



Mombasa County Climate Action Plan 2023 – 2050



THE GOVERNMENT
OF THE GRAND DUCHY OF LUXEMBOURG
Ministry of the Environment, Climate
and Sustainable Development





Climate change is a global development challenge that requires global response. In recent decades, there has been an increase in frequency and intensity of extreme climate events such as droughts and floods, which pose a challenge to the attainment of Kenya's development aspirations.

In the response toward climate change There is need of mainstreaming of climate smart actions that promote low carbon climate resilient and green economy/ growth development to ensure that investments are climate proofed against climate change related in addition, the mainstreaming will ensure that development in the different socio-economic sectors does not adversely impact on the environment. My government acknowledge the need to enhance institution capacity of the county on climate change adaptation and mitigation in the effort to reduced climate risk to the community and infrastructure, this will play a vital role in building local momentum in addressing climate change, supporting ongoing efforts to enhance the County's resilience. To achieve climate resilience county, it requires strong political leadership and partnership between all levels of government; allocation of appropriate human, technical and financial resources; establishment of long-term objective going beyond political mandate; Inclusive engagement of relevant stakeholders; and empowerment of citizens and specific support of to community most vulnerable to the impact of climate change. Upon realization of climate smart city, it is very key to support low carbon pathway, Mombasa County commits 1-2% financing locally led climate actions to implement locally interventions and establishing of enabling environment for public private partnership on green investments.

H.E. Abdulswamad Sharif Nassir
The Governor
County Government of Mombasa





Mombasa County Climate change Action plan twenty five-year plan that prioritize action on achieving climate change adaptation and mitigation. The action plan is meant to guide implementation of climate change actions towards strengthening resilience towards the impact of climate change. The county government realizes the urgency with which it needs to respond to the challenges brought about by climate change. This action plan provides a pathway towards more sustainable and resilient institutions and communities in the face of climate change. The process of county climate change action plan involved relevant department, civil society organizations, Community based organization and youth groups. In the effort to have participatory engagement to allow the prioritization of actions through active stakeholder engagement and call for partners to take active role in support the implementation of the plan. This activity was funded by the City Climate Finance Gap Fund, a Multi-Donor Trust Fund with support from the Governments of Germany and Luxembourg. The development of the document was led by World bank Kenya, Ricardo, technical staff from climate change unit, interdepartmental effort, Kenya climate change working group.

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Vision and Goal

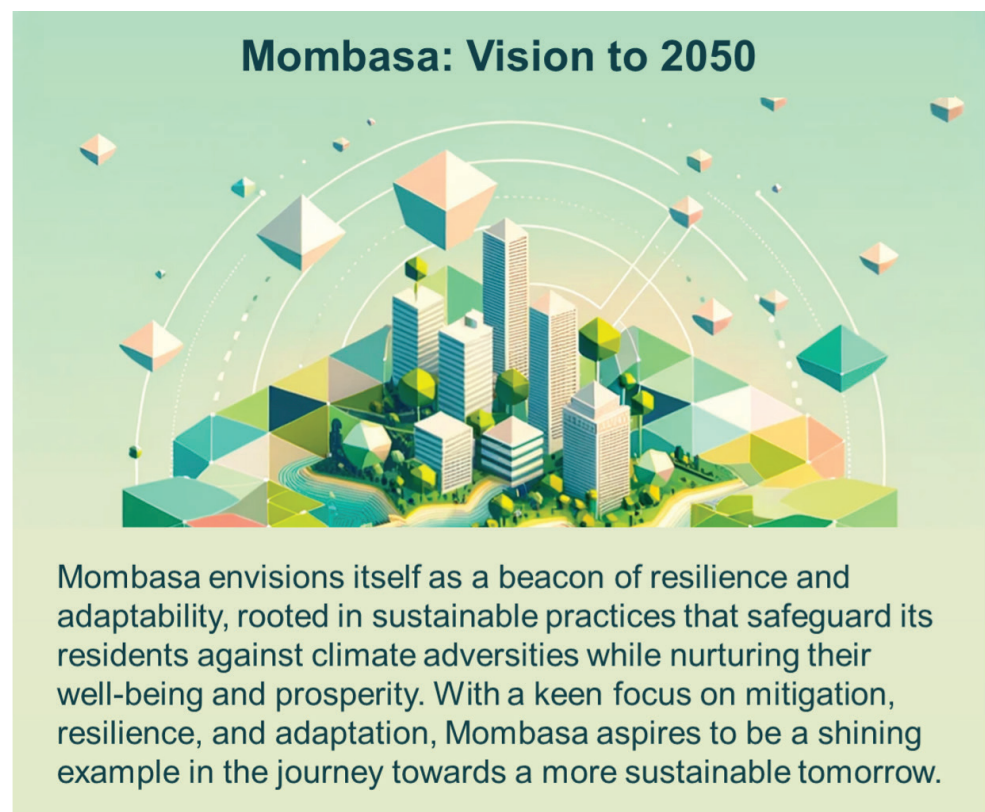


Mombasa's unique geographic and demographic context offers it a prominent role in the ongoing fight against climate change. As such, it faces tangible challenges brought on by a changing climate, including recurrent flooding and severe weather events. These climate-related adversities continue to negatively impact its population, economy, and biodiversity, highlighting the need for urgent, context-driven climate action.

Recognising the vulnerabilities of its key sectors, Mombasa is actively committed to enhancing its resilience. As such, this effort aims to ensure more than just disaster risk reduction; that is, it looks to build a county which thrives even amidst the challenges posed by climate change.

To this end, Mombasa's Climate Action Plan (CAP) embodies its dedication to bolstering its resilience while aligning with broader national and international climate objectives, including the United Nations Sustainable Development Goals (UN-SDGs). Similarly, to showcase its leadership and dedication to a comprehensive global climate solution, Mombasa County has recently pledged its commitment to the Global Covenant of Mayors. Through this commitment, the county shares a unified vision for the year 2050, which encompasses the development of a comprehensive inventory of greenhouse gas emissions, a thorough assessment of climate risks, the establishment of quantifiable emissions reduction targets, ambitious climate adaptation objectives, and the implementation of a Climate Action Plan in harmony with the Paris Agreement.

Figure 1 Mombasa's vision to 2050



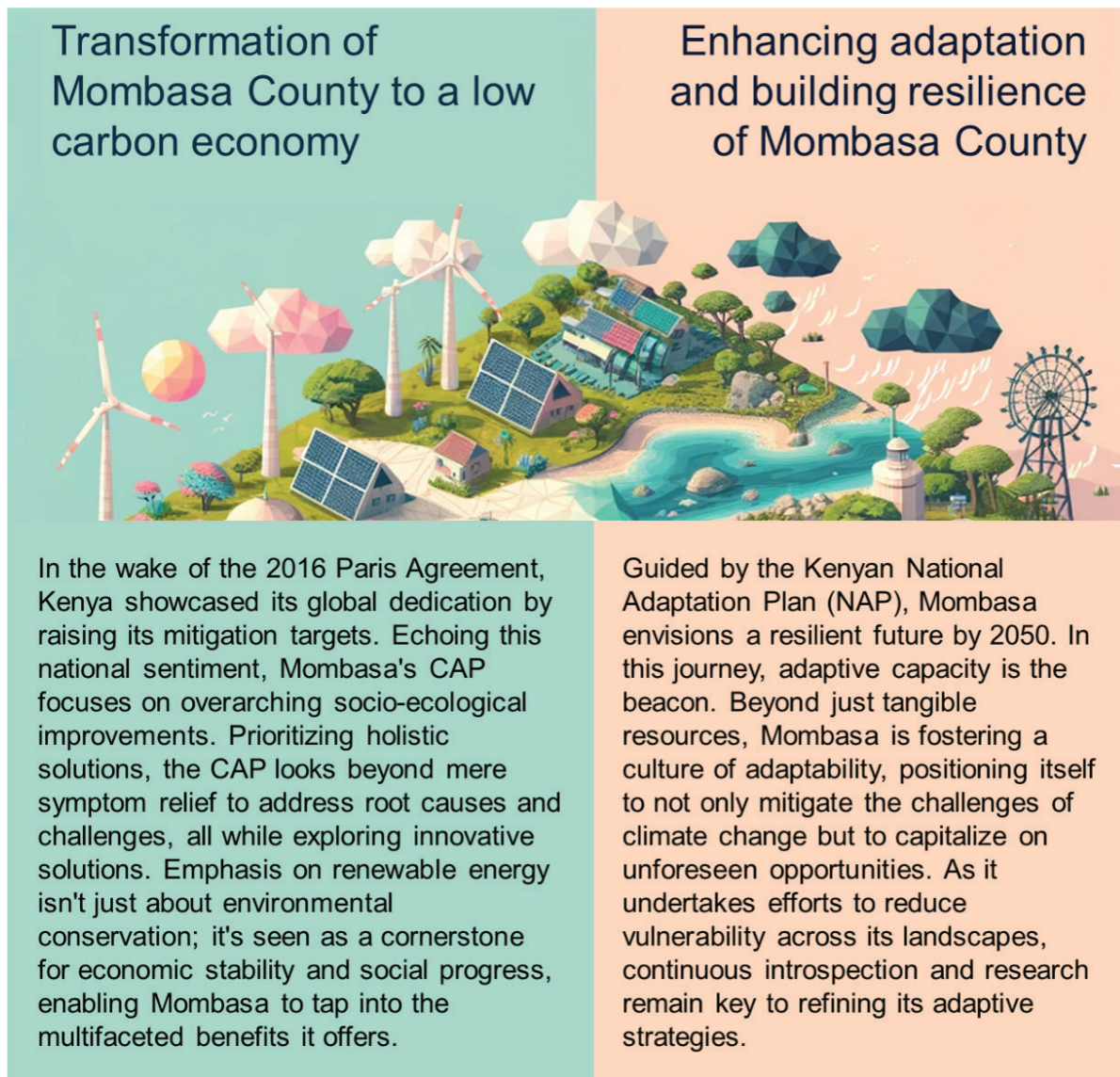
This image was created with the assistance of DALL·E 3



Mombasa envisions itself as a beacon of resilience and adaptability, rooted in sustainable practices that safeguard its residents against climate adversities while nurturing their well-being and prosperity. With a keen focus on mitigation, resilience, and adaptation, Mombasa aspires to be a shining example in the journey towards a more sustainable tomorrow.

The development of this climate vision involved an inclusive and collaborative process that effectively involved a wide array of stakeholders. With inclusivity and equity as guiding principles, stakeholder consultations were thoughtfully organised, making sure to employ diverse methods such as sector-specific meetings, workshops, and online surveys to ensure that all voices were heard. These efforts not only gathered insights on climate priorities and channelled the collective wisdom and aspirations of Mombasa’s residents into the vision, but also nurtured a shared sense of ownership and dedication towards it.

Figure 2 Mombasa’s mitigation and adaptation vision



<https://www.cambridge.org/core/books/abs/searching-for-a-new-kenya/history-of-publics-in-mombasa/412D87B2EA8397EB7BB6B11F211AD094>

Not all mitigation measures could be modelled

This image was created with the assistance of DALL-E 3



Evidence Base



Taking Stock of Greenhouse Gas Emissions

Compiling a GHG inventory is an essential step in the CAP development process. Mombasa’s inventory was compiled for the year 2019 and its boundary includes all of Mombasa County, which covers a land area of 151 km² and six parliamentary constituencies – Changamwe, Jomvu, Kisauni, Nyali, Likoni, and Mvita. Mombasa’s GHG inventory was developed in accordance with global best practices, making it compliant with the Global Protocol for Community Scale Greenhouse Gas Emission Inventories (GPC).

Mombasa’s total GHG emissions in the stationary energy, transport and waste sectors amounted to 1,782 ktCO₂e in 2019. When industrial processes and product use, livestock, and aviation (i.e., BASIC+ sources) were included, the emissions estimate rose to 2,210 ktCO₂e. Likewise, when including the port, emissions rose to 2,745 ktCO₂e (BASIC+ plus other scope 3) (Figure 2).

Direct emissions from owned or controlled sources in Mombasa show significant contributions from various sectors. The transportation sector is the dominant contributor, accounting for 48.90% of the total Scope 1 emissions, mainly driven by on-road transportation. Following closely is the waste sector, representing 28.61% of the emissions, primarily from waste generated within the city. The stationary energy sector, contributes 6.04%, while the IPPU (Industrial Processes and Product Uses) sector constitutes 15.67%. The AFOLU (Agriculture, Forestry, and Other Land Use) sector has a minimal contribution at 0.77%, mainly from livestock and related activities. Collectively, these emissions provide insights into the areas with the highest direct greenhouse gas emissions, indicating potential focal points for mitigation strategies.

The GPC distinguishes between emissions that physically occur within the city (scope 1), from those that occur outside the city but are driven by activities taking place within the city’s boundaries (scope 3), from those that occur from the use of electricity, steam, and/or heating/cooling supplied by grids which may or may not cross city boundaries (scope 2).

Figure 4 GHG Emissions in Mombasa by sector (scope 1 - 2019)

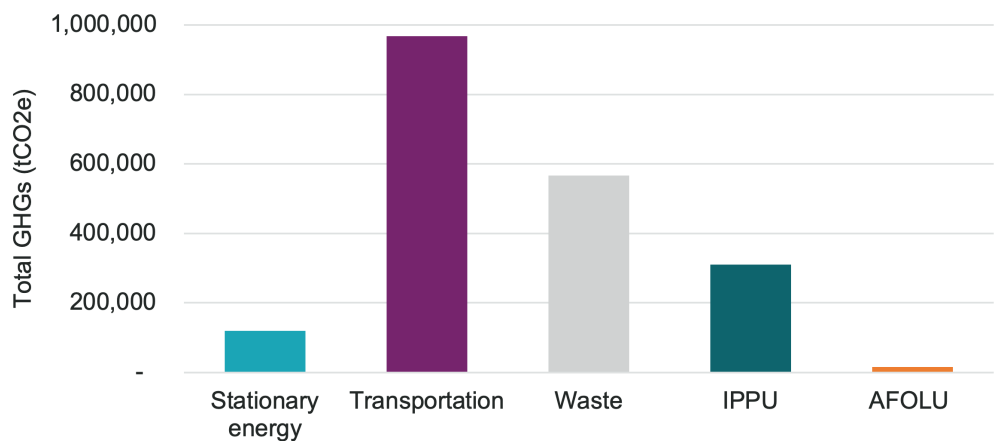
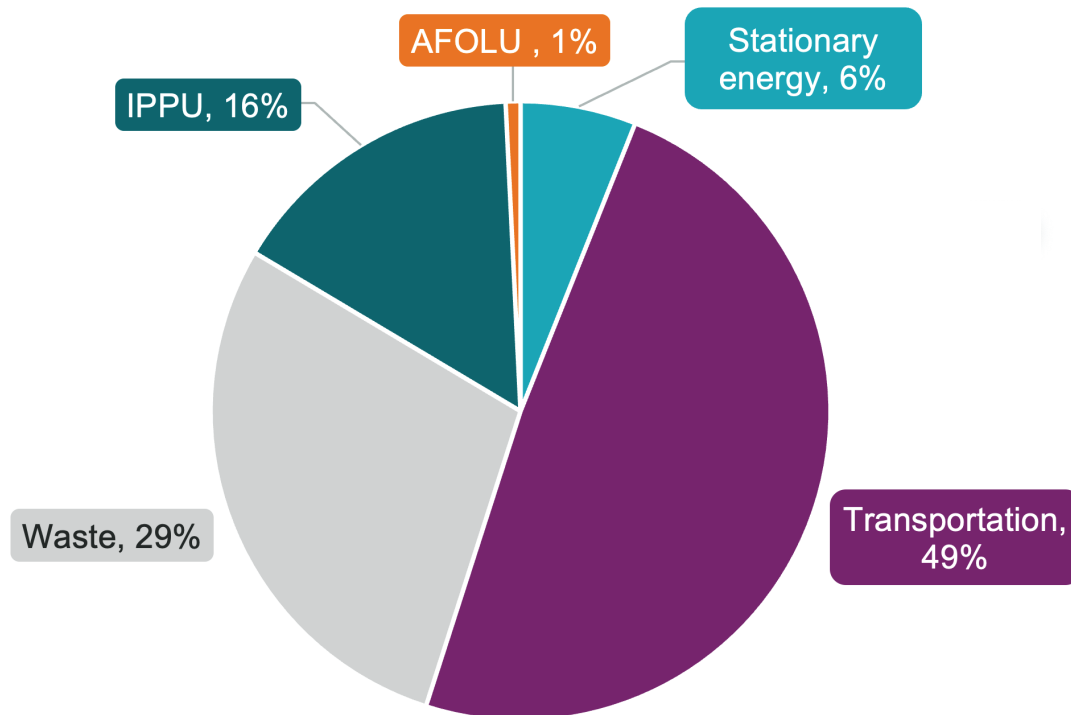


Figure 5: GHG Emissions by sector (2019)



Scope 1 emissions represent direct emissions from owned or controlled sources and provide valuable insights into Mombasa's GHG emission profile. The sectoral breakdown below refers to the scope 1 emissions of Mombasa:

1. Transportation Sector (49% of emissions):

The transportation sector stands out as the most significant contributor, accounting for nearly half of the total Scope 1 emissions. The bulk of these emissions, amounting to 936,116.58 metric tonnes CO₂e, comes from on-road transportation, emphasizing the heavy reliance on road transport in Mombasa.

2. Waste Sector (29% of emissions):

The waste sector is the second-highest contributor, driven predominantly by waste generated within the city. Solid waste alone contributes a staggering 323,196 metric tonnes CO₂e, making it an essential area to target for emission reductions.

3. Stationary Energy Sector (6% of emissions):

Contributions from the stationary energy sector are mainly from residential buildings and commercial

facilities, amounting to 47,719.38 and 47,393.42 metric tonnes CO₂e, respectively. Notably, certain energy industries and energy generation for the grid have been excluded from this contribution.

4. IPPU (Industrial Processes and Product Uses) Sector (16% of emissions):

The IPPU sector showcases significant emissions, with industrial processes within the city boundary alone emitting 246,010.36 metric tonnes CO₂e. This indicates the presence of considerable industrial activity in Mombasa, impacting its emission profile.

5. AFOLU (Agriculture, Forestry, and Other Land Use) Sector (1% of emissions):

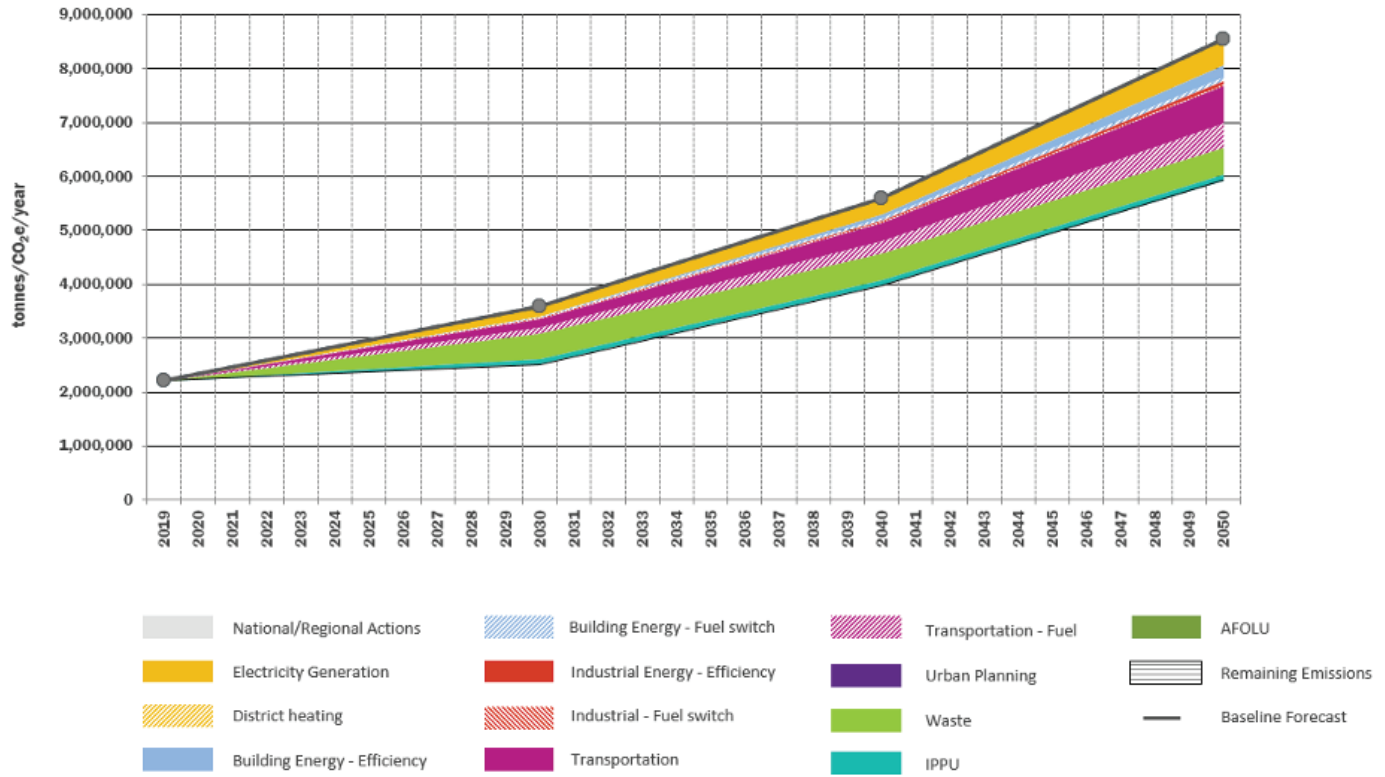
The AFOLU sector, while contributing the least to the total, is primarily driven by emissions from livestock, amounting to 15,285.03 metric tonnes CO₂e. This figure suggests a comparatively lower impact of agricultural activities on the city's direct emissions.



GHG Projections for Mombasa

Figure 6 below shows the results from the modelling undertaken for Mombasa. The modelling was undertaken in C40’s pathways tool following an “existing and planned” approach, meaning that all measures that have been captured in the tool are either already in place of have been planned in official strategy or policy documents. Most of these were taken from the national level and scaled to Mombasa using the appropriate scaling factors.

Figure 6 Emissions Reductions Scenario for Mombasa (Existing and Planned Measures)⁴



The top line on the graph shows the baseline forecast, illustrating how emissions would develop without any additional measures in place. The increase in emissions is a result of GDP and population growth figures. The areas below the graph show the reductions from the measures in each sector. It should be noted that AFOLU emissions reductions measures weren’t modelled as there is no comprehensive emissions baseline for this sector due to lack of data availability.

The sections below outline the specific actions and sources for each sector.

- **Electricity Generation:** The plan underscores Kenya’s commitment to a renewable-powered grid, with substantial progress already achieved. Future projections envision a gradual shift towards nearly complete reliance on renewable energy sources by 2050. To accelerate this transition, Mombasa plans to add significant capacity in geothermal, solar, and wind power by 2028. The ultimate aim is a zero-emission grid

by 2030, emphasizing the city’s dedication to sustainable energy.

- **Buildings and Energy:** The focus here is on certifying new buildings as green structures to enhance energy efficiency and transition to environmentally friendly refrigerants. While the plan prioritizes sustainability in new constructions, specific retrofitting targets for existing buildings are yet to be defined.
- **Transport:** Addressing emissions from the transport sector due to urbanization and growth, the plan advocates for non-motorized transport facilities, electrification of motorcycles, and stricter vehicle emission standards. It recommends a transition to electric vehicles and the electrification of the standard gauge railway for more significant emissions reduction.
- **Waste:** Emissions reductions in waste management are to be achieved by source segregation and waste



reduction. Challenges include a low waste recovery rate and the need to address wastewater emissions as the city works toward its goal of a 73% reduction in waste sector emissions by 2027.

- **Industry:** Cement production, a significant emitter, is the primary focus in the industrial sector. Measures aim to improve energy efficiency, promote circular economy practices, and encourage green building design, although increased cement demand may pose challenges.
- **Agriculture:** The plan aligns with Kenya's ambitious goal of establishing agroforestry practices. While a specific share is assigned to Mombasa, the high-level assessment may require further viability assessments. Additionally, the plan suggests considering soil improvement measures for sustainable agriculture.
- **Forestry:** In the forestry sector, efforts centre around rehabilitating mangrove forests and tree planting. Mombasa is allocated a share for mangrove restoration and potential woodland planting, with the understanding that species selection and maintenance are pivotal for carbon sequestration and environmental benefits.

Mombasa's Climate Change Impacts Context

Kenya has observed shifts in its annual and extreme temperature patterns, rainfall distribution, prolonged droughts, increased occurrence of severe weather events such as storms, and outbreaks of diseases. While these hazards manifest differently across the country, Mombasa County, located along the southeastern coast, stands out due to its characteristic high temperatures and humidity. Consequently, Mombasa's climate exhibits extremes in temperature, precipitation, flooding, and storm events. As such, five primary climate-related hazards hold particular significance for Mombasa: drought, flooding, sea-level rise, extreme heat, and landslides.

- **Droughts:** The projection data indicates that the duration of droughts and precipitation events is expected to increase.
- **Precipitation:** Additionally, precipitation events are expected to intensify, as demonstrated by an increase in the largest monthly cumulative precipitation.
- This intensification may elevate the risk of flooding and landslides due to heavy, sudden, and extreme rainfall.
- **Sea level rise:** Likewise, the sea level is forecasted to rise for the East African Coast, potentially heightening the probability of coastal flooding and storm surges.
- **Extreme heat:** Lastly, extreme temperatures are projected to consistently increase throughout the century, with maximum daily temperatures reaching between 38°C and 40°C and notably, there's a significant increase in the number of days exceeding 35°C.

The collective picture is that Mombasa's climate will undergo a shift towards greater extremes. This entails prolonged periods of higher temperatures and heat extremes, heightened intensity of precipitation events, and the encroachment of sea levels along the coastline



Assessing Potential Climate Impacts In Mombasa

Mombasa County has a long history of feeling the effects of climate impacts associated with growing climate hazards, Given that the projections above indicate that Mombasa's susceptibility towards climate hazards and therefore impacts will only increase in the future, it is imperative to assess the potential future impacts of climate change in Mombasa. Doing so will allow the county to identify adaptation measures and priority areas of intervention to bolster its resilience.

The following table highlights the results of a Rapid climate risk assessment (CRA) that was based upon the county's earlier participatory CCRA. It identifies the potential impacts across sectors, associated with each of the five key climate-related hazards relevant to Mombasa.

Table 1: Potential impacts of five key climate-related hazards across sectors in Mombasa

Climate-related hazard	Capital	Sector	Impacts
Drought	Social	Health	Drought induced food and water insecurity, increasing potential for malnutrition and poor health, increasing likelihood of spreading disease
		Education	Drought induced insecurity can reduce the attendance of schools, particularly for those in poverty and early-years education
	Natural	Natural resources	Reduction in freshwater resources leading to biodiversity loss
		Water resources	Reduction in fresh water and ground water resources leading to water insecurity and soil instability
	Economic	Agriculture & livestock	Reduction in agriculture yield and reduction in water availability for rearing of cattle, sheep, and goats
		Energy	Kenya possesses hydro-electric generation capacity. Mombasa's energy supply has been disrupted due to occurrences of drought in-land. This could lead to black outs and loss of energy supply from outside of the county.
		Tourism	Sustained drought may discourage tourists from visiting the Mombasa coast
		Water resources	Decreased availability of fresh water, increasing reliance and demand for desalinated water, and may also increase the operational cost of water services



Climate-related hazard	Capital	Sector	Impacts
Flooding	Social	Health	Immediate risk to life from extreme flooding events and chronic risk to health from persistent flooding or contamination from flooding events through the spread of water-borne disease
		Human settlements	Mombasa's informal settlements are located in areas of rapid urbanisation with little drainage and are built on reclaimed wetlands, which possess little to no flood protection, leading to damage to settlements and risk to life
		Water resources	Contamination of water resources and water infrastructure leading to reduction in clean water availability
		Education	Disruption from flooding can reduce the attendance of schools, particularly for those in poverty and early-years education
		Waste	Contamination of natural and domestic spaces from flood-induced pollution
	Natural	Natural resources	Contamination and damage to natural resources, soil erosion, leading to water and food insecurity, and biodiversity loss
		Water resources	Contamination of rivers and fresh water sources through siltation and pollution spread
	Economic	Agriculture & livestock	Damage to urban farming, leading to food insecurity, and risk to life for urban livestock (cattle, sheep, goats), ultimately causing disruption to food production and trade
		Transport & infrastructure	Disruption to transport, leading to loss of business and prevention of economic activity
		Energy	Damage to energy supply infrastructure causing black-outs
		Fisheries	Contamination of coastal ecosystems through run-off into oceans, affecting abundance of fish catch
		Tourism	Flooding events can discourage tourists from visiting the coast due to disruption in transport, damage to natural spaces, and unpleasant conditions
		Infrastructure	Damage to infrastructure through immediate damage and long-term degradation



Climate-related hazard	Capital	Sector	Impacts
Sea level rise	Social	Human settlements	Damage to settlements located on coast, specifically those located around Mombasa port which are close to sea level and small estuaries
		Mangroves and shoreline protection	Damage to mangrove forests which are the focus of many conservation programmes, currently engaging local vulnerable communities to provide them with a source of income and coastal protection
		Health	Inundation may lead to persistent flooding and contamination, which can increase the spread of disease
	Natural	Fisheries	Changes to coastal ecosystems, causing coastal biodiversity loss
		Mangroves and shoreline protection	Damage to mangrove forests leading to loss of biodiversity and also loss in coastal protection from storms and coastal flooding, emphasising impacts from future sea level rise and extreme coastal events
		Natural resources	Salt-water intrusion can increase salinity of soil, affecting soil quality and stability
		Energy	Damage to mangrove forests which provide fuel for those in informal settlements
		Water resources	Salt-water intrusion may affect fresh water supply through ground water resources
	Economic	Tourism	Damage to coastal habitats, beaches, coastal erosion, tourism assets, resorts, and leisure activities
		Transport & infrastructure	Damage to water-based transport, including the Likoni ferry terminal which sits at 4m above sea level
		Transport & infrastructure	Disruption to shipping access within Mombasa port
		Fisheries	Changes to coastal ecosystems, affecting abundance of fish catch
		Mangroves and shoreline protection	Damage to mangrove forests which income through mangrove conservation programmes
Natural resources		Salt-water intrusion may change the areas in which mangrove forests can be grown, leading to new economic opportunities	
Infrastructure		Damage to infrastructure from coastal flooding and inundation through immediate damage and long-term degradation	
Landslides	Social	Human settlements	Informal settlements are located near slopes of rivers and small estuaries, and are made of unstable material, which may lead to damage and risk to life under heavy or prolonged rain
	Natural	Natural resources	Landslides can lead to siltation and blockage of rivers and estuaries, causing damage to ecosystems
	Economic	Transport & infrastructure	Damage to transport routes, such as the South Mombasa ring road, which requires funds for repair and delays major infrastructure projects, such as the Nyali-Kilifi road
		Transport & infrastructure	Disruption to transport, leading to loss of business and prevention of economic activity



Climate-related hazard	Capital	Sector	Impacts
Extreme heat	Social	Human settlements	Rapid urbanisation and removal of green spaces contribute to increasing urban heat island effect, emphasised by extreme heat
		Human settlements	Informal settlements are often built using materials that do not encourage airflow or natural cooling, leading to increased urban heat island effect
		Health	Extreme heat and high humidity will cause significant risk to health; temperatures above 32 degrees C inhibit the ability for humans to cool via sweating and significantly increases potential for heat-related illness
	Natural	Natural resources	Extreme heat can lead to drying out of plant life and exacerbate stress on biodiversity, leading to biodiversity loss
		Water resources	Increased water insecurity through increased evaporation, reducing water availability for people or ecosystems
		Fisheries	Continued warming of oceans, exacerbated by localised extreme heat, may affect coastal ecosystems, leading to biodiversity loss
	Economic	Agriculture & livestock	Damage to urban farming crops, resulting in reduced yield, increased food insecurity, and heavier reliance on trade/imports
		Water resources	Increased water insecurity through increased demand for domestic, commercial, and industrial cooling needs
		Tourism	Changes to numbers throughout tourism seasons; extreme temperatures can discourage tourists due to health concerns, but also encourage tourists to travel to coastal resorts
		Transport & infrastructure	Damage to roads and railway lines causing disruption to transport routes and increased maintenance costs
		Energy	Increased demand for domestic, commercial, and industrial cooling needs



Mombasa's Climate Actions

The development of Mombasa's CAP resulted in an initial list of 127 potential actions for the county. Through a process of prioritisation, this initial list was reduced to 47 prioritised actions, spread across both mitigation and adaptation. Tables 2 and 3 below indicate these actions across Mombasa's key sectors.

Table 2: Adaptation actions

Enhancing adaptation and building resilience of Mombasa County
Agriculture, livestock and fisheries
Agr-1: Promote conservation tillage
Agr-2: Increase deep/offshore fishing fleet
Agr-3: Promote climate-smart technologies and practices and agroforestry
Agr-4: Using low-carbon (recirculation) aquaculture
Health
Hea-1: Strengthen and promote emergency management services to better handle emergency and disaster situations related to climate change and health .
Hea-2: Promote disease surveillance, monitoring and early warning system
Hea-3: Integrate climate change considerations into the health sector
Hea-4: Promote climate vulnerability and risk assessment tools and decision support systems to enhance informed decision making in the health sector
Water resources
Wat-1: Climate proof existing water infrastructure, and any new investments in the water sector.
Wat-2: Enhance access to clean and safe water and sanitation and improved water efficiency.
Wat-3: Enhance protection of water catchment areas that are important for trans-basin water transfer by working with the Counties of Taita Taveta, Kilifi, and Kwale
Wat-4: Develop Integrated Water Infrastructure Management Plans at County and Sub-County levels that will include inter alia enhance rainwater harvesting and storage among other measures
Wat-5: Develop and implement standards and guidelines for management and use of surface and ground water resources
Human settlement
Hum-1: Enhance community awareness and training on climate risk and disaster preparedness
Hum-2: Develop a comprehensive early warning system and disaster risk management plans
Hum-3: Enhance informal settlements improvement schemes
Inshore waters
Ins-1: Promote sustainable activities in the inshore waters that do not stress the sea grasses beds, corals and coral reefs such as destructive fishing.



Ins-2: Put in place measure that regulate inflows and discharges especially a range of nutrients, pollutants and sediment loads into the inshore waters that may affect sea grass ecosystem and the reef system.
Mangroves and shoreline protection
Man-1: Enhance the protection and rehabilitation of mangrove ecosystem.
Infrastructure
Inf-1: Ensure climate risks and vulnerability assessments are done for all existing and new infrastructure development
Tourism
Tou-1: Strengthen education, information and public awareness on climate change among the residents in the county.
Tou-2: Work with hotel establishments to put in place natural defence measures for protection of the shoreline
Tou-3: Diversify and orientate sustainable tourism activities across the county
Tou-3: Promote climate proofing of tourism sector establishments and operations within the county
Buildings
Bui-3: Promote efficient water management through implementing water-saving measures like low-flow faucets, dual-flush toilets, and efficient irrigation systems to minimise water consumption and reduce strain on local water resources

Table 3: Mitigation actions

Transformation of Mombasa County to a low carbon economy
Transport
Tra-1: Put in place infrastructure to promote use of non-motorized modes of transport especially bikeways and pedestrian walkways.
Tra-2: Work with all stakeholder groups to accelerate the transition to net zero by 2050
Tra-3: Implement the “Greening of the Mombasa Port” plan, and build resilience and mitigate GHG emissions through installation of solar panels
Tra-4: Encourage transition from fossil fuel-based vehicles and vessels to other low carbon technologies such as electric vehicles
Forestry
For-1: Expand and protect mangrove forest cover for coastal adaptation and blue carbon sequestration
For-2: Institute an annual county tree planting day
For-3: Promote rehabilitation of mangroves and degraded areas in the County.
For-4: Promote establishment and maintenance of greens zones.
Agriculture, livestock and fisheries
Agr-1: Promote conservation tillage
Agr-3: Promote climate-smart technologies and practices and agroforestry
Agr-4: Using low-carbon (recirculation) aquaculture



Energy
Ene-1: Calls for residential and commercial premises that use more than 100 cubic meters of water daily to install solar or water heating in the premises to reduce the energy demand and load in heating water and utilize renewable energy
Ene-2: Promote investments in renewable energy especially wind and solar
Ene-3: Promote energy efficiency technologies and approaches
Ene-4: Work with Kenya Bureau of Standards towards enhancing energy management standards covering energy management systems, energy auditing and energy efficiency performance measurement & verifications.
Waste
Was-1: Prepare County-based waste management plans that are consistent with the National Waste Management Strategy and other relevant policies
Was-2: Set up a waste and by-product exchange database for matchmaking
Was-3: Incentivise and facilitate establishment of a circular economy based on waste across the county
Was-4: Strengthen waste management regulation in the county
Buildings
Bui-1: Use energy-efficient appliances and equipment within buildings, such as ENERGY STAR-rated appliances, efficient HVAC systems, and LED lighting
Bui-2: Develop minimum energy performance standards for new buildings
Industry
Ind-1: Promotion of local manufacture, development, and enforcement of quality standards and servicing of clean cookstoves, fuels and other appliances

Ready to Implement Actions

Among the 47 prioritised actions, a subset of 10 has been identified as “ready to implement.” This classification is based on an alignment with Mombasa’s climate priorities, the areas it deems most important for both reducing emissions and adapting to climate change, as well as its available capacity and resources. Table 4 below highlights these ready to implement actions.

Mombasa’s Climate Actions in Context

Mombasa, with its distinctive coastal position and biodiversity, faces both environmental challenges and opportunities. In response to the broader climate crisis and its specific implications for the region, Mombasa has developed a focused climate action strategy. The core objectives are to transition towards a low-carbon economy and enhance the county’s resilience to climate-related impacts.

In the realm of low-carbon transformation, Mombasa’s actions are rooted in understanding its environmental strengths and urban needs. The mangrove forests, a key ecological component, are central to mitigation efforts. By

prioritising their protection and expansion, Mombasa aims to strengthen its natural defences against coastal threats and harness benefits such as carbon sequestration and ecotourism potential. Urban areas in Mombasa are also seeing shifts with the integration of green zones, addressing urban heat issues and improving air quality. Waste management, another critical area, is being addressed through plans that include a circular economy model and updated regulations, focusing on efficient waste handling and increased recycling.

On the adaptation front, Mombasa’s strategies cater to its specific vulnerabilities. Infrastructure is undergoing climate



risk assessments to ensure it can withstand future climate events. The tourism sector, vital to Mombasa's economy, is being adapted to be more resilient. This involves promoting climate education, implementing natural shoreline protection measures, and diversifying tourism activities to be more sustainable.

In summary, Mombasa's climate actions reflect its commitment to balancing development and environmental concerns. By addressing challenges such as rising sea levels and urban environmental strains, the city is working towards a sustainable future.

Table 4: Ready to implement actions

Transformation of Mombasa County to a low carbon economy
Forestry
For-1: Expand and protect mangrove forest cover for coastal adaptation and blue carbon sequestration
For-3: Promote rehabilitation of mangroves and degraded areas in the County.
For-4: Promote establishment and maintenance of greens zones.
Waste
Was-1: Prepare County-based waste management plans that are consistent with the National Waste Management Strategy and other relevant policies
Was-3: Incentivise and facilitate establishment of a circular economy based on waste across the county
Was-4: Strengthen waste management regulation in the county
Enhancing adaptation and building resilience of Mombasa County
Infrastructure
Inf-1: Ensure climate risks and vulnerability assessments are done for all existing and new infrastructure development
Tourism
Tou-1: Strengthen education, information and public awareness on climate change among the residents in the county.
Tou-2: Work with hotel establishments to put in place natural defence measures for protection of the shoreline
Tou-3: Diversify and orientate sustainable tourism activities across the county



Transformation of Mombasa County to a Low Carbon Economy

Forestry-1: Expand and protect mangrove forest cover for coastal adaptation and blue carbon sequestration

Climate strategy		Mangrove Expansion
Type of Action	Program	
Climate impact	Mangrove protection and enhancement Emissions reductions Coastal ecosystem protection	
Lead agency	Department of Environment and Solid Waste Management	
Collaborative agencies	Department of Water, Natural Resource and climate resilience State Department of Fisheries NEMA - National Environment Management Authority KWS - Kenya Wildlife Service MoT&W - Ministry of Tourism and Wildlife CoG - Council of Governors KFS - Kenya Forest Service KEFRI - Kenya Forestry Research Institute KMFRI - Kenya Marine And Fisheries Research Institute County Government of Mombasa	
Timeline	25 years (5 years mid-term reviews)	
Resourcing plan (funding & financing; human & technical)	City county resources and donors	
Level of city control	High	
Alignment with Policies & Plans	National Mangrove Ecosystem Management Plan NCCAP 2023-2027	
KPIs	- No. of hectares of mangrove forest cover - No. of hectares of shoreline areas under protective management - Carbon sequestration rates	
Co-benefits	Community benefit: Reduced flood-risk Economic benefit: Increased revenue from mangrove ecotourism, Improved fish production, Enhanced coastal protection of infrastructure Environmental benefit: Increased carbon sequestration, Improved water quality, Coastal erosion control	
Sub-actions	Short term (By 2030)	Conduct a comprehensive assessment of existing mangrove forests
	Medium Term (By 2040)	Develop a restoration and conservation plan
	Long term (By 2050)	Establish community-based management initiatives. Monitor carbon sequestration and biodiversity outcomes. Raise awareness about the importance of mangroves and sustainable use practices



Forestry-3: Promote rehabilitation of mangroves and degraded areas in the County.

Climate strategy		Mangrove restoration
Type of Action	Program	
Climate impact	Biodiversity restoration and protection Enhanced carbon sequestration	
Lead agency	Department of Environment, Waste Management	
Collaborative agencies	State Department of Fisheries Department of Water, Natural Resource and climate resilience NEMA - National Environment Management Authority KWS - Kenya Wildlife Service MoT&W - Ministry of Tourism and Wildlife CoG - Council of Governors KFS - Kenya Forest Service KMFRI - Kenya Marine and Fisheries Research Institute	
Timeline	25 years (5 years mid-term reviews)	
Resourcing plan (funding & financing; human & technical)	County Government of Mombasa resources and donors	
Level of city control	High	
Alignment with Policies & Plans	National Mangrove Ecosystem Management Plan NCCAP 2023-2027 Kenya Vision 2030	
KPIs	Hectares of mangrove area restored Carbon sequestration rates	
Co-benefits	Community benefit: Protection against coastal erosion, Reduced flood-risk, Community empowerment Economic benefit: Eco-tourism growth, Improved fish production, Sustainable livelihood opportunities Environmental benefit: Improved soil quality	
Sub-actions	Short term (By 2030)	Stakeholder engagement to involve local communities and NGOs in planning and implementing rehabilitation projects Conduct educational campaigns and awareness programs to engage the public in mangrove conservation and restoration efforts Conduct site assessments to identify degraded mangrove areas and prioritise sites for rehabilitation
	Medium Term (By 2040)	Establish and manage mangrove nurseries for propagating tree seedlings
	Long term (By 2050)	Implement ongoing monitoring and management of rehabilitates areas to ensure long-term success Organise and execute mangrove planting activities, ensuring proper techniques and monitoring of planted areas



Forestry-4: Promote establishment and maintenance of greens zones.

Climate strategy		Urban greening
Type of Action	Program	
Climate impact	Reduced urban heat island effect Improved air quality Increased carbon sequestration	
Lead agency	Department of Environment, Waste Management	
Collaborative agencies	State Department of Fisheries Department of Water, Natural Resources and climate resilience NEMA - National Environment Management Authority KWS - Kenya Wildlife Service MoT&W - Ministry of Tourism and Wildlife CoG - Council of Governors KFS - Kenya Forest Service KMFRI - Kenya Marine and Fisheries Research Institute	
Timeline	25 years (5 years mid-term reviews)	
Resourcing plan (funding & financing; human & technical)	County Government of Mombasa resources and donors	
Level of city control	High	
Alignment with Policies & Plans	NCCAP 2023-2027	
KPIs	No. of green zones developed in the county	
Co-benefits	Community benefit: Increased area for recreation and relaxation, Enhanced quality of life in urban areas Economic benefit: Increased tourism opportunities, Increased opportunities for recreational opportunities benefiting local businesses, Potentially increased property values	
Sub-actions	Short term (By 2030)	Site selection to identify suitable locations for green zone development, prioritizing areas with limited green cover and high urban heat island effect Stakeholder engagement to involve local communities in the planning and design of green zones, considering their needs and preferences
	Medium Term (By 2040)	Implement tree planting, landscaping, and maintenance plans, including irrigation and waste management
	Long term (By 2050)	Launch educational and awareness campaigns to inform residents about the benefits of urban green spaces



Waste-1: Prepare County-based waste management plans that are consistent with the National Waste Management Strategy and other relevant policies

Climate strategy		Waste Management
Type of Action		Policy/Plan
Climate impact		Reduced waste Reduced emissions from waste Increased recycling
Lead agency		Department of Environment and solid Waste Management, County Government of Mombasa
Collaborative agencies		MITC - Mombasa Industrial and Technology Park KIRDI - Kenya Industrial Research and Development Institute NEMA - National Environment Management Authority KAM - Kenya Association of Manufacturers Private sector (industrialists) Waste Management Authority
Timeline		25 years (5 years mid-term reviews)
Resourcing plan (funding & financing; human & technical)		County Government of Mombasa resources and donors
Level of city control		High
Alignment with Policies & Plans		LTLED NCCAP 2018-2022 Kenya Vision 2030 National Solid Waste Management Strategy (NSWMS) CIDP
KPIs		No. of sub-counties with waste management plans
Co-benefits		Environmental benefit: Reduced waste sent to landfill, Improved groundwater quality, Improved ecosystem health Community benefit: Improved public health Economic benefit: Increased resource efficiency in the industry sector, Employment opportunities
Sub-actions	Short term (By 2030)	Assess the current waste management practices and infrastructure Establish waste reduction and recycling targets
	Medium Term (By 2040)	Develop a comprehensive waste management plans at the sub-county level that align with national strategies.
	Long term (By 2050)	Engage with local communities and stakeholders for input. Implement waste collection and separation programs Monitor and evaluate the progress of waste management initiatives.



Waste-3: Incentivise and facilitate establishment of a circular economy based on waste across the county

Climate strategy		Circular economy
Type of Action		Program
Climate impact		Reduced waste Increased recycling
Lead agency		Department of Environment and solid Waste Management, County Government of Mombasa
Collaborative agencies		MITC - Mombasa Industrial and Technology Park KIRDI - Kenya Industrial Research and Development Institute NEMA - National Environment Management Authority KAM - Kenya Association of Manufacturers Private sector (industrialists) Waste Management Authority
Timeline		25 years (5 years mid-term reviews)
Resourcing plan (funding & financing; human & technical)		County Government of Mombasa
Level of city control		High
Alignment with Policies & Plans		LTLED NCCAP 2018-2022 Kenya Vision 2030 National Solid Waste Management Strategy (NSWMS) CIDP
KPIs		Waste diversion rate (recycling, composting etc.)
Co-benefits		Community benefit: Reduced waste and pollution Improved public health Economic benefit: Employment opportunities in waste recycling, upcycling, and sustainable product manufacturing, Cost savings due to reuse, Revenue generation from sale of recycled/upcycled products Environmental benefit: Resource conservation, Reduced emissions from landfills
Sub-actions	Short term (By 2030)	Identify and map available waste resources and potential circular economy opportunities within the county
	Medium Term (By 2040)	Develop and implement policies that incentivize circular economy practices, such as tax incentives, subsidies, and regulatory frameworks Provide trainings and workshops for businesses and industries on circular economy practices
	Long term (By 2050)	Establish mechanisms for monitoring and reporting on the progress and impact of circular economy initiatives Encourage local businesses and industries to adopt circular economy practices, providing support and incentives for participation Conduct public awareness campaigns to educate the community about the benefits of circular economy practices



Waste-4: Strengthen waste management regulation in the county

Climate strategy		Waste management
Type of Action	Regulations	
Climate impact	Reduced waste Increased recycling	
Lead agency	Department of Environment and solid Waste Management, County Government of Mombasa	
Collaborative agencies	MITC - Mombasa Industrial and Technology Park KIRDI - Kenya Industrial Research and Development Institute NEMA - National Environment Management Authority KAM - Kenya Association of Manufacturers Waste Management Authority	
Timeline	25 years (5 years mid-term reviews)	
Resourcing plan (funding & financing; human & technical)	County government of Mombasa	
Level of city control	High	
Alignment with Policies & Plans	LTLED NCCAP 2022-2027 Kenya Vision 2030 National Solid Waste Management Strategy (NSWMS) CIDP	
KPIs	No. of waste sector regulations reviewed and improved No. of new waste management regulations developed % of waste management entities complying with revised regulations	
Co-benefits	Community benefit: Reduced waste and pollution Improved public health Economic benefit: Employment opportunities in waste recycling, upcycling, and sustainable product manufacturing, Cost savings due to reuse, Revenue generation from sale of recycled/upcycled products Environmental benefit: Resource conservation, Reduced emissions from landfills	
Sub-actions	Short term (By 2030)	Review existing waste management regulations to identify areas for improvement
	Medium Term (By 2040)	Develop new regulations and/or amend existing ones to align with best practices and circular economy principles Conduct public awareness and outreach campaigns to inform relevant stakeholders of the new regulations Establish a system for monitoring waste management entities' compliance with regulations, ensuring routine auditing
	Long term (By 2050)	Develop and implement enforcement actions, including fines and penalties for non-compliance



Enhancing Adaptation and Building Resilience Of Mombasa County

Infrastructure-1: Ensure climate risks and vulnerability assessments are done for all existing and new infrastructure development

Climate strategy		Vulnerability and Risk Assessment (VRA)
Type of Action		Assessment
Climate impact		Reduced vulnerability of infrastructure
Lead agency		Department of Transport, Infrastructure and Public Works, County Government of Mombasa
& Collaborative agencies		Ministry of Transport, Infrastructure, Housing and Urban Development (MOTIHUD) State Department of Housing and Urban Development Physical Planning Department National Construction Authority
Timeline		25 years (5 years mid-term reviews)
Resourcing plan (funding & financing; human & technical)		County Government of Mombasa, MDAs and donors
Level of city control		High
Alignment with Policies & Plans		NCCAP 2018-2022 LTLED The Green Economy Strategy and Implementation Plan (GESIP) 2016-2030 Kenya Building Research Centre: Strategic Plan 2017/18-2021/22 CIDP
KPIs		% of existing infrastructure assessed for climate vulnerability % of new/planned infrastructure assessed for climate vulnerability
Co-benefits		Community benefit: Enhanced safety and security, Improved public service delivery Economic benefit: Investment protection, Reduced expenditure on post-disaster reconstruction/recovery, Insurance savings Environmental benefit: Natural resource protection
Sub-actions	Short term (By 2030)	Compile a comprehensive inventory of existing infrastructure assets in the county Conduct VRA of critical infrastructure, including historical climate data and projections and risk mapping (hazard, impact, and vulnerability assessment)
	Medium term (By 2040)	Develop regulations mandating VRAs for all planned infrastructure and monitor compliance Provide training for infrastructure planners and developers on climate resilience concepts and approaches
	Long term (By 2050)	Develop climate adaptation plans for vulnerable infrastructure and integrate resilience measures into infrastructure planning and design



Tourism-1: Strengthen education, information and public awareness on climate change among the residents in the county.

Climate strategy		Climate education
Type of Action		Program
Climate impact		Increased community understanding of climate change Enhanced collective actions to mitigate and adapt
Lead agency		Department of Tourism, County Government of Mombasa
Collaborative agencies		Ministry of Tourism, Wildlife and Heritage Ministry of Environment, Climate Change and Forestry (MoECCF) Ministry of Information, Communication and The Digital Economy Ministry of Education
Timeline		25 years (5 years mid-term reviews)
Resourcing plan (funding & financing; human & technical)		Ministry of Tourism, Wildlife and Heritage And County Government of Mombasa
Level of city control		High
Alignment with Policies & Plans		NCCAP 2018-2022 Education for Sustainable Development Strategy (EDS) The Wildlife Conservation and Management Bill 2023
KPIs		No. of IEC materials integrating climate change information and tourism and conservation disseminated to stakeholders No. of high school clubs trained on climate change integration No. of tourism destination institutions integrating climate information and conservation in their charter mandates
Co-benefits		Community benefit: Strengthened community resilience
Sub-actions	Short term (By 2030)	Develop climate change education materials suitable for different age groups and communities Use media platforms for broader outreach and engagement. Organize workshops, seminars, and community events to raise awareness about climate change.
	Medium Term (By 2040)	Collaborate with local schools and educational institutions to integrate climate education into curricula.
	Long term (By 2050)	Promote sustainable tourism practices and encourage tourists to engage in climate-friendly behaviors. Monitor and evaluate the impact of education and awareness efforts.



Tourism- 2: Work with hotel establishments to put in place natural defence measures for protection of the shoreline

Climate strategy		Coastal resilience
Type of Action	Program	
Climate impact	Reduced vulnerability of coastal establishments	
Lead agency	Department of Tourism, County Government of Mombasa	
& Collaborative agencies	Ministry of Transport, Infrastructure, Housing and Urban Development (MOTIHUD) State Department of Housing and Urban Development Physical Planning Department National Construction Authority Ministry of Tourism and Wildlife Kenya Tourism Board CoG - Council of Governors Private Sector (tourist establishments, operators)	
Timeline	25 years (5 years mid-term reviews)	
Resourcing plan (funding & financing; human & technical)	County Government of Mombasa and donors	
Level of city control	High	
Alignment with Policies & Plans	NCCAP 2022-2023 LTLED New Tourism Strategy for Kenya 2021-2025 National Wildlife Conservation and Management Policy	
KPIs	No. of tourism establishments that have implemented natural defence measures	
Co-benefits	Community benefit: Enhanced safety and security, Improved public service delivery Economic benefit: Investment protection, Reduced expenditure on post-disaster reconstruction/recovery, Insurance savings, Employment opportunities in construction phase, Tourism promotion Environmental benefit: Natural resource protection	
Sub-actions	Short term (By 2030)	Initiate discussions and collaborations with local tourism establishments Conduct site assessments to identify suitable areas for natural defense measures
	Medium Term (By 2040)	Develop plans for implementing natural defense measures, including coastal vegetation restoration and sand dune construction Educate tourists and local communities about the importance of shoreline protection and their role in preserving the environment
	Long term (By 2050)	Implement natural defense measures in collaboration with tourism establishments/ stakeholders Conduct routine monitoring and maintenance to assess the effectiveness of defense measures



Tourism- 3: Diversify and orientate sustainable tourism activities across the county

Climate strategy		Sustainable tourism
Type of Action		Program
Climate impact		Increased awareness on climate change and sustainable tourism
Lead agency		Department of Tourism, County Government of Mombasa
Collaborative agencies		Ministry of Tourism and Wildlife Kenya Wildlife Services Kenya Tourism Board CoG - Council of Governors Private Sector (tourist establishments, operators)
Timeline		25 years (5 years mid-term reviews)
Resourcing plan (funding & financing; human & technical)		County Government of Mombasa and national government
Level of city control		City government has critical mandate working closely with national government
Alignment with Policies & Plans		NCCAP 2018-2022 LTLED New Tourism Strategy for Kenya 2021-2025 National Wildlife Conservation and Management Policy
KPIs		No. of new diversified sustainable tourism activities developed/offered % improvement in tourist satisfaction and reviews % increase in tourism revenue
Co-benefits		Community benefit: Cultural preservation Economic benefit: Revenue growth, Business stimulation/opportunities, Employment opportunities Environmental benefit: Reduced pressure on ecosystems
Sub-actions	Short term (By 2030)	Collaborate with local tourism associations, communities, establishments, and operators to identify new sustainable tourism activities Conduct market research to identify emerging tourism trends and preferences Develop new sustainable tourism activities/experiences
	Medium Term (By 2040)	Promote the diversified tourism offerings through marketing campaigns Engage local communities in histing and providing experiences for tourists Provide training for local guides and service providers on sustainable tourism practices Educate tourists about responsible and sustainable tourism practices
	Long term (By 2050)	Continuously monitor feedback from tourists and local communities for improvement



Moving Forward: Call to Action



The County Government of Mombasa is determined to achieve ambitious climate goals through collaboration with the National government’s agriculture, transport, and energy sectors. This partnership aims to drive innovation, streamline operations, and create jobs while improving air quality. To effectively implement the Climate Action Plan (CAP) at the county level, two key components are necessary: a Legal and Policy Framework and a well-structured Institutional Setup.

Legal and Policy Framework: To establish effective climate governance in Mombasa, it is imperative to enact a Climate Change Bill that not only defines the legal framework for climate action but also sets climate goals, targets, and mechanisms for monitoring and enforcement. This legal foundation should be accompanied by a comprehensive Climate Policy that outlines overarching objectives, strategies, and priorities for addressing climate change within the county. Additionally, emphasizing the enforcement of climate-related regulations is essential, aligning them with existing environmental laws, which can encompass emissions standards, land use planning, and environmental impact assessments. Integrating climate considerations into land use and zoning regulations can aid in the management of urban and rural development, reducing vulnerability to climate impacts. Furthermore, incorporating climate resilience and sustainability into Natural Resource Management Plans is critical to safeguarding ecosystems and adapting to evolving climate conditions.

Institutional Setup: To strengthen Mombasa’s institutional capacity for effective climate governance, the formation of a Climate Change Coordination Committee is essential, bringing together representatives from diverse sectors including government agencies, NGOs, and community organizations. This collaborative body facilitates information sharing. Additionally, a customized climate finance strategy should be devised to secure funding from various sources, encompassing national government grants, private investments, and international funds like the Green Climate Fund. The establishment of data and monitoring systems, which include a climate information system and a knowledge management strategy, is imperative for tracking progress, assessing climate risks, and evaluating the effectiveness of climate initiatives. To engage the community and raise awareness about climate issues, a communication and education plan should be developed. Furthermore, forging partnerships and collaborations with neighbouring counties, national agencies, research institutions, and international organizations is crucial to leverage expertise and resources. Concurrently, investing in capacity-building programs is vital to equip county officials, stakeholders, and the public with the knowledge and skills required to effectively address climate challenges.



GLOSSARY OF TERMS

Term	Definition
Adaptation Actions	Strategies and activities designed to enhance a community's or region's resilience to the impacts of climate change, including measures to adapt to changing weather patterns, rising sea levels, extreme events, and other climate-related hazards.
Biodiversity Loss	The reduction in the variety and abundance of plant and animal species within ecosystems. Biodiversity loss can result from various factors, including habitat destruction, pollution, and climate change impacts.
Blue Carbon	A term referring to the carbon captured and stored by coastal and marine ecosystems, such as mangrove forests. Protecting and expanding blue carbon ecosystems can help sequester carbon and mitigate climate change.
Carbon Sequestration	The capture and long-term storage of carbon dioxide (CO ₂) and other greenhouse gases from the atmosphere. Carbon sequestration helps mitigate climate change by reducing the concentration of CO ₂ , often through processes such as reforestation and afforestation.
Circular Economy	An economic model focused on sustainability and minimizing waste. It promotes the reuse, refurbishment, recycling, and remanufacturing of products and materials to extend their lifespan and reduce the impact on the environment.
Climate Action Plan (CAP)	A comprehensive strategy or roadmap developed by a region, city, or organization to address and mitigate the impacts of climate change through a set of specific actions and initiatives, which may include both adaptation and mitigation measures.
Climate Risk and Disaster Management	Strategies, plans, and actions aimed at identifying, assessing, and managing the risks associated with climate-related hazards and natural disasters. This includes measures to reduce vulnerability, enhance preparedness, and respond effectively to disasters resulting from climate change impacts.
Climate Vulnerability	The degree to which a system, community, or infrastructure is susceptible to harm from climate change-related impacts. Vulnerability assessment identifies areas or assets at risk of damage or disruption due to climate effects.
Climate-Related Hazards	Environmental events or conditions that are influenced by climate patterns and can lead to adverse impacts. These hazards can include droughts, floods, sea-level rise, extreme heat, and landslides, among others.
Coastal Ecosystems	Ecological systems that exist along coastlines, including mangrove forests, coral reefs, and seagrass beds. Coastal ecosystems provide habitat and protection for marine life and play a critical role in shoreline stability and carbon sequestration.
Disaster Risk Reduction (DRR)	A systematic approach to reduce the risk of disasters, including natural hazards, through prevention, mitigation, preparedness, and response strategies, with the aim of saving lives and reducing damage.
Drought	A prolonged period of abnormally low precipitation levels, resulting in water scarcity for various uses, including drinking water, agriculture, and industry. Droughts can have severe economic, social, and environmental consequences.



Term	Definition
Energy Efficiency Technologies	Technologies and practices that reduce energy consumption while maintaining or improving the quality of energy services. Energy efficiency technologies aim to lower energy waste and greenhouse gas emissions.
Energy Management Standards	A set of guidelines and specifications for managing energy usage efficiently. Energy management standards cover areas such as energy management systems, energy auditing, and the measurement and verification of energy efficiency performance.
Extreme Heat	Extremely high temperatures that exceed typical climatic conditions. Extreme heat events can have adverse effects on human health, agriculture, and ecosystems and may lead to heat-related illnesses and heatwaves.
Extreme Temperature Patterns	Deviations from normal temperature conditions, including unusually high or low temperatures. Extreme temperature patterns can lead to heatwaves or cold spells, affecting human health, agriculture, and various sectors of the economy.
GHG Inventory	A comprehensive record of greenhouse gas emissions from various sectors and sources within a specific geographic area, typically measured in units like metric tonnes of carbon dioxide equivalent (ktCO ₂ e).
GPC Compliant	Adhering to the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC), which sets global best practices and standards for calculating and reporting greenhouse gas emissions.
Green Economy	An economic system that prioritizes sustainability, resource efficiency, and low-carbon practices. The green economy aims to reduce environmental impact while fostering economic growth, often focusing on renewable energy, clean technologies, and conservation.
Greenhouse Gas (GHG) Emissions	Gases, such as carbon dioxide (CO ₂), methane (CH ₄), and nitrous oxide (N ₂ O), that trap heat in the Earth's atmosphere and contribute to the greenhouse effect, resulting in global warming and climate change.
Greenhouse Gas Emissions (GHG)	Gases, such as carbon dioxide (CO ₂), methane (CH ₄), and nitrous oxide (N ₂ O), released into the atmosphere due to human activities, primarily burning fossil fuels and deforestation, which contribute to global warming and climate change.
Groundwater Resources	Underground water reservoirs that store freshwater. Groundwater resources are a vital source of drinking water and irrigation for many regions and are susceptible to contamination and depletion, especially during droughts or increased water demand.
Heat-Related Illness	Health conditions or diseases caused or exacerbated by exposure to high temperatures, particularly when temperatures exceed the body's ability to cool itself through sweating. Heat-related illnesses can range from heat exhaustion to heatstroke.
Integrated Coastal Management (ICM)	A holistic approach to managing coastal and marine environments that considers ecological, social, economic, and political aspects. ICM seeks to balance conservation with sustainable use and to address issues like coastal erosion and pollution.



Term	Definition
Minimum Energy Performance Standards	Regulations or guidelines that define the minimum level of energy efficiency required for certain types of products, buildings, or equipment, often implemented to reduce energy consumption and associated emissions.
Mitigation Actions	Measures and activities aimed at reducing or preventing the emission of greenhouse gases (GHGs) and other factors contributing to climate change, with the goal of mitigating or limiting the extent of global warming and its associated impacts.
Net Zero	A state where the balance between greenhouse gas emissions and their removal from the atmosphere is achieved, resulting in no net increase in emissions. Achieving net-zero emissions is a critical climate mitigation goal.
Non-motorized Modes of Transport	Transportation methods that do not rely on motorized vehicles, including options like biking and walking. Promoting non-motorized transportation can reduce emissions and alleviate traffic congestion.
Precipitation Intensification	An increase in the amount and intensity of rainfall or precipitation events. Precipitation intensification can lead to more significant and sudden downpours, increasing the risk of flooding and landslides.
Projection Data	Data and information generated from climate models and observations used to forecast future climate conditions and trends, including shifts in temperature, rainfall patterns, and extreme weather events.
Prolonged Droughts	Extended periods of abnormally low precipitation, resulting in water scarcity, reduced soil moisture, and negative impacts on agriculture, water resources, and ecosystems.
Rainfall Distribution	The geographic and temporal pattern of rainfall or precipitation in a given region. Changes in rainfall distribution can impact water availability, agriculture, and ecosystem health.
Renewable Energy	Energy derived from sources that are naturally replenished, such as sunlight (solar energy), wind (wind energy), and water flow (hydropower), which do not deplete finite resources and produce fewer GHG emissions compared to fossil fuels.
Scope 1 Emissions	Direct greenhouse gas emissions from sources that are owned or controlled by a specific entity or region, such as emissions from local transportation, waste, and stationary energy sources.
Scope 2 Emissions	Indirect greenhouse gas emissions associated with the generation of electricity, steam, and heating/cooling supplied by grids, which may cross city boundaries, but are driven by local activities.
Scope 3 Emissions	Indirect emissions resulting from activities outside a city's boundaries but influenced by its actions, such as emissions from product use, supply chains, and transportation of goods and services.



Term	Definition
Sea-Level Rise	The gradual increase in the average level of the Earth's oceans and coastal waters due to the melting of polar ice caps and the thermal expansion of seawater. Sea-level rise can lead to coastal flooding and erosion, impacting coastal communities.
Severe Weather Events	Weather phenomena characterized by their intensity and potential for damage. Severe weather events can include storms, hurricanes, tornadoes, and other extreme weather occurrences that pose threats to human safety and infrastructure.
Soil Erosion	The process by which the topsoil layer of the Earth's surface is removed or displaced due to natural forces such as water, wind, or human activities. Soil erosion can lead to land degradation, reduced agricultural productivity, and environmental problems.
Soil Salinity	The presence of excess salts in soil, which can negatively affect soil quality and crop productivity. Soil salinity can be exacerbated by factors such as sea-level rise and saltwater intrusion, impacting agriculture and land usability.
Tax Incentives	Financial benefits provided by governments to individuals or businesses to encourage specific behaviors or practices. In the context of a circular economy, tax incentives can promote waste reduction, recycling, and sustainable practices.
United Nations Sustainable Development Goals	A set of 17 global goals established by the United Nations in 2015 to address various sustainable development challenges, including poverty, inequality, climate change, environmental degradation, and more.
Urban Heat Island Effect	The phenomenon where urban areas experience higher temperatures than their rural surroundings due to human activities, buildings, and reduced vegetation. It can lead to extreme heat in cities and has adverse effects on the urban environment and health.
Waste Diversion Rate	The percentage of waste materials diverted from landfills and incineration through recycling, composting, and other sustainable waste management practices. A higher diversion rate indicates a reduction in waste sent to landfills.
Water Catchment Areas	Geographical regions where water is collected, stored, and naturally replenished, such as watersheds, river basins, or aquifers. Protecting these areas is essential for maintaining a sustainable and reliable supply of freshwater resources.





