



Covenant of Mayors in Sub-Saharan Africa



ADAPTATION TARGET SETTING REPORT

Nakuru County,
Kenya



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Abbreviations

ATAR	Adaptation Technical Analysis Report
BEI	Baseline Emissions Inventory
CCCF	County Climate Change Fund
CEC	County Executive Committee
CIDP	County Integrated Development Plan
CIP	Climate Information Platform
CSA	Climate-smart agriculture
CoM SSA	Covenant of Mayors in Sub-Saharan Africa
EC	European Commission
EU	European Union
GCoM	Global Covenant of Mayors for Climate & Energy
GHG	Greenhouse gas
JRC	Joint Research Centre
KMD	Kenya Meteorological Department
M&E	Monitoring and evaluation
NAP	National Adaptation Plan
NCCAP	National Climate Change Action Plan
NCCCAP	Nakuru County Climate Change Action Plan
NDC	Nationally Determined Contribution
RVA	Risk and Vulnerability Assessment
SDGs	Sustainable Development Goals
SEACAP	Sustainable Energy Access and Climate Action Plan
SMART	Specific, Measurable, Achievable, Realistic, Time-bound

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1. The Covenant of Mayors Sub-Saharan Africa (CoM SSA) and Sustainable Energy Access and Climate Action Plans (SEACAPs)

1.1 The Covenant of Mayors in Sub-Saharan Africa (CoM SSA)

The Covenant of Mayors in Sub-Saharan Africa (CoM SSA) is an initiative launched by the European Union (EU) to support local authorities in sub-Saharan Africa in the climate challenge and in their efforts to ensure access to clean energy. It is the “regional covenant” or chapter of the Global Covenant of Mayors for Climate & Energy. CoM SSA is delivered through a partnership of global and local city networks as well as initiatives funded by the European Commission (EC). It is a bottom-up and voluntary initiative that invites cities to define and meet ambitious and realistic energy access and climate targets set by themselves, in line with GCoM requirements. This means that targets are at least as ambitious as cities’ respective government's Nationally Determined Contribution (NDC) under the Paris Agreement. Furthermore, targets need to be in line with National Adaptation Plans (where these exist) and be consistent with the principles around energy access and urban sustainability embodied in the Sustainable Development Goals (SDGs). Local authorities are encouraged to voluntarily commit to the implementation of a climate and energy action plan in their area of influence. They are also encouraged to define long-term vision actions towards a sustainable future based on the pillars of climate change mitigation and adaptation, and sustainable, affordable, and secure access to energy. CoM SSA is open to any city in sub-Saharan Africa, regardless of the size. In order to translate the political commitment into practical measures, CoM SSA signatories commit to producing and implementing a strategic and operational document called the Sustainable Energy Access and Climate Action Plan (SEACAP).

1.2 Sustainable Energy Access and Climate Action Plan (SEACAP)

The Sustainable Energy Access and Climate Action Plan (SEACAP) is the key document that sets the strategies, plans, and actions for a sustainable and low greenhouse gas (GHG) emission development pathway, while including climate adaptation actions and ensuring access to secure, affordable and sustainable energy, in response to the current and future impacts of climate change in the region. The SEACAP is both a strategic and an operational document. It uses the results of the Baseline Emissions Inventory (BEI) to identify the best fields of action and opportunities for reaching the local authority’s greenhouse gas (GHG) emission reduction targets. It is based on the climate change Risk and Vulnerability Assessment (RVA), which identifies the city’s most relevant climate hazards and vulnerabilities. It also includes an Access to Energy Assessment, which articulates a plan to improve the access to secure, sustainable, affordable and reliable energy. The SEACAP defines concrete measures for climate mitigation, adaptation and access to sustainable energy, with timeframes and assigned responsibilities, translating the long-term strategy into action.

1.3 Phases of the SEACAP development within the Adaptation pillar

The Adaptation pillar of the SEACAP development involves four phases:

- i. **Initiation phase** – Activities in this phase include identifying national action plans on adaptation, mobilising and engaging stakeholders, and affirming political commitment to the SEACAP development from the heads of the municipality and the national government.
- ii. **Planning phase** – This phase includes pre-assessment and development stages. Thus, it involves developing a Risk and Vulnerability Assessment (RVA) which highlights the climate hazards that affect a local government and indicates the sectors and population groups within the city most heavily impacted by climate hazards. The RVA offers an opportunity for local government authorities to obtain data specific to the local government, thus increasing awareness of the current status and providing a premise for further action to improve the status quo. After the development of the RVA, targets are set for each sector particularly vulnerable to climate change, and thereafter actions are set to achieve these targets.
- iii. **Implementation phase** – This phase involves delivering practical actions, starting with the ones identified as priority in the planning phase. All the information necessary to implement these actions is collected, funding is secured (either internally or from external sources) and a project management approach is adopted – including deadline control, financial control, planning and risk management.
- iv. **Monitoring and reporting phase** – This phase involves reviewing progress and re-adjusting priorities. The proposed actions are monitored to ensure that the targets are achieved in this phase. Specific procedures and processes for each of the actions are confirmed, while maintaining constant communication with the stakeholders throughout. On a regular basis, progress is assessed, and priorities are adjusted as needed to fit the current situation. A progress report is submitted every second year after the SEACAP was developed, for monitoring and evaluation.

This document constitutes the Adaptation Target Report, the target setting report component for the Adaptation pillar. This report will be used to guide the development of climate change adaptation actions to reduce the impacts of climate change in Nakuru County, Kenya.

2. Summary of the Risk and Vulnerability Assessment

The objective of the Nakuru County Risk and Vulnerability Assessment (RVA) 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 timescale in the future as a result of climate change.

Based on data from two participatory workshops, a household survey, interviews with key stakeholders and a literature review, the RVA found that Nakuru County is already facing several climate hazards, the most severe being **drought, rainstorms, flash/surface floods, river floods, and waterborne diseases**. These results are aligned with the hazards described in the Nakuru County Climate Change Action Plan (2018) (NCCCAP) which include increasing frequency of droughts, heavy rains, flooding and waterborne diseases as hazards which affect the county.

The RVA found that 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 (Climate Information Platform (CIP): Nakuru Meteorological Station). 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.

The sectors identified by the RVA as being the most affected by current and future climate hazards are: (i) **environment, biodiversity and forestry**; (ii) **water supply and sanitation**; (iii) **land use planning**; and (iv) **food and agriculture**. The NCCCAP (2018) similarly states that **agriculture, livestock and fisheries; water; wildlife and tourism; forestry; transport and infrastructure; health; energy; mining; and manufacturing and trade** are considered key sectors to prioritise when promoting a transition to a low-carbon, climate-resilient economy and livelihoods. The National Adaptation Plan (2015) (NAP) also identified the **agriculture and livestock, water, infrastructure, sustainable livelihoods, energy, and tourism sectors** as priority sectors for which adaptation actions are needed.

The RVA indicated that the most vulnerable groups to climate hazards in Nakuru County are **women and girls** and **low-income households**. This is partly aligned with the NCCCAP (2018) which highlights the need to focus adaptation actions **on indigenous communities, women, children, the elderly, youth, and the disabled**, among other groups, as these are already — and are likely to be in the future — the most vulnerable groups to climate hazards such as droughts and floods 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.

3. Target setting methodology

This section briefly describes the methodology followed to gather the necessary information to prioritise sectors and to set an overarching adaptation vision and sectoral targets to inform climate change adaptation actions in Nakuru County.

Following the completion and validation of the Nakuru County RVA, consultations with stakeholders were held to prioritise sectors to focus on, set an overarching adaptation vision, and sector-specific targets for the key sectors. The consultations took the form of a hybrid participatory and virtual workshop, held on 15 June 2021 and involving 33 participants, 23 of whom attended in person and 10 of whom attended virtually. Participants represented sectors and departments within Nakuru County government, including health, resource mobilisation, water and sanitation, tourism, roads, transport and public works, among others. To meet the goals of the workshop, both presentations and focused group discussions were held. The workshop allowed for a co-development process when establishing the overarching vision and setting targets.

After the workshop, an additional validation meeting was held on 14 September 2021 with high-level representatives of the relevant sector departments in the Nakuru County Government. During this meeting, further inputs were gathered, minor adjustments were made to the targets and the overarching vision and targets were validated by the county.

4. Overarching climate change adaptation vision

According to the SEACAP development guidelines developed by the JRC, local authorities are required to establish a long-term vision which indicates the direction that the city wishes to follow. Setting a longer-term vision is considered a key success factor of SEACAPs as it clearly shows the local authority's political commitment and gives a strong message to citizens and stakeholders on how the local authority wants to develop in the future, paving the way for more substantial investment in sustainable infrastructure.

According to the RVA, there are several pieces of legislation which should guide climate change adaptation target setting at the county level.

At the national level, Kenya's updated Nationally Determined Contribution (2020) (NDC) sets out the country's actions towards achieving the global goals outlined in the Paris Agreement. The adaptation vision outlined in Kenya's NDC is as follows: *"Kenya aims to ensure a climate resilient society. This is to be achieved through mainstreaming climate change adaptation into the Medium-Term Plans (MTPs) and County Integrated Development Plans (CIDPs) and implementing adaptation actions. Subject to national circumstances, Kenya intends to mobilise domestic resources to cater for 10% of the adaptation cost, while 90% of the adaptation cost will require international support in the form of finance, technology development and transfer, and capacity building."*

The vision outlined in Kenya's National Adaptation Plan (2015) (NAP) is *"Enhanced climate resilience towards the attainment of Vision 2030"*. Enhanced climate resilience includes strong economic growth, resilient ecosystems, and sustainable livelihoods for Kenyans. It will also result in reduced climate-induced loss and damage, mainstreamed disaster risk reduction approaches in various sectors, reduced costs of humanitarian aid, and improved knowledge and learning for adaptation and the future protection of the country.

At the county level, and aligned with these national ambitions and commitments, the Nakuru County Climate Change Action Plan 2018–2022 (NCCCAP), outlines 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"*.

The above vision statements were presented to participants at the Adaptation Vision and Target-setting Workshop and discussions were had around a set of visions proposed by participants. Consensus was reached and 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. The sector-specific adaptation targets presented in Section 5 below collectively contribute to this overarching vision. The base year for implementation of this adaptation vision is 2021 and the year to achieve this vision is 2030, aligned with Kenya's NDC target date.

5. Sector targets

According to the SEACAP development guidelines of the JRC, once the overarching vision for the pillar is established, it is necessary to translate this into more specific targets for the different sectors under each pillar in which the local authority intends to take action. The sector targets should follow the principles of the SMART acronym: Specific, Measurable, Achievable, Realistic, and Time-bound. SMART targets should be guided by the principles outlined in Annexure 1.

5.1 Existing adaptation targets at national and county level

At the national level, the 2020 updated NDC includes a number of prioritised adaptation targets for different sectors; however, most of these are not SMART. The list of targets is as follows:

Table 1: Prioritised sectors and adaptation targets in Kenya’s 2020 NDC

Sector	Adaptation targets
Adaptation M&E system	<ul style="list-style-type: none"> Refine and operationalise the adaptation M&E system at national and county levels
Agriculture (crops, livestock and fisheries)	<ul style="list-style-type: none"> Mainstream climate-smart agriculture towards increased productivity through value chain approach to support the transformation of agriculture (crops, livestock and fisheries) into an innovative, commercially oriented, competitive and modern sector Build resilience of agricultural systems through sustainable management of land, soil, water and other natural resources as well as insurance and other safety nets Strengthen communication systems on CSA extension and agro-weather issues
Devolution	<ul style="list-style-type: none"> Develop and adopt county adaptation guidelines for integration in the CIDPs Build the capacities of County CCUs on adaptation Conduct vulnerability and risk assessments in counties Develop county adaptation plans for the counties with CCCFs
Disaster risk reduction	<ul style="list-style-type: none"> Improve drought risk management including drought early warning, preparedness, and response for enhanced drought resilience Improve flood risk management incorporating nature-based solutions
Environment	<ul style="list-style-type: none"> Rehabilitate and conserve degraded forests Establish at least 2,000 ha to promote nature-based (non-wood forest products) enterprises across the country Plant 350,000 agroforestry trees in farmlands established Greening of 14,000 ha of infrastructure (roads, railway lines, dams) Enhance/strengthen governance of community structures in participatory resource management in coastal ecosystems Conduct blue carbon readiness assessment for full integration of blue carbon/ocean climate actions into NDCs Develop marine spatial planning and outline sustainable management approaches Promote and expand opportunities for nature-based enterprises including seaweed farming and mangrove ecotourism Integrate the use of nature-based solutions, including the implementation of the national mangrove management plan, into national and county development plans Strengthen early warning and tailor-made climate information services through institutional strengthening of KMD and other information user institutions Roll out Early Action Protocols for forecast-based financing

Sector	Adaptation targets
Gender, youth and other vulnerable groups	<ul style="list-style-type: none"> ● Develop social safety net structures for women, youth and other vulnerable groups within the CCCFs ● Strengthen access of women, youth and other vulnerable groups to enterprise funds, climate finance and credit lines ● Promote gender-responsive technologies and innovations in the private sector, through financing capacity building and start-up services ● Consolidate successful technologies and develop a transfer strategy to women, youth and other vulnerable populations
Health	<ul style="list-style-type: none"> ● Conduct a vulnerability and risk assessment of different climate risks on human health ● Develop a public awareness and social mobilisation strategy on climate change and health impacts ● Develop health programmes, protocols and guidance to manage new climate change related diseases and risks ● Reduce the incidence of malaria, other vector-borne diseases, and other health conditions
Infrastructure (energy)	<ul style="list-style-type: none"> ● Develop and adopt guidelines on how to climate-proof energy infrastructure using vulnerability and risk assessments ● Enhance climate-proofing of energy infrastructure along the renewable energy supply chain ● Increase the number of companies participating in energy-efficient water use initiatives by 40% from the baseline
Infrastructure (roads)	<ul style="list-style-type: none"> ● Upscale the construction of roads to systematically harvest water and reduce flooding ● Enhance institutional capacities on climate-proofing vulnerable road infrastructure through vulnerability assessments ● Promote the use of appropriate designs and building materials to enhance resilience of at least 4,500 km of roads to climate risk
Population, urbanisation and housing	<ul style="list-style-type: none"> ● Introduce nature-based solutions in flood control, especially around informal settlements and selected urban areas ● Strengthen the enforcement of green building codes by national and county governments ● Conduct climate risk and vulnerability assessment of building/housing infrastructure, especially to flooding and sea level risk
Private sector	<ul style="list-style-type: none"> ● Mobilise financial resources from capital markets and other financial instruments for green investments and implementation of the Green Business Agenda ● Eco-label industrial products to promote green procurement, especially by public procurement agencies ● Climate-proof waste management infrastructure for waste management facilities in SEZ (effluent treatment plants) ● Increase the number of companies participating in efficient water-use initiatives
Tourism	<ul style="list-style-type: none"> ● Develop and adopt guidelines of how to integrate adaptation across the tourism sector ● Conduct a climate risk and vulnerability assessment of the tourism sector ● Develop climate-resilient action plans for the sector
Water and sanitation	<ul style="list-style-type: none"> ● Conduct and implement recommendations on climate and risk assessments on water, sanitation and irrigation infrastructure ● Build resilience infrastructure for the protection of dams and dykes and river lines ● Promote water harvesting and storage at county and household levels ● Mainstream climate change into water catchment management plans

Climate change adaptation targets are also included in Kenya’s 2015 NAP, but are not quantified or SMART. These include:

- Highlight the importance of adaptation and resilience building actions in development;
- Integrate climate change adaptation into national- and county-level development planning and budgeting processes;
- Enhance the resilience of public and private sector investment in the national transformation, economic and social pillars of Vision 2030 to climate shocks;
- Enhance synergies between adaptation and mitigation actions in order to attain a low-carbon, climate-resilient economy; and
- Enhance the resilience of vulnerable populations to climate shocks through adaptation and disaster risk reduction strategies.

Finally, at the national level, adaptation targets are included as strategic objectives for different action areas in the National Climate Change Action Plan (NCCAP) Volume II, Adaptation Technical Analysis Report (ATAR) 2018–2022. These are as follows:

Table 2: Strategic action areas and objectives in Kenya’s NCCAP Volume II, ATAR (2018)

Strategic action area	Adaptation target/objective
Disaster risk management: drought risk management/ending drought emergencies by 2022	To reduce the vulnerability of communities to drought-related disasters, through improved institutional resilience (preparedness and response) at all levels (national, county, community)
Disaster risk management: flood and landslide risk management	To reduce the vulnerability of communities to flood-related disasters, through improved institutional resilience (preparedness and response) at all levels (national, county, and community)
Agriculture, food and nutrition security	Increase food, nutrition, and income security through enhanced productivity and resilience of agricultural systems and value chains
Climate-resilient electricity supply mix	Enhance an electricity supply mix that is based on renewable energy, is resilient to climate change, and promotes energy efficiency
Forest cover	Increase forest cover to 10% of total land area
Climate change adaptation in the health system	Mainstream climate change adaptation in the health system
Resilience and adaptive capacities of urban infrastructure	Improve the resilience and adaptive capacities of urban areas by enforcing climate-proof standards for housing and other urban infrastructure
Resilience of the manufacturing infrastructure and systems	Promote the growth and resilience of the manufacturing industry to drive jobs in the manufacturing sector
Climate-proofing transport infrastructure	Establish efficient, safe, world-class transport systems and logistic services that are better able to withstand projected impacts of climate change
Resilience of water resources	Enhance the resilience of water resources by ensuring adequate access to, and efficient use of, water for agriculture, manufacturing, domestic, wildlife, and other uses
Resilience of the tourism value chain: tourism subsector	Enhance the resilience of tourist attractions and tourism infrastructure
Resilience of the tourism value chain: wildlife subsector	Enhance the resilience of wildlife, and habitats and ecosystems that sustain wildlife
Marine and coastal resources sector	Mainstream climate change adaptation into the Blue Economy

At the county level, the NCCCAP (2018–2022) includes the following adaptation objectives:

- Enhanced food security;
- Enhanced 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.

Actions for each of these county-level objectives have been developed and prioritised in the NCCCAP, but are not yet quantified and measurable. This is a gap that the Nakuru County SEACAP will fill by identifying overarching targets for key sectors that are quantified based on national targets.

5.2 Adaptation targets for key sectors

5.2.1 Prioritisation of sectors

Prior to setting adaptation targets for key sectors, it was necessary to identify the sectors that are considered a priority and key for setting targets and adaptation actions, in order to be most effective in building resilience to the impacts of climate change. As noted in Section 2, the sectors identified through the development of the RVA as being the most affected by current and future climate hazards are environment, biodiversity and forestry; water supply and sanitation; land use planning; and food and agriculture. The NCCCAP (2018) similarly states that agriculture, livestock and fisheries; water; wildlife and tourism; forestry; transport and infrastructure; health; energy; mining; and manufacturing and trade are considered key sectors to prioritise when promoting a transition to a low-carbon and climate-resilient economy and livelihoods. The National Adaptation Plan (2015) (NAP) also identified the agriculture and livestock; water; infrastructure; sustainable livelihoods; energy and tourism sectors as priority sectors for which adaptation actions are needed. **Table 3** highlights the similarities between these three plans:

Table 3: Sectors identified as priority for adaptation planning

RVA	NCCCAP	NAP
Environment, biodiversity and forestry	Forestry	
Water and sanitation	Water	Water
Land use planning		
Food and agriculture	Agriculture , livestock and fisheries	Agriculture and livestock
	Transport and infrastructure	Infrastructure
		Sustainable livelihoods
	Energy*	Energy*
	Wildlife and tourism	Tourism
	Health	
	Mining, manufacturing and trade	

* The Energy sector is prioritised under the Access to Energy pillar of the Nakuru SEACAP so will not be covered in this report.

Combining the results of the RVA, the NCCCAP (2018) and the National Adaptation Plan (2015), workshop participants agreed that the sectors that should be prioritised to set targets and adaptation actions for are:

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

Targets for these four prioritised sectors are outlined in the remainder of this section.

5.2.2 Agriculture, livestock and fisheries

Nakuru County's economy is mostly built around agriculture, which accounts for approximately 60% of total economic activity (Nakuru County, 2018a). The agricultural sector comprises the following subsectors: livestock keeping, fish farming, and food and cash crop farming, including horticulture and floriculture. Both subsistence and large-scale commercial farming is practiced, with flower farms being 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).

Climate hazards that negatively impact agriculture in Nakuru County include prolonged dry spells, frost, intense precipitation, flooding, heat stress and increased temperatures. Temperature increase and drought have been key causes of decreased productivity for 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, flooding also leads to loss of crops and livestock, as well as incidence of pests and diseases, such as locusts, fall armyworm, livestock diseases and East Coast fever. For example, in 2016, the county lost approximately 30% of its crops to pest invasions (NCCCAP, 2018). These impacts result in the loss of crops and livelihoods, negatively impacting the population of Nakuru County.

In an effort to address the above-described climate impacts, the target for the agriculture, livestock and fisheries sector proposed by workshop participants was as follows:

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

During the target validation meeting, minor changes were made to the wording of the target to ensure it is as inclusive as possible. The term "farming" was replaced with "crop", while "workers" was replaced with "farmers and other stakeholders". Thus, the final target for the agriculture, fisheries and livestock sector adopted by the county is as follows:

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).

5.2.3 Water

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, from the lakes, are not available for domestic, industrial or even 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 (CIDP) 2013–2017, water coverage within the county increased from 58% to 63%. In terms of water quality, Nakuru County regularly experiences contamination of water sources due to open defecation and overflowing of sewage into open water. For example, an outbreak of cholera was reported in the Kapchawea area in 2017.

Some of the negative impacts that climate change is having on the water sector in Nakuru County include:

- Depletion of aquifers: This is due, in part, to declining rainfall and has very negative impacts on communities, including the drying of boreholes and natural springs. For example, the drying up of boreholes at Egerton University in 2010 was attributed to climate change.
- Over-abstraction of water: Climate 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.
- Fluctuating water levels in the lakes: The levels of water at lakes Naivasha, Nakuru, and Elementaita, as well as other rift valley lakes have been fluctuating extensively. This is due, in part, to reduced rainfall, as well as reduced forest cover, over-abstraction, and siltation.
- Flooding and stormwater: Flash floods occur due to excessive rainfall, deforestation, and poor drainage systems.
- Drying up of or decreased water levels in many rivers/streams and wetlands.

In an effort to address the above-described climate impacts, the target proposed by workshop participants for the water sector was as follows:

Target: By 2030, increase access to clean water and sanitation to 80% of the population.

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 target. Therefore, the target related to access to clean water was adopted to read as follows:

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 NCCAP (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 related to improved water storage, as improved storage will improve access to clean water for the population.

The target related to sanitation was adopted to read as follows:

Target: By 2030, increase *access to sanitation to 100%* of the population.

Current access to improved sanitation¹ 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 SEACAP target to increase access to sanitation to 100% of Nakuru County's population is aligned with existing local and national targets.

5.2.4 Forestry

Nakuru County has ~68,000 ha of gazetted forests (currently 9% of total land cover in the county), 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. Forests are important because of the valuable goods and services they provide, including timber, charcoal, firewood, and bamboo, in addition to providing employment in the timber industry. Forest conservation in water catchment areas is critical for the regulation of water supply and the control of soil erosion. Forests are also important carbon sinks that help regulate the climate (Nakuru County Government, 2018b).

Some of the negative impacts that climate change is having on the forestry sector in Nakuru County include:

- Increased forest encroachment: This is partly a result of limited livelihood options.
- Overgrazing: Climate change leads to livestock feed scarcity. This results in local communities relying on forests for pasture which leads to unregulated livestock grazing, and subsequently soil erosion.
- Forest fires: During prolonged drought periods, there is increased incidence of forest fires leading to habitat loss, vegetation destruction, and loss of biodiversity.
- Increased incidence of diseases and pest infestations in forests: This is due to increasing temperatures and flooding.

In an effort to address the above-described climate impacts, the target proposed by workshop participants for the forestry sector was as follows:

Target: By 2030, establish 75,000 ha of tree cover in Nakuru County.

During the target validation meeting, minor wording changes were made to the target to ensure it is clear that the target is to increase tree cover to 75,000 ha by 2030, not to establish 75,000 ha of tree cover between 2021 and 2030. Thus, the final target for the forestry sector was adopted to read:

Target: By 2030, *increase* tree cover in Nakuru County *to 75,000 ha*.

¹ 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; composting toilet (Source: JMP 2015 for MDG monitoring).

As mentioned earlier, the county's current tree cover forms 9% of its total land cover. 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.

5.2.5 Tourism

Tourism is a key sector in Nakuru County. The county has three national parks, including Lake Nakuru, Hells Gate, and Longonot. It also has a number of private wildlife conservancies, which include Marura, Oserian, and Kedong in Naivasha subcounty and Kigio and Soysambu in Gilgil subcounty. Its lakes, particularly Lake Nakuru but also the others, are known for their large flocks of birds, notably flamingos. Lake Nakuru National Park is also known as a home of the endangered rhino, and Rothschild's giraffe among other wild mammalian species. Lake Naivasha is also known for large herds of hippos. The forests that dot the county are also rich in wildlife. These natural assets attract tourism to the county, which is an important source of revenue for the economy (Nakuru County Government, 2018b).

Climate change is negatively impacting the tourism sector in Nakuru County predominantly by affecting environmental processes and conditions, the results of which deter tourism activities. For example, in Lake Nakuru, the number of flamingos (a wildlife tourism attraction) has been fluctuating due to changes in water levels, a phenomenon directly and strongly attributed to climate change (Kiprutto et al., 2012; Kameri-Mbote, 2016). The continued migration of flamingos away from Lake Nakuru has derailed tourism activities at this Ramsar Site (Thampy, 2002), threatening local livelihoods, and damaging the county's economic well-being. In addition, droughts and resultant water scarcity often result in wild animals moving into human-inhabited areas and farmlands in search of food and water, resulting in an increase in human-wildlife conflict which can deter tourists from visiting these areas. Climate hazards such as increased drought and more erratic rainfall patterns are also resulting in increased incidences of waterborne wildlife diseases.

In an effort to address the above-described climate impacts, the target proposed by workshop participants for the tourism sector was as follows:

Target: By 2030, ensure that 100% of the tourism sector (national parks, lakes, game reserves, conservancy) is climate-resilient)

In this case, "climate resilient" is defined as having the capacity to bounce back from the impacts of climate hazards.

During the target validation meeting, the wording of this target was adjusted to incorporate the terms "ecotourism" and "sustainability", and the target was adjusted from 100% to 80% to ensure it is as realistic as possible for the county to achieve by 2030. Thus, the final target for the tourism sector was adopted to read:

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 NCCAP (2018).

6. Conclusion

The purpose of this report is to prioritise sectors on which to focus adaptation actions, define a long-term overarching climate change adaptation vision, as well as set sector-specific targets for each of the key sectors considered to be a priority.

The overarching climate change adaptation vision indicates the overall direction that the county wishes to go with regards to climate change adaptation and should be closely linked to the NDC, NAP and NCCCAP. The overarching adaptation vision set for Nakuru County is: **“A climate resilient county with sustainable ecosystems and livelihoods by the year 2030.”** This is in line with the 2020 NDC which highlights a need to ensure a climate resilient society through mainstreaming climate change adaptation into long-term plans and implementing adaptation actions. It is also aligned with the 2015 NAP which aims to enhance climate resilience towards the attainment of Vision 2030. Importantly, the overarching climate change adaptation vision is aligned with the vision in the NCCCAP 2018–2022 which is as follows: *“Nakuru County has a low-carbon, climate-resilient economy that sustains the livelihoods of its citizens while contributing to the national development agenda.”*

Sector targets translate the overarching adaptation vision into practical targets per sector. Sectors that have been prioritised to focus adaptation efforts on, and thus the sectors for which targets have been set are: **agriculture, livestock and fisheries; water; forestry; and tourism.** These sectors were selected specifically to align with priority sectors identified in the NAP, NDC, NCCCAP, information gathered during the desktop literature review, participatory workshops and supporting interviews.

The sector-specific targets adopted by the county are as follows:

Sector	Target
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).
Water	By 2030, increase access to clean water to 80% of the population.
	By 2030, increase access to sanitation to 100% of the population.
Forestry	By 2030, increase tree cover in Nakuru County to 75,000 ha.
Tourism	By 2030, ensure that the Nakuru County tourism sector promotes ecotourism and sustainability in 80% of its tourism destinations

These sector-specific targets will be used to guide the development of climate change adaptation actions (each contributing to the achievement of a target) to reduce the impacts of climate change on Nakuru County.

7. References

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Annexures

Annex 1: SMART Targets

SMART Targets	Guiding principle
S	Specific (well-defined, focused, detailed and concrete): What are we trying to do? Why is this important? Who is going to do what? When do we need it done? How are we going to do it?
M	Measurable (kWh, time, money, %, etc.): How will we know when this objective has been achieved? How can we make the relevant measurements?
A	Achievable (feasible, actionable): Is this possible? Can we get it done within the timeframe? Do we understand the constraints and risk factors? Has this been done (successfully) before?
R	Realistic (in the context of the resources that can be made available): Do we currently have the resources required to achieve this objective? If not, can we secure extra resources? Do we need to reprioritise the allocation of time, budget and human resources to make this happen?
T	Time-bound (defined deadline or schedule): When will this objective be accomplished? Is the deadline unambiguous? Is the deadline achievable and realistic?

Annex 2: Attendance register for the target setting workshop

Name and surname	Organisation
Jackson Kinyanjui	Founder of Climate Change Kenya Org
Hilda Kibet	WRA
Alex Ndichu	Ministry of Trade and Tourism
Nderitu Kelvin	CGN - Environment
Kennedy Kirwa	CGN - Environment
Antony Kamau	CGN - Environment
Agnes Waithera	CGN - Environment
Peter N. Wanyela	Nakuru Coffee Platform
Grace Karanja	CGN - Environment
Michell Marie	County Government
Amos Karanja	Egerton University
Salome Ng'ang'a	County Government
Irene Kibon	World Vision
George Gachomba	Department of Health
Caroline Ngeta	CGN - County WASH Coordinator (Public Health)
Samuel Kimani	CGN - Environment (Environmental Officer)
Vivian Yegon	CGN - Gender Department
John Waweru	Greenbelt Movement (Project Officer)
Joel Bett	CGN - Environment
Dorcas Mwangi	CGN - Senior Economist
Stephen Muriithi	Ministry of Agriculture, Livestock and Fisheries