plans are very key to community adaptive capacity. This might entail the development of spatial plans to guide resource utilisation and management. In this case, the county and its citizens need to be proactive in	• The effects of climate change in Nakuru County include an increase in forest fires, flooding areas, decreased soil productivity, urban sprawl, surging of lakes, increased migration and conflict as a result of porous borders and fights over resources. Consequently, the sector has increasingly lost its value and resulted in community incapacitation to adapt to the impacts of climate change.	• If no action is taken, increasing challenges such as sinking grounds and even the loss of lives could be seen shortly in Nakuru County.

Priority sector for adaptation actions	Sector description	Impact of climate hazards on the sector	Projected impact of climate hazards under BAU scenario
	planning rather than reactive.		

ADAPTATION AND MITIGATION TARGETS AND ACTION PLAN

1.24 Introduction

This chapter aims to present an overview of the methodology used for action setting, during the Nakuru PCCRA development process. The existing relevant policies and plans, as well as stakeholders, both at the national and county level, that informed these targets have also been outlined. This chapter outlines the strategy that Nakuru County will use to respond to the impacts of climate change to sustain the economic and social well-being of its citizens and their environment. This strategy is based on the amplification of appropriate on-going climate change adaptation and mitigation actions, and the adoption of other potential climate actions. It is aligned to the current governments **Big Four Agenda** (Food and nutrition security, affordable Housing, Enhancing manufacturing and Universal Health Care) and to the **Sustainable Development Goals** (**SDGs**). It also clarifies the stakeholders who need to be engaged in these activities and the resource required and suggests the timelines that specific actions need to be carried out.

1.25 Mitigation Targets and Actions

With regards to mitigation, all local governments (CoM SSA signatories) are required to set a long-term overarching mitigation vision and target, as well as individual targets for each emitting sector identified in the BEI. The mitigation vision and targets for Nakuru County are informed by the BEI, existing County policies and plans, and national mitigation targets. They were formulated and discussed during a participatory workshop in November 2021. The vision and targets were then validated during a validation meeting with the County Government of Nakuru in February 2022.

The vision and targets are therefore aligned with national and local policies and strategies, including Kenya's updated Nationally Determined Contribution (NDC) and Kenya's National Climate Change Action Plan (NCCAP) 2018-2022. The targets meet the requirement of being *at least as ambitious as the unconditional component of the NDC*, set out in the CAP Development Guidebook (Palermo, 2018). In addition, like the national mitigation targets set out in the NDC, the mitigation targets for Nakuru County are set relative to a baseline or 'business as usual' scenario, outlined below.

Mitigation actions (based on existing local and national strategies and plans) to reach the mitigation sectoral targets set for Nakuru County were formulated during a participatory workshop on the 18th of November 2021. Twenty emissions reduction actions, covering the stationary energy, transportation, and waste sectors, were identified by the county to be implemented by 2030. These are outlined below with further details included in **Error! Reference source not found.**.

1.25.1 Overarching climate change mitigation vision and target

The long-term mitigation vision of Nakuru County formulated in line with the national and international policy environment is as follows.

A low carbon county that supports sustainable development by 2030.

In addition to the qualitative vision, Nakuru County has set an overall county-wide target to reduce GHG emissions incorporated in the BEI and projected in the BAU scenario. The county-wide target is as follows:

Nakuru County seeks to reduce GHG emissions by 33% by 2030 compared to the business as usual scenario. Nakuru County commits to achieving a reduction of GHG emissions of at least 6% compared to the BAU scenario from domestic resources, while the remaining 27% is conditional on external support.

This overall target of 33% is equivalent to a reduction of 890 963 tCO_2e compared to the BAU scenario by 2030. If this target is achieved, GHG emissions in Nakuru County will be limited to 1 827 730 tCO_2e in 2030 (**Error! Reference source not found.**). The unconditional target of 6% is equivalent to a reduction of 168 101 tCO_2e compared to the BAU scenario by 2030. If this target is achieved, GHG emissions in Nakuru County will be limited to 2 550 592 tCO_2e in 2030 (**Error! Reference source not found.**5).

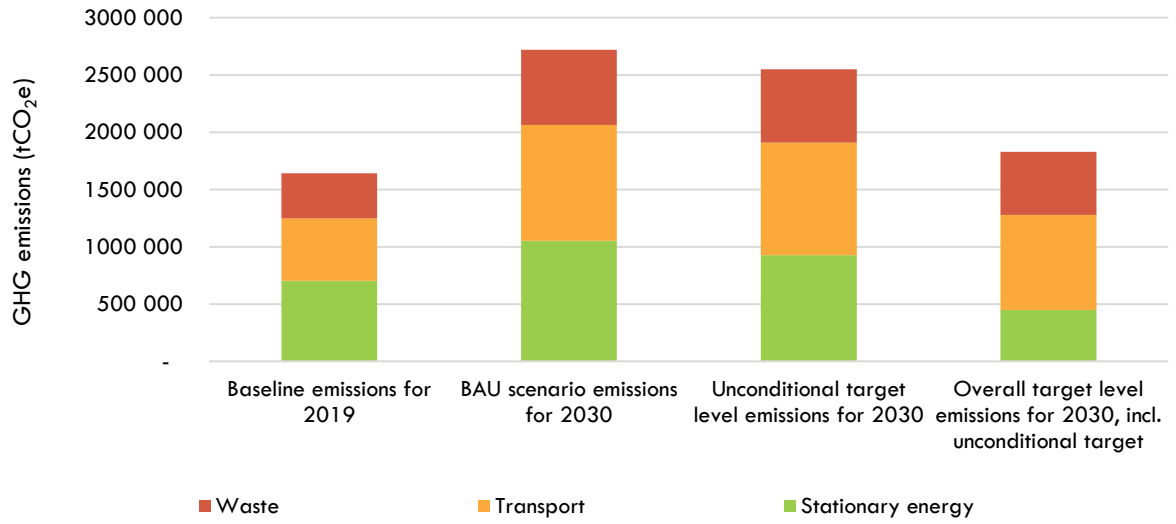

Figure 1.25-1 Baseline emissions for 2019, and emissions under the BAU and target scenarios for Nakuru County in 2030

In addition to this overall target, specific targets have been set for each sector included in the BEI.

1.25.2 Stationary Energy Sector Target

Nakuru County seeks to reduce GHG emissions from the stationary energy sector by 57.5% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the stationary energy sector of at least 12% compared to the BAU scenario from domestic resources, while the remaining 45.5% is conditional on external support.

The targets for the stationary energy sector are aligned with the overall targets for the Energy Demand and Electricity Generation sectors in Kenya's NCCAP 2018-2022, and the proportion of the national NDC target that is unconditional. If the overall target of 57.5% is achieved, it is equivalent to a reduction in GHG emissions of 605 751 tCO_2e compared to the BAU scenario in 2030 (**Error! Reference source not found.**; **Error! Reference source not found.**).

Table 1.25-1 Mitigation targets for the stationary energy sector in Nakuru County

Baseline emissions for 2019 (tCO_2e)	703 860	Rationale
BAU scenario emissions for 2030 (tCO_2e)	1 053 480	Aligned with unconditional and overall targets in Kenya's NDC and NCCAP 2018-2022 for the Energy Demand and Electricity Generation sectors.
Unconditional target reduction off BAU scenario by 2030 (%)	12%	
Unconditional target scenario emissions for 2030 (tCO_2e)	927 062	
Overall target reduction off BAU scenario by 2030 (%)	57.5%	
Overall target scenario emissions for 2030 (tCO_2e)	447 729	

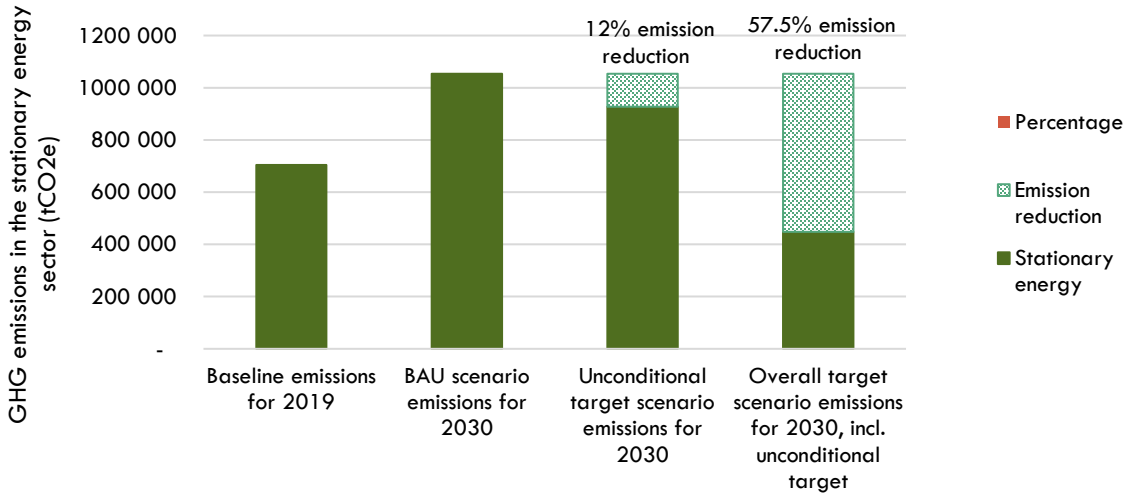

Figure 1.25-2 GHG emissions from the stationary energy sector in Nakuru County in the 2019 baseline, BAU and target scenarios

1.25.3 Stationary Energy Sector Actions

Stationary Energy Target: Nakuru County seeks to reduce GHG emissions from the stationary energy sector by 57.5% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the stationary energy sector of at least 12% compared to the BAU scenario from domestic resources, while the remaining 45.5% is conditional on external support.

Action 1: Install solar photovoltaic (PV) systems on 25 County Government facilities

Under this action, the County Government of Nakuru (CGN) plans to install solar photovoltaic (PV) systems to generate renewable energy on at least 25 of its buildings and facilities. The solar PV systems will supply electricity to these buildings and facilities, complementing or replacing existing electricity sources with sustainable and reliable renewable energy. In this way, the CGN will encourage uptake of solar PV in the County and reduce GHG emissions from other less sustainable energy sources in its buildings and facilities. This action is expected to result in the generation of 215 MWh of renewable energy per year and to reduce GHG emissions by 26.83 tCO_2e per year compared to the BAU scenario.

Action 2: Create incentives to promote the uptake of renewable energy technologies by businesses, households and communities in Nakuru County

This action aims to promote uptake of renewable energy technologies by businesses, households and communities within the County, with a focus on solar PV and bio-energy. This action will include:

- Developing a standard to require that new buildings make use of renewable energy, like rooftop PV, linked to Action 7 relating to the promotion of green buildings
- Streamlining the licensing process for renewable energy sources
- Providing incentives to private sector suppliers of distributed renewable energy (DRE) technologies to supply these to underserved communities.

The action aims to drive the transitions to widespread uptake of DRE in Nakuru County, building on the increased use of solar PV at County Government facilities. This will include encouraging the substitution of at least 1 200 diesel generators with solar PV as a back-up electricity sources for businesses and households, as well as encouraging the uptake of bio-energy for businesses and household. The action will also link to the creation of sensitisation and awareness forums for community members, in synergy with other stationary energy sector actions. This action is expected to result in the generation of 6 192 MWh of renewable energy per year and to reduce GHG emissions by 1 611.07 tCO_2e per year compared to by BAU scenario.

Action 3: Develop and enforce an Energy Act and Regulations on energy efficiency within Nakuru County by 2027

Improving energy efficiency is one of the most cost effective and technically feasible ways to reduce GHG emissions in the stationary energy sector. Under this action, the County Government of Nakuru plans to develop a strong institutional and regulatory framework to improve energy efficiency across the County. This will be done by developing, passing and enforcing an energy policy, an Energy Act and Regulations on energy efficiency at the county level by 2027. This action will be closely aligned with the County Energy

Plan, under development at the time of writing. The regulatory framework will consider energy efficiency across sectors, at household level, in institutional and commercial facilities, and in industrial processes.

Action 4: Undertake regular energy audits on 2 000 buildings and facilities within the county

Under this action, the CGN aims to improve efficient use of electricity within its own facilities, as well as in commercial, institutional and residential buildings. This will be done by undertaking energy audits on 2 000 buildings and facilities within the County in collaboration with the Energy and Petroleum Regulatory Authority (EPRA) and promoting uptake of energy audits for other commercial and institutional buildings. The energy audits will highlight areas where energy efficiency improvements can be made in these buildings, and contribute to behaviour change and the uptake of more energy efficient technologies, for example under Action 5.

Action 5: Install energy efficient lighting in commercial, institutional and residential buildings

Under this action, Nakuru County aims to promote the uptake of energy efficient LED lights and other energy efficient technologies. This will be done through the replacement of conventional lightbulbs with energy-saving LEDs in CGN buildings and facilities to reduce resources spent on energy bills. In addition to this and the previous actions, the targets of improving energy efficiency by 20% in institutional and commercial buildings and facilities and by 15% in households will be further pursued as through awareness-raising and educational activities, including community meetings, exhibitions, and awareness-raising materials. This will be supported through the creation of the energy centres under Action 8. In combination with Actions 3 and 4, this action is expected to result in energy savings of 41 906.74 MWh per year and to reduce GHG emissions by 3 529.3 tCO_2e per year compared to the BAU scenario.

Action 6: Develop small-scale biogas production facilities to promote clean cooking in Nakuru County in partnership with the private sector

Under this action, the County aims to increase use of clean energy for cooking and lighting to 75% of all households in the County by 2030. This includes promoting the uptake of liquid petroleum gas (LPG), biogas and ethanol as cooking fuels. To achieve this, the County Government will support the development of small-scale biogas production facilities to encourage uptake in 25% of households in the county, with a focus on low-income households in rural areas, like Rongai and Kiambogo. This will be done through partnerships with the private sector to make biogas generation equipment more accessible and through the development of innovative mechanisms to provide finance to households and consumers to use these clean energy technologies. In this way, the action aims to improve the affordability and access to clean cooking and lighting for households. The uptake of biogas production and its use as a cooking fuel will be promoted through public awareness raising and community engagement undertaken through the energy centers under Action 8. This action is expected to result in the generation of 67 2017.2 MWh of renewable energy per year and to reduce GHG emissions by 101 015.2 tCO_2e per year compared to the BAU scenario.

In addition to reducing GHG emissions and contributing to the achievement of the stationary energy sector mitigation target, this action will contribute substantially to the reducing of biogenic CO_2 emissions, reducing them by more than one million tones per year.

Action 7: Develop policies and guidelines on green buildings to encourage the use of green building technologies

This action aims to encourage the uptake of green building technologies in new and existing buildings across Nakuru County. These technologies include the use of sustainable building materials and renewable energy, as well as the incorporation of design features that prioritize passive lighting and ventilation and energy efficiency. Uptake of these technologies will be encouraged through the development of policies and guidelines to promote their use, and through partnerships in the building sector, information sharing, exhibitions, and sensitization on the use of green building technologies. In addition, the development of a building code and enforcement of existing regulations and standards, for example relating to solar water heating, will be prioritized. This action will be closely linked to the development of energy efficiency regulations under Action 3.

Action 8: Create 3 energy centres to disseminate information and raise awareness on sustainable energy

Under this action, the County Government of Nakuru aims to establish 3 energy information centres in the County, at the headquarters of selected sub-counties. The energy centres will be used to disseminate information and education materials relating to sustainable energy. For example, these centres will be used to raise awareness about the benefits of energy efficiency and electricity-saving practices, clean cooking solutions, and green building practices. The energy centres can also host exhibitions of sustainable energy technologies. The energy centres will be hubs for the sustainable energy transition in Nakuru County. In particular, the energy centres will be used to run awareness raising and community engagement campaigns relating to clean cooking and lighting solutions to support the uptake of biogas as a clean cooking fuel under Action 6. Similarly, awareness raising through the energy centres will support the uptake of energy efficient technologies and behavior's under Actions 3 and 5, and renewable energy technologies under Action 2.

Table 1.25-2 Action plan for Stationary Energy infrastructure climate proofing

Objective 5: Stationary Energy infrastructure.					
Issue/Problem: Limited climate proofing of infrastructure/loss of human life, injuries, and loss of property.					
Big 4 Pillars: Affordable Housing, Enhanced manufacturing, and Universal Health.					
SDGs: Primarily Goal 13: Climate Action; Goal 3: Good Health and Well-Being for People, Goal 1: No Poverty; Goal 2: Zero Hunger; Goal 7: Affordable and Clean Energy but Goal 9: Industry, Innovation, and Goal 11 Infrastructure; Sustainable Cities and Communities					
Climate Change Activity	**Stakeholders**	**Indicators**	**Priority**	**Timing**	**Budget**
Conduct Strategic Environmental Assessments (SEA) for infrastructural programmes and EIAs Environmental audits for Stationary Energy related projects.	NEMA, County Government, Private sector, CSOs	Number SEA, EIA and EA made	Very urgent	Continuous	
Develop and legislate Climate-proof infrastructure policies and plans informed by using ecosystem-based approaches.	County Government, KFS, NEMA, developers	Proportion of climate proofed infrastructure	Very urgent	Continuous	
Make legislative provisions for adoption of “Stationary energy” technology.	County Government, Ministry of Transport and infrastructure development, private sector	Regulations drafted and passed	Not Urgent	Year 2	
Zero rate solar panels and other energy saving construction materials	National Treasury, County Government	Gazettement of regulations	Urgent	Year 2	
Increase number of Health facilities and equip them.	County Government ,Development partners	Number of health facilities	Very urgent	Year 1	

1.25.4 Transportation Sector Target

Nakuru County seeks to reduce GHG emissions from the transportation sector by 17.6% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the transportation sector of at least 2.7% compared to the BAU scenario from domestic resources, while the remaining 14.9% is conditional on external support.

The overall target for the transportation sector in Nakuru County is aligned with the overall target for the transportation sector in Kenya's NCCAP. The unconditional component of the transportation sector target for Nakuru County is proportionally slightly lower than the unconditional component of Kenya's NDC. This is because the County Government of Nakuru has limited ability to implement actions relating to the national road and standard gauge railway that run through the County which are a major driver of emissions and a critical component of a sustainable transport system, respectively (**Error! Reference source not found.**13; **Error! Reference source not found.**7).

Table 1.25-3Mitigation targets for the transportation sector in Nakuru County

Baseline emissions for 2019 (tCO_2e)	544 749	**Rationale**
BAU scenario emissions for 2030 (tCO_2e)	1 009 769	Aligned with overall targets in NCCAP 2018-2022 for the Transportation sector. Slightly less ambitious than NDC for unconditional target due to limited scope for County Government to influence planning on national roads and railways.
Unconditional target reduction off BAU scenario by 2030 (%)	2.7%	
Unconditional target scenario emissions for 2030 (tCO_2e)	982 505	
Overall target reduction off BAU scenario by 2030 (%)	17.6%	
Overall target scenario emissions for 2030 (tCO_2e)	832 050	

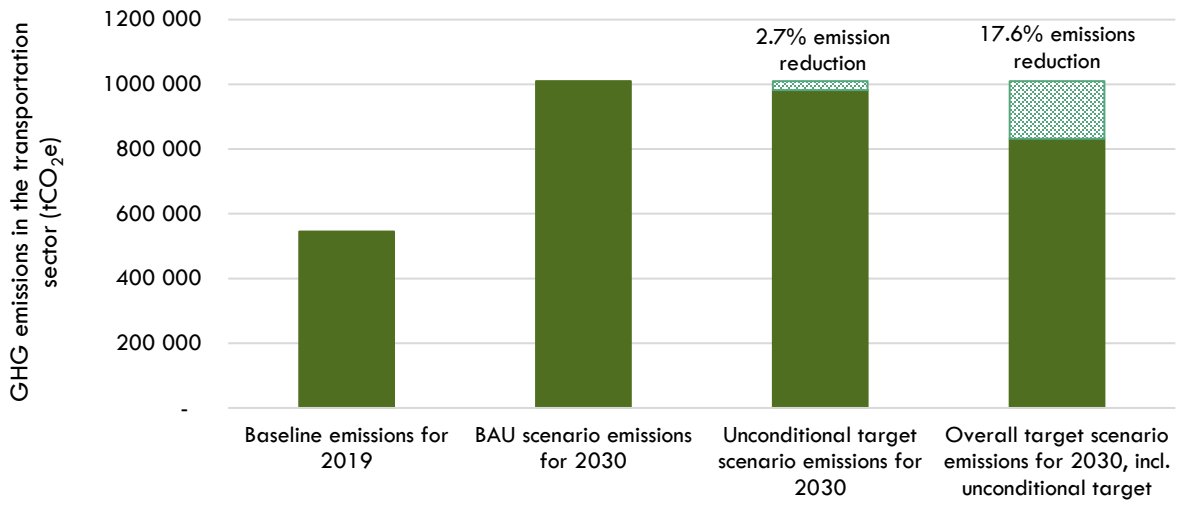

Figure 1.25-3 GHG emissions from the transportation sector in Nakuru County in the 2019 baseline, BAU and target scenarios

1.25.5 Transportation Sector Actions

Transportation Sector Target: Nakuru County seeks to reduce GHG emissions from the transportation sector by 17.6% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the transportation sector of at least 2.7% compared to the BAU scenario from domestic resources, while the remaining 14.9% is conditional on external support.

Action 9: Construct and/or upgrade 10 km of non-motorized transport routes in urban centres

Over the last three years, the Government of Nakuru County have upgraded several non-motorized transport (NMT) corridors in the County to improve facilities for pedestrians and cyclists. This includes the corridor between the A104 (Old Nairobi Road) and Oginga Odinga Avenue to the east of the Nakuru City Centre and Kenyatta Avenue. Under this action, the County aims to expand uptake of NMT by constructing/ upgrading an additional 10 km of NMT pathways in major urban centres in the County. These upgraded pathways will improve access for pedestrians and cyclists, making it safer and easier for people to move around the urban centres without requiring motorized transport. By making walking and cycling safer, this action will reduce congestion and road accidents in the urban centres, as well as reducing GHG emissions from the transport sector. In addition to physically upgrading the NMT corridors, the action will improve the integration of NMT into transport sector development plans for the County to facilitate continued improvement of NMT facilities. This action is expected to result in a reduction in GHG emissions of 31.3 tCO_2e per year compared to the BAU scenario.

Action 10: Create green open spaces in the county's urban centres including NMT corridors

One of the priorities of the Government of Nakuru County is to create green open spaces in the County's urban centres to offer recreational areas for public use and provide a host of benefits in terms of climate resilience and low carbon development. Areas that have been upgraded already include the Nyayo Gardens and the A104 corridor. Under this action, greening and beautification will be expanded to include other well-

used NMT corridors and along major roads, including Geoffrey Kamau Avenue in Nakuru city. The action will involve planting trees and plant beds as well as the maintenance of the green open spaces created. The aim of the action is to encourage adoption of NMT by creating safe and beautiful corridors for pedestrians and cyclists in urban centres.

Action 11: Improve parking facilities on the edge of urban centres to reduce congestion

As a component of developing a low carbon and efficient transport system, this action aims to reduce congestion caused by private vehicles in the urban centres. Four 'park-and-ride' facilities will be developed on the edge of the urban centres, from which drivers can access the center through walking, cycling or public transport. These facilities would be strategically located to link to public transport and NMT routes to effectively reduce congestion in the urban centres. Possible locations include Mai Mahiu Hill, Naivasha or the Barnabas Centre, Nakuru. This action would create the opportunity to further develop the 'park-and-ride' facilities into green hubs by partnering with Nakuru and Naivasha municipalities and businesses to facilitate bicycle hire in the urban centres, for example. The improved parking facilities will be accompanied by financial incentives to reduce private vehicle use in the urban centres. This action is expected to result in a reduction in GHG emissions of 762.95 tCO_2e per year compared to the BAU scenario.

Action 12: Expand the public transport system to include bus mass transport along major transit routes

This action aims to increase the capacity and efficiency of public transport systems by introducing large buses along major routes. Large 30-seater buses will be integrated into the transport system to service the busiest routes, connecting with additional routes serviced by matatus (minibuses), tuk-tuks (three-wheelers), and boda bodas (motorcycles). The large buses will increase the efficiency of transport along these major routes, thereby reducing congestion. The introduction of these buses would be informed by lessons from the bus rapid transport system in Nairobi. It would include the engagement of current transport service providers, including for example tuk tuk drivers, to ensure no one is left behind.

Possible routes for bus mass transport are:

- Between Nakuru city centre and Bahati
- Between Naivasha and the university
- Along Moi Avenue and Kenyatta Avenue, Naivasha

This action is expected to result in a reduction in GHG emissions of 2 400.4 tCO_2e per year compared to the BAU scenario.

Action 13: Import and pilot the use of electric hybrid vehicles in the county fleet

The aim of this action is to initiate uptake of and transition to electric mobility in Nakuru County through piloting electric vehicles for public transport. This action will prioritize the import of electric buses, in alignment with Action 12, to support the integration of low carbon and efficient bus mass transport into the transport system in Nakuru County, in addition to electric minibuses (*matatus*). By replacing petrol or diesel-powered vehicles with electric ones, this action will reduce GHG emissions from the transport sector. To

implement the action, the County Government of Nakuru will partner with the national Ministry of Transport and private sector stakeholders.

As Nakuru County introduces electric vehicles into the fleet, several additional actions to support e-mobility will be considered. These actions are still in the early stages of consideration and will be developed further as local and national support for e-mobility grows and the need for a more comprehensive infrastructural, regulatory and financial framework arises. The actions include:

- Developing infrastructure to support e-mobility, including electric vehicle charging facilities;
- Developing an e-mobility policy and plan for Nakuru County; and
- Creating an enabling environment for the private sector to invest in e-mobility.

Table 1.25-4 Action plan for Transport infrastructure climate proofing

Objective 5: Transport infrastructure.					
Issue/Problem: Limited climate proofing of infrastructure/loss of human life, injuries and loss of property.					
Big 4 Pillars: Affordable Housing , Enhanced manufacturing and Universal Health.					
SDGs: Primarily Goal 13: Climate Action; Goal 3: Good Health and Well-Being for People, Goal 1: No Poverty; Goal 2: Zero Hunger; Goal 7: Affordable and Clean Energy but Goal 9: Industry, Innovation, and Goal 11 Infrastructure; Sustainable Cities and Communities					
Climate Change Activity	**Stakeholders**	**Indicators**	**Priority**	**Timing**	**Budget**
Conduct Strategic Environmental Assessments (SEA) for infrastructural programmes and EIAs Environmental audits for transport projects.	NEMA, County Government, Private sector, CSOs	Number SEA, EIA and EA made	Very urgent	Continuous	
Climate-proof infrastructure using ecosystem-based approaches.	County Government, KFS, NEMA, developers	Proportion of climate proofed infrastructure	Very urgent	Continuous	
Make legislative provisions for “green House” construction technology.	County Government, Ministry of Transport and infrastructure development, private sector	Regulations drafted and passed	Not Urgent	Year 2	
Zero rate solar panels and other energy saving construction materials	National Treasury, County Government	Gazettement of regulations	Urgent	Year 2	
Increase number of Health facilities and equip them.	County Government	Number of health facilities	Very urgent	Year 1	

1.25.6 Waste Sector Target

Nakuru County seeks to reduce GHG emissions from the waste sector by 16.4% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the waste sector of at least 2.2% compared to the BAU scenario from domestic resources, while the remaining 14.2% is conditional on external support.

The unconditional target for the waste sector in Nakuru County is aligned with the targets for the waste sector in Kenya's NCCAP 2018-2022 and NDC. The conditional component of the target, and therefore the overall target, is substantially more ambitious than the national waste sector target in the NCCAP 2018-2022. This is because Nakuru County is pioneering sustainable and low emission waste management systems and the County Government of Nakuru, with external support, is able to be more ambitious than the national waste management targets (**Error! Reference source not found.***4*; **Error! Reference source not found.***8*).

Table 1.25-5 Mitigation targets for the waste sector in Nakuru County

Baseline emissions for 2019 (tCO_2e)	394 258	**Rationale**
BAU scenario emissions for 2030 (tCO_2e)	655 444	Aligned with unconditional targets in NCCAP 2018-2022 and NDC for the Waste sector. More ambitious than NCCAP for overall target, due to proactive sustainable waste management approach of County Government.
Unconditional target reduction off BAU scenario by 2030 (%)	2.2%	
Unconditional target scenario emissions for 2030 (tCO_2e)	641 024	
Overall target reduction off BAU scenario by 2030 (%)	16.4%	
Overall target scenario emissions for 2030 (tCO_2e)	547 951	

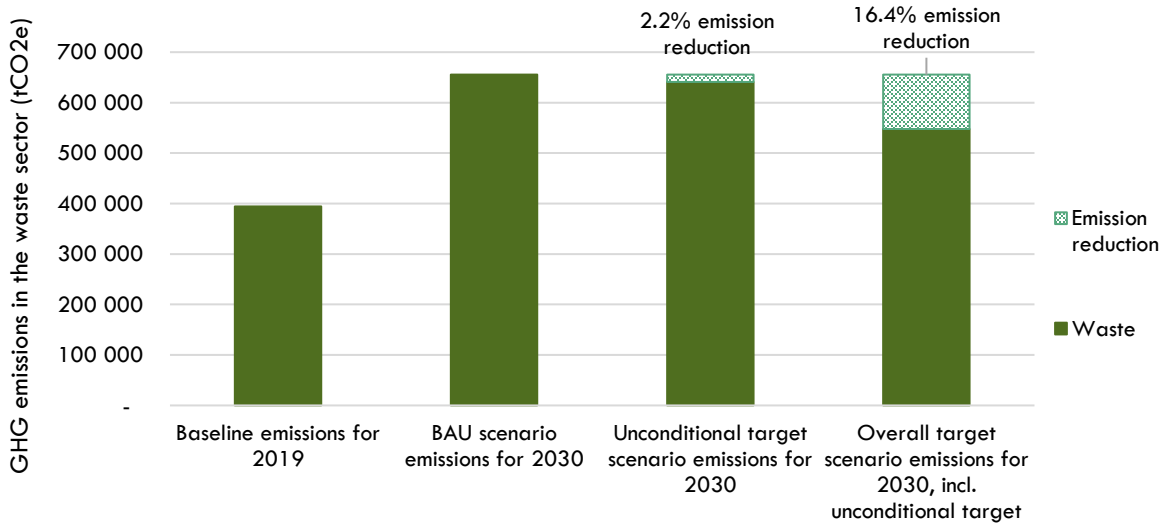

Figure 1.25-4 GHG emissions from the waste sector in Nakuru County in the 2019 baseline, BAU and target scenarios

1.25.7 Waste Sector Actions

Waste Sector Target: Nakuru County seeks to reduce GHG emissions from the waste sector by 16.4% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the waste sector of at least 2.2% compared to the BAU scenario from domestic resources, while the remaining 14.2% is conditional on external support.

Action 14: Upgrade three existing waste disposal sites in Nakuru County by improving access roads, fencing and zoning of the tipping areas

This action aims to improve the effectiveness of waste management in Nakuru County by improving facilities and the organization of three waste disposal sites in the County. The targeted waste disposal sites are Gioto (to the northwest of Nakuru city centre), Naivasha, and Mai Mahiu. The upgrades will include:

i) improving access roads into the waste disposal sites, to enable waste deliveries and recycling collectors to more easily access tipping areas and prevent disorganised dumping;
ii) fencing the waste disposal sites to reduce movement of waste into the surrounding environment, and therefore reduce pollution; and
iii) zoning tipping areas to enable more effective waste sorting and recovery as well as zoned management of the disposal sites.

By improving organization of the disposal sites, this action will enable better management and more effective waste recovery, thereby reducing emissions from the waste sector. The upgrade of Gioto waste disposal site near the centre of Nakuru city is already underway, including improved access roads, fencing and tipping zones. This action is expected to result in a reduction in GHG emissions of 24 074 tCO_2e per year compared to the BAU scenario.

Action 15: Develop a sanitary landfill and waste recovery facility at Gilgil

Under this action, the County Government of Nakuru aims to establish the County's first sanitary landfill/waste recovery site in Gilgil, a town between Nakuru and Naivasha. The County will aim to mobilise resources for the development of the landfill and waste recovery site in partnership with the private sector and national government. The sound environmental management of waste through a sanitary landfill will reduce GHG emissions and the production of Unintentionally Produced Persistent Organic Pollutants (UPOPs) from the waste sector by reducing open burning and dumping of waste and enabling waste recovery and methane capture. In addition, centralising waste management at the landfill site will enable the creation of economic opportunities related to the recovery, recycling and reuse of materials. This action is expected to result in a reduction in GHG emissions of 21 115 tCO_2e per year compared to the BAU scenario.

Action 16: Establish a resource recovery centre in Nakuru County to increase waste recovery

The aim of this action is to reduce the amount of solid waste ending up in disposal sites or subject to open burning by increasing waste recovery. This action will involve empowering Nakuru Solid Waste Management Association (NASWAMA) by establishing and equipping a resource recovery centre within the County. The resource recovery centre will be integrated into the County's solid waste management system, including the collection of solid waste and existing disposal sites or the new sanitary landfill. In synergy with the other actions in the waste sector, this action will aim to reduce emissions from the waste sector by

reducing the amount of waste burned, dumped and sent to landfill. This action is expected to result in a reduction of GHG emissions of 60 457 tCO_2e per year compared to the BAU scenario.

Action 17: Organise annual public awareness raising campaigns and incentives to increase household level waste segregation

Increased waste segregation at household level is an important component of increasing waste segregation in Nakuru County. In partnership with private waste collection services and other waste sector stakeholders, this action aims to increase awareness of the benefits of waste segregation at household level and provide incentives (for example reduced costs for waste collection) for households to separate their waste. Annual awareness-raising campaigns will be undertaken in the County through local media channels to provide information on the benefits of waste segregation and how to do it. This action is expected to result in a reduction in GHG emissions of 55 431 tCO_2e per year compared to the BAU scenario.

Action 18: Increase briquette production from organic waste and faecal sludge to contribute to waste recovery

This action aims to increase resource recovery through waste-to-energy conversion. This will involve the production of 25 tonnes of briquettes per month from the NAWASCO waste water treatment plant, in partnership with NAWASSCOAL. The briquettes will be produced by reusing organic waste and faecal sludge. They can be used as a cleaner and more energy-dense biomass fuel, providing an alternative energy for local industry and businesses.

Action 19: Increase the extent of the sewer network and the capacity of the wastewater treatment infrastructure to service 60% of the population of Nakuru County

Coverage of the sewer network and centralised wastewater treatment in Nakuru County is currently estimated at 27% (NAWASSCO, 2021). This action aims to increase coverage to 60% of the population by increasing the capacity of the wastewater treatment plants as well as the sewerage network. The Njoro Sewerage Treatment Plant (to the west of the Nakuru City Centre) currently has a capacity of 9,600 m^3 per day, which is ~45% utilised. The sewer network extends approximately 200 km across Nakuru town. Increasing the extent of the sewer network and capacity of the sewerage treatment plant would reduce GHG emissions from untreated wastewater and increase the efficiency of Nakuru's wastewater treatment system. This action is expected to result in a reduction in GHG emissions of 13 302.32 tCO_2e per year compared to the BAU scenario.

Action 20: Strengthen enforcement of existing laws and regulations on waste management in Nakuru County

This action will aim to strengthen enforcement and improve effectiveness of the waste management laws and regulations in the Nakuru County Waste Management Act of 2021, the Nakuru County Water and Sanitation Act of 2021 and the Nakuru County Climate Change Act of 2021. This will be done by building capacity within the County Government of Nakuru on the existing laws, policies and regulations, and their enforcement. In addition, the County will seek to enhance partnerships and collaboration with other waste sector stakeholders to improve compliance with the laws and regulations.

Table 1.25-6. Action plan for Green Energy production and use.

Objective 4: Green Energy production and use.					
Issue/Problem: Climate change impacts/ High dependency on biomass, hydro power and fossil energy/ Unsuitable solid and liquid waste disposal/lack of policy framework to support adoption of clean energy/overreliance on road transport.					
Big 4 Pillar: Enhanced manufacturing, Universal Health Care and Affordable Housing.					
SDGs: Primarily Goal 7: Affordable and Clean Energy but also Goal 8: Decent Work and Economic Growth, Goal 9: Industry, Innovation, and Infrastructure; Goal 3: Good Health and Well-Being for People; Goal 10: reducing Inequalities and Goal 11: Sustainable Cities and Communities					
Climate Change activity	**Stakeholders**	**Indicators**	**Priority**	**Timing**	**Budget**
Support clean electric power generation.	KENGEN, County Government, GDC	Amount of clean power generated	Urgent	Continuous	
Monitor environmental impacts of geothermal power generation.	KENGEN, NEMA, KWS, Research Institutions	Monitoring reports	Urgent	Continuous	
Introduce incentives for clean energy adoption e.g. zero rate tax on solar panels, VAT and exercise exemption on cooking stoves and other appliances.	County Government, National Treasury	Number of households and institutions using clean energy	Urgent	Year 3	
Adoption of renewable energy	County Government, CSOs, private sector	Number of households and institutions using renewable energy	Urgent	Continuous	
Set standards to improve and promote clean cook stoves	County Government,	Reports. Standards	Urgent	Year 2	

	CSOs, private sector				
Diversify alternative energy sources.	County Government, CSOs, private sector	Reports. Number alternative energy sources used	Urgent	Continuous	
Construct climate-proofed sanitary landfills /wastw recovery facility with methane capture technology for solid waste disposal in Nakuru City and other major towns.	County Government, NEMA, CSOs, Development partners	KWH generated Tonnes of solid waste disposed. Reduction in solid waste related health complications.	Urgent	Years 3 and 4	
Promote improved cook stoves.	KFs, CSOs, County Government	Proportion of households and institutions using cook	Urgent	Continuous	
Promote the use of Clean energy eg biogas.	National Government, County Government	Proportion of residents using clean energy	Very Urgent	Continuous	
Create incentives for car-pooling and use of alternative means of transport e.g. bicycles, public transport, train.	County Government, Ministry of Transport, Private sector	Level of use of alternative transport and car-pooling	Not urgent	Year 4	
Promote establishment of Climate change, energy innovation hubs.	County Government, Ministry of	Number of ICT hubs established.	Urgent	Year 2	

	Information, Communication and Technology	Average distance to ICT hub.			
Introduce tax incentives for ICT products.	National Government, Council of Governors, KRA	Number of ICT products with tax exceptions. Level of ICT uptake in county	Not urgent	Year 2	
Provide essential services/facilities in satellite towns to decongest the CBD.	County Government,	Number of satellite towns with essential services	Not Urgent	Continuous	
Improve road network to reduce traffic jam and to connect SGR.	County Government, KENHA,	Km of roads constructed	Urgent	Continuous	

1.26 Mitigation Action and Target cost benefit Analysis

Table 1.26-1 Co-benefits, trade-offs and synergies associated with actions to reduce GHG emissions in Nakuru County

MITIGATION ACTIONS						
					ADDRESSES ANOTHER CAP PILLAR?	
Nº	**ACTION TITLE**	**CO-BENEFITS**	**TRADE-OFFS**	**SYNERGIES OF ACTION WITH OTHER ACTIONS AND OTHER POLICIES / PLANS**	**ADAPTATION**	**ACCESS TO ENERGY**
Stationary Energy Target		Nakuru County seeks to reduce GHG emissions from the stationary energy sector by 57.5% by 2030 compared to the business as usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the stationary energy sector of at least 12% compared to the BAU scenario from domestic resources, while the remaining 45.5% is conditional on external support.				
1	Install solar photovoltaic (PV) systems on 25 County Government facilities	• Reduced energy costs for CGN • More reliable electricity supply for government facilities • Reduced dependence on centralised electricity infrastructure	• High installation costs of RE • Potential for increasing taxes	• Aligns with public health priorities relating to air quality • Alignment with Action 2 under the Stationary Energy sector and the County's priorities for sustainable energy access and climate change adaptation	YES	YES
2	e incentives to promote the uptake of renewable energy technologies by businesses, households and communities in Nakuru County	• Increase skilled job creation and development of technical capacity • Improved air quality • Reduced noise pollution from generators • Reduced risk of respiratory diseases • Reduced dependence on centralised electricity infrastructure	• High installation costs of RE • Potential for increasing taxes	• Alignment with Sustainable Development Goals (SDGs) 7 and 8 • Promotion of bio-energy use links to efforts to promote climate-smart agriculture • Aligns with public health priorities relating to air quality • Aligns with priorities relating to increasing tree cover and ecosystem protection • Alignment with Action 1 to promote renewable energy and Action 6 to increase biogas production under the stationary energy sector, as well as and the County's priorities for sustainable	YES	YES

				energy access and climate change adaptation		
3	Develop and enforce an Energy Act and Regulations on energy efficiency within Nakuru County by 2027	• Reduce energy costs for households, businesses and institutions • Increase knowledge of energy efficiency	Challenges in monitoring progress on energy efficiency	• Alignment with SDGs 7, 9 and 11 • Alignment with Action 4 and 5 to increase energy efficiency, and Action 7 to promote green building principles under the Stationary Energy sector and the County's priorities for sustainable energy access	NO	YES
4	Undertake regular energy audits on 2000 buildings and facilities within the County	• Reduce energy costs for businesses and institutions • Increase employment opportunities through energy audits • Increase knowledge of sustainable energy and energy efficiency	• Challenges in monitoring and data availability • Requirement for ongoing maintenance • Potential rebound effect of increasing electricity use	• Alignment with SDGs 7 and 9 • Alignment with Action 3 and Action 5 to increase energy efficiency in the Stationary Energy sector, and the County's priorities for sustainable energy access	NO	NO
5	Install energy-efficient lighting in commercial, institutional and residential buildings	• Reduce energy costs for households, businesses and institutions • Increase uptake of cleaner energy technologies-	• Challenges in monitoring progress in energy efficiency • Requirement for ongoing maintenance • Uptake to date has been slow • Potential rebound effect of increasing electricity use	• Alignment with SDG 7, 8 and 9 • Alignment with Action 3 and Action 4 to increase energy efficiency, and Action 8 to raise public awareness under the Stationary Energy sector, and the County's priorities for sustainable energy access	NO	YES
6	Develop small-scale biogas production facilities to promote clean cooking in Nakuru County in partnership with the private sector	• Improved air quality • Reduced risk of respiratory diseases • Reduced risk of fires • Reduced energy costs • Reduce deforestation and dependence on wood fuel • Reduce time spent by women and children gathering fuel wood	• Change in livelihood activities and social interactions of women collecting fuel wood • Potential increasing cost of living, where households go from gathering fuel wood to buying fuel	• Alignment with SDGs 3, 7 and 15 • Alignment with public health priorities relating to air quality • Alignment with priorities in the County Integrated Development Plan (CIDP) • Alignment with agricultural sector priorities (biogas production) • Alignment with Action 2 under the Stationary Energy sector and the County's priorities for sustainable energy access and climate change adaptation	YES	YES

7	Develop policies and guidelines on green buildings to encourage the use of green building technologies	• Reduced energy costs • Contributes to creating a clean and safe environment • Improved capacity for sustainable design • Improved aesthetic value of built environment	High costs of construction and retrofitting	• Alignment with SDG 9 • Alignment with the Environmental Management and Coordination Act No. 8 of 1999 (EMCA) and priorities of the National Environmental Management Authority (NEMA) • Alignment with Action 3 to strengthen regulations for energy efficiency under the Stationary Energy Sector	YES	NO
8	Create 3 energy centres to disseminate information and raise awareness on sustainable energy	• Increased knowledge of sustainable energy among communities • Reduced environmental pollution • Improved safety of humans and wildlife	Influencing attitudes of communities may be challenging	• Alignment with SDG 7 • Alignment with public education priorities and access to information and computer technologies (ICT) • Alignment with Actions 2, 5 and 6 in the Stationary Energy sector and the County's priorities for sustainable energy access	YES	YES
Transport Target		Nakuru County seeks to reduce GHG emissions from the transportation sector by 17.6% by 2030 compared to the business as usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the transportation sector of at least 2.7% compared to the BAU scenario from domestic resources, while the remaining 14.9% is conditional on external support.				
9	Construct and/or upgrade 10 km of non-motorised transport routes in urban centres	• Improved health and physical well-being of communities • Reduced air and noise pollution • Reduced risk of traffic accidents • Job created for construction and maintenance of facilities • Reduced cost of transport	• Possible increase in littering • Possible increase in insecurity, for example mugging • Reduced income and employment for public transport operators, for example boda boda drivers • Reduced revenue for County for example through parking fees	• Alignment with SDGs 3, 9 and 11 • Alignment with Public Health Priorities • Alignment with other actions in the Transport Sector, including Action 10 to create green open spaces and Action 11 to improve parking facilities	YES	NO
10	Create green open spaces in the County's urban centres, including NMT corridors	• Increased aesthetic value of urban spaces • Reduced air pollution • Reduced urban heat island effect	• Planting trees may increase space limitations along road verges • High maintenance costs • Possibility of malicious damage to greened spaces	• Alignment with SDG 11 • Alignment with national and County-level target of achieving 10% tree cover • Alignment with CIDP • Alignment with other Transport sector actions, including Action 9 to construct and improve NMT corridors	YES	NO

		• Improved urban ecosystems and ecological processes				
11	Improve parking facilities on the edge of urban centres to reduce congestion	• Reduce congestion and air pollution • Improve road safety for vehicles and pedestrians • Create opportunities for small businesses related to the green hub • Improved integration in the transport sector	Expense of developing or improving parking facilities	• Alignment with SDGs 3 and 11 • Alignment with the CIDP, Nakuru County Climate Change Action Plan, Integrated Sustainable Urban Development Plan • Alignment with other actions in the Transport sector, including Action 9 to upgrade NMT corridors and Action 12 to expand of the public transport system	NO	NO
12	Expand the public transport system to include bus mass transport along major transit routes.	• Reduce congestion and air pollution • Improved integration in the transport sector • Improve road safety for vehicles and pedestrians • Potentially reduced cost of transport	• Expense of investing in buses and related infrastructure • Political difficulty of replacing matatus and other existing transport modes • Possibility of job losses for existing transport operators	• Alignment with SDGs 3 and 11 • Alignment with national and County-level priorities in the transport sector, including the NDC and NCCAP • Alignment with other actions in the transport sector, including Action 11 to provide park and ride facilities and Action 13 to import and pilot electric hybrid vehicles	NO	NO
13	Import and pilot the use of electric hybrid vehicles in the County fleet	• Source of revenue for County Government • Improved partnerships between national and county governments and with private sector actors	Capital-intensity of importing vehicles	• Alignment with Kenya's NCCAP 2018-2022 and Vision 2030 • Alignment with other actions in the transport sector, including expansion of the public transport system to include bus mass transport	NO	NO
Waste Target		**Nakuru County seeks to reduce GHG emissions from the waste sector by 16.4% by 2030 compared to the business as usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the waste sector of at least 2.2% compared to the BAU scenario from domestic resources, while the remaining 14.2% is conditional on external support.**				
14	Upgrade three existing municipal waste disposal sites in Nakuru County by improving access roads, fencing and	• Employment opportunities created for waste recovery • Improved environmental health • Improved water quality • Improved aesthetic value of environment	• Costs of upgrading waste disposal facilities • Negative impacts of waste disposal practices on ecosystems	• Alignment with SDG 3 and 11 • Alignment with the Article 69 of the Constitution of Kenya • Alignment with priorities in the CIDP	YES	NO

	zoning of the tipping areas					
15	Develop a sanitary landfill and waste recovery facility at Gilgil	• Reduced land pollution from dumping • Reduced air pollution from open burning • Reduced water pollution from leeching • Employment creation for waste recovery and landfill management • Potential for energy generation from methane	• High cost of developing sanitary landfill • Need to rehabilitate land before any other use • Political challenges	• Alignment with SDGs 3, 9 and 11 • Alignment with the CIDP • Alignment with Kenya's National Solid Waste Management Strategy and Nakuru County's Waste Management priorities • Alignment with other actions in the Waste sector, including Action 16 and 17 to improve sorting and recovery of waste	NO	NO
16	Establish a resource recovery centre in Nakuru County to increase waste recovery	• Economic opportunities created for valorisation of waste and circular economy activities • Increased lifespan of waste disposal sites	Cost of developing a waste recovery centre	• Alignment with SDG 8 and 12 • Alignment with Kenya's National Solid Waste Management Strategy • Alignment with Nakuru County Waste Management Act of 2021 and Waste Management Regulation of 2006 • Alignment with other actions in the Waste sector to improve waste recovery, including Action 17	NO	NO
17	Organise annual public awareness raising campaigns and incentives to increase household level waste segregation	• Economic opportunities created for valorisation of waste and circular economy activities • Increased lifespan of waste disposal sites • Changed public perception towards waste as a resource	Need to change behavioural and cultural practices	• Alignment with SDG 12 • Alignment with Kenya's National Solid Waste Management Strategy • Alignment with Nakuru County Waste Management Act of 2021 and Waste Management Regulation of 2006 • Alignment with other actions in the Waste sector to improve waste recovery, including Action 16	NO	NO
18	Increase briquette production from organic waste and faecal sludge to contribute to waste recovery	• Increased availability of briquettes as a clean energy source • Increased revenue for utility	Stigma relating to use of human waste for energy	• Alignment with SDG 12 • Alignment with Nakuru County Waste Management Act of 2021 and Waste Management Regulation of 2006 • Alignment with other actions in the Waste sector to improve waste recovery including Action 16	NO	YES

19	Increase the extent of the sewer network and the capacity of the wastewater treatment infrastructure to service 60% of the population of Nakuru County	● Improved environmental health and reduced risk of waterborne diseases ● Increased availability of recycled water, for example for irrigation and food production	Costs associated with upgrading wastewater treatment plants and expanding the sewer network	● Alignment with SDGs 3, 6 and 9 ● Alignment with Kenya's Water Act of 2016 ● Alignment with Nakuru County Sanitation Policy and public health priorities ● Alignment with other actions in the Waste sector, including Action 18 to increase waste recovery and actions under the Adaptation Pillar to improve sanitation	YES	NO
20	Strengthen enforcement of existing laws and regulations on waste management in Nakuru County	● Improved environmental health and reduced health risks ● Cleaner environment ● Improved compliance and reduced number of convictions	● Public resistance to enforcement of regulations ● Political resistance	● Alignment with SDG 3, 11 and 12 ● Alignment with Kenya's EMCA of 1999 ● Alignment with Nakuru County's Waste Management Act of 2021; Climate Change Act of 2021; and Water and Sanitation Act of 2021	YES	NO

For further detail on how the actions were set for the Mitigation pillar for the Nakuru County CAP, please refer to the Nakuru County Mitigation Action Report.

1.27 Adaptation Targets and Actions

Adaptation actions (based on existing national and county-level strategies and plans) were developed during through a participatory approach by participants from various sectors and departments within the Nakuru County Government, non-governmental organisations, and universities, most of whom were involved since the beginning of the PCRA development process. Actions were formulated to contribute directly to achieving the sectoral targets set during the previous step of the process. After the workshop, a diverse group of high-level representatives from relevant sector departments in the Nakuru County Government were engaged in a validation of the plan.

Stakeholders identified and described 15 adaptation actions (three per sectoral target) that the county needs to implement to contribute to achieving the sector-specific targets previously identified. Each of the actions are aligned with Kenya's NCCAP 2018-2022, the NCCCAP 2018-2022, as well as several sector-specific plans. The actions are outlined below, with further detail included in Table 12.

Following the completion and validation of the Nakuru County RVA, consultations with stakeholders were held to prioritize sectors to focus on, set an overarching adaptation vision, and sector-specific targets for the key sectors. The consultations took the form of a participatory multistakeholder workshop.

Prior to setting adaptation targets for key sectors, it was necessary to identify the sectors that are considered the highest priority and key for setting targets and adaptation actions, to be most effective in building resilience to the impacts of climate change. The sectors identified through the development of the RVA as being the most affected by current and future climate hazards are food and agriculture; water supply and sanitation; environment, biodiversity, and forestry; and land use planning. Combining the results of the RVA, NCCCAP 2018–2022 and the National Adaptation Plan (2015), and considering the existing sectors in Nakuru County, stakeholders agreed that the sectors that should be prioritised to set targets and adaptation actions for are:

- Agriculture, livestock and fisheries;
- Water;
- Forestry; and
- Tourism.

1.28 Overarching climate change adaptation vision

The overarching adaptation vision for Nakuru County (base year 2021) was adopted to read as follows:

A climate-resilient county with sustainable ecosystems and livelihoods by the year 2030.

This vision, which was formulated by workshop participants and subsequently validated by high-level representatives of the Nakuru County Government, represents the desired future state of Nakuru County and its local government with respect to resilience to the impacts of climate change. It is aligned with the intention of Kenya's NDC (2020) and NAP (2015), as well as the NCCCAP 2018–2022. The base year for implementation of this adaptation vision is 2021 and the year by which to achieve this vision is 2030, aligned with Kenya's NDC target date.

1.29 Adaptation Sector Targets

To support the achievement of the overarching adaptation vision, Nakuru County developed specific targets for each of the four key sectors prioritised previously in the adaptation planning process. The sectoral targets developed by the county are as follows:

1.29.1 Agriculture, livestock, and fisheries sector target

By 2030, ensure that at least 70% of crop, livestock and fishery farmers and other stakeholders are using climate-resilient practices including water-harvesting techniques and nature-based enterprises (e.g. agroforestry)

This target is well aligned with the targets for the agriculture sector in Kenya's updated NDC (2020), specifically: *"Build resilience of the agriculture systems through sustainable management of land, soil, water and other natural resources"* and *"Mainstream climate-smart agriculture towards increased productivity"*. It is also aligned with the target *"Increase food, nutrition, and income security through enhanced productivity and resilience of agricultural systems and value chains"* in the NCCAP Volume II, ATAR (2018). Finally, this target is aligned with the goal of "*Enhanced food security*" in the NCCCAP (2018).

1.29.2 Agriculture, livestock, and fisheries sector actions

Agriculture, livestock and fisheries sector target: By 2030, ensure that at least 70% of crop, livestock and fishery farmers and other stakeholders are using climate-resilient practices including water-harvesting techniques and nature-based enterprises (e.g. agroforestry).

Action 1: Desilt 60 water pans and construct 25 new water pans in Naivasha and Rongai sub counties by 2030 to promote water harvesting, conservation, and utilization for domestic and agricultural use in Nakuru County.

Currently, there are 95 private and public water pans in Nakuru County, 60 of which require desilting in order to function effectively. In addition, 25 more water pans with a volume of 30,000 m^3 should be installed in Naivasha and Rongai subcounties by 2030. This action will promote water harvesting, water storage and efficient utilisation for domestic and agricultural use. It will help to ensure that at least 70% of farmers are practising water-harvesting techniques, thereby increasing food security. This action addresses the climate hazards of drought, flash/surface floods, river floods and rainstorms.

Action 2: Train 70% of smallholder farmers and pastoralists in Nakuru County on how to adopt appropriate technologies in fodder production and animal husbandry by 2030.

This action aims to build technical capacity of smallholder farmers and pastoralists in Nakuru County to adopt and implement appropriate technologies in fodder production, such as hydroponics; breeding and selection technologies, and animal husbandry, such as AI services and embryo transplants by 2030. Farmers should be trained on feed conservatism, and drought-tolerant pastures and fodder should be introduced. This action will ensure that at least 70% of farmers are adopting these technologies. This action addresses the climate hazards of drought and disease.

Action 3: Train 70% of fish farmers in Nakuru County on how to adopt sustainable modern fish farming technologies by 2030.

Climate change has resulted in drought, forcing a shift in fish farming in Nakuru County from traditional fish farming to climate smart methods. Aquaponic systems use 90% less water than traditional farming methods. The action will empower youth, women and other vulnerable groups to adopt sustainable modern fish farming technologies such as recirculating aquaculture systems and adoption of aquaponic systems in Nakuru County by 2030. In addition, there should be distribution of fingerlings, fish feeds and liners for demos. This action will ensure that 70% of fish farmers are adopting and practising these systems for water conservation and food security. This action addresses the climate hazard of drought.

Table 1.29-1 Climate change Action plan for food security in Nakuru County

Objective 1: Enhanced Food Security						
Issue/Problem: Unpredictable weather patterns/extreme weather events/food scarcity/increased disease incidences/loss of climate resilient crop and animal breeds/poverty/environmental degradation						
Big 4 Pillar: Food and Nutrition security, Enhanced manufacturing and Universal Health Care						
SDG : Goal 1: No Poverty; Goal 2: Zero Hunger; Goal 3: Good Health and Well-Being for People; Goal 5: Gender Equality; Goal 8: Decent Work and Economic Growth; Goal 9: Industry, Innovation, and Infrastructure; Goal 10: Reducing Inequalities; Goal 13: Climate Action; and Goal 15: Life on Land						
Sub-sector	**Climate change Activity**	**Stakeholders**	**Indicators**	**Priority**	**Timeframe**	**Budget**
Crop production	Diversification of crops and adoption of kitchen garden	County Government, Extension officers , Research institutions e.g. KARLO and Egerton University, Community, CSOs Farmers	Level of diversification Number of residents with kitchen gardens.	Urgent	Continuous	
	Promote production of drought-resistant varieties	County Government, Extension officers , Research institutions e.g. KARLO and Egerton University, Farmers	Number of farmers engaged.	Urgent	Continuous	
	Promote use of organic farming	County Government, Extension officers , Research institutions e.g. KARLO and Egerton University, CSOs	Number of farmers trained and participating.	Urgent	Continuous	

		Farmers				
	Promote appropriate irrigation techniques such as drip irrigation	County Government, Extension officers , Research institutions e.g. KARLO and Egerton University, CSOs, WRA Farmers	Number of farmers using drip irrigation and other appropriate technologies.	Urgent	Continuous	
	Promote innovative water harvesting techniques	County Government, Extension officers CSOs, WRA Farmers	Number of Earth dams excavated and in use for irrigation.	Urgent	Continuous	
	Invest in research on crop varieties, disease and pests	County Government, Extension officers , Research institutions e.g. KARLO and Egerton University, CSOs Farmers	Percentage of budget used for research. Number of research initiatives supported.	Urgent	Continuous	
	Promote value addition of harvested crops	County Government, Extension officers , CSOs, farmers	Number of value addition projects	Urgent	Continuous	
	Invest in early warning systems to determining cropping cycles and	County Government, Extension officers , Met Department, CSOs, Research Institutions, Farmers	Early warning infrastructure in place and working	Very Urgent	Year 1	

	planting times.					
	Promote indigenous knowledge in crop production	County Government, Extension officers , Research institutions , CSOs, Farmers	Indigenous knowledge documented. Orphaned crops seeds available	Urgent	Continuous	
	Enhanced adoption of certified seeds	County Government, Extension officers , Research institutions , KEPHIS, CSOs, Farmers	Number of farmers using certified seeds	Urgent	Continuous	
	Engaging youth, women, and other vulnerable groups in appropriate commercial farming technologies	County Government, Extension officers , Research institutions , CSOs, Farmers	Number of vulnerable groups supported	Urgent	Continuous	
	Awareness creation and information sharing	County Government, Extension officers , Research institutions , CSOs, Farmers	Number of awareness meetings held. Level of awareness of climate change impacts on farming	Urgent	Continuous	
	Promote agroforestry activities	County Government, Extension officers , KFS, KEFRI, Farmers	Number of farmers practicing agroforestry	Urgent	Continuous	

	Promote water harvesting for irrigated agriculture and conservation techniques	County Government, Extension officers Farmers	Acreage under irrigated agriculture	Urgent	Continuous	
	Promote uptake of	County Government, Insurance companies, Banks and farmers	Number of farmers with insurance covers for crops	Very urgent	Continuous	
Livestock production	Promoting zero grazing	KALRO, Farmers, Veterinary Officers, Private feed distributors, County Government	Number of farmers practicing zero grazing Amount of milk/cow produced	Urgent	Continuous	
	Adoption of appropriate livestock breeds	KALRO, Farmers, Veterinary Officers, Private feed and livestock drugs distributors, County Government	Number of farmers with improved breeds	Urgent	Year 2 and 3	
	Investing in production and storage of drought-resistant fodder crops	KALRO, Farmers, Veterinary Officers, Private feed and livestock drugs distributors, County Government, CSOs	Amount of drought resistant fodder produced	Urgent	Continuous	
	Promote water harvesting	Farmers, Veterinary Officers, Water Provision Service Providers,	Number of earth dams excavated Number of people engaged in water harvesting in their farms	Very Urgent	Continuous	

	and conservation techniques	Research Institutions, WRA County Government, CSOs				
	Promote timely culling and destocking	Farmers, Veterinary Officers, Health Department, County Government	Report on culling and stocking levels	Urgent	Continuous – on furcating drought	
	Enhancement of appropriate technologies in livestock production husbandly	Farmers, Health Department, Private feed and livestock drugs distributors, County Government, CSOs	Report on technology uptake Change in livestock production	Urgent	Continuous	
	Sensitisation, awareness creation and capacity enhancement	Farmers, Veterinary Officers, County Government, CSOs	Number of sensitization/ awareness/ capacity building meetings/workshops	Urgent	Continuous	
	Introduce alternative livelihood options	Farmers, Veterinary Officers, County Government, CSOs	Diversity of livelihood options	Urgent	Continuous	
	Invest in value addition and research	Farmers, Veterinary Officers, County Government, CSOs	Change in farmer incomes due to value addition Number of ongoing research projects	Urgent	Continuous	
	Livestock insurance schemes	Farmers, Veterinary Officers, Insurance companies, Banks, County Government, CSOs	Number of farmers with insurance for livestock	Urgent	Continuous	

	Awareness creation and information sharing	Farmers, Veterinary Officers, County Government, CSOs	Number of awareness events, trainings etc	Urgent	Continuous	
Fisheries production	Adoption of sustainable modern fish farming technologies	County Government – Fisheries department CBOs, fish farmers	Number of fish farmers using modern technologies	Urgent	Continuous	
	Enforcement of pollution control measures and standards	County Government, NEMA, WRA, WRUAs	Water quality reports Number of arrests, warnings and stop orders	Very Urgent	Continuous	
	Awareness creation, sensitization, and capacity building	County Government, Private sector, BMUs, CSOs, CBOs	Conflicting laws and regulations documented Number of patrols Number of arrests	Urgent	Continuous	
	Value addition and creation of enabling markets	County Government, Fisheries Department Private sector, KFS, WRUAs	Number of trainings conducted, Number of units/ individuals trained	Urgent	Continuous	
	Comprehensive stakeholder involvement - coordination	County Government, Private sector, CSOs, CBOs	Number of consultative for a conducted	Urgent	Continuous	

	Harmonization and enforcement of existing laws and policies	County Government, NEMA, WRA	Conflicting laws and regulations documented Number of patrols Number of arrests	Urgent	Year 1	
	Capacity building Beach management units	County Government, Private sector, BMUS	Number of trainings conducted, Number of units/ individuals trained	Urgent	Year 2	
	Develop appropriate legislative instruments to regulate fishing	County Government, County Assembly, CSOs	Legislative documents and regulations documented and ratified	Urgent	Year 2	
	Engaging youth, women and other vulnerable groups in fish production	County Government, County Assembly, CSOs	Number of members of vulnerable groups engaged	Urgent	Continuous	

1.29.3 Water Sector targets

During the target validation meeting, it was decided that two targets would be more appropriate for the water sector, as access to clean water (or water supply) and sanitation are two distinct services that require different actions in order to achieve the targets. These two targets are outlined below:

Access to clean water target:

By 2030, increase access to clean water to 80% of the population

Currently, the county has 66% coverage of clean water supply, thus 80% was considered by workshop participants to be a realistic target to achieve by 2030. This was further supported in the subsequent validation meeting where it was noted that coverage of clean water supply in Nakuru County increases.

by an average of 5% annually. This target is aligned with the goal of "Enhanced water security" in the NCCCAP (2018) and the target "Enhance the resilience of the water resources by ensuring adequate access to, and efficient use of, water for agriculture, manufacturing, domestic, wildlife, and other uses" in the NCCAP Volume II, ATAR (2018). It is also in line with the objective in the NDC relating to improved water storage, as improved storage will improve access to clean water for the population.

1.29.4 Water sector actions

Action 4: Map all community water sources in Nakuru County by 2030, including springs, boreholes, pans, dams and shallow wells.

Currently, Nakuru County has 66% coverage of clean water supply, with this figure increasing by roughly 5% per year. In the Rift Valley Catchment Area, which includes the Nakuru area, around 32% of the population is estimated to get their water from springs, wells or boreholes, some of which are unprotected and are categorised as unimproved drinking water sources (Kenya National Water Master Plan 2030). This action aims to contribute towards increasing annual per capita clean water availability to 80% of the population by 2030. This will be achieved through the construction and maintenance of safe water storage containers, protection of the water catchment areas and community water sources, and enforcement of the Nakuru County Public Health and Sanitation Act on access to clean water and other regulations. The action will also ensure that spatial planning of wetlands and water catchments will take place to facilitate planning and implementation.

The County Government of Nakuru have an ongoing waterworks programme which has begun the mapping process using GIS to understand where water sources are located in different catchments, how the water sources are being used, and whether they are being depleted. This action will contribute to this programme by ensuring all community water sources are mapped and protected by 2030 to ensure availability of water sources for future use. There will be close coordination between the Water Resources Authority, county-level water utilities, water resource users' associations, Ministry of Water, and County Department of Water Resources. This action addresses the climate hazards of drought and waterborne diseases.

Action 5: Reduce water losses by 15% by 2030 through replacement of existing dilapidated water infrastructure with advanced technologies including HDPE pipes and smart meters.

Currently, high water wastage in Nakuru County is as a result of physical losses from dilapidated water infrastructure, apparent losses from illegal connections and vandalism by households. To reduce this, replacement of the dilapidated infrastructure and support should take place, and the capacity of communities must be strengthened to reduce illegal water use. This action will result in the reduction of water losses by 15% by 2030. This action addresses the climate hazards of drought and waterborne diseases.

Action 6: Introduce water filters and water treatment tablets to 80% of the population by 2030 to improve access to safe water storage and treatment methods.

In the Rift Valley Catchment Area, which includes the Nakuru area, around 40% of the population is estimated to get their water from unimproved drinking water sources that have not been properly treated. This results in high incidences of preventable waterborne diseases. This action will ensure that households in Nakuru County have access to safe water storage and treatment methods and will reduce the spread of waterborne diseases. This action addresses the climate hazards of drought and waterborne diseases.

Sanitation sector target: By 2030, increase access to sanitation to 100% of the population.

Action 7: Establish at least five new sewage/decentralised treatment facilities in major urban and peri-urban areas in Gilgil, Subukia, Njoro, Elburgon and Bahati by 2030.

Currently, the sanitation system is old and dilapidated and inadequate for the current population, resulting in frequent blocks and leakages. There are also a limited number of off-site treatment facilities - there are four small-scale wastewater treatment plants in Nakuru, Naivasha, and Molo - and only around 10% of the urban population is covered by sewerage systems. This action would result in the construction of at least five simplified sewer systems and the connection of households to the main sewer system. In addition, the capacities of existing wastewater treatment plants should be enhanced. This action addresses the climate hazard of waterborne diseases.

Action 8: Support all rural villages in Nakuru County with achieving "Open Defecation Free (ODF)" status by 2030, including follow-ups, claims, verification, certification and celebration of ODF villages.

As of 2019, only 29.7% and 21% of the urban and rural populations in Nakuru County respectively use improved sanitation facilities, with sewerage coverage estimated at only 3.4%. Around 1.8% of Nakuru County's population still defecates in the open. As a result, water- and sanitation-related diseases such as diarrhoea and cholera continue to pose a great challenge to the county. Indeed, waterborne diseases are ranked among the top five diseases in Nakuru County. The county has so far achieved the certification of 507 villages as Open Defecation Free (ODF), with 1,484 villages remaining. This action will upscale the number of villages achieving ODF status, aiming to increase access to sanitation to 100% of the population by 2030. This will improve hygiene standards, enhance social dignity and reduce the economic burden in accessing

healthcare by reducing the prevalence of waterborne diseases. This action addresses the climate hazard of waterborne diseases.

Action 9: Train communities and WASH service providers on improved hygiene and sanitation practices, including the formation of Community Led Total Sanitation (CLTS) and ODF committees from village, wards and subcounty levels, so as to ensure sustainability of ODF villages.

Currently, the management of sanitation is unequal and exclusive, and poor hygiene behaviours around sanitation exist in many communities. To address this, community members and WASH service providers will be trained under this action on improved hygiene and sanitation practices. Women and girls will be specifically targeted for this action, as they are typically the primary home caregivers. This action addresses the climate hazard of waterborne diseases.

Table 1.29-2 Climate Change Action plan for water security in Nakuru County

Objective 2: Enhanced Food Security					
Issue/Problem: Water catchment degradation, Drought and Water scarcity, pollution, fragmented jurisdiction					
Big 4 Pillar: Food and Nutrition security, Enhanced manufacturing and Universal Health Care					
SDG : Primarily Goal 6: Clean Water and Sanitation but also Goal 1: No Poverty; Goal 2: Zero Hunger; Goal 3: Good Health and Well-Being for People; Goal 5: Gender Equality; Goal 9: Industry, Innovation, and Infrastructure; Goal 11: Sustainable Cities and Communities; Goal 13: Climate Action; Goal 14: Life Below Water; Goal 15: Life on Land; and Goal 17: Partnerships for the Goals					
Climate change Activity	**Stakeholders**	**Indicators**	**Priority**	**Timing**	**Budget**
Promote access to safe water for marginalized groups.	County government, Water service providers, WRA, CFAs, WRUAs, CSOs	Proportion of marginalized people with access to safe water.	Urgent	Continuous	
Promote water catchment conservation and restoration using appropriate tree species.	County government, Water service providers, Water Towers Agency, KFS, WRA, CFAs, WRUAs, CSOs	Area Restored No. of trees planted.	Very Urgent	Continuous	
Enforcement of existing laws on water conservation.	County government, WRA, NEMA	Reports, No of Arrests, convictions.	Very Urgent	Continuous	
Enactment of the county water laws as necessary.	County Government, County Assembly, CSOs	No. of laws enacted.	Urgent	Year 1	
Conduct studies to monitor groundwater.	County Government, WRA, Research Institutions	Study report.	Very Urgent	Year 1 and 2	
Domesticate national groundwater policy	County Government, WRA, CSOs	Domesticated policy document.		Year 3	

Reforestation to achieve a 10% forest cover.	County Government, KFS, CSOs, Private land Owners, CFAs WRUAs	Reports on forest cover.	Urgent	Continuous	
Enforcement of relevant environmental laws and policies.	NEMA, County Government, Public Health Department	Reports, No of Arrests, convictions.	Urgent	Continuous	
Restoration of wetlands (lakes and riparian zones).	County Government, NEMA, WRA, WRUAs, CFAs, CSOs, KFS	Acreage restored.	Urgent	Year 2 and 3	
Support research and monitoring.	County Government, Research Institutions, CSOs	Monitoring and research reports.	Urgent	Continuous	
Promote information sharing.	County government, NEMA, WRA CSOs,	Meetings, reports, magazines, newsletters.	Urgent	Continuous	
Conduct hydrological studies.	County Government, Research Institutions, CSOs	Study reports.	Urgent	Year 2 and 3	
Spatial planning of wetlands and water catchments.	County Government, NEMA, Research Institutions, CSOs, Water towers Agency	Plan documents.	Urgent	Year 2	
Promote appropriate water harvesting technologies.	County Government, WRA, WRUAs	Reports	Urgent	Continuous	
Engaging vulnerable groups (including youth, women and indigenous communities) in habitat restoration, water harvesting.	County Government, CSOs, KFS, WRUAs, WRA	Report on level of engagement of vulnerable groups.	Urgent	Continuous	

1.29.5 Sanitation Sector target:

By 2030, increase access to sanitation to 100% of the population

Current access to improved sanitation[4] in Nakuru County is relatively low. Only about 25% of Nakuru County's two million inhabitants have access to improved sanitation; 30% use shared sanitation facilities and 42% use unimproved sanitation facilities (Nakuru County Government, 2019). Despite this, the vision in the Nakuru Countywide Sanitation Strategy (2019) is for universal access to sanitation to be achieved by 2030. This aligns with the national target in the National Water Master Plan 2030 of "*Increase coverage rate of improved sanitation to 100% (improve sanitation by sewerage system and on-site treatment facilities)".* Therefore, the CAP target to increase access to sanitation to 100% of Nakuru County's population is aligned with existing local and national targets.

1.29.6 Forestry sector target

By 2030, increase tree cover in Nakuru County to 75,000 ha

The county currently has approximately 68,000 ha of gazetted forests (currently 9% of total land cover in the county). The target adopted by the county represents an increase to 10% of total land cover, which directly aligns with the national target to increase forest/tree cover to at least 10% on public, private and community lands, as stated in the NCCAP Volume II, ATAR (2018) and the National Forest Programme 2016-2030.

1.29.7 Forestry sector actions

Action 10: Reduce deforestation and forest degradation by introducing alternative energy sources to households in Nakuru County.

According to the Kenya National Bureau of Statistics (KNBS) 2019 report, the highest energy consumption by the residents of Nakuru County is through the use of firewood and charcoal. This has resulted in forest deforestation and degradation in Nakuru County. To address these problems, this action will look to introduce alternative energy sources (solar, biogas, energy saving jikos, charcoal briquettes) while promoting the participation of the youth, women and Indigenous communities in ecosystem conservation. This action addresses the climate hazards of drought, flash/surface floods and rainstorms.

Action 11: Restore degraded landscapes in riparian habitats and water catchment areas in Nakuru County using indigenous vegetation.

The current tree cover in Nakuru County stands at 9% of total land cover, with the woodland and farmland constituting the largest percentage of degraded landscapes. To increase tree cover in Nakuru County to 10% of total land cover by 2030, this action will involve the restoration of degraded landscapes including riparian habitats and water catchment areas by engaging vulnerable groups (including youth, women and Indigenous

[4] An improved sanitation facility is one that hygienically separates human excreta from human contact. They include: flush/pour flush to pipe sewer system, septic tank, pit latrine; ventilated improved pit latrines; pit latrine with a slab; composing toilet (Source: JMP 2015 for MDG monitoring).

communities) in habitat restoration. This action addresses the climate hazards of drought, flash/surface floods and rainstorms.

Action 12: Rehabilitate open public green spaces in Nyayo Garden, Lion Garden, Naivasha People's Park and others, and reforest areas in gazetted forests with a focus on indigenous trees and the restoration of indigenous ecosystems.

Kenya's target at the national and local level is to increase forest/tree cover to at least 10% of total land cover on public, private and community lands by 2030. The current area under tree cover in Nakuru County is approximately 69,000 ha (9% of total land cover), therefore, the target of 10% tree cover by 2030 amounts to 75,000 ha (an increase of 6,000 ha). There is additionally a goal in Nakuru County to plant at least 2 million trees per year until 2030 in forest and green spaces, including efforts across departments (environment, forestry, agriculture, etc.).

To attain this target, this action will undertake afforestation and reforestation activities within the farmlands and the promotion of natural regeneration techniques within degraded landscapes by 2030. Open public places to be rehabilitated include green spaces such as: Nyayo Garden, Lion Garden, Naivasha People's Park and the Park opposite Statehouse, road reserves, schools and institutions, abandoned quarries, mountainous areas and riparian areas. The action would also include reforestation of gazetted forests, e.g. Eastern Mau (Kiptunga, Mariashoni, Likia, Logoman, Naisuet, Sururs), Menengai, Bahati and Dondori. This reforestation will be undertaken using indigenous trees and will focus on the restoration of indigenous ecosystems. It should also incorporate GIS mapping of trees planted and the monitoring of tree survival and improvement of care of trees after planting for at least three years. This action addresses the climate hazards of drought, flash/surface floods and rainstorms.

Table 3: Climate Change Action plan for water security in Nakuru County

Objective 2: Enhanced Food Security					
Issue/Problem: Water catchment degradation, Drought and Water scarcity, pollution, fragmented jurisdiction					
Big 4 Pillar: Food and Nutrition security, Enhanced manufacturing and Universal Health Care					
SDG : Primarily Goal 6: Clean Water and Sanitation but also Goal 1: No Poverty; Goal 2: Zero Hunger; Goal 3: Good Health and Well-Being for People; Goal 5: Gender Equality; Goal 9: Industry, Innovation, and Infrastructure; Goal 11: Sustainable Cities and Communities; Goal 13: Climate Action; Goal 14: Life Below Water; Goal 15: Life on Land; and Goal 17: Partnerships for the Goals					
Climate change Activity	**Stakeholders**	**Indicators**	**Priority**	**Timing**	**Budget**
Promote access to safe water for marginalized groups.	County government, Water service providers, WRA, CFAs, WRUAs, CSOs	Proportion of marginalized people with access to safe water.	Urgent	Continuous	
Promote water catchment conservation and restoration using appropriate tree species.	County government, Water service providers, Water Towers Agency, KFS, WRA, CFAs, WRUAs, CSOs	Area Restored No. of trees planted.	Very Urgent	Continuous	
Enforcement of existing laws on water conservation.	County government, WRA, NEMA	Reports, No of Arrests, convictions.	Very Urgent	Continuous	

Enactment of the county water laws as necessary.	County Government, County Assembly, CSOs	No. of laws enacted.	Urgent	Year 1	
Conduct studies to monitor groundwater.	County Government, WRA, Research Institutions	Study report.	Very Urgent	Year 1 and 2	
Domesticate national groundwater policy	County Government, WRA, CSOs	Domesticated policy document.		Year 3	
Reforestation to achieve a 10% forest cover.	County Government, KFS, CSOs, Private land Owners, CFAs WRUAs	Reports on forest cover.	Urgent	Continuous	
Enforcement of relevant environmental laws and policies.	NEMA, County Government, Public Health Department	Reports, No of Arrests, convictions.	Urgent	Continuous	
Restoration of wetlands (lakes and riparian zones).	County Government, NEMA, WRA, WRUAs, CFAs, CSOs, KFS	Acreage restored.	Urgent	Year 2 and 3	
Support research and monitoring.	County Government, Research Institutions, CSOs	Monitoring and research reports.	Urgent	Continuous	
Promote information sharing.	County government, NEMA, WRA CSOs,	Meetings, reports, magazines, newsletters.	Urgent	Continuous	

Conduct hydrological studies.	County Government, Research Institutions, CSOs	Study reports.	Urgent	Year 2 and 3	
Spatial planning of wetlands and water catchments.	County Government, NEMA, Research Institutions, CSOs, Water towers Agency	Plan documents.	Urgent	Year 2	
Promote appropriate water harvesting technologies.	County Government, WRA, WRUAs	Reports	Urgent	Continuous	
Engaging vulnerable groups (including youth, women and indigenous communities) in habitat restoration, water harvesting.	County Government, CSOs, KFS, WRUAs, WRA	Report on level of engagement of vulnerable groups.	Urgent	Continuous	

1.29.8 Tourism sector target

By 2030, ensure that the Nakuru County tourism sector promotes ecotourism and sustainability in 80% of its tourism destinations

This target is aligned with the targets for the tourism sector in Kenya's updated NDC (2020), specifically*: "Develop climate-resilient action plans for the sector",* as well as the targets of *"Enhance the resilience of tourist attractions and tourism infrastructure"* and *"Enhance the resilience of wildlife, habitats and ecosystems that sustain wildlife"* in the NCCAP Volume II, ATAR (2018). It is also aligned with the goal of *"Ecosystem conservation for sustainable economic development"* in the NCCCAP (2018).

1.29.9 Tourism sector actions

Tourism sector target: By 2030, ensure that the Nakuru County tourism sector promotes ecotourism and sustainability in 80% of national parks, lakes, game reserves, conservancies, etc.

Action 13: Map all wildlife corridors in Nakuru County using GIS, and gazette at least one wildlife corridor by 2030

The tourism sector frequently uses mapping to promote destinations, local attractions and marketing. Through this action, all wildlife corridors in Nakuru County will be mapped using GIS, which will facilitate better planning and will enhance the commercial tourism opportunities for local communities. Gazetting of wildlife corridors will also assist in conservation of wildlife habitats, ensuring wildlife will persist in these areas and continue to attract tourists, for example in Lake Solai. This action addresses the climate hazard of drought.

Action 14: Conduct sensitisation and capacity-building on sustainable tourism activities with vulnerable groups (including youth, women and Indigenous communities) across Nakuru County's 55 wards by 2030.

Most tourism destinations in Nakuru County are starting to adopt sustainable practices. For example:

- Lake Solai: bird conservation, fishing and boat-riding, hiking
- Lake Naivasha: bird sanctuary, snake conversation, fishing and boat-riding (existing)
- Hells Gate National Park: hiking, biking, mountain climbing, game drives, conservation of indigenous species (birds, and other animals)
- Lake Nakuru: game drives, conservation including of species such as flamingos, rhinos, lions, etc., boat-riding, clean-up activities by communities, sensitisation of community is ongoing (including on human-wildlife conflict)

In these destinations, this action will build on what's already happening, supporting the expansion of eco-tourism activities and the addition of others. Where destinations are still in the early stages of adopting sustainable tourism practices, the action would help them to start the process of sustainable tourism, based on what has been done elsewhere. Further identified activities in these areas include:

- Lake Solai: prioritising the blue economy

- Lake Naivasha: prioritising the blue economy
- Hells Gate National Park: tree planting, beautification, tour guiding, beadwork
- Lake Nakuru: removal of invasive species, (including invasive grass, hyacinths)

To do this, sensitisation and capacity-building for communities will be done in partnership with the private sector and the Kenya Wildlife Service (KWS). The first step will be sensitisation, training communities on what sustainable tourism is, what makes it sustainable, and what some of the possibilities are. The second step, capacity-building, would then include more direct training or workshopping of skills needed for running eco-tourism activities. There could also be opportunities here for knowledge exchange between communities – those already running small eco-tourism businesses, and those who aren't yet, so that agency and entrepreneurship within the communities is supported. The third step would then be to engage community members in sustainable tourism employment opportunities in partnership with KWS and the private sector. This action addresses the climate hazards of drought and flooding.

Action 15: Introduce water-harvesting techniques in 80% of Nakuru County's conservation areas by 2030 for wildlife use.

Most conservation areas have been affected by the surrounding human activities. Some of the rivers and swamps dry up during the dry seasons due to human activities like irrigation and infrastructural development on riparian lands. Flooding also occurs during the wet seasons. Introducing water-harvesting techniques into 80% of Nakuru County's conservation areas will contribute to providing reliable sources of water for the wildlife conservancies during dry seasons, and will also mitigate waterborne diseases during wet seasons. This action addresses the climate hazards of drought and waterborne diseases.

Table 1.29-3 Action plan for ecosystem conservation and sustainable tourism development in Nakuru County:

Objective 3 : Ecosystem conservation for sustainable development.					
Issue/Problem: Ecosystem degradation due to climate change, pollution, deforestation, habitat fragmentation, encroachment of protected areas and riparian habitats, overexploitation habitat conversion, invasive species, overgrazing among others/ limited information on biodiversity, climate change and diseases/increased human wildlife Conflicts.					
Big 4 Pillar: Food and Nutrition security, Affordable housing, Enhanced manufacturing and Universal Health Care.					
SDGs : Primarily Goal 13: Climate Action but also Goal 6: Clean Water and Sanitation; Goal 1: No Poverty; Goal 3: Good Health and Well-Being for People; Goal 5: Gender Equality;Goal 9: Industry, Innovation, and Infrastructure; Goal 11: Sustainable Cities and Communities; Goal 14: Life Below Water; Goal 15: Life on Land; and Goal 17: Partnerships for the Goals					
Climate change Activity	Stakeholders	Indicators	Priority	Timing	Budget
Restore degraded landscapes including riparian habitats and water catchment areas.	County Government, KWS, KFS, NEMA, WRA, WRUAs, CFAs	Area Restored.	Very urgent		
Map and gazette wildlife corridors	KWS, County Government, NEMA, Private landowners,	No of wildlife corridors mapped and gazette.	Urgent	Year 2	
Develop and implement strategies to deal with invasive species e.g. water hyacinth and *Salvinia*	Research Institutions, WRA, IMARISHA Naivasha, KWS	Invasive species strategies and implementation reports.	Urgent	Year 2 and 3	

molesta at lake Naivasha.					
Support biodiversity monitoring, knowledge management and information sharing.	Research Institutions (National Museums of Kenya (NMK), Kenya Forestry Research Institute (KEFRI), KWS, universities, CSOs	Census and monitoring reports. Scientific papers.	Urgent	Continuous	
Promote water harvesting in conservation areas for wildlife use.	KWS, Private sector,	Number of dams established.	Very Urgent	Continuous	
Address illegal activities by enforcing Wildlife Act 2013	KWS, National Police Service	Number of arrests and prosecution.	Very urgent	Continuous	
Enhance community involvement in wildlife conservation.	KWS, County government	Community meetings.	Urgent	Continuous	
Promote wildlife disease surveillance and control.	KWS, DVS, County Government	Reports, Tests on carcasses.	Urgent	Continuous	
Monitor and control forest fires, including maintenance of fire breaks.	KFS, CFAs, County Government	Reports Control measures, awareness meetings.	Urgent	Continuous	

Invest in disaster preparedness.	County Government, National Government, Fire and Rescue Service Authority, Security agents (Police, KDF)	Reports on responses.	Very Urgent	Continuous	
Promote urban forestry.	KFS, County Government, private sector	Trees planted.	Not Urgent	Continuous	
Promote afforestation and reforestation activities within the farmlands.	County Government, Extension officers, KFS	Acreage of farmland with forest cover	Urgent	Continuous	
Support adoption of Participatory Forest Management that should entail forest zonation	KFS, CFAs	Signed Forest management agreements, reports	Urgent	Continuous	
Adopt innovative soil and water management techniques (gabions, terraces)	County Government, KFS, Agriculture extension workers,	Reports	Urgent	Continuous	
Promote access to meteorological information on weather forecast.	MET Department, County government	Level of access to Met information	Urgent	Continuous	

Acquire and install automatic weather stations in each Ward.	MET Department, County government	No. of weather stations with weather stations Timely weather data available	Very Urgent	Continuous	
Promoting sustainable mining techniques and restoration of closed mining sites.	NEMA, County Government, Industrialist KFS, CBOs, WRA	Reports Number of old mines restored.	Very urgent	Continuous	
Enforce application of EMCA regulations for discharge of effluents in water systems.	NEMA, County Government – Health Department	Number of Stop orders. Water quality reports Audit reports.	Very Urgent	Continuous	
Promote participation of youth, women, and indigenous communities in ecosystem conservation.	County Government, National Government Gender department, KFS, CSOs	Number of vulnerable people engaged.	Urgent	Continuous	
Promote water harvesting in conservation areas for wildlife use.	KWS, private sector	Number of earth dams established	Very urgent	Continuous	
Gazette and protect tourist attractions.	County Government, KWS, Ministry of Tourism and Wildlife	Tourist attractions gazette and protection documented.	Urgent	Year 2	

Identify and protect cultural sites.	NMK, County Government	Cultural sites and protection mechanisms documented.	Urgent	Year 3	
Develop standards for tourist facilities.	County Government, KWS, Ministry of Tourism and Wildlife	Standards documented.	Urgent	Year 3	
Diversify and Market tourist attractions.	County Government, KWS, Ministry of Tourism and Wildlife, private sector	Increase in diversity of tourism products	Urgent	Year 2	
Engaging vulnerable groups (including youth, women and indigenous communities) in habitat restoration.	County Government, KFS,	Number of vulnerable people engaged	Urgent	Continuous	
Engaging vulnerable groups (including youth, women and indigenous communities) ecotourism activities.	County Government, KWS, KFS, CSOs	Number of vulnerable people engaged	Urgent	Continuous	

1.30 Action and Target cost benefit Analysis

Table 1.30-1 Co-benefits, trade-offs and synergies associated with actions to reduce the impacts of climate change in Nakuru County

ADAPTATION ACTIONS						
#	**ACTION TITLE**	**CO-BENEFITS**	**TRADE-OFFS**	**SYNERGIES OF ACTION WITH OTHER ACTIONS AND OTHER POLICIES / PLANS**		
Agriculture, livestock and fisheries sector target:		**By 2030, ensure that at least 70% of crop, livestock and fishery farmers and other stakeholders are using climate-resilient practices including water harvesting techniques and nature-based enterprises (e.g. agroforestry).**				
1	Desilt 60 water pans and construct 25 new water pans in Naivasha and Rongai subcounties by 2030 to promote water harvesting, conservation and utilisation for domestic and agricultural use in Nakuru County	Improve access to water Improve income Improve food security Mitigate flooding, drought and river floods	None identified	National Climate Change Action Plan (NCCAP, 2018) – *"Promote water harvesting, water storage, soil moisture conservation, climate-smart irrigation infrastructure, and efficient water use"* Nakuru County Climate Change Action Plan (NCCCAP, 2018) – *"Promote innovative water-harvesting techniques"*	NO	NO
2	Train 70% of smallholder farmers and pastoralists in Nakuru County on how to adopt appropriate technologies in fodder production and animal husbandry by 2030	Reduce vulnerability of livestock farmers Improve food security	None identified	NCCCAP (2018) – "Investing in production and storage of drought-resistant fodder crops"	NO	NO
3	Train 70% of fish farmers in Nakuru County on how to adopt sustainable modern fish farming technologies by 2030	Increase sense of ownership and empowerment Improve income Increase water conservation	Initial cost is high Not many crops can be grown in aquaponics High energy consumption	NCCAP (2018) – "Promoting the up-scaling of climate resilient strategies/ technologies in fisheries and, climate-resilient fish species" NCCCAP (2018) – "Adoption of sustainable modern fish farming technologies"	NO	NO

		Improve food security Increase biodiversity				
Access to clean water sector target:		**By 2030, increase access to clean water to 80% of the population.**				
4	Map all community water sources in Nakuru County by 2030, including springs, boreholes, pans, dams and shallow wells	Enhance understanding of water resources Improve water resource management Reduce exploitation of water catchment areas Quantify amount of water available for abstraction	Conflict with communities on reclamation of encroached catchment areas	NCCAP (2018) – *"Climate-proof the construction and maintenance of at least 12 and at most 36 multipurpose dams, small dams, water pans, and in situ water harvesting and storage structures countrywide by June 2023"* NCCCAP (2018) – *"Promote access to safe water for marginalised groups"* Kenya National Water Master Plan 2030 (NWMP) – *"All water resources are managed, regulated and conserved in an effective and efficient manner by involving the stakeholders, guaranteeing sustained access to water and equitable allocation of water while ensuring environmental sustainability"*	NO	NO
5	Reduce water losses by 15% by 2030 through replacement of existing dilapidated water infrastructure with advanced technologies including HDPE pipes and smart meters current environmental regulations	Increase revenue for service expansion Increase water supplied Easier access to supplied water	Water supply disruption during implementation	NCCAP (2018) – *"Reduce water wastage and non-revenue water (unbilled and unaccounted for) from the current 43% to 20%, by June 2023"*	NO	NO
6	Introduce water filters and water treatment tablets to 80% of the population by 2030 to improve access to safe water storage and treatment methods.	Increase access to safe water for marginalised groups Reduce the incidence of waterborne diseases	None identified	NCCAP (2018) – *"Increase to 2,000 the number of annual climate-proofed water harvesting/storage infrastructure from 700"*	NO	NO
Sanitation sector target:		**By 2030, increase access to sanitation to 100% of the population.**				

7	Establish at least five new sewage/ decentralised treatment facilities in major urban and peri-urban areas in Gilgil, Subukia, Njoro, Elburgon and Bahati by 2030	Reduce environmental pollution Improve hygiene standards Increase employment opportunities Reduce incidence of waterborne diseases	Limited land use	Aligns with Action 19 under the Mitigation pillar NWMP 2030 – *"Increase coverage rate of sewerage system to 80% for urban population"*	YES	NO
8	Support all rural villages in Nakuru County with achieving "Open Defecation Free (ODF)" status by 2030, including follow-ups, claims, verification, certification and celebration of ODF villages	Improve hygiene standards Reduce incidence of waterborne diseases Enhance social dignity Reduce economic burden in accessing healthcare	There might be some expectations for payments/ subsidies	Aligns with Action 19 under the Mitigation pillar Kenya NWMP 2030 – *"Install improved on-site treatment facilities for remaining population not covered by sewerage systems"* Kenya Environmental Sanitation and Hygiene Policy 2016-2030 – *"aims to make Kenya Open Defecation Free by 2020"*	YES	NO
9	Train communities and WASH service providers on improved hygiene and sanitation practices, including the formation of Community Led Total Sanitation (CLTS) and ODF committees from village, wards and subcounty levels, so as to ensure sustainability of ODF villages	Improve hygiene standards Reduce incidence of waterborne diseases Enhance social dignity	There might be some expectations for payments/ subsidies	Aligns with Action 20 under the Mitigation pillar Nakuru Countywide Strategic Sanitation Plan – *"Through sanitation marketing, capacity building and political goodwill universal access to sanitation has been achieved, open defecation eliminated and waterborne diseases minimised"*	YES	NO
Forestry sector target:		**By 2030, increase tree cover in Nakuru County to 75,000 ha.**				
10	Reduce deforestation and forest degradation by introducing alternative energy sources to households in Nakuru County	Reduce CO_2 levels through increased carbon stocks Improve biodiversity Improve human health as a result of no longer breathing	Loss of jobs in the timber industry Increase cost of living in regard to the alternative sources of energy	Aligns with Actions 1 and 2 under the Mitigation pillar NCCAP (2018) – *"Reduce deforestation and forest degradation, and enhance the protection of an additional 100,000 hectares of forests"*	YES	YES

		in smoke from using wood for energy				
11	Restore degraded landscapes in riparian habitats and water catchment areas in Nakuru County using indigenous vegetation	Reduce soil erosion Improve aesthetic value Improve biodiversity Improve water quality	Potential for people to be displaced Reduce agricultural/ pastoral land	Aligns with Actions 1 and 2 under the Mitigation pillar NCCAP (2018) – *"Restore up to 200,000 hectares of forest on degraded landscapes, especially in ASALs and rangelands"* NCCCAP (2018) – *"Restore degraded landscapes including riparian habitats and water catchment areas."* National Forest Programme 2016-2030 – *"Increase forest /tree cover to at least 10% on public, private and community lands"*	YES	NO
12	Rehabilitate open public green spaces in Nyayo Garden, Lion Garden, Naivasha People's Park and others, and reforest areas in gazetted forests with a focus on indigenous trees and the restoration of indigenous ecosystems	Increase employment opportunities in forest sector e.g. tree nurseries Create more opportunities for research Reduce CO_2 levels through increased carbon stocks Improved biodiversity	Potential for people to be displaced Reduce agricultural/ pastoral land	Aligns with Action 10 under the Mitigation pillar NCCAP (2018) – *"Afforestation/reforestation/ agroforestry of additional 100,000 hectares of land"* NCCCAP (2018) – *"Promote urban forestry"; "Promote afforestation and reforestation activities within the farmlands"; "Engage vulnerable groups (including youth, women and indigenous communities) in habitat restoration."* National Forest Programme 2016-2030 – "*Increased forest /tree cover to at least 10% on public, private and community lands"*	YES	NO
Tourism sector target:		**By 2030, ensure that the Nakuru County tourism sector promotes ecotourism and sustainability in 80% of national parks, lakes, game reserves, conservancies, etc.**				

13	Map all wildlife corridors in Nakuru County using GIS, and gazette at least one wildlife corridor by 2030	Can share the mapped areas with other relevant stakeholders Improve planning and planning tools Improve biodiversity	Conflict of use of the gazetted land Potential for people to be displaced	NCCAP (2018) – *"Identify and effectively conserve 30,000 hectares of wildlife habitats, to support a broad range of wildlife and plants under changing conditions"* NCCCAP (2018) – *"Map and gazette wildlife corridors"*	NO	NO
14	Conduct sensitisation and capacity-building on sustainable tourism activities with vulnerable groups (including youth, women and Indigenous communities) across Nakuru County's 55 wards by 2030	Increase job creation Reduce crime Reduce violence against women and girls Increase feeling of inclusion for vulnerable groups in the community Promote cohesion and integration Reduce land degradation Support conservation Improve livelihoods	Cultural conflicts Conflicting responsibilities	NCCCAP (2018) – *"Engaging vulnerable groups (including youth, women and indigenous communities) in ecotourism activities"*	NO	NO
15	Introduce water-harvesting techniques in 80% of Nakuru County's conservation areas by 2030 for wildlife use	Reduce human-wildlife conflict Improve access to water in conservation areas Improve wildlife health Enhance tourism opportunities Enhance opportunities for livelihood improvement	Disturbs the ecological balance which may lead to animals relying on human beings	NCCCAP (2018) – "*Promote water harvesting in conservation areas for wildlife use"*	NO	NO

1.31 Prioritised NCCAP Actions

Once the mitigation and adaptation actions were developed for each sector target, stakeholders selected one action to be prioritised for each sector-specific target. These actions were prioritised because of their contributions to achieving the sectoral targets, their potential to directly reduce GHG emissions and/or address climate hazards affecting each sector, their feasibility, as well as the numerous co-benefits offered by the actions.

Once the adaptation actions were developed for each sector target (three per sector target), stakeholders selected one action to be prioritised for each sector-specific target (five actions in total). These actions were prioritised because of their contributions to achieving the sectoral targets, their potential to directly address climate hazards affecting each sector, their feasibility, as well as the numerous co-benefits offered by the actions. **Error! Reference source not found.** indicates which actions were prioritised by the county and provides a rationale for each.

Error! Reference source not found. indicates which actions have been prioritised and also provides a rationale for why these actions specifically have been prioritised. Annex 2 and Annex 3 respectively provides the additional information on these prioritised mitigation and adaptation actions as required by CoM SSA, to support county planning in the future. Fourteen actions were highlighted by the County as priority for the mitigation pillar and five for the adaptation pillar.

Table 1.31-1 Priority climate change mitigation and adaptation actions in Nakuru County

ACTION NUMBER	ACTION TITLE	RATIONAL FOR PRIORITISATION
PRIORITY MITIGATION ACTIONS		
SECTOR:	**STATIONARY ENERGY**	
3	Develop and enforce an Energy Act and Regulations on energy efficiency within Nakuru County by 2027.	These three actions were originally proposed and prioritised as one action to improve energy efficiency in Nakuru County. They have been split into three actions for ease of reporting. Improving energy efficiency is a cost-effective way to reduce GHG emissions with considerable co-benefits in terms of reducing energy costs. In many cases, energy efficiency can be improved without substantial upfront investment, and can be done at a small or large scale. Many energy efficient technologies are also readily available. These actions can increase capacity for
4	Undertake regular energy audits on 2000 buildings and facilities within the County	
5	Install energy-efficient lighting in	

ACTION NUMBER	ACTION TITLE	RATIONAL FOR PRIORITISATION
PRIORITY MITIGATION ACTIONS		
	commercial, institutional, and residential buildings	efficient energy use through the awareness-raising components.
6	Develop small-scale biogas production facilities to promote clean cooking in Nakuru County in partnership with the private sector	Improving access to clean cooking and lighting at household level is well aligned with County-level, national and international priorities across sectors. This action can benefit most households in the County as there is a need to move away from traditional cooking methods that lead to bad air quality, high energy costs, degraded ecosystems, and large health risks. Biogas production is aligned with circular economy and waste management priorities as well as energy access and climate change adaptation.
8	Create 3 energy centres to disseminate information and raise awareness on sustainable energy	This action is achievable and realistic, as it does not require large financial investments or new capacities and technologies. Improving community awareness of sustainable energy technologies and energy saving activities can influence uptake of several beneficial behavioural changes, including the use of clean cooking and energy efficient technologies, renewable energy and the adoption of energy efficient practices.
SECTOR:	**TRANSPORTATION**	
9	Construct and/or upgrade 10 km of non-motorised transport routes in urban centres	Implementation of NMT corridor upgrades in Nakuru County have already been piloted and have been highly successful thus far, having multiple co-benefits. This action is realistic and achievable and has many synergies with other priorities in the County.
10	Create green open spaces in the County's urban centres, including NMT corridors	Upgrading of urban green spaces, including along NMT corridors in Nakuru and Naivasha, has been ongoing over the last few years. It is well-aligned with the County priorities across several sectors and has significant co-benefits in terms of climate resilience. In addition, the implementation of this action is considered technically, financially and politically feasible.

ACTION NUMBER	ACTION TITLE	RATIONAL FOR PRIORITISATION
PRIORITY MITIGATION ACTIONS		
11	Improve parking facilities on the edge of urban centres to reduce congestion	Decongesting the urban centres of Nakuru and Naivasha will contribute substantially to reducing GHG emissions in the transport sector, as well as realising multiple co-benefits, including improved air quality and reduced time spent in traffic. This action is well-aligned with other actions in the transport sector.
12	Expand the public transport system to include bus mass transport along major transit routes.	The inclusion of bus mass transport in the public transport system for the County will contribute to the climate-smart urban development of Nakuru as a city as well as for Naivasha. Along with the improvement of NMT corridors and decongestion of the city centres, the modal shift from single-occupancy vehicles, matatus and two- and three-wheelers will significantly improve the efficiency of passenger transport along major routes.
SECTOR:	**WASTE**	
14	Upgrade three existing municipal waste disposal sites in Nakuru County by improving access roads, fencing and zoning of the tipping areas	Ongoing efforts to upgrade the Gioto waste disposal site have been effective in improving organisation and recovery of waste and reducing environmental pollution outside the disposal site. While this action has cost implications, it will be less capital intensive than investments in new landfill sites, as the land is existing and designated for waste management.
16	Establish a resource recovery centre in Nakuru County to increase waste recovery	These three actions were originally prioritised as a single action to improve waste recovery practices in Nakuru County. The actions have been separated for ease of detailing and reporting them.
17	Organise annual public awareness raising campaigns and incentives to increase household level waste segregation	Promoting circular economy practices, including resource recovery is one of the most efficient ways to improve waste management at the local level. Involving all stakeholders along the value chain from households to businesses, industries, waste utilities and services providers is essential for developing an integrated and

ACTION NUMBER	ACTION TITLE	RATIONAL FOR PRIORITISATION
PRIORITY MITIGATION ACTIONS		
18	Increase briquette production from organic waste and faecal sludge to contribute to waste recovery	effective waste management system. By improving waste recovery, these actions will not only reduce GHG emissions from the waste sector, but also create economic opportunities and increase the lifespan of waste management facilities.
19	Increase the extent of the sewer network and the capacity of the wastewater treatment infrastructure to service 60% of the population of Nakuru County	This action is aligned with existing targets and priorities in the sanitation and public health sectors in Nakuru County as well as climate change adaptation priorities. Increasing wastewater treatment coverage will not only reduce GHG emissions from the waste sector, but also reduce public health risks and enable the effective treatment and reuse of effluent.
PRIORITY ADAPTATION ACTIONS		
SECTOR:	**AGRICULTURE, LIVESTOCK AND FISHERIES**	
1	Desilt 60 water pans and construct 25 new water pans in Naivasha and Rongai subcounties by 2030 to promote water harvesting, conservation and utilisation for domestic and agricultural use in Nakuru County	Many farms in Nakuru County are impacted negatively by flooding due to heavy rains during the rainy season, as well as water shortages during the dry season. Water pans are an intervention that addresses both of these climate hazards, as they reduce flooding locally by collecting runoff water, while also extending water availability through the dry season. In addition, it is an action that has already been undertaken in some areas in the county, and thus is definitely feasible. This action will directly mitigate against drought and river flooding, and will have high impact on increasing the resilience of the agriculture sector to the impacts of climate change.
SECTOR:	**WATER: Access to clean water**	
4	Map all community water sources in	Around 32% of the population is estimated to get their water from springs, wells or boreholes, some of which

ACTION NUMBER	ACTION TITLE	RATIONAL FOR PRIORITISATION
PRIORITY MITIGATION ACTIONS		
	Nakuru County by 2030, including springs, boreholes, pans, dams and shallow wells	are unprotected and are categorised as unimproved drinking water sources, resulting in the spread of waterborne diseases that are exacerbated by flooding caused by climate change. These water sources have not all been mapped, meaning it is difficult for the county to protect them, as well as ensuring that the population has access to clean water and ensuring the health of vulnerable groups in more rural areas. This action is a priority as it will ensure the protection of community water sources, contributing to the target of access to clean water for 80% of the population (a human right), while preventing the spread of waterborne diseases.
SECTOR:	**WATER: Sanitation**	
8	Support all rural villages in Nakuru County with achieving "Open Defecation Free (ODF)" status by 2030, including follow-ups, claims, verification, certification and celebration of ODF villages	Waterborne diseases are ranked among the top five diseases in Nakuru County and are exacerbated by climate change related flooding. They are also preventable with improved sanitation. One aspect of the vision in the Nakuru Countywide Strategic Sanitation Plan is for open defecation to be eliminated and for waterborne diseases to be minimised in Nakuru County by 2030. It is estimated (as of 2019) that Nakuru County loses about KES 978 million per year due to poor sanitation (Nakuru Countywide Strategic Sanitation Plan, 2019). This figure is likely to increase as climate change induced flooding events increase in intensity and frequency in the future. To address these problems, this action was considered a priority. In addition to improving hygiene standards, this action will enhance social dignity and reduce the economic burden in accessing healthcare by reducing the prevalence of waterborne diseases.
SECTOR:	**FORESTRY**	
12	Rehabilitate open public green spaces in Nyayo Garden, Lion Garden, Naivasha	As part of the resolutions and commitments within Kenya's NDC, the National Forest Programme, as well as county-determined contributions, this action will ensure that Nakuru County meets the target of 10% tree

ACTION NUMBER	ACTION TITLE	RATIONAL FOR PRIORITISATION
PRIORITY MITIGATION ACTIONS		
	People's Park and others, and reforest areas in gazetted forests with a focus on indigenous trees and the restoration of indigenous ecosystems	cover by 2030, thereby reducing negative impacts of climate change such as flooding, erosion, and extreme heat while also increasing the county's carbon sinks. In addition, this action will contribute to the social value of Nakuru County's open public green spaces by rehabilitating them, resulting in aesthetically pleasing areas that can be used for recreation and community-upliftment purposes. This action will also focus on the reforestation of gazetted forests with indigenous vegetation, contributing to the overall functioning of these ecosystems. These additional benefits contribute to this action being considered a priority by the county.
SECTOR:	**TOURISM**	
14	Conduct sensitisation and capacity-building on sustainable tourism activities with vulnerable groups (including youth, women and Indigenous communities) across Nakuru County's 55 wards by 2030	Ecotourism contributes to the conservation and preservation of natural and cultural resources, increasing their resilience to climate change impacts such as flooding and droughts. It is also a well-established way of uplifting local communities and generating livelihoods, while increasing economic activity in the county in general. Thus, this action will build resilience to climate change through increased means by which to respond to climate hazards. Local residents, especially vulnerable groups such as the youth, women and Indigenous groups, will enjoy economic and social benefits through this action. Examples of this are already seen in Lake Naivasha, Lake Solai, Hells Gate National Park and Lake Elementaita. This action will result in community empowerment through ecotourism, as well as improved conservation and increased climate resilience. It is thus considered a priority for the county.

CAPACITY BUILDING, KNOWLEDGE MANAGEMENT AND INFORMATION SHARING

Awareness creation, knowledge management, and capacity building on climate change science and practice among the key stakeholders will be critical to successful implementation of this action plan. These stakeholders include the local community members, policy makers, civil society, and private sector players.

1.32 Capacity building

It is the local community members including farmers, pastoralists, fishermen, and others who rely on nature for sustenance and are the first to be impacted on by climate change. There is the need to raise their awareness on the ways to cope with the effects of climate change. More important is for them to have the capacity to implement appropriate climate adaptation and mitigation tactics at the local level. At the same time, it is crucial for practitioners on climate change particularly agricultural and forestry sector, both in the government and non-government sectors have appropriate knowledge on climate change if they are to pass the same knowledge to the local people. The policymakers, especially the members of the County Assembly are mandated to make laws and policies at the county level. They need to have the capacity to make appropriate contributions towards this end. Private sector practitioners need to understand the impacts of their actions on climate change. They also need to learn about the business opportunities that exist due to the need for climate change adaptation and mitigation. This includes the provision of goods (e.g. solar panels, heaters, lighting, energy stoves) and services (e.g. insurance for crops, livestock, and property). In addition, they can understand their entry points for participation in Payment for Ecosystem Services and also in ways to focus their Cooperate Social Responsibilities (CSR) towards conservation, as a way of helping communities cope with the impacts of climate change.

1.33 Knowledge Management

Various institutions and individuals have generated knowledge of climate change in Nakuru County over the years. . These include government research and academic institutions, civil society organizations, and private sector companies. However, this information is scattered and needs to be compiled into a comprehensive database for it to inform a coordinated approach to enabling stakeholders to adapt to climate change. Methods of passing timely information to users also need to be designed. Institutions involved in climate change information generation including research institutions and the Metrological Department need to be well-resourced to provide timely information. Stakeholders on climate change will need to invest in various ways of communicating climate change information including the use of:

- Print and electronic media.

- Social media.
- Barazas.
- Drama, songs, and Dance.
- Demonstrations.
- Short Message Service (SMS).
- Workshops.

Table 1.33-1 Action plan for Knowledge Management and Capacity building

Objective 6: Capacity building, knowledge management and information sharing					
Issue/Problem: Limited technical capacity on climate change among stakeholders/Lack of timely information on climate Change/limited mainstreaming of climate change in county and stakeholder planning processes.					
Big 4 Pillars: Enabler of all the pillars.					
SDGs: Goal 4: Quality Education; Goal 5: Gender Equality; Goal 10: Reducing Inequalities; Goal 16: Peace, Justice and Strong Institutions and Goal 17: Partnerships for the Goals.					
Climate Change Activity	**Stakeholders**	**Indicators**	**Priority**	**Timing**	**Budget**
Assess the capacity of stakeholders in climate change.	County Government, Research institutions, CSOs	Capacity assessment report	Very Urgent	Year 1	
Provide capacity support to address identified gaps among stakeholders.	County Government, Research institutions, CSOs	No. of stakeholders trained	Urgent	Year 1 and Year 2	
Develop and maintain an electronic and print climate	County Government, Research institutions, CSOs	Working database in place	Urgent	Year 1 and continuous	

change database.					
Develop a county climate change resource centre.	County Government, Research institutions, CSOs	Resource Centre established and equipped	Not Urgent	Year 3	
Develop and implement a robust public awareness programme on climate change.	County Government, Research institutions, CSOs	No of climate change awareness campaigns, talks, shows , events	Urgent	Continuous	
Mainstream climate change education at all education levels.	National Government, County Government, CSOs	School, colleges, universities with cc in curriculum	Urgent	Year 3	
Provide early warning on climate change hazards.	MET Department, County Government, Print and Electronic, Media	Radio, Print Media and socio media, public announcements	Very Urgent	continuous	

SUSTAINABLE FINANCING FOR CLIMATE CHANGE ACTIONS

There will be costs associated with implementing climate change adaptation and mitigation actions. The Nakuru County Government needs to ensure that climate change actions are mainstreamed into the county budgeting and other planning processes. Moreover, other relevant stakeholders including the national government agencies, non-governmental organizations, community-based organizations, and private sector players will need to familiarise themselves with responsibilities that are relevant to them and mainstream them in their individual budgeting and fundraising activities. There are many business opportunities for private sector players in the field of climate change adaptation and mitigation. For example, insurance companies can insure assets and infrastructure including crops, livestock, equipment, and buildings against climate change hazards like drought, floods, and related hazards. Banks can invest in providing financing to businesses and individuals as they implement climate change adaptation and mitigation actions. Stakeholders can also explore innovative financing mechanisms including payment for Ecosystem Services (PES) to fund some of the actions. However, there will be a need for the county government to establish a modest Climate Change Fund to sustain basic operational costs of implementing this action plan. It will also be prudent to establish a Disaster Risk Management Fund to help deal with climate change-related disasters. Sustainable financing is an enabler for all the Big Four Agenda pillars and addresses the SDG goals 16 and 17 (Table 9). The activities, relevant stakeholders, prioritization and the M&E indicators are illustrated in Table 8.

Table 1.33-1 Action plan for sustainable financing

Objective 7: Sustainable financing for climate change actions					
Issue/Problem: Limited funding for climate change activities					
Big 4 Pillars: Enabler of all the pillars					
SDGs: Goal 16: Peace, Justice and Strong Institutions and Goal 17: Partnerships for the Goals					
Climate Change Activity	**Stakeholders**	**Indicators**	**Priority**	**Timing**	**Budget**
Operationalize ClimateChange Fund.	County Government,, development partners	County assembly approval	Very Urgent	Year 1	
Enhance resource mobilization channels	County Government, National Government, CSOs	County assembly approval	Very Urgent	Year 1	
Mainstreaming climate change adaptation and mitigation actions in budgetary and	County Government, all stakeholders	No. of government departments and policies that mainstream climate change No of stakeholders participating in implementation	Urgent	Year 1	

other planning processes.					
Establishing partnerships with private sector players.	County Government, Private sector players, CSOs	No of partnerships established	Urgent	continuous	
Design and implement Payment for Ecosystem Services schemes.	County Government, private sector, CSOs eg CSO –WWF.	Number of working PES schemes	Urgent	Continuous	

GOVERNANCE AND COORDINATION OF CLIMATE CHANGE ACTIONS –THIS MAY REQUIRE TO BE ADDRESSED LAST AS IT IS CROSS-CUTTING AND SEEKS TO CREATE AN ENABLING ENVIRONMENT.

Implementing this action plan will involve many stakeholders but will be led and coordinated by the Nakuru County Government. Political will by the highest level at both the Executive and the Legislative Arms of the County government is necessary. It is, therefore, recommended that the Governor's Office takes leadership in climate change affairs in the county and a county climate change secretariat established in the ministry responsible for Environmental affairs. This secretariat will implement climate change actions as advised by the County Environmental Committee. The secretariat will work with relevant stakeholders to draw annual work plans that conform to the county budgetary process and timing. To actualize this processes and establish the recommended institutional framework (Figure 2), the county government through the county assembly will need to enact the necessary legislative instruments. To realize this objective, there is an urgent need for the establishment of an enabling institutional framework for climate change actions and the enactment of enacting enabling policy and legal instruments (Table 2). There is also need to ensure the participation of vulnerable groups including women, youth, and, indigenous groups in climate change actions. The county climate change desk should be in the Directorate.

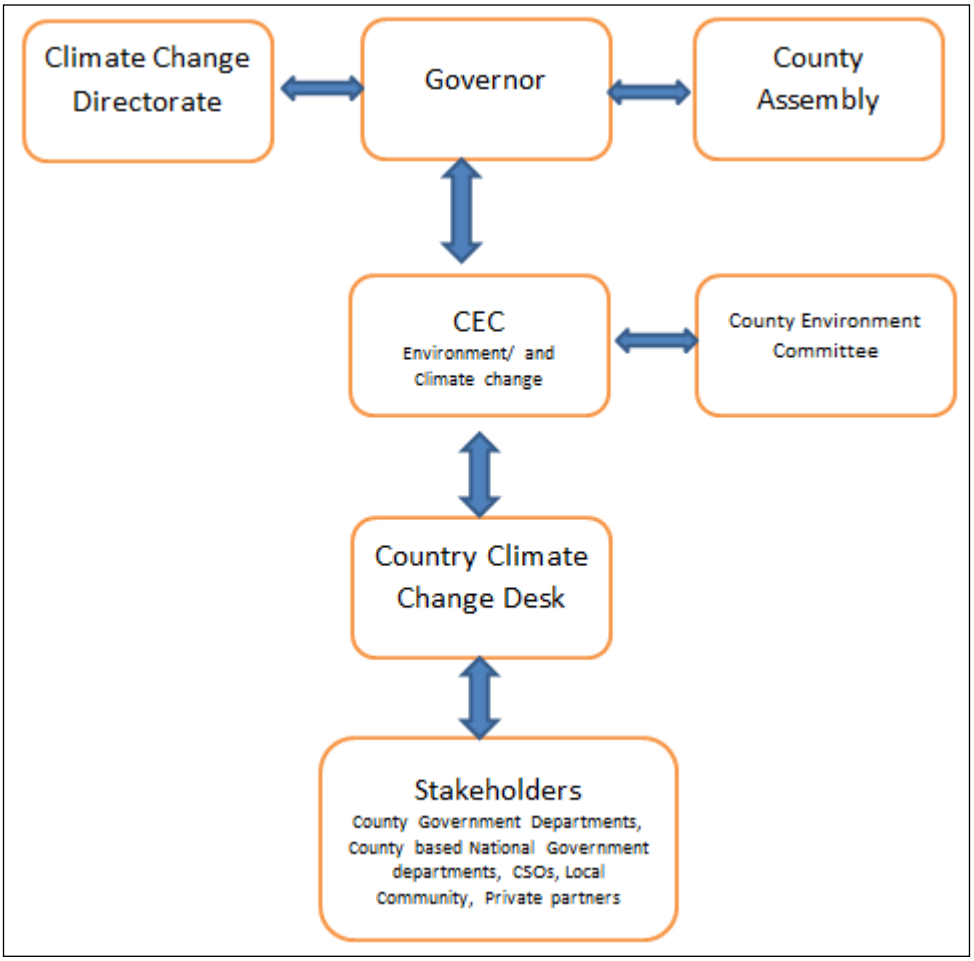

Figure 1.33-1.: Institutional and Governance arrangements for climate change actions in Nakuru County.

Objective 8: Governance and coordination of climate change actions					
Issue/Problem: Climate change impacts cuts across all sectors/diverse actors/Need for political will and coordination of action implementation at the highest county office.					
Big 4 Pillar: Enabler for all pillars					
SDG: Goal 16 (Peace, Justice and Strong Institutions) and Goal 17 (Partnerships for the Goals**)**					
Activity	**Stakeholders**	**Indicators**	**Priority**	**Timing**	**Budget**
Equip County Climate Change Unit/secretariat.	County Government	Operational climate change unit	Very Urgent	Year 1	
Implementation of appropriate county laws for climate change actions	County Government	No. of Climate change laws enacted and implemented	Urgent	Year 1 and Year 2	
Prepare annual work plans.	County Government, all stakeholders	• Departmental work plans with climate change actions developed	Very, Urgent	Every year	
Prepare annual report on implementation and present it to County assembly.	CECM – responsible for climate change	• Annual report	Urgent	Every year	

5.3.9 Cross-cutting and emerging issues

Climate change has a greater impact on those sections of the population that are most reliant on natural resources for their livelihoods and/or who have the least capacity to respond to natural hazards, such as droughts, landslides and floods. Women commonly face higher risks and greater burdens from the impacts of climate change because

- Women have unequal participation in decision-making processes.
- Their household responsibilities such as childcare and the collection of firewood and water are particularly climate-sensitive
- They have to take up more agricultural work as men migrate for labour
- Have less access to agricultural resources such as land, extension services and inputs with which to adapt to variability and change
- Gendered social norms and roles can inhibit women's adaptive capacity

Other vulnerable groups include youth, the aged, children, the disabled, indigenous and other vulnerable groups in the climate change actions. Specific actions targeting women and other vulnerable groups have been included in as many objectives as possible

Health issues have also been considered as a cross cutting issue and its actions to deal with climate related health issues are in many of the objectives including in the objective on food security, water security, environmental conservation and infrastructure development.

IMPLEMENTATION STRATEGY / PLAN OF THE NCCAP

To accompany the implementation and achievement of the climate vision as presented in the NCCAP of Nakuru County, a strategy or plan for the implementation of the NCCAP is an essential tool to not only mobilise all stakeholders but also to consider the dissemination of results throughout the implementation of actions.

This implementation strategy will detail the financial needs, particularly for carrying out project feasibility studies, the role of the actors involved in implementation according to the levels of intervention, the mechanisms, and sources of funding (local, national, or international financing from public, private, bilateral, and multilateral sources, decentralised cooperation etc.). Indeed, implementation will require the support of financial and technical partners.

It will include a resource mobilisation strategy that will serve as a roadmap describing precisely how resources could be mobilised to meet the financing needs of the NCCAP. This strategy must notably detail how the county will be able to mobilise the financial resources necessary for the implementation of the NCCAP. Part of the funds required to implement the actions will be taken from the County's own funds (mainly the Nakuru County Climate Change fund), particularly for actions directly related to its competences. In this specific context, the planning of the implementation must be aligned with the planned cycle.

The county's resource mobilisation strategy will focus on raising funds for adaptation and mitigation actions and on advocating for the allocation of resources for all programmes. It will also explore the various possibilities for raising funds, attracting technical and financial partners, and exploring opportunities in green finance, which is giving rise to new trends and challenges.

PLAN, REVIEW AND MONITORING

1.34 Introduction

The establishment of an intercommunal monitoring and evaluation system is essential to track the progress of the implementation of the NCCAP and to guide adjustments to the NCCAP when necessary. It should detail the accompanying measures and arrangements necessary to ensure the execution of the actions foreseen in the NCCAP and the continuous monitoring of its implementation. The indicators should incorporate several evaluation criteria such as: impact (the result obtained in relation to the objective set), perception (the reaction of the populations and the perceived value of the proposed action) and performance (quantitative evaluation of the state of implementation of the action).

Monitoring and Evaluation (M&E) of the planned activities will help the County Government and other stakeholders to know whether the desired outcomes have been achieved and if the issues identified at the planning stage are being addressed, have been resolved, or whether the situation is getting worse. Project monitoring will be an on-going process throughout the plan period and will be coordinated by the Department of Environment and Natural Resources. Other key stakeholders in the monitoring process will be the national government agencies with mandates in climate change and environmental conservation including NEMA, KWS, and KFS. Conservation NGOs operating in the area can also contribute significantly to this process.

The implementation of this action plan is linked with other plans and strategies, action plans, and other policies both at the county and national levels. These include the national planning process as captured by Vision 2030, County planning processes, and the national climate change policy processes among others.

1.35 Institutional and county arrangements for the implementation, monitoring and evaluation of the NCCAP

1.35.1 Steering Committee

To supervise the monitoring and evaluation of the implementation progress of the CAP, it is recommended that the county sets up a steering committee to coordinate the CAP implementation at the political level.

The steering committee ideally should consist of the stakeholders who were part of the development of the NCCAP and should be made up of elected representatives for all departments at the county, traditional chiefs, representatives of the different sub counties and civil society, with gender balance considerations incorporated as much as possible. The role of the committee will be reviewed as part of the monitoring-evaluation system.

The steering committee should ideally meet at least once a year; its main role will be to:

- Represent the NCCAP implementation team at the level of the county integrated planning
- Monitor the progress of the implementation of the action plan and ensure the involvement of all the county's departments and services where applicable
- Validate any adjustments proposed by the implementing body;
- Submit the annual report on the state of implementation of the NCCAP to the County government, especially the department of economic planning and resource mobilization, during the budgetary orientation debates.

1.35.2 NCCAP Implementation, Monitoring, and Evaluation Team

The establishment of a team in charge of the implementation, monitoring, and evaluation of the NCCAP in Nakuru County is an essential first step. Its composition can be based on the team who was part of the development of the CAP with the CoM SSA focal points and those usually in charge of reporting to the CDPs and climate action as a core team, and include representatives of relevant County departments as well as other stakeholders (university, scientists, associations) as and when needed. This team could be subdivided into four sub-entities, depending on the needs of the city (Error! Reference source not found. and Figure 1.35-1).

Table 1.35-1 Composition of the team in charge of implementation, monitoring and evaluation of the NCCAP

ROLES	ROLE AND RESPONSIBILITIES
Climate Action Implementation and monitoring role	This role, in synergy with all the county's departments and services, will entail implementing climate initiatives and actions, but also evaluate and monitor the implementation of the CAP. It will be made up of officials from the various departments of the county
Monitoring climate data role	This role will entail managing the climate databases, for providing information on the climate-related indicators. Its composition will be determined at a later stage.
Access to funding role	This person(s) will be responsible for responding to calls for projects and accessing green finance. The implementation of the action plan will necessarily require exceptional mobilisation of resources, both internally and externally. It is therefore essential to define a strategy for seeking green financing, based on existing levers. To achieve this, it is necessary to understand the mechanisms for accessing funds and the related institutional arrangements. This team will be composed of experts in institutional support for the search for funding.
Communication role	This person will be in charge of the communication around the CAP, targeting both the population and investors or other relevant stakeholders.

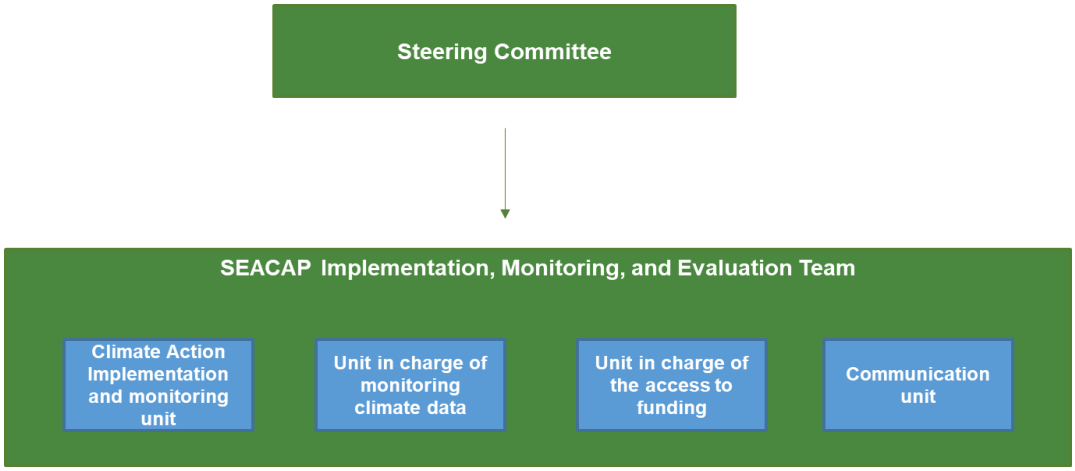

Figure 1.35-1: Organigram of the CAP implementation, monitoring and evaluation team

1.35.3 Reporting

In the framework of the CoM SSA, the signatory cities must submit monitoring reports on a regular basis, according to their financial and human resources and capacities. The monitoring reports provide information on the status of implementation of each action/area of action/sector in the action plan, but also update the data, thus helping to monitor progress.

The elements to be reported and the recommended timetable are detailed in the Error! Reference source not found..

Table 1.35-2.Reporting elements and corresponding timelines for all CoM SSA signatory cities

Reporting element	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Baseline Emissions Inventory			X			
Risk and vulnerability assessment			X			
Target and goals (mitigation/adaptation)			X			
Access to Energy Assessment			X			
Climate action plan(s) (mitigation and adaptation, or integrated plan				X		
Progress Report						X

According to the CAP guidebook, local governments must submit monitoring reports every two years after submitting the action plan. The local government shall update and resubmit the action plan(s) when there are significant changes to the existing plan(s). Local governments may apply for an extension of reporting deadlines along with a clear justification. Local authorities should compile and report on a GHG inventory at least every fourth year.

1.36 Plan Review and monitoring

1.36.1 Monitoring Issues

This plan will need to be revised at five-year intervals in accordance with the climate change Act 2016. Key issues that will need to be monitored and evaluated to inform the review process include:

i. Ecosystem conservation including forest cover and habitat restoration.
ii. Level of adoption of green energy and energy efficiency.
iii. Carbon and other greenhouse gas emissions.
iv. Agricultural and industrial production.
v. Biodiversity status.
vi. Water quality in key water sources and lakes.
vii. Habitat condition.
viii. Poverty levels.
ix. Level of engagement of women, youth, and vulnerable groups in climate issues.

1.36.2 : Forms of Evaluation and Review

Two forms of evaluation will take place:

1. **Annual reviews** – An annual summary of progress made in implementing the activities as outlined in the activity plans.
2. **5-year evaluation and review:** At the end of 5 years year of implementation of this plan. This evaluation will inform the revision of activities and objectives for the following five -year implementation period. There will be a need to revise the plan every five years to ensure conformity with the county and national development priorities, and ensure relevance to the Integrated County Development Plans. In addition, the revision will provide an opportunity to capitalize on emerging opportunities.

COMMUNICATION STRATEGY

To accompany the implementation of the NCCAP, it is useful to develop an effective communication strategy. Communications on the NCCAP actions could be carried out using media adapted to the target audience: the population, investors, national and regional authorities.

This communication strategy should detail the communication activities and media adapted to the target:

- Using the shorter format (executive summary) of the NCCAP for investors and decision makers
- Sensitisation campaigns on the actions implemented with posters
- Citizen debates with the population
- Official launching ceremony of the NCCAP in the county
- Use of social networks and the media
- Setting up climate and energy events
- Collaborating with other sub national governments in developing and implementing transboundary actions

Translating key messages of the NCCAP into local languages understandable by the average resident in the County.

ANNEX

Attendance Sheet for the PCRA Training Workshop at Merica Hotel on 4th and 5th May 2023

DEPARTMENT OF WATER, ENVIRONMENT, ENERGY, CLIMATE ... NATURAL RESOURCES

COUNTY OF UNLIMITED OPPORTUNITIES

ATTENDANCE LIST FOR PARTICIPATORY CLIMATE RISK ASSESSMENT TRAINING WORKSHOP HELD AT MERICA HOTEL FROM 4th TO 5th MAY 2023 AT 9:00AM.

No.	Name	Organisation	Phone No.	Email Address	Gender M	Gender F	Age < 35	Age > 35	PWD Y	PWD N	Day 1 Sign	Day 2 Sign
1	PETER KIMANI NJAU	Biashara WCCPC	0716 506 226	[illegible]14@gmail.com	✓		✓			✓	[signature]	[signature]
2.	MARY W. KARANJA	EENR. NAKURU	0702571336	mkaranja957@gmail.com		✓	✓			✓	✓	[signature]
3	LUCY W. NGAHDU	ALIN	0759407212	Ingandu@alin.net		✓	✓				[signature]	[signature]
4	JAEL COLLEEN	ALIN	0723079611	Jonyango@alin.net		✓	✓			✓	[signature]	[signature]
5.	ANNE W. MWANGI	SOCIAL SERVICES	0725530515	wmwangi.a@gmail.com		✓		✓			[signature]	[signature]
6	Brian Omenyi	SEAF-K	0101953683	omenyibrian@gmail.com	✓		✓				[signature]	[signature]
7.	SAMMY NGIGE	CGN	0712195920	Sammyngigekimani@gmail.c	✓			✓			[signature]	[signature]
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10	Imelda Simiyu	CGN	0717206695	imeldasimiyu@gmail...		✓		✓			[signature]	[signature]
11	Jackline Chemutai	CGN	0721570808	lelachchemutai@gmail.com		✓	✓			✓	[signature]	[signature]
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15	FREDRICK O.O. OWINO	CGN-AGRIC	0710467777	cdanakura@gmail.com	✓	[mark]		✓			[signature]	[signature]
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ATTENDANCE LIST FOR PARTICIPATORY CLIMATE RISK ASSESSMENT TRAINING WORKSHOP HELD AT MERICA

No.	Name	Organisation	Phone No.	Email Address	Gender M	Gender F	Age < 35	Age > 35	PWD Y	PWD N	Day 1 Sign	Day 2 Sign
50	KENNEDY MUNGAI	C.O.-EENRC	0720665096	ken@[illegible].go.ke								
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54	Kipyator Dennis	CGN-ENV	0717739000	Kipyatordennis@gmail.com	✓			✓		✓	[signature]	[signature]
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61	Ephraim Nginyo	CGN ENVIRONMENT	0726-044-396	nginyofrein@gmail.com		✓	✓			✓	[signature]	[signature]
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ENCES

ATTENDANCE LIST FOR PARTICIPATORY CLIMATE RISK ASSESSMENT TRAINING WORKSHOP HELD AT MERICA HOTEL FROM 4th TO 5th MAY 2023 AT 9:00AM.

No.	Name	Organisation	Phone No.	Email Address	Gender		Age		PWD		Day 1 Sign	Day 2 Sign
					M	F	< 35	> 35	Y	N		
	Bob Aston	ALIN	0725342537	baston@alin.net	V					V		
	George Maina	CGN-Environment	0725982367	georgemaina69@gmail.com	V							

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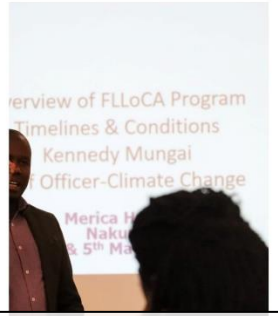

Members in attendance during the PCRA Training at Merica Hotel on 4th & 5th May, 2023



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