REPUBLIC OF KENYA

MINISTRY OF ENVIRONMENT,
CLIMATE CHANGE
AND FORESTRY

Kenya's First Biennial Transparency Report (BTR)

First BTR to The United Nations Framework Convention on Climate Change (UNFCCC)

Foreword

This inaugural BTR provides a comprehensive assessment of Kenya's progress in implementing our first updated Nationally Determined Contribution (NDC).

On behalf of the Government of Kenya, I am honored to present our first Biennial Transparency Report (BTR), which includes a comprehensive Greenhouse Gas Inventory Report submitted to the United Nations Framework Convention on Climate Change (UNFCCC). This report represents Kenya's unwavering commitment to addressing global climate challenges and demonstrates our national resolve to take meaningful action on climate change.

This inaugural BTR provides a comprehensive assessment of Kenya's progress in implementing our first updated Nationally Determined Contribution (NDC). It encompasses critical information including greenhouse gas (GHG) emissions and removals from 1990 to 2022, detailed NDC tracking, climate change impacts and adaptation strategies, and an analysis of support received and required. This report builds upon our previous National Communications submitted in 2002 and 2015, reflecting our ongoing commitment to transparency and international climate reporting.

Compiled in strict accordance with Article 13 of the Paris Agreement and the guidelines outlined in decision 18/CMA.1, this report meets our international obligations. The framework requires both developed and developing countries to submit Biennial Transparency Reports every two years, detailing mandatory GHG inventory and NDC tracking, along with voluntary information on adaptation and support mechanisms.

I extend my sincere gratitude to the experts from various government ministries, departments, civil society organizations, and the private sector who worked diligently under the leadership of the Climate Change Directorate and the ETF Reporting Project. Their collaborative and participatory approach has been instrumental in preparing this comprehensive report.

The insights contained within this report will be crucial in guiding government priorities for climate action, identifying potential areas for international financial support, and accelerating our progress towards achieving NDC targets by 2030. This report represents a significant milestone in Kenya's journey towards a low-carbon, climate-resilient economy and sustainable development.

Hon. Aden Bare Duale, EGH
CABINET SECRETARY, MINISTRY OF ENVIRONMENT, CLIMATE CHANGE AND FORESTRY

Acknowledgement

The report represents a comprehensive national effort, drawing expertise from multiple sectors and stakeholders. Line sectors took the lead in compiling their respective inventories, while the NDC tracking and adaptation chapters benefited from contributions from national and county-level ministries, departments, agencies, and non-state actors.

This Biennial Transparency Report (BTR) has been compiled for the Government of Kenya to fulfill our national obligations under the enhanced transparency framework established by Article 13 of the Paris Agreement. The report's comprehensive methodology reflects our commitment to rigorous and transparent climate reporting.

The compilation of this report involved a collaborative and multifaceted approach, with specific methodological considerations for each chapter. The national greenhouse gas (GHG) inventory, for instance, was developed using the Intergovernmental Panel on Climate Change (IPCC) 2006 inventory software and adhering to its Good Practice Guidance, ensuring scientific accuracy and international comparability.

The report represents a comprehensive national effort, drawing expertise from multiple sectors and stakeholders. Line sectors took the lead in compiling their respective inventories, while the NDC tracking and adaptation chapters benefited from contributions from national and county-level ministries, departments, agencies, and non-state actors. This inclusive approach ensured that the report captures the diverse perspectives and priorities outlined in Kenya's Nationally Determined Contribution (NDC).

We extend our profound gratitude to the numerous organizations and individuals who made this report possible. Special recognition is due to our key supporters, including the Capacity-building Initiative for Transparency Global Support Programme (CBIT-GSP), Transparency Accelerator Initiative, NAP-Global, Fauna & Flora Kenya, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and the International Livestock Research Institute-Climate Change, Agriculture and Food Security (ILRI-CIAT). Their technical expertise, financial support, and commitment to climate action were instrumental in preparing this comprehensive report.

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Preface

The report comprehensively describes climate actions that Kenya has implemented, is implementing, and plans to implement to achieve its Nationally Determined Contribution and the global long-term goals of the Paris Agreement.

Kenya has remained steadfast in supporting the multilateral process on climate change. As a Party to the United Nations Framework Convention on Climate Change and its Kyoto Protocol and the Paris Agreement, the government of Kenya continues to work domestically and through international cooperation to address the adverse impacts of climate change in the context of sustainable development and efforts to eradicate poverty. Despite not being a significant emitter, Kenya continues to make ambitious mitigation commitments in solidarity with other countries to keep within the temperature goal provided in Article 2 of the Paris Agreement.

Kenya made its first significant policy step on climate change when it developed the National Climate Change Response Strategy in 2010. The two key components of the strategy were the establishment of the Climate Change Secretariat and the National Climate Change Action Plan. The Secretariat was responsible for oversight, policy, and coordination of climate change affairs, and the Action plan became an instrument for prioritizing climate change actions to facilitate budgeting and implementation of climate change actions.

The efforts of the climate change secretariat were recognized by climate change stakeholder who successfully advocated for the enactment of a climate change law. Kenya became one of the first countries globally to enact a climate change law, the Kenya Climate Change Act 2016, which was revised in 2023 to incorporate carbon markets. The Act provides for an elaborate institutional arrangement that includes the National Climate Change Council chaired by the President. The act also retains the climate change action plan as the principal document for climate change response measures and actions.

The Paris Agreement established the Enhanced Transparency Framework (ETF) to build mutual trust among Parties and facilitate enhanced reporting by Parties. The ETF tracks the implementation of NDCs and other climate change policies and plans aimed at implementing Article 2 of the Paris Agreement and provides relevant inputs for the global stocktake (GST), which assesses the collective progress of the implementation of the Paris Agreement.

Under the ETF, each Party needs to submit Biennial Transparency Report (BTR) every two years, which includes a national inventory report on anthropogenic GHG emissions and removals, information necessary to track progress in implementing and achieving NDCs under Article 4 of the Paris Agreement, information related to climate change impacts and adaptation under Article 7 of the Paris Agreement, and information on financial, technology transfer and capacity-building support needed and received from developed country Parties under Articles 9, 10 and 11 of the Paris Agreement. Like all other countries, this is Kenya's first Biennial Transparency Report (BTR1) submitted in accordance with the Paris Agreement, especially the modalities, procedures and guidelines provided in decision 18/CMA.1. The report comprehensively describes climate actions that Kenya has implemented, is implementing, and plans to implement to achieve its Nationally Determined Contribution and the global long-term goals of the Paris Agreement.

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Abbreviations and Acronyms

AD	Activity Data
AdCom	Adaptation Communication
AFOLU	Agriculture, Forestry, and Other Land Uses
AFREC	African Energy Commission
ASAL	Arid and Semi-Arid Lands
ATAR	Adaptation Technical Analysis Report
BAU	Business As Usual
BUR	Biennial Update Report
BTR	Biennial Transparency Report
CBIT-GSP	Capacity-building Initiative for Transparency - Global Support Programme
CCD	Climate Change Directorate
CCU	Climate Change Units
CGIAR	Consultative Group on International Agricultural Research
CH4	Methane
CIDPs	County Integrated Development Plans
CIS	Climate Information Services
CKD	Completely Knocked Down
CMA	Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement
CO	Carbon monoxide
CO2	Carbon dioxide
CSA	Climate Smart Agriculture
CSO	Civil Society Organization
EOPS	Early Oil Pilot Scheme
EF	Emission Factors
EFDB	Emission Factor Database
ETF	Enhanced Transparency Framework
FLLOCA	Financing Locally-Led Climate Action
GDP	Gross Domestic Product
GEF	Global Environment Facility
GgCO_2eq	Gigagrams of CO2 Equivalent
GHG	Greenhouse Gas
GoK	Government of Kenya
GWP	Global Warming Potential
HFC	Hydrofluorocarbon
HSNP	Hunger Safety Net Programme
ICAO	International Civil Aviation Organization
ICD	Inland Container Depot
IPCC	Intergovernmental Panel on Climate Change
ICPAC	IGAD Climate Predictions and Application Center
IPPU	Industrial Processes and Product Use
KAM	Kenya Association of Manufacturers
KCSAP	Kenya Climate Smart Agriculture Project
KMD	Kenya Meteorological Department
KNBS	Kenya National Bureau of Statistics
KPRL	Kenya Petroleum Refineries Ltd.
KT	Kiloton
KPC	Kenya Pipeline Company
LPG	Liquified Petroleum Gas
LULUCF	Land Use, Land-use Change, and Forestry
MoECCF	Ministry of Environment, Climate Change and Forestry
MPGs	Modalities, Procedures and Guidelines
MRV	Measurement, Reporting and Verification
MSD	Medium Speed Diesel
M&E	Monitoring and Evaluation
NAP	National Adaptation Plans
N_20	Nitrous Oxide
NCCAP	National Climate Change Action Plan
NCCRS	National Climate Change Response Strategy
NCV	Net Calorific Values
NDC	Nationally Determined Contribution
NDMA	National Drought Management Authority
NEMA	National Environment Management Authority
NID	National Inventory Document
NIR	National Inventory Report
NMVOC	Non-Methane Volatile Organic Compounds
NTSA	National Transport and Safety Authority
PFCs	Perfluorocarbons
PMU	Project Management Unit
PWD	Persons With Disability
QA/QC	Quality Assurance / Quality Control
REDD+	Reducing Emissions and Forests Degradation
SAGAs	Semi-Autonomous Government Agencies
SNC	Second National Communication

Abbreviations and Acronyms

SO_2	Sulfur Dioxide
TFI	Task Force on National Greenhouse Gas Inventories
TNC	Third National Communication
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Programme
USD/US$/$	United States Dollar

Executive Summary

A. National inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases

Kenya has prepared a national GHG inventory report for 1990-2022. The inventory has been prepared in line with the Modalities, procedures and guidelines for the enhanced transparency framework for action and support referred to in Article 13 of the Paris Agreement (Annex to Decision 18/CMA.1) as a stand-alone report annexed to this report. For details, please refer to the national inventory document.

- Kenya's total greenhouse gas emissions were equivalent to **113,366** $GgCO_2eq$, including the LULUCF Sector in 2022. Total CO_2 emissions for the year 2022 are estimated to be **66,519.7** $GgCO_2eq$without contribution from LULUCF.
- Total CO2 emissions for the year 2022 are estimated to be **66,519.7** $GgCO_2eq$ without contribution from LULUCF.
- Trends in total emissions for the time series 1990 to 2022 show that, generally, emissions have been increasing since 1990, rising to **69,399.5** $GgCO_2eq$ in 2021 without LULUCF and then dropping slightly in 2022.
- Emission growth is primarily driven by Energy and AFOLU sectors which have remained net emitters, showing deforestation and forest degradation have been exceeding the reforestation rates throughout the period and together with increased consumption of fossil fuels.
- Other drivers of emissions are; increased agricultural activities, and demand for fossil fuels in the energy sector.
- Over the period 1990 - 2022, the average annual growth in overall emissions has been **4 percent** per year including the LULUCF sector.

B. Information necessary to track progress made in implementing and achieving nationally determined contributions under Article 4 of the Paris Agreement.

- Kenya communicated a single-year target NDC for a 10-year time frame from January 1st 2021 to December 31st 2030. The NDC is an economy-wide absolute GHG emissions target.
- Kenya updated her first NDC in 2020 which seeks to abate GHG emissions by **32%** relative to the BAU scenario of **143 $MtCO_2eq$** by 2030, in line with Kenya's sustainable development agenda and national circumstances.
- Key sectors covered include Energy, Agriculture, Land Use, Land-Use Change and Forestry (LULUCF), Industrial Processes and Product Use (IPPU) and Waste. Greenhouse gases covered are carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O).
- The NDC sets out both adaptation and mitigation contributions on the condition that it receives international support for implementation.
- Kenya has an NDC adaptation target of achieving a climate-resilient society by 2030
- The resource requirements for mitigation activities for the period 2020 to 2030 are estimated at $17,725 Million. Subject to national circumstances, Kenya will bear 21% ($3,725 Million) of the mitigation cost for domestic sources, while 79% the balance of ($14,000 Million) is subject to international support.
- The total cost of adaptation actions up to 2030 is estimated at $43,927 Million. Subject to national circumstances, Kenya intends to mobilize domestic resources to cater for 10% of the adaptation cost, while 90% will require international support.
- Kenya selected the total annual greenhouse gas emissions (including LULUCF) as the primary indicator to track progress in implementing and achieving her NDC, which seeks to abate GHG emissions by 32% (46 $MtCO_2eq$) relative to the BAU scenario of 143 $MtCO_2eq$ by 2030.
- Kenya's current trajectory aligns with its emissions reduction target, reflecting a sustained commitment to achieving a low carbon climate resilient development pathway. Kenya is on track with meeting the 2030 NDC target.
- Key data points in the NDC for tracking progress include projected emissions of 122 $MtCO_2eq$ by 2022, 112.4 $MtCO_2eq$ by 2025, advancing toward the 2030 target of 97 $MtCO_2eq$. Kenya's most recent 2022 total annual greenhouse gas emissions were approximately 113.3 $MtCO_2eq$ (including LULUCF) and 66.5 $MtCO_2eq$ (excluding LULUCF), according to the latest inventory data.

C. Climate Change Impacts and Adaptation under Article 7 of the Paris Agreement

- Kenya has established an elaborate policy, legal and institutional framework for addressing the adverse impacts of climate change and adaptation.
- Analysis in the Kenya National Adaptation Plan (2015 – 2030) and the climate hazard analysis in the National Climate Change Action Plans (e.g., in the NCCAP 2023 – 2027) demonstrate Kenya is exposed to climate hazards and detail the actual biophysical events that are driven by climate change.
- It is estimated that over 70% of natural disasters in Kenya are attributable to extreme climatic events – particularly flooding and droughts. For example, evidence now shows that climate change increased the intensity of rainfall in the short rainy season in the Horn of Africa in 2023, leading to severe flash flooding in eastern which caused more than 300 deaths and displaced over a million people.
- The three most significant climatic hazards in Kenya are analysed in latest draft AdCom (2024) for the country and summarised below, these include increasing temperatures, changing rainfall patterns, and sea level rise along the coast.
- Current data shows that Kenya is ranked 145th out of 187 countries in the Notre Dame Global Adaptation Initiative (ND-GAIN) index, which ranks countries on their level of vulnerability to climate change and readiness to implement adaptation solutions.
- Kenya's rapidly increasing population and subsequent migration to urban areas has also been identified as a factor that increases vulnerability to climate change; this is significantly attributable to low coping adaptive capacity as over 51 percent of the urban population in Kenya in 2020 was considered poor and living in unplanned informal settlements without basic infrastructure and services.
- Overall, across the country, evidence suggests that frequent cycles of floods and droughts have significant socio-economic impacts; these often cause high economic costs as scarce government resources are re-allocated to respond to climate emergencies.
- In monetary terms, the socio-economic losses associated with climate change in Kenya over the past decade were estimated to amount to between 3 percent and 5 percent of the country's GDP per year.

D. Implementation Progress

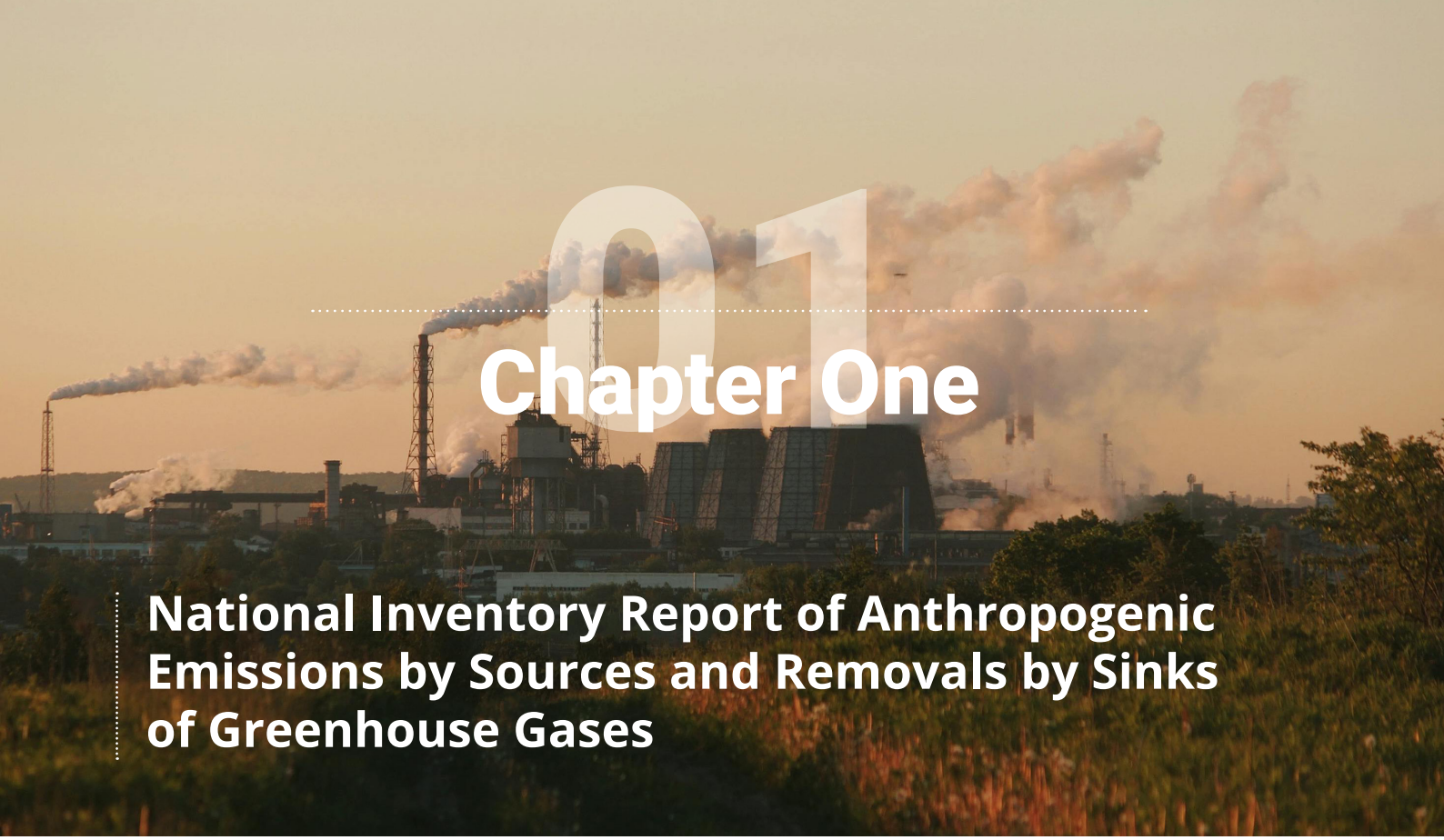
The government has made progress in implementing adaptation actions towards the target of a climate-resilient society by 2030. Some areas of progress have been highlighted below.

- The government effectively coordinated more than Ksh. 70 billion drought response interventions during the 2021 – 2023 drought. The government contributed KSh. 22 billion, while non-state actors contributed KSh. 48 billion.
- Over 3,000 water tanks, dams, boreholes, pans, or earth dams were constructed or installed for water harvesting and storage across ASAL counties with high drought risk.
- The Asset Creation Programme constructed rainwater harvesting structures in 1,000 sites across 14 ASAL counties. The government operationalized the National Drought Emergency Fund (NDEF) and gazetted and sensitized the members of the County Drought and Food Security Committees (CDFSC) for county-level coordination in the 23 ASAL counties. So far, the Fund has received a total of Ksh. 345 million in funding from the National Treasury for different components.
- As part of the plan to increase flood resilience, the government, through the Kenya Meteorology Department (KMD), has increased the amount and timeliness of flood early warnings and weather forecasts during rain seasons.
- The National Drought Management Authority (NDMA) disbursed over KES 3.3 billion under the HSNP through more than 100,000 households, out of which 60% of recipients were women in arid counties.
- Around 200,000 actors in the agriculture sector are now harvesting and storing water for irrigation.
- The area under irrigation in Kenya has increased by over 5,000 Hectares.
- Close to 400,000 farmers have access to climate-oriented crop insurance
- The number of farmers accessing climate-oriented livestock insurance increased marginally as new farmer households insured over 90,000 cattle by the end of 2022.
- Over 55 hydrogeological surveys were undertaken across several counties in Kenya as efforts towards sustainable groundwater abstraction.
- De-siltation of existing dams, extending water pipelines, and protecting water catchment areas and sources such as springs enhanced the availability of safe water and reduced distances travelled to access water.
- The annual ASALs water harvesting and storage capacity improved by 1,130,000 M3 from the 38 water pans, 6 subsurface dams constructed, and 73 boreholes and shallow wells in 11 ASAL counties
- The annual ASALs water harvesting and storage capacity improved by 1,130,000 M3 from the 38 water pans, 6 subsurface dams constructed and 73 bore holes and shallow wells in 11 ASAL counties
- The government has also supported close to 300,000 new households in Kenya to adopt diversified adaptive enterprises for sustained livelihoods and nutrition security. Examples of such enterprises include indigenous poultry, dairy goats, dairy intensification, tissue culture in banana production, and pasture seeds, among others.

- The Kenya Integrated Water, Sanitation, and Hygiene Project (KIWASH, 2015-2020) enabled nearly 900,000 Kenyans across nine counties to gain access to improved water security, sanitation, and hygiene services and assisted households in gaining access to irrigation and nutrition services.
- To increase water harvesting and water storage infrastructure, over 600 boreholes have been constructed to tap into groundwater resources in response to increased water scarcity resulting mainly from drought in the most vulnerable counties.
- In the coast of Kenya, over 600 Ha of mangrove forests were either planted or rehabilitated to protect the coastline and sustain ecosystem services for the coastal communities; this is key for their livelihood resilience and adaptation.
- The World Agroforestry Centre established the Kenya Rangelands Ecosystem Services Productivity Programme to improve the livelihoods of communities and their landscapes by enhancing the productivity of ecosystem services provided by rangelands for food, feed, and human and wildlife security in Laikipia, Samburu, Isiolo, and Baringo.
- Kenya Breweries developed a low-cost beer made from sorghum. This has created new market opportunities for the brewer as well supported over 47,000 farmers from marginal areas to transition from subsistence to sustainable commercial farming.

E. Support Needed and Received

- Kenya requires USD 62 billion until 2030 to support the implementation of NDC targets.
- Kenya has received a total of about USD 508 Million in this BTR period. This constitutes both on-budget and off-budget support.
- The on-budget support accounts for 89% of the total sum which is USD 457 Million.
- Off-budget support amounted to USD 51 Million.
- USD 53 Million was delivered as grants, USD 365 million was in loans.



Chapter One

National Inventory Report of Anthropogenic Emissions by Sources and Removals by Sinks of Greenhouse Gases

1.1. Overview

Kenya has developed a stand-alone inventory report that includes a national inventory document and common reporting tables. The inventory document has been annexed to the Biennial Transparency Report (BTR), while the common reporting tables have been submitted electronically using the UNFCCC CRT tools.

The inventory report has been prepared in line with the modalities, procedures, and guidelines for the enhanced transparency framework provided in the annex to decision 18/CMA.1.

According to the estimations, Kenya's total greenhouse gas emissions were equivalent to **113,366** $GgCO_2eq$, including the LULUCF Sector in 2022. Total CO_2 emissions for the year 2022 are estimated to be **66,519.7** $GgCO_2eq$ without contribution from LULUCF. For details, please refer to the national inventory document.

1.2. Description of GHG emissions and removals

1.2.1. Overview of greenhouse gas inventory

Background information on Kenya's greenhouse gas inventory

Kenya has developed a stand-alone GHG inventory document that contains information on emissions and removals of GHGs. The inventory document has been developed in line with the provisions of the modalities, procedures and guidelines for the enhanced transparency framework provided in the annex to decision 18/CMA.1. Therefore, this chapter provides only a summary of the information in the report.

Kenya's emissions for the GHG inventory have been estimated in line with the 2006 IPCC Guidelines for the National Greenhouse Gas Inventories (2006 IPCC Guidelines), which were developed by the Intergovernmental Panel on Climate Change (IPCC). Kenya used the IPCC software to estimate the emissions for all the sectors.

1.2.2. Description of emission and removal trends for aggregated GHG emissions and removals

Kenya's total greenhouse gas emissions were equivalent to **113,366** $GgCO_2eq$ including the LULUCF Sector in 2022. The total greenhouse gas emissions have increased by **343** percent since 1990 (Table 1.1). Total CO_2 emissions for the year 2022 are estimated to be **66,519.7** $GgCO_2eq$ without contribution from LULUCF. Trends in total emissions for the time series 1990 to 2022 are shown in figures 1.1 and 1.2. In general emission have been increasing since 1990 rising to **69,399.5** $GgCO_2eq$ in 2021 without LULUCF and then dropping slightly in 2022.

Table 1.1: Total National Emissions without and with LULUCF

Total National emissions ($GgCO_2eq$)	Year					Annual growth rate	~% Change 1990 - 2022
	1990	2000	2010	2020	2022		
Without LULUCF	25,593.70	25,045.00	40,886.20	67,873.60	66,519.70	5%	160%
With LULUCF	25,593.70	25,045.00	55,861.10	108,330.40	113,366.00	10%	343%

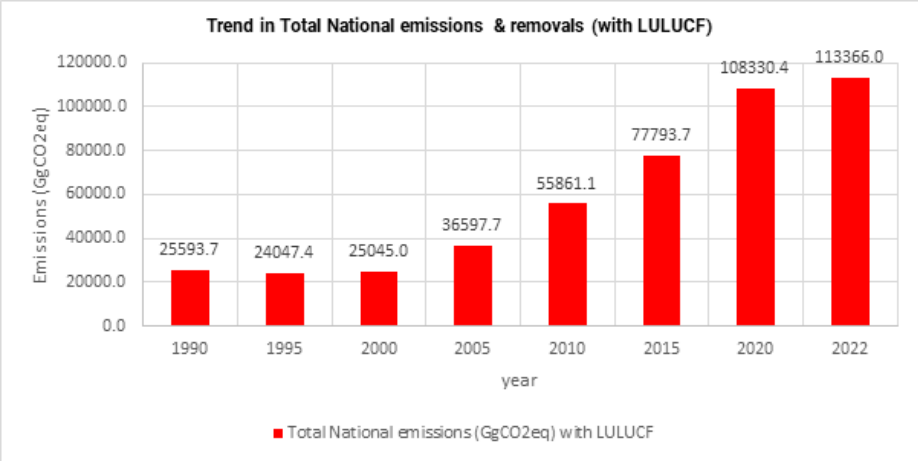


Figure 1.1: Kenya total greenhouse gas emissions trends 1990 – 2022 with the LULUCF sector

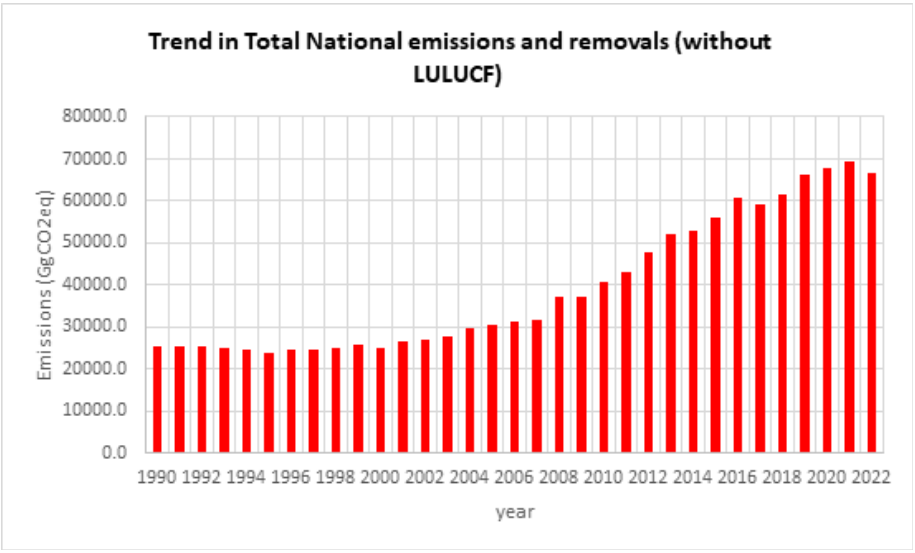


Figure 1.2: Kenya total greenhouse gas emissions trends 1990–2022 without LULUCF

Emission growth is primarily driven by Energy and AFOLU sectors which have remained net emitters, showing deforestation and forest degradation have been exceeding the reforestation rates throughout the period and together with increased consumption of fossil fuels. Other drivers of emissions are; increased agricultural activities, and demand for fossil fuels in the energy sector.

Over the period 1990 to 2022, the average annual growth in overall emissions has been 4 percent per year including the LULUCF sector.

Greenhouse gas emission contributions by sector and by type of greenhouse gas are summarized in section 2.2 below.

1.2.3. Description of emission and removal trends by sector and by gas

Emission trends by Source-Sector

Kenya is amongst developing nations in which Agriculture and LULUCF sectors dominates the share of its total greenhouse gas emissions. Tables 1.2 provides a summary of sectoral greenhouse gas emissions results for all sectors, and figure 1.3

shows Emissions trends by sectors without LULUCF, while figure 1.4 shows emissions trends by sector including LULUCF.

Table 1.2: Kenya's sectoral greenhouse gas emissions Summary 1990-2022

Categories	1990	2000	2010	2020	2022	Annual growth rate	~% Change 1990 – 2022
3A/C - Agriculture	15,639.70	13,732.70	19,941.10	40,211.60	36,102.20	4%	131%
1 - Energy	7,018.60	7,767.70	15,185.00	20,625.90	21,503.20	6%	206%
4 - Waste	2,171.50	2,953.30	4,113.40	5,009.30	5,237.00	4%	141%
2 - IPPU	764	591.2	1,646.70	2,026.90	3,677.20	12%	381%
3B - LULUCF	-	-	14,974.90	40,456.80	46,846.30	20%	653%

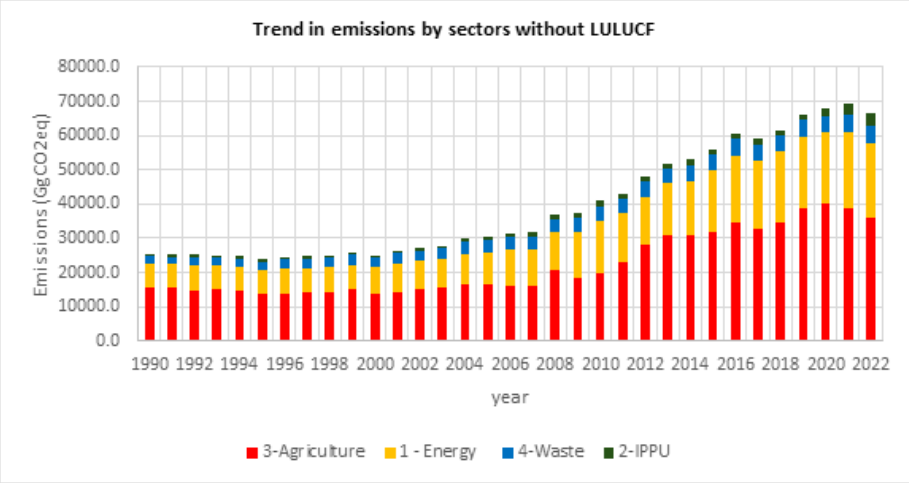


Figure 1.3: GHG emission trend by sector in GgCO2eq, excluding LULUCF

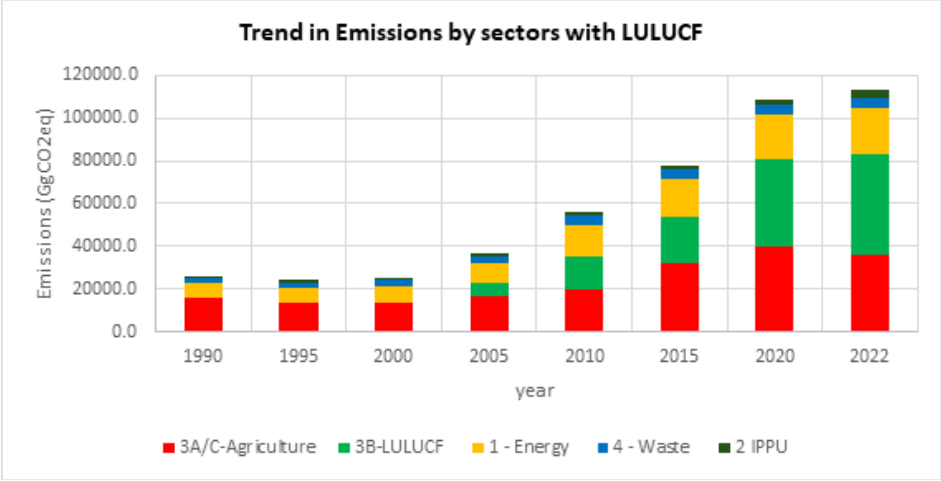


Figure 1.4: GHG emission trend by sector in GgCO2eq., including LULUCF

The LULUCF sector emitted **46,846.3** $GgCO_2eq$ in 2022 (41% of the national emissions). The Agriculture sector was a net emitter in 2022 contributing approximately **36,102.2** $GgCO_2eq$ or 32% of the national emissions. Thus AFOLU (combined agriculture, land use change and forestry) is the largest contributor to the total emissions in Kenya having **73%** share. (Tables 1.2 and figure 1.5).

The energy sector emitted **21,503.2** $GgCO_2eq$., contributing 20 percent of the total GHG emissions in 2022. The waste sector emitted **5,237.0** Gg CO2eq in 2022, which was 5 percent of the total GHG emission. The Industrial Processes and Product Use emitted **3,677.2** Gg CO_2eq or about **3%** of total GHG emissions. (Tables 1.2 and figure 1.5).

The LULUCF emissions grew at average rate of **20%** per annum which is the highest annual rate by sector, followed by Industrial process emissions at an average rate of **12 %** per year. The Energy emissions grew at an average rate of **6%** per year between 1990 and 2022. Waste process and Agriculture emissions grew much slower at an average rate of **4%** per year. (Table 1.2).

Emissions from the AFOLU sector have been increasing steadily since 1990 to 2022 due steady demand for agricultural land, deforestation activities and use of synthetic fertilizers, and increasing number of livestock. IPPU Emissions have continued to grow primarily due to increased CO_2 emissions from cement production (more factories became operational). Emissions

from the Energy Sector had increased over the years largely due to increased importation of fossil consuming vehicles in the transport sector.

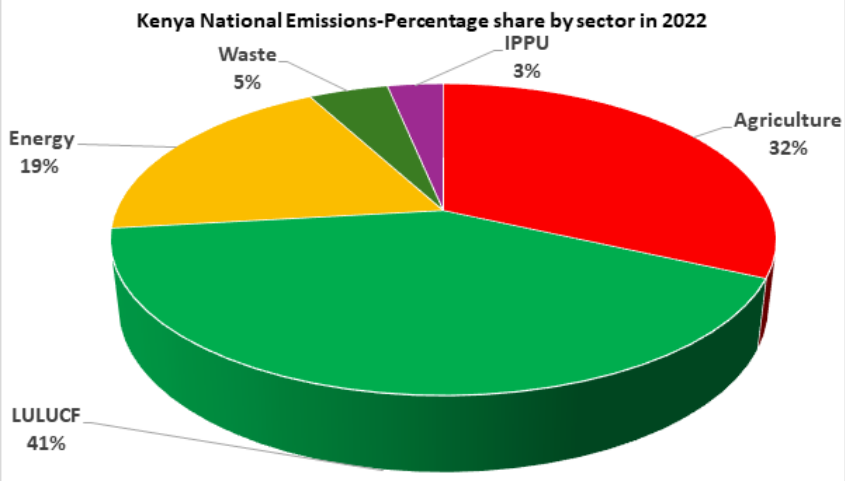


Figure 1.5: Kenya`s Sectoral greenhouse gas emissions percentage share of national total emissions in 2022 including LULUCF

The current level of emissions from LULUCF is **653** percent above the 1990 level, while IPPU is **381%** above that of the 1990, agriculture sector is 131 percent, and energy sector is **206%** (table 1.2). Detailed results by sector and source categories for each of the inventory period 1990 to 2022 are provided in chapters 3-6.

Emission trends by gas

Methane (CH_4) and Carbon dioxide (CO_2) dominate Kenya's increase in greenhouse gas emissions (table 1.3 and figure 1.6). In 2022, CH_4 comprised **51** percent of total CO_2 equivalent (CO2eq) emissions, whereas CO2 contributed **44** percent and N_2O, **5** percent. Therefore, CO_2 and CH_4 remain the major greenhouse gases in Kenya's historical emissions profile. Figure 2.6 illustrates the share of emission by gas type.

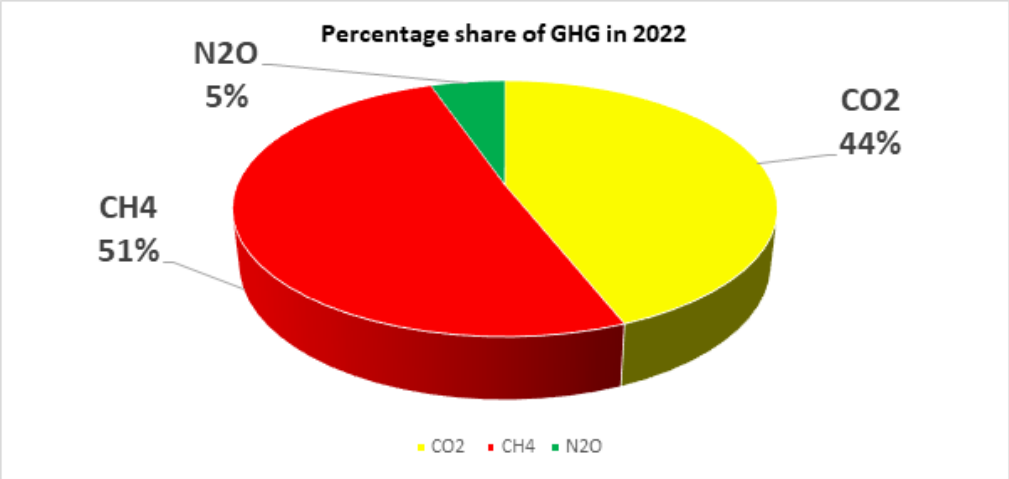


Figure 1.6: Kenya's emissions share by gas in 2022

Table 1.3: Kenya`s emissions by gas 1990 - 2022 (Gg CO2 Eq)

GHG Type	1990	2000	2010	2020	2022	% change 1990 - 2022
CO2	6,622.4	7,136.2	29,334.8	58,674.7	67,114.2	913%
CH4	17,036.2	15,865.0	23,843.3	45,599.8	42,127.5	147%
N2O	1,935.2	2,043.8	2,682.9	4,055.9	4,124.4	113%
Total Emissions (Gg CO_2eq)	25,593.7	25,045.0	55,861.1	108,330.4	113,366.0	343%

The growth in CH_4 emissions can be associated with increased number of livestock population. The growth in CO_2 represents the increased emissions from the LULUCF and energy sectors, in particular transport sub-sector. N_2O emissions have increased due to increased use of nitrogenous fertilizers in agricultural soils since 1990.

Table 1.3 and figure 1.7 indicate the amounts of emissions of the three main greenhouse gases (i.e., CO_2, CH_4, N_2O) for each of the inventory years and the relative changes from 1990 to 2022. CO_2 relative change in emissions is far the largest changing by **913%** since 1990 to 2022, followed by CH_4 at **147%**, and N_2O at **113%** change.

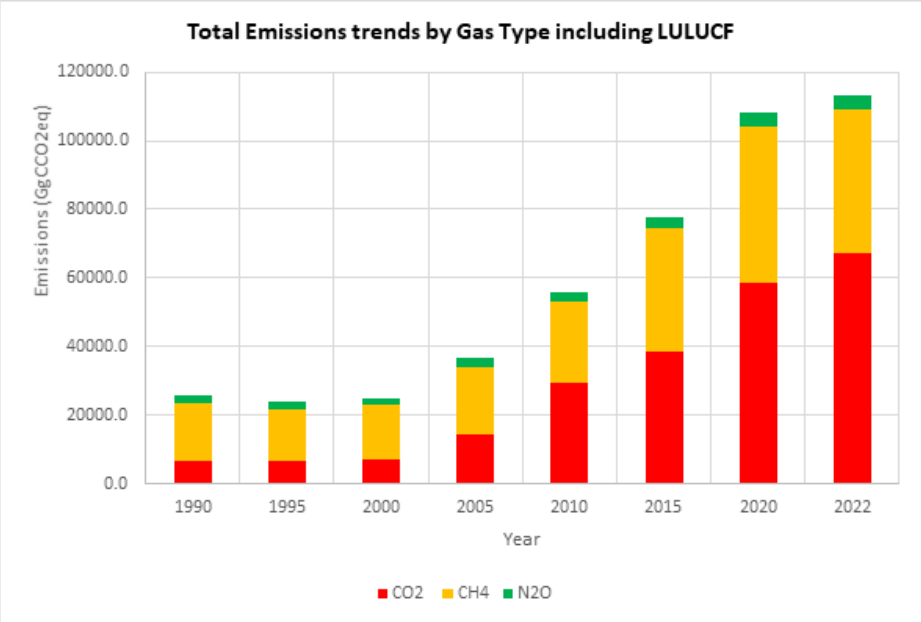


Figure 1.7: Trend in GHG emissions by gas type 1990-2022

Category 2.F product uses as substitutes for ozone depleting substances was not estimated due to insufficient data on Hydrofluorocarbons (HFCs) and, to a very limited extent, perfluorocarbons (PFCs) that are serving as alternatives to ozone depleting substance.

Emission trends for indirect greenhouse gases and SO_2

The indirect greenhouse gases CO, NOx, NMVOC as well as SO2 are not included in the current Kenya's total greenhouse gas emissions.

Chapter Two

Information necessary to track progress made in implementing and achieving nationally determined contributions under Article 4 of the Paris Agreement

2.1. National Circumstances and Institutional Arrangements

2.1.1. National Circumstances

The Republic of Kenya is a unitary state with a multi-party democratic political system, located in the in the Greater Horn of Africa. In 2010, the Government of Kenya (GoK) enacted a new constitution which created a devolved, two-tier government consisting of a National government and County governments. The constitution and the new government structure have established 47 constitutionally distinct County Governments that have defined spheres of power and functions.

The Government of Kenya has established a structure that assigns the coordination of climate change affairs to the Ministry of Environment, Climate Change and Forestry, State Department for Environment and Climate Change. Overarching policy, coordination and oversight of climate change affairs is performed by the National Climate Change Council, chaired by the President. The Climate Change Directorate, established by the Climate Change Act, 2016[1] , is the lead agency of the government on national climate change plans and actions to deliver operational coordination. The Directorate performs coordination work through the Climate Change Units established in all ministries, counties, departments and agencies.

Population Profile

Kenya is a middle-income developing country in Sub-Saharan Africa with a stable democratic government. Kenya has a 2022 projected population of 50,622,914 based on the Kenya population and housing census conducted in 2019[2] . As highlighted above, there are 47 county governments with different population projections. Population is projected to increase during the entire forecast period, with an estimated population of 70,179,943 by 2045. The six top counties expected to experience the highest percentage of the population are Samburu, Tana River, Narok, Lamu, Wajir and Turkana. In terms of numbers, Nairobi, Kiambu, Nakuru, Narok and Kakamega counties are expected to have the highest increase.

Data from Kenya National Bureau of Statistics (KNBS) on household projections show that there were approximately 13,478,733 households in 2022 and are expected to increase to 15,908,968 by 2030.

Geographical Profile

Kenya is a tropical, water-scarce country located on the equator in East Africa. It shares international borders with Ethiopia to the North, South Sudan to the North-West, Uganda to the West, Tanzania to the South and Somalia to the East.

The total surface area is about 610,000 square kilometres comprising of land area of approximately 580,609 sq.km, water area of approximately 11,362 sq.km and terrestrial water area of approximately 18,029 sq.km.

1 http://kenyalaw.org:8181/exist/rest/db/kenyalex/Kenya/Legislation/English/Acts%20and%20Regulations/C/Climate%20Change%20Act%20%20No.%2011%20of%202016/docs/ClimateChangeAct11of2016.pdf

2 https://www.knbs.or.ke/wp-content/uploads/2023/09/2019-Kenya-population-and-Housing-Census-Summary-Report-on-Kenyas-Population-Projections.pdf

Climate Profile

Kenya has a number of distinct climatic and ecological zones, linked in part to its widely varying topography. The coastal region in the East, bordering the Indian Ocean, is characterized by predominantly flat plains with warm, humid weather. The plains give way to vast sprawling savannah in the South-East lowlands, dominated by grassy ecosystems with an arid and semi-arid climate[3].

Kenya has two main wet seasons: March to May is referred to as the "long rains", and October to December as the "short rains". Parts of the country experience a third wet season between June and August.

Kenya's landscape can be categorized into three major climatological zones, distinguished primarily by the distribution of rainfall: arid and semi-arid, tropical, and temperate (see figure 2.1).

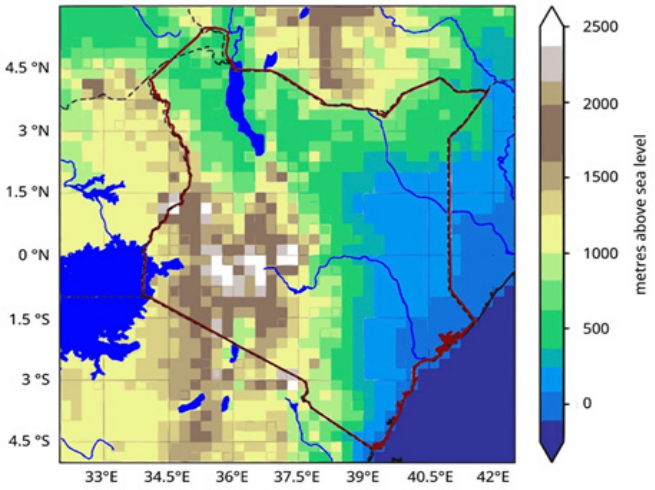


Figure 2.1: Kenya's topography and climate are highly diverse. Situated between 5° N and 5° S latitude and 34° E and 42° E longitude, Kenya's geography spans low-lying coastal regions up to the towering peaks of Mount Kenya in the central highlands.

The arid and semi-arid lands are characterized by low and erratic rainfall, strong winds and intense sunlight for most of the year. They provide generally hostile environmental conditions and frequently experience drought. Kenya's temperate zones are typically highland areas, such as the Lake Victoria basin and Mount Kenya regions.

These zones are characterized by cool temperatures and relatively high rainfall. The tropical zones, predominantly the plateaus, receive moderate rain during the two main wet seasons and serve as transition zones between temperate and arid areas (see figure 2.2).

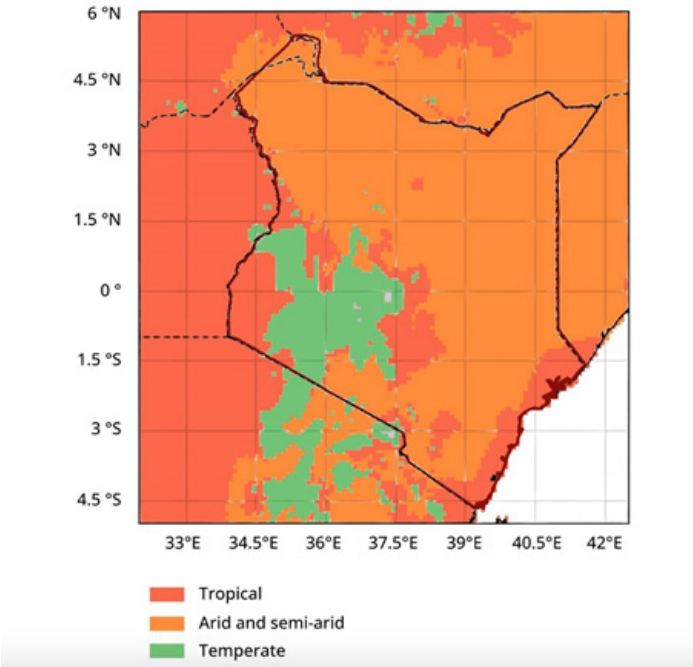


Figure 2.2: Kenya has three main climatic zones, according to the Köppen–Geiger classification. Arid and semi-arid regions (orange) cover most of the land area, with the tropical (red) and temperate (green) climates less dominant.

Kenya is exposed to climate hazards or the actual biophysical events that are driven by climate change. Slow onset climate hazards, such as temperature increase, drought, changes in precipitation patterns, and sea level rise have intensified.

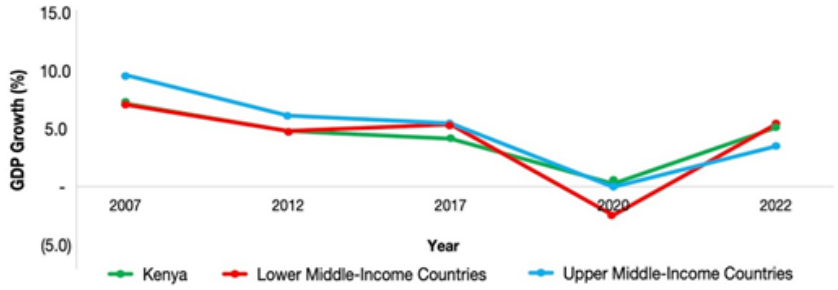
3 https://www.climateimpacts.co.ke/wp-content/uploads/2024/04/KE_FINAL_12-Apr_ONLINE.pdf

Acute climate hazards, such as extreme precipitation, floods, landslides, and wildfires, are expected to increase in frequency and severity in Kenya.

Climate change is, therefore, causing an increase in average global temperatures, increasing temperatures, changing precipitation patterns, and rising sea levels, creating significant environmental and economic disruption and adversely affecting Kenyans. The impacts of climate change and climate-related disasters are felt at the household level through food insecurity, damage to property, increased prices of food and fuel, and declining access to water and other environmental services.

Economy

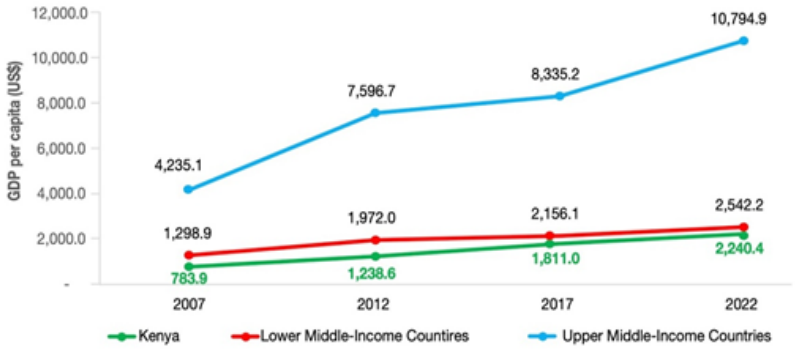
The Kenya Vision 2030 aimed to achieve a 10% annual GDP growth rate by 2012 and sustain it up to the year 2030. However, between 2012 and 2022, annual GDP growth rate averaged 4.8%. This performance fell short of the target of 10 percent annual growth due to various factors, including: the adverse effects of climate change, which has resulted to recurring drought and invasion of pests and diseases; rising oil prices; exchange rate volatility; the COVID-19 pandemic; geo-political conflicts, terrorist attacks and piracy incidents. Kenya's annual GDP growth rate in comparison to lower middle-income and upper middle-income categories between 2007 and 2022 is presented in Figure 2.3.



Source: KNBS Economic Surveys (Various), and World Bank Open Data 2023

Figure 2.3: Kenya's annual GDP growth in comparison to Lower Middle-income and Upper Middle-income categories, 2007-2022

Kenya made progress towards the attainment of a middle-income county status as envisaged in the Kenya Vision 2030. The country transitioned from a low-income status to a lower middle-income status upon attaining a GDP per capita of US$ 1,430 in 2014. The GDP per capita improved to US$ 2.240 in 2022. However. Kenya's Gross Domestic Product (GDP) per capita performance has been lower than the average for lower middle-income and upper middle-income categories between 2007 and 2022, as shown in Figure 2.4



Source: Economic Surveys, and World Bank Open Data, 2023

Figure 2.4: Kenya's GDP per capita (USD) in comparison to Lower Middle-Income and Upper Middle-income categories, 2007 - 2022

Sectors with significant contribution to economic growth in Kenya include Agriculture and livestock; Manufacturing; Tourism; Trade; Business process outsourcing; and Financial services.

Agriculture and livestock sector aims to promote an innovative, commercially oriented and modern agriculture. The sector majorly contributed towards the attainment of food and nutrition security, income generation, employment creation, and enhancing export earnings. Agriculture contribution to GDP marginally decreased from 21.7 % in 2007 to 21.2% in 2022. The performance was attributed to adverse weather conditions in some years and increasing costs of farm inputs. The share contribution of agriculture, forestry and fishing to GDP in Kenya compared to lower-middle-income and upper middle-income countries between 2007 and 2022 was higher, indicating that the country is still heavily dependent on agriculture (See figure 2.5).

Source: KNBS Economic Surveys (Various), and World Bank Open Data 2023

Figure 2.5: Share contribution of Agriculture, Forestry and Fishing to GDP in Kenya compared to Lower Middle-Income and Upper Middle-Income categories, 2007 - 2022

Kenya aims to have a robust, diversified and competitive manufacturing sector. The sector supports the country's socio-economic development agenda through job creation, foreign exchange generation and foreign direct investment attraction. The contribution of the manufacturing sector to GDP declined from 10.4% in 2007 to 7.8 per cent in 2022 against a target of 15%. The decline was due to high cost of production, competition from counterfeit goods, low technology adoption and recurring drought. The sector facilitated export-oriented investment by developing Athi River textile hub; modernizing Rivatex Textile Factory; and initiating the establishment of Special Economic Zones in Dongo Kundu and Naivasha. The share contribution of manufacturing to GDP in Kenya in comparison to lower middle-income and upper middle-income countries between 2007 and 2022 (see figure 2.6).

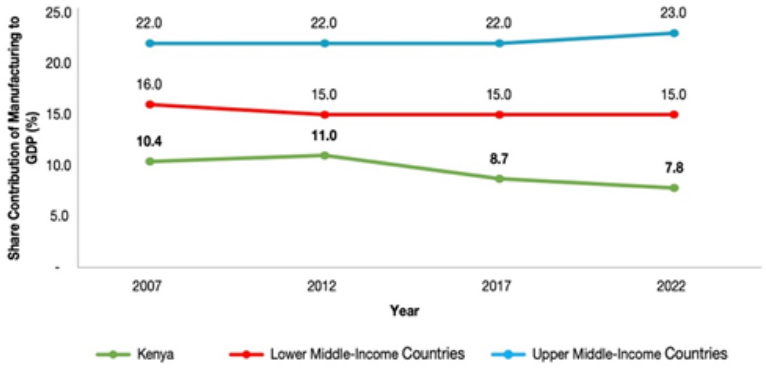


Figure 2.6: Share contribution of Manufacturing to GDP in Kenya compared to Lower Middle-Income and Upper Middle-Income categories, 2007 - 2022

2.1.2. Institutional Arrangements

Due to these impacts which continue to disrupt the country's economy, Kenya has prioritized climate change response and put in place an elaborate policy, legal and institutional framework on climate change. Kenya communicated an ambitious updated Nationally Determined Contribution (NDC) to the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) in December 2020 to demonstrate its global commitment to addressing the adverse effects of climate change in the context of sustainable development and eradication of poverty.

Kenya has established an elaborate institutional arrangement for addressing the adverse impacts of climate change and implementing the NDC. The institutional arrangement takes a multi-stakeholder approach recognizing the role of state and non-state actors at both the national and county levels.

a) Climate Change Act 2016 (Revised Edition 2023)

Kenya enacted its climate change law, the Climate Change Act, in 2016, which it revised in 2023 to integrate carbon markets. The Act is applied for the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya.

The 2023 revised edition of the Climate Change Act 2016 provides an elaborate institutional arrangement for implementing and tracking the Kenya Nationally Determined Contributions. The Act established the National Climate Change Council, which provides overarching national climate change coordination mechanisms. The Council is comprised of members drawn from both state and non-state actors, including the youth, marginalised communities, and academia, to facilitate stakeholder engagement in policy, coordination and oversight of climate change response in Kenya.

The Act further establishes the Climate Change Directorate as

the lead agency of the government on national climate change plans and actions to deliver operational coordination of climate change response. The directorate works with the climate change units established in other ministries, counties, departments, and agencies to deliver operational coordination using an integrated approach as provided for under the Act.

b) National Climate Change Action Plan (NCCAP)

The Climate Change Act 2016 provides for the Cabinet Secretary responsible for climate change affairs to formulate, through public consultation, a National Climate Change Action Plan. The Climate Change Action Plan prioritizes climate change response measures and actions over a five-year period and is aligned with the election cycles to facilitate mainstreaming of government's development priorities in the context of sustainable development and efforts to eradicate poverty. The action plan also prioritizes actions for the implementation of the NDC with an elaborate implementation and reporting framework.

2.2. Description of Kenya's NDC under Article 4 of the Paris Agreement

Kenya submitted her first Nationally Determined Contribution (NDC) with instruments for ratification to the Paris Agreement on 28th December 2016. In her first NDC, Kenya committed to reducing emissions by 30% against a Business as Usual (BAU) scenario of 143 $MtCO_2eq$ by 2030.

Kenya updated her first NDC in 2020 which seeks to abate GHG emissions by 32% relative to the BAU scenario of 143 $MtCO_2eq$ by 2030, in line with Kenya's sustainable development agenda and national circumstances.

The NDC is an economy-wide absolute GHG emissions target. It is a single-year target, and the implementation period is from 1st January 2021 to 31st December 2030, with milestone targets in 2025. Key sectors covered include Energy, Agriculture, Land Use, Land-Use Change and Forestry (LULUCF), Industrial Processes and Product Use (IPPU) and Waste. Greenhouse gases covered are carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF_6) and Nitrogen trifluoride (NF_3) are currently negligible.

For the land Use, land-use change and forestry sector (LULUCF), emissions and removals from the following reporting categories are included: The five carbon pools above-ground biomass, below ground biomass, litter, dead wood and soil organic matters.

2.2.1. Description of Kenya's NDC

The NDC sets out both adaptation and mitigation contributions on the condition that it receives international support for implementation. Tables 2.1 and 2.2 below describe the mitigation and adaptation elements of the NDC:

Mitigation

Table 2.1: Mitigation elements of the NDC

Elements	Description
Target(s) and description, including target type(s), as applicable	• Kenya's NDC is an economy- wide absolute emissions target to abate GHG emissions by 32% by 2030 relative to the BAU scenario of 143 $MtCO_2eq$
Target year(s) or period(s), and whether they are single-year or multi-year target(s), as applicable	• Kenya's NDC is a single-year target, with target year of 2030.
Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s), as applicable	• Base year for emission projections: 2010 – 69 $MtCO_2eq$ Reference year for BAU emissions target: 2030
Time frame(s) and/or periods for implementation, as applicable	• From 1st January 2021 to 31st December 2030, with a milestone target in 2025

Elements	Description
Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases, as applicable	• Kenya's NDC is an economy-wide absolute GHG emissions target. Key sectors covered include Energy, Agriculture, Land Use, Land-Use Change and Forestry (LULUCF), Industrial Processes and Product Use (IPPU) and Waste. Greenhouse gases covered are carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF_6) and Nitrogen trifluoride (NF_3) are currently negligible. For the land Use, land-use change and forestry sector, emissions and removals from the following reporting categories are included: Forest Land, grassland wetland, including land use changes between the categories, and between these categories and settlements and other land.
Intention to use cooperative approaches that involve the use of ITMOs under Article 6 towards NDCs under Article 4 of the Paris Agreement, as applicable	• Kenya intends to use ITMOs under Article 6 of the Paris Agreement towards its NDC.
Any updates or clarifications of previously reported information, as applicable	• Not Applicable

The resource requirements for mitigation activities for the period 2020 to 2030 are estimated at $17,725 Million. Subject to national circumstances, Kenya will bear 21% ($3,725 Million) of the mitigation cost for domestic sources, while 79% the balance of ($14,000 Million) is subject to international support. However, these estimated resource requirements may change with changing circumstances.

Adaptation

Kenya NDC also places equal importance on enhancing adaptation and building a climate-resilient future to reduce risks on communities and livelihoods.

Table 2.2: Prioritized adaptation programs

Sector	Adaptation Programme
Disaster risk reduction	P1: Drought risk management, including drought early warning, preparedness, and response for enhanced drought resilience P2: Flood risk management incorporating nature-based solutions
Agriculture (crops, livestock and fisheries)	P3: Mainstream CSA 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. P4: Build resilience of the agriculture (crops, livestock and fisheries) systems through sustainable management of land, soil, water and other natural resources as well as insurance and other safety nets. P5: Strengthen communication systems on CSA extension and agro-weather issues

Sector	Adaptation Programme
Environment	P6: Rehabilitation and conservation of degraded forests P7: Establish at least 2,000 hectares to promote nature-based (non-wood forest products) enterprises across the country P8: Establish 150,000 ha commercial private forests plantations P9: Plant 350,000 agro-forestry trees in farmlands established P10: Greening of 14,000 ha of infrastructure (roads, railway lines, dams) P11: Enhance/strengthen governance of community structures in participatory resource management in coastal ecosystems P12: Conduct blue carbon readiness assessment for full integration of blue carbon /ocean climate actions into NDCs P13: Develop marine spatial planning and outline sustainable management approaches P14: Promote and expand opportunities for nature-based enterprises, including seaweed farming and mangrove ecotourism. P15: Integrate the use of nature-based solutions, including the implementation of national mangrove management plan, into national and county development plans P16: Strengthen early-warning and tailor-made climate information services through institutional strengthening of KMD and other information user institutions P17: Roll-out Early Action Protocols for forecast based financing
Infrastructure (energy)	P18: Develop and adopt guidelines on how to climate proof energy infrastructure using vulnerability risk assessments P19: Enhance climate proofing of energy infrastructure along the renewable energy supply chain P20: Increase the number of companies participating in energy efficient water-use initiatives by 40% from the baseline
Infrastructure (roads)	P21: Upscale the construction of roads to systematically harvest water and reduce flooding P22: Enhance institutional capacities on climate proofing vulnerable road infrastructure through vulnerability assessments P23: Promote the use of appropriate designs and building materials to enhance resilience of at least 4500km of roads to climate risk
Water and sanitation	P24: Conduct and implement recommendations on climate and risk assessments on water, sanitation and irrigation infrastructure. P25: Build resilience infrastructure for the protection of dams and dykes and river lines P26: Promote water harvesting and storage at county and household levels P27: Mainstream climate change into water catchment management plans.
Health	P28: Conduct a vulnerability and risk assessment of different climate risks on human health P29: Develop a public awareness and social mobilization strategy on climate change and health impacts P30: Develop health programmes, protocols and guidance to manage new climate change related diseases and risks P31: Reduce the incidence of malaria, other vector borne disease and other health conditions

Sector	Adaptation Programme
Population, urbanization and housing	P32: Introduce nature-based solutions in flood control especially around informal settlements and selected urban areas P33: Strengthen the enforcement of green building codes by national and county governments P34: Conduct climate risk and vulnerability assessments of building/housing infrastructure especially to flooding, and sea level rise
Tourism	P35: Develop and adopt guidelines of how to integrate adaptation across the tourism sector P36: Conduct a climate risk and vulnerability assessment of the tourism sector P37: Develop climate resilient action plans for the sector P38: Develop social safety net structures for women, youth and other vulnerable groups within the CCCFs
Gender, youth and other vulnerable groups	P39: Strengthening access of women, youth, other vulnerable groups to enterprise funds, climate finance and credit lines. P40: Promote gender responsive technologies and innovations in the private sector, through financing capacity building and start-up services P41: Consolidate successful technologies and develop a transfer strategy to women, youth and other vulnerable populations
Private Sector	P42: mobilize financial resources from capital markets and other financial instruments for green investments and implementation of the Green Business Agenda P43: Eco-label industrial products to promote green procurement especially by public procurement agencies P44: Climate-proof waste management infrastructure for waste management facilities in SEZ (effluent treatment plants) P45: Increase the number of companies participating in efficient water-use initiatives
Devolution	P46: Develop and adopt county adaptation guidelines for integration in CIDPs P47: Build the capacities of County CCUs on adaptation P48: Conducting vulnerability and risk assessments in counties P49: Develop county adaptation plans for the counties with CCCFs
Adaptation M&E system	P50: Refine and operationalize the adaptation M&E system at national and county levels

The total cost of adaptation actions up to 2030 is estimated at $43,927 Million. Subject to national circumstances, Kenya intends to mobilize domestic resources to cater for 10% of the adaptation cost while 90% will require international support.

2.3. Information on Kenya's progress toward achieving its 2030 emission reduction target is as follows

Indicator including definitions

To track progress towards the implementation and achievement of Kenya's NDC, total annual GHG emissions and removals has been selected as the indicator, consistent with the scope of the NDC in tCO_2eq

Table 2.3: Definition of the Indicator

Information	Description
Selected Indicator	Annual total greenhouse gas emissions and removals in tCO_2eq.
Information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s)	Base year: 2010 Reference point (baseline GHG emissions in 2010): 69 $MtCO_2$ eq.

Table 2.4: Structured Summary; Tracking Progress Made in Implementing and Achieving the NDC under Article 4 of the Paris Agreement

Structured summary: Tracking progress made in implementing and achieving the NDC under Article 4 of the Paris Agreementa								
Example for Parties that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 of the Paris Agreement								
	Unit, as applicable	**Reference point(s), level(s), baseline(s), base year(s) or starting point(s) {MPGs, p. 67, 77(a)(i)}**	**Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period {MPGs, p. 68, 77(a)(ii–iii)}**		**Target level**	**Target year or period**	**Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s) (paras. 69–70 of the MPGs)**	
			Year 1	**Year 2**				
Indicator(s) selected to track progress towards the implementation and/or achievement of the NDC under Article 4 of the Paris Agreementc: {MPGs, p. 65, 77(a)}								
Total greenhouse gas emissions	$MtCO_2$ eq	67,000,000.00	140,668,000.00	113,366,000.00	97000000	2030	The most recent level of the indicator is 19.4% below the start year of the NDC implementation period (2021)	
Where applicable, total GHG emissions and removals consistent with the coverage of the NDC {MPGs, p. 77(b)}	$MtCO_2$ eq		140,668,000.00	113,366,000.00				
Contribution from the LULUCF sector for each year of the target period or target year, if not included in the inventory time series of total net GHG emissions and removals, as applicable {MPGs, p. 77(c)}	$MtCO_2$ eq		-71,268.46	-46,846				
Each Party that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 of the Paris Agreement, or authorizes the use of mitigation outcomes for international mitigation purposes other than achievement of the NDC, shall provide: {MPGs, p. 77(d)}								
If applicable, an indicative multi-year emissions trajectory, trajectories or budget for its NDC implementation period (para. 7(a)(i), annex to decision -/CMA.3)								

Structured summary: Tracking progress made in implementing and achieving the NDC under Article 4 of the Paris Agreementa								
Example for Parties that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 of the Paris Agreement								
	Unit, as applicable	Reference point(s), level(s), baseline(s), base year(s) or starting point(s) {MPGs, p. 67, 77(a)(i)}	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period {MPGs, p. 68, 77(a)(ii–iii)}		Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s) (paras. 69–70 of the MPGs)	
			Year 1	Year 2				
Indicator(s) selected to track progress towards the implementation and/or achievement of the NDC under Article 4 of the Paris Agreementc: {MPGs, p. 65, 77(a)}								
If applicable, multi-year emissions trajectory, trajectories or budget for its NDC implementation period that is consistent with the NDC (para. 7(b), annex to decision -/CMA.3)								
Annual anthropogenic emissions by sources and removals by sinks covered by its NDC or, where applicable, from the emission or sink categories as identified by the host Party pursuant to paragraph 9 of annex to decision -/CMA.3 (para. 23(a), annex to decision -/CMA.3) (as part of para. 77 (d)(i) information)	$MtCO_2$ eq		69,399,500	66,519,700				
Annual anthropogenic emissions by sources and removals by sinks covered by its NDC or, where applicable, from the portion of its NDC in accordance with paragraph 10, annex to decision -/CMA.3 (para. 23(b), annex to decision -/CMA.3)								
If applicable, annual level of the relevant non-GHG indicator that is being used by the Party to track progress towards the implementation and achievement of its NDC and was selected pursuant to paragraph 65, annex to decision 18/CMA.1 (para. 23(i), annex, decision -/CMA.3)								

Structured summary: Tracking progress made in implementing and achieving the NDC under Article 4 of the Paris Agreementa								
Example for Parties that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 of the Paris Agreement								
	Unit, as applicable	Reference point(s), level(s), baseline(s), base year(s) or starting point(s) {MPGs, p. 67, 77(a)(i)}	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period {MPGs, p. 68, 77(a)(ii–iii)}		Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s) (paras. 69–70 of the MPGs)	
			Year 1	Year 2				
Indicator(s) selected to track progress towards the implementation and/or achievement of the NDC under Article 4 of the Paris Agreementc: {MPGs, p. 65, 77(a)}								
Annual quantity of ITMOs first transferred (para. 23(c), annex to decision -/CMA.3) (para. 77(d)(ii) of the MPGs)			N/A	N/A				
Annual quantity of mitigation outcomes authorized for use for other international mitigation purposes and entities authorized to use such mitigation outcomes, as appropriate (para 23(d), annex to decision -/CMA.3) (para. 77(d)(ii) of the MPGs)								
Annual quantity of ITMOs used towards achievement of the NDC (para. 23(e), annex to decision -/CMA.3) (para. 77(d)(ii) of the MPGs)								
Net annual quantity of ITMOs resulting from paras. 23(c)-(e), annex to decision -/CMA.3 (para. 23(f), annex to decision -/CMA.3)								
If applicable, the cumulative amount of ITMOs, divided by the number of elapsed years in the NDC implementation period (para. 7(a)(ii), annex to decision -/CMA.3)								
Total quantitative corresponding adjustments used to calculate the emissions balance referred to in para. 23(k)(i), annex to decision -/CMA.3, in accordance with the Party's method for applying corresponding adjustments.								

Structured summary: Tracking progress made in implementing and achieving the NDC under Article 4 of the Paris Agreementa								
Example for Parties that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 of the Paris Agreement								
	Unit, as applicable	Reference point(s), level(s), baseline(s), base year(s) or starting point(s) {MPGs, p. 67, 77(a)(i)}	Implementation period of the NDC covering information for previous reporting years and the most recent year, including the end year or end of period {MPGs, p. 68, 77(a)(ii–iii)}		Target level	Target year or period	Progress made towards the NDC, as determined by comparing the most recent information for each selected indicator, including for the end year or end of period, with the reference point(s), level(s), baseline(s), base year(s) or starting point(s) (paras. 69–70 of the MPGs)	
			Year 1	Year 2				
Indicator(s) selected to track progress towards the implementation and/or achievement of the NDC under Article 4 of the Paris Agreementc: {MPGs, p. 65, 77(a)}								
The cumulative information in respect of the annual information in para. 23(f), annex to decision -/CMA.3, as applicable (para. 23(h), annex to decision -/CMA.3)								
For metrics in tonnes of CO2 eq. or non-GHG, an annual emissions balance consistent with chapter III.B (Application of corresponding adjustment), annex, decision -/CMA.3 (para. 23(k)(i), annex to decision -/CMA.3) (as part of para. 77 (d)(ii) of the MPGs)								
Any other information consistent with decisions adopted by the CMA on reporting under Article 6 (para. 77(d)(iii) of the MPGs)								
Notes: (1) Pursuant to para. 79 of the MPGs, each Party shall report the information referred to in paras. 65–78 of the MPGs in a narrative and common tabular format, as applicable. (2) A Party may amend the reporting format (e.g. Excel file) to remove specific rows in this table if the information to be provided in those rows is not applicable to the Party's NDC under Article 4 of the Paris Agreement, in accordance with the MPGs. (3) The Party could add rows for each additional selected indicator. aThis table could be used for each NDC target in case Party's NDC has multiple targets. b Parties may provide information on conditional targets in a documentation box with references to the relevant page in their biennial transparency report.								

Updates	This is the first time the reference level has been reported, hence there are no updates. The value of the reference level may be updated or recalculated in future due to methodological improvements or data availability, in subsequent GHG inventories.
Definitions needed to understand indicator	Total annual GHG emissions and removals correspond to the annual total of emissions and removals reported in tCO2 equivalents in Kenya's latest GHG inventory. The totals comprise all sectors and gases listed in the table 2.1, description of Kenya's NDC.
Relation to NDC	The indicator is defined in the same unit and metric as the NDC target hence it can be used to track progress in implementing and achieving Kenya's NDC target.
Most recent information	Kenya's total GHG emissions in 2022 was approximately 113.3 MtCO₂eq (including LULUCF) and 66.5 MtCO2eq (excluding LULUCF)

2.3.1. Tracking Progress Towards NDC

Kenya selected the total annual greenhouse gas emissions (including LULUCF) as the primary indicator to track progress in implementing and achieving her NDC, which seeks to abate GHG emissions by 32% (46 MtCO2eq) relative to the BAU scenario of 143 MtCO2eq by 2030.

Kenya's current trajectory aligns with its emissions reduction target, reflecting a sustained commitment to achieving a low carbon climate resilient development pathway. Kenya is on track with meeting the 2030 NDC target.

Key data points in the NDC for tracking progress include projected emissions of 122 MtCO₂eq by 2022, 112.4 MtCO₂eq by 2025, advancing toward the 2030 target of 97 MtCO2eq. Kenya's most recent 2022 total annual greenhouse gas emissions were approximately 113.3 MtCO₂eq (including LULUCF) and 66.5 MtCO2eq (excluding LULUCF), according to the latest inventory data.

2.3.2. Methodologies and accounting approaches for tracking progress toward implementing and achieving the NDC

The methodologies and accounting approaches are equivalent to those in the GHG inventory, which uses 2006 IPCC Guidelines for National GHG Inventories. Emissions estimates were based on the sectoral approach. Most emissions estimates were derived using Tier 1 methodology provided in the 2006 IPCC Guidelines.

Chapter 1 of this BTR as well as the inventory provide further details on our accounting approaches and methodologies.

Details of the methodologies and accounting approaches to be used to track progress in implementing and achieving the NDC are provided in the table below:

Table 2.5: Methodologies and accounting approaches.

Reporting requirement	Description
Accounting for anthropogenic emissions and removals in accordance with methodologies and common metrics assessed by the IPCC and adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement:	
Accounting approaches	
Information on the accounting approach used is consistent with paragraphs 13–17 and annex II of decision 4/CMA.1	Kenya accounted for the GHG emissions and removals using the 2006 Intergovernmental Panel on Climate Change (IPCC), the good practice guidance and Uncertainty Management for National Greenhouse Gas Inventories (IPCC 2000), Good Practice Guidance for land use, land-use change and forestry (IPCC 2003).

Reporting requirement	Description
Each methodology and/or accounting approach used to assess the implementation and achievement of the target(s), as applicable	Kenya will assess the implementation and achievement of its NDC target by accounting for its annual total GHG emissions and removals using the 2006 IPCC Guidelines.
Each methodology and/or accounting approach used for the construction of any baseline, to the extent possible	
If the methodology or accounting approach used for the indicator(s) differ from those used to assess the implementation and achievement of the target, describe each methodology or accounting approach used to generate the information generated for each indicator	The accounting approach for the indicator does not differ from the accounting approach used to assess the implementation and achievement of Kenya's NDC target.
Any conditions and assumptions relevant to the achievement of the NDC under Article 4, as applicable and available	The achievement of Kenya's NDC is subject to availability of international support in the form of finance, technology development and transfer and capacity building. Implementation of Kenya's NDC is estimated at $62 billion up-to 2030. Kenya will consider any climate finance in terms of loans as part of her domestic contribution.
Key parameters, assumptions, definitions, data sources and models used, as applicable and available	The accounting approach will be aligned with the methodologies in the GHG inventory. Any key parameters, assumptions, definitions, data sources and models used within the inventory would also be used to account for the NDC target.
IPCC Guidelines used, as applicable and available	2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories
Report the metrics used, as applicable and available	Kenya's emissions for CO2, CH4, N2O will be derived using the 2006 IPCC Guidelines, via the Sectoral approach. The Tier 1 methodology will be used for most emissions estimates. Higher tier methodology will be used, where relevant and depending on availability of data. The aggregation of GHG emissions and removals will be reported using the 100-year time- horizon global warming potential (GWP) values from the IPCC Fifth Assessment Report.
For Parties whose NDC cannot be accounted for using methodologies covered by IPCC guidelines, provide information on their own methodology used, including for NDCs, pursuant to Article 4, paragraph 6, of the Paris Agreement, if applicable	Not applicable. Kenya's NDC will be accounted for using IPCC guidelines.
Provide information on methodologies used to track progress arising from the implementation of policies and measures, as appropriate	Not Applicable
Where applicable to its NDC, any sector-, category or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, taking into account any relevant decision under the Convention, as applicable:	
For Parties that address emissions and subsequent removals from natural disturbances on managed lands, provide detailed information on the approach used and how it is consistent with relevant IPCC guidance, as appropriate, or indicate the relevant section of the national GHG inventory report containing that information	GHG emissions and removals from natural disturbances, if any, will be accounted for in accordance with the Good Practice Guidance for land use, land-use change and forestry (IPCC 2003).
For Parties that account for emissions and removals from harvested wood products, provide detailed information on which IPCC approach has been used to estimate emissions and removals	Emissions and removals from harvested wood products are not included.

Reporting requirement	Description
For Parties that address the effects of age-class structure in forests, provide detailed information on the approach used and how this is consistent with relevant IPCC guidance, as appropriate	Kenya will estimate GHG emissions and removals in the LULUCF sector with Tier 1 approaches and apply high-resolution satellite images, coupled with collection of country-specific data resulting from field inventory measurements undertaken at regular intervals and estimated by modelling approaches.
How the Party has drawn on existing methods and guidance established under the Convention and its related legal instruments, as appropriate, if applicable	Kenya will assess the implementation and achievement of its NDC target by accounting for its GHG emissions and removals using the 2006 IPCC Guidelines, the good practice guidance and Uncertainty Management for National Greenhouse Gas Inventories (IPCC 2000) and Good Practice Guidance for land use, land-use change and forestry (IPCC 2003).
Any methodologies used to account for mitigation benefits of adaptation actions and/or economic diversification plans	Not Applicable
Describe how double counting of net GHG emission reductions has been avoided, including in accordance with guidance developed related to Article 6 if relevant	As of 2022, Kenya had not participated in cooperative approaches that involve the use of internationally transferred mitigation outcomes (ITMOs) under Article 6 of the Paris Agreement.
Any other methodologies related to the NDC under Article 4	Not applicable.
Ensuring methodological consistency, including on baselines, between the communication and implementation of NDCs:	
Explain how consistency has been maintained in scope and coverage, definitions, data sources, metrics, assumptions and methodological approaches including on baselines, between the communication and implementation of NDCs	The scope and coverage, definitions, data sources, metrics, assumptions and methodological approaches used for communicating and implementing Kenya's NDC are equivalent and, therefore, consistent.
Explain how consistency has been maintained between any GHG data and estimation methodologies used for accounting and the Party's GHG inventory, pursuant to Article 13, paragraph 7(a), of the Paris Agreement, if applicable (para. 2(b) of annex II to decision 4/CMA.1) and explain methodological inconsistencies with the Party's most recent national inventory report, if applicable	The methodologies used to estimate GHG emissions and removals for accounting NDC and the methodologies used in the GHG inventory are similar, hence consistent.
For Parties that apply technical changes to update reference points, reference levels or projections:	
Explain how any methodological changes and technical updates made during the implementation of their NDC were transparently reported	To the extent possible, any methodological changes and technical updates will be reported in Kenya's GHG inventory.
Striving to include all categories of anthropogenic emissions or removals in the NDC and, once a source, sink or activity is included, continuing to include it:	
Explain how all categories of anthropogenic emissions and removals corresponding to their NDC were accounted for	All categories of anthropogenic GHG emissions and removals will be accounted for using the 2006 IPCC Guidelines.
Explain how Party is striving to include all categories of anthropogenic emissions and removals in its NDC, and, once a source, sink or activity is included, continue to include it	Kenya will strive to continue to report emissions from the key categories in subsequent GHG inventories.
Provide an explanation of why any categories of anthropogenic emissions or removals are excluded	Not Applicable
Each Party that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4, or authorizes the use of mitigation outcomes for international mitigation purposes other than achievement of its NDC	
Provide information on any methodologies associated with any cooperative approaches that involve the use of ITMOs towards an NDC under Article 4	Not Applicable. As of 2022, Kenya had not participated in cooperative approaches that involve the use of internationally transferred mitigation outcomes (ITMOs) under Article 6.

2.4. Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement

Kenya is a developing country with diverse challenges compounded by the impacts of climate change. Over the NDC implementation period, climate change actions will be implemented through selected and prioritized measures covering both mitigation and adaptation.

This section outlines a few selected significant policies and measures, actions and plans, by sector, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans relating to the implementation of the NDC:

2.4.1. Agriculture Sector

Within the Agriculture sector, the overarching policy is the Agricultural Sector Transformation and Growth Strategy (ASTGS) 2019-2029. This strategy is designed to support agricultural productivity, ensure food security, and contribute to environmental sustainability. It provides guidelines for soil conservation, improvement of soil health, and the adoption of best practices in soil management to optimize agricultural outputs. The objective of the strategy is to contribute to economically and environmentally viable, and socially acceptable development opportunities for agricultural production in Kenya to reduce poverty and improve food security through improved soil management.

The strategy is implemented by the Ministry of Agriculture and Livestock Development and other key stakeholders including other Ministries and agencies such as Kenya Agricultural Livestock and Research Organization (KALRO); Ministry of Environment, Climate Change and Forestry; National Land Commission (NLC); National Environment Management Authority (NEMA); Kenya Bureau of Standards (KEBS), Radiation Board, among others.

The Kenya Climate Smart Agriculture Strategy (KCSAS 2017-2026) is the main policy instrument geared towards the implementation of the NDC through initiatives and measures such as:

a. Reducing the rate of emissions from livestock (manure and enteric fermentation).

b. Reducing the rate of emissions from rice production systems.

c. Providing accurate, timely and reliable climate/weather information to inform decisions of actors on crops, livestock and fisheries value chains.

d. Promoting crop varieties, livestock and fish breeds and tree species that are adapted to varied weather conditions and tolerant to associated emerging pests and diseases

e. Technology development, dissemination and adoption along crops, livestock, fisheries and forestry value chains

f. Diversification of enterprises and alternative livelihoods

g. Enhancing productivity and profitability of agricultural enterprises.

Through the Agricultural Sector Transformation and Growth Strategy (ASTGS) 2019-2029, the sector has developed several plans and implemented actions that directly and indirectly support climate actions. These include:

1. Agricultural Soil Management Policy (NASMP)- (2020) - This policy is designed to support agricultural productivity, ensure food security, and contribute to environmental sustainability. It provides guidelines for soil conservation, improvement of soil health, and the adoption of best practices in soil management to optimize agricultural outputs.
2. Agriculture (Farm Forestry) Rules, 2009 – These are regulations established under the Agriculture Act in Kenya to encourage the integration of forestry practices within agricultural landscapes. These rules are part of Kenya's broader strategy to enhance environmental conservation, increase forest cover, and improve agricultural productivity through sustainable land use practices. The rules mandate farmers to allocate a portion of their land for tree planting and management, contributing to ecological balance, soil fertility improvement, and climate change mitigation.
3. Sessional Paper No. 3 of 2020 on the Livestock Policy – Policy aims to utilize livestock resources for food and nutrition security, improved livelihoods while safeguarding the environment.

In support of these interventions, the sector implemented the following measures and initiatives as described in the table below:

Table 2.6: Overview of the mitigation policies and actions in the Agricultural Sector.

Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement										
Name	**Description**	**Objectives**	**Type of Instrument (Regulatory, Economic, Voluntary, other)**	**Status (Planned, adopted, Implemented)**	**Sector(s) affected**	**Gases affected**	**Start year of implementation**	**Implementing entity or entities**	**Estimates of GHG emission reductions (kt CO_2 eq) [j, k]** Achieved | Expected	
Kenya Climate Smart Agriculture Strategy (KCSAS 2017-2026)	The recurrent droughts and rising temperatures attributed to climate change continue to exert more pressure on fisheries resources due to reduction of water supply, and increased evaporation of water in lakes and rivers. The country therefore requires transformation of its agricultural systems to make them more productive, resilient and competitive in generating incomes under a changing climate. The CSA strategy provides an excellent opportunity for this transformation.	The overall objective of this strategy is to build resilience and minimize emissions from agricultural farming systems for enhanced food and nutritional security and improved livelihoods.	Economic	Adopted	Agriculture Cross-cutting	CO_2, CH_4, N_2O	2017	The National Government (Ministry of Agriculture and Livestock Development) The County Governments	NE	NE

Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement										
Name	**Description**	**Objectives**	**Type of Instrument (Regulatory, Economic, Voluntary, other)**	**Status (Planned, adopted, Implemented)**	**Sector(s) affected**	**Gases affected**	**Start year of implementation**	**Implementing entity or entities**	**Estimates of GHG emission reductions (kt CO_2 eq)[j, k]** Achieved | Expected	
Dairy Nationally Appropriate Mitigation Actions (NAMA)	The NAMA is aimed at transforming the dairy sector to reduce greenhouse gas emissions while enhancing productivity and economic benefits. The program is structured around implementing sustainable dairy farming practices that improve productivity, animal health, and resource efficiency. It focuses on enhancing the capacity of dairy farmers, cooperatives, and institutions to adopt practices that lower emissions while improving livelihoods. By targeting both smallholder and commercial dairy operations, the NAMA aims to create a resilient and competitive dairy industry in Kenya.		Economic	Planned	Livestock Environment	CO_2, CH_4, N_2O	N/A	Ministry of Agriculture and Livestock Development Ministry of Environment, Climate Change and Forestry World Agroforestry Centre (ICRAF) Consultative Group on International Agricultural Research (CGIAR) Kenya Dairy Board (KDB)	NE	NE

Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement										
Name	**Description**	**Objectives**	**Type of Instrument** (Regulatory, Economic, Voluntary, other)	**Status** (Planned, adopted, Implemented)	**Sector(s) affected**	**Gases affected**	**Start year of implementation**	**Implementing entity or entities**	**Estimates of GHG emission reductions (kt CO_2 eq)** [j, k] Achieved | Expected	
TWENDE: Towards Ending Drought Emergencies: Ecosystem Based Adaptation in Kenya's Arid and Semi-Arid Rangelands	The project targets eleven counties in two major climate zones which have devolved powers under Kenya's new constitution. Building capacity and institutions for the improved implementation of devolution is seen as necessary to enhance the climate resilience of Kenya's arid and semi-arid lands. Interventions focus on increasing the adaptive capacities of communities and local institutions to develop evidence-based landscape planning. This will be done by increasing accessibility to climate data and information; and enhancing the ability of community-based	Increasing the resilience of the livestock and other land-use sectors through restored and effectively governed rangeland Ecosystems in Kenya's arid and semi-arid lands	Regulatory Economic	Adopted	Agriculture Forestry	CO_2, CH_4, N_2O	2020	Ministry of Agriculture and Livestock Development Water Resources Authority (WRA) International Union for Conservation of Nature (IUCN)	NE	NE

Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement										
Name	**Description**	**Objectives**	**Type of Instrument** (Regulatory, Economic, Voluntary, other)	**Status** (Planned, adopted, Implemented)	**Sector(s) affected**	**Gases affected**	**Start year of implementation**	**Implementing entity or entities**	**Estimates of GHG emission reductions (kt CO_2 eq)** [j, k] Achieved | Expected	
	cottage industries to access markets and financial services. This project has an estimated lifespan of 5 years.									

Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement										
Name	**Description**	**Objectives**	**Type of Instrument (Regulatory, Economic, Voluntary, other)**	**Status (Planned, adopted, Implemented)**	**Sector(s) affected**	**Gases affected**	**Start year of implementation**	**Implementing entity or entities**	**Estimates of GHG emission reductions (kt CO_2 eq)** [j, k] Achieved | Expected	
National Agricultural and Rural Inclusive Growth Project (NARIGP)	The project was formed to intervene in the following areas: through the increased adoption of new technologies and improved practices and by federating into POs and other forms of rural institutions like SACCOs, rural smallholder farmers will be able increase their productivity, incomes and profitability	To boost agricultural productivity and profitability in selected rural communities in 21 selected counties, and in the event of an Eligible Crisis or Emergency, to provide immediate and effective response.	Economic Regulatory	Implemented	Agriculture	CO_2, CH_4, N_2O	2017	Ministry of Agriculture and Livestock Development	NE	NE
Kenya Climate Smart Agriculture Project (KCSAP)	The project is a government-led initiative designed to transform Kenyan agriculture into a more sustainable and climate-resilient sector.	The project aimed to improve crop and livestock productivity through climate	Economic	Implemented	Agriculture	CO_2, CH_4, N_2O	2017		NE	NE

Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement										
Name	**Description**	**Objectives**	**Type of Instrument (Regulatory, Economic, Voluntary, other)**	**Status (Planned, adopted, Implemented)**	**Sector(s) affected**	**Gases affected**	**Start year of implementation**	**Implementing entity or entities**	**Estimates of GHG emission reductions (kt CO_2 eq) [j, k]** Achieved | Expected	
	The program seeks to address the vulnerabilities of Kenyan agriculture to climate change by promoting practices that increase productivity, enhance resilience, and reduce greenhouse gas emissions. KCSAP emphasizes the use of innovative technologies and farming practices that are aligned with climate change mitigation and adaptation strategies, aiming to achieve food security, improve livelihoods, and protect the environment.	-smart technologies and practices, ensuring food security and economic growth; Strengthen the capacity of farming communities to adapt to climate variability and change, reducing vulnerability and enhancing resilience; Promote agricultural practices that minimize carbon footprints and contribute to climate change mitigation; Improve the capability of institutions	Economic	Implemented	Livestock Environment	CO_2, CH_4, N_2O	2017		NE	NE

Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement										
Name	**Description**	**Objectives**	**Type of Instrument** (Regulatory, Economic, Voluntary, other)	**Status** (Planned, adopted, Implemented)	**Sector(s) affected**	**Gases affected**	**Start year of implementation**	**Implementing entity or entities**	**Estimates of GHG emission reductions (kt CO_2 eq)** [j, k] Achieved | Expected	
		involved in agricultural development to implement climate-smart strategies effectively; Ensure that marginalized groups, including Women and youth benefit from climate smart agricultural practices.	Economic	Implemented	Agriculture Livestock Environment	CO_2, CH_4, N_2O	2017		NE	NE

2.4.2. Energy Sector

The Energy sector through various policies and legislations has over the years progressed towards more sustainable generation and consumption of energy most notably through the Sessional Paper No. 4 on Energy, 2004, and the Energy Act, 2006, Feed-in-Tariffs Policy, 2008 (revised in 2012) that promoted renewable energy generation, the Energy (Energy Management) Regulations, 2012 promoted enhanced energy efficiency. The national Energy Policy was revised in 2018 leading to the Energy Act, 2019 which captures the national ambition and aspirations.

In line with achieving the NDC target, the energy sector aims to increase renewables in the electricity generation mix of the national grid. The Government through the Ministry responsible for Energy has over the years undertaken power development planning for the country through the Least Cost Power Development Plan (LCPDP). The Least Cost Power Development Plan is a rolling 20-year plan prepared biennially (since 2011), and five-year medium-term plans compiled to guide particularly the expansion of the electricity sector.

In 2020, the plan was updated with emphasis on the prioritization of renewable energy options for generation of electricity. The expansion of the grid (electricity network) has enabled the dispatch of more renewable electricity and improved the grid's robustness to take up more renewable energy sources especially with regards to the instantaneous, daily and seasonal variability. Subsequent updates of the plan have sustained this trajectory achieving 89.8% and 87.7% electricity generated from renewable energy sources in the years 2021 and 2022 respectively.

Table 2.7: Overview of the mitigation policies and actions in the Energy Sector..

Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement										
Name	**Description**	**Objectives**	**Type of Instrument (Regulatory, Economic, Voluntary, other)**	**Status (Planned, adopted, Implemented)**	**Sector(s) affected**	**Gases affected**	**Start year of implementation**	**Implementing entity or entities**	**Estimates of GHG emission reductions (kt CO_2 eq) [j, k]** Achieved |	Expected
Least Cost Power Development Plan	The Government through the Ministry responsible for Energy has over the years been undertaking power development planning for the country through the Least Cost Power Development Plan (LCPDP). Updates of the Least Cost Power Development Plan are prepared biennially (since 2011) covering 20-year periods, and five-year medium-term plans compiled in alternate years.	The 2020-2022 plan emphasized the prioritization of renewable energy options for generation of electricity. The expansion of the grid (electricity network) has enabled the dispatch of more renewable electricity and improved its robustness sources especially with relation to the variability of the RE to take up more of the renewable energy.	Economic Regulatory	Adopted	Energy	CO_2	2011	Ministry of Energy and Petroleum Energy and Petroleum Regulatory Authority (EPRA) Kenya Power and Lighting Company (KPLC) Kenya Electricity Generating Company (KENGEN) Geothermal Development Company (GDC) Kenya Electricity Transmission Company (KETRACO)	18,000	904.316

2.4.3. Transport Sector

GHG emissions from the transport sector have always constituted a significant share of the total emissions, consistently being the most significant source of emissions in the energy sector, particularly due to its reliance on fossil fuels. With population growth, modernization of society and increasing economic prosperity, there has been a sustained surge in motor vehicle ownership and use, which is a significant contributor to GHG emissions, primarily due to the reliance on petrol and diesel vehicles. Increased economic activities mean more goods and people need to be transported, further raising emissions. As one of the main contributors to emissions in the country, the transport sector is at the heart of achieving the NDC target.

The Government's Bottom-Up Economic Transformation Agenda, which is currently being implemented through the Fourth Medium Term Plan 2023 – 2027 of the Kenya Vision 2030 Agenda, recognizes the role e-mobility could play in the attainment of national development and environmental goals. With the objective of achieving a low carbon and efficient transportation system in the NDC, the transport sector aims to promote several identified mitigation measures such as: Transfer of freight from road to rail; Transition to e-mobility; Electrification of the Standard gauge railway between Nairobi and Mombasa by 2022, among others.

The total length of the rail network in the country is 2,778 km comprising both the meter-gauge track and the standard-gauge track. In 2017, the construction of Phase I of the Standard Gauge Railway spanning 472 km of track from the port city of Mombasa to Nairobi was completed, this has significantly reduced freight and passenger tariffs and travel time and led to a significant shift of freight and passengers from road to rail. The cargo transported using the railway system increased from 1,380,000 tonnes in 2016 to 6,090,000 tonnes in 2022. The passenger per km increased from 113 million in 2016 to 2,392 million in 2022. (source KNBS Economic Survey 2018 and 2023). This is observed in the trend of emissions for heavy-duty vehicles which declined in 2017.

The National Energy Efficiency and Conservation Strategy (2020) envisions that by 2025, 5 % of all registered vehicles in Kenya will be electric powered.

As of 2022, the sector was not able to implement most of the planned actions for the achievement of the NDC, due to inadequate financial support.

Table 2.8: Overview of the mitigation policies and actions in the Transport Sector.

Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement										
Name	**Description**	**Objectives**	**Type of Instrument (Regulatory, Economic, Voluntary, other)**	**Status (Planned, adopted, Implemented)**	**Sector(s) affected**	**Gases affected**	**Start year of implementation**	**Implementing entity or entities**	**Estimates of GHG emission reductions (kt CO_2 eq)** [j, k] Achieved | Expected	
Transfer of freight from road to rail between Nairobi and Mombasa	30% of freight from Mombasa to Nairobi shifted from road to rail. The transfer of freight from road to rail between Nairobi and Mombasa in Kenya is part of the Kenya Railway Expansion project, which aims to reduce road damage and provide a faster and safer intercity transportation system. The project includes the Mombasa-Nairobi-Malaba Corridor, which connects the Port of Mombasa to Nairobi and Malaba, Uganda.	Reduce fuel consumption and fuel overhead costs	Economic	Adopted	Transport Cross-cutting	CO_2	2018	Ministry of Roads and Transport Kenya Railways	NE	NE

2.4.4. Land Use, Land-Use Change and Forestry (LULUCF) Sector

The Land Use, Land-Use Change, and Forestry (LULUCF) sector plays a critical role in achieving the NDC. The sector is central to Kenya's climate action, providing significant mitigation potential through sustainable forest management, afforestation, reforestation, and landscape restoration initiatives. These actions are complemented by policies and measures that prioritize climate-smart agriculture, agroforestry, and nature-based solutions, ensuring the integration of adaptation co-benefits. Additionally, economic diversification plans focusing on green jobs and sustainable livelihoods enhance the sector's contribution to emissions reductions while fostering community resilience and environmental sustainability.

This section outlines the key mitigation policies, actions, and plans for the sector, designed to advance Kenya's NDC commitments while addressing broader socio-economic and environmental objectives. These include the commitment to progressively achieve a minimum of 10% tree cover across the total land area; efforts towards achieving land degradation neutrality; scaling up nature-based solutions (NBS) for mitigation and enhancement of REDD+ activities.

In its efforts to achieve 10% tree cover, Kenya implemented the strategy for increasing tree cover to at least 10% of the total land area by 2022. As a result, approximately 80,398.5 hectares were successfully planted with trees through afforestation, reforestation, and agroforestry initiatives. On-the-ground initiatives that were implemented, such as the Green Zones Support Project Phase II and the Adopt a Forest Initiative, actively engage stakeholders to restore degraded landscapes, enhance forest cover, and integrate tree planting with agricultural practices.

Kenya, in its efforts to enhance REDD+ activities, finalized its REDD+ Strategy in 2021, which outlines an ambitious framework for implementing national REDD+ activities to reduce emissions from deforestation and forest degradation while promoting conservation, sustainable forest management, and enhancement of forest carbon stocks. The strategy identifies key areas of focus to address deforestation and forest degradation, including scaling up afforestation, reforestation, and landscape restoration programs. It also emphasizes improving governance and policy implementation to curb the conversion of forests to other land uses and increasing the productivity of public plantation forests. In addition, the strategy seeks to enhance efficiency, effectiveness, and skill development across forest-related value chains, ensuring sustainable utilization of forest resources.

Recognizing the importance of financial resources, the strategy prioritizes the mobilization of funding to support the implementation of REDD+ initiatives in Kenya. It is worth noting that Kenya has not implemented REDD+ at the national level. As of 2022, Kenya was at the REDD+ readiness phase. However, several site-level REDD+ activities, such as the Kasigau Corridor REDD project (phases I and II), Mikoko Pamoja Mangrove Restoration in Gazi Bay and the Chyulu Hills REDD+ Project, are being implemented in the voluntary carbon markets.

Additionally, Kenya has operationalized other policies and measures, actions and plans related to implementing and achieving her NDC within the forestry sector. The National Forestry Programme (2016-2030) aims to enhance forest restoration, agroforestry and sustainable land use, contributing to socio-economic growth and climate resilience. Community involvement is also paramount in enhancing forest conservation and management efforts and is encouraged through legislative measures like the Forests (Participation in Sustainable Forest Management) Rules, 2009, which promote collaborative forest management between local communities and the Kenya Forest Service (KFS). This has borne fruits in the management of existing forests reducing conversions to other uses and reforesting degraded areas.

All these, and many other efforts within the sector, collectively target greenhouse gas reductions, particularly carbon dioxide (CO_2), methane (CH4), and nitrous oxide (N_2O), and increasing of sinks across the land-use, land-use change, and forestry (LULUCF) sectors.

Table 2.9: Overview of the mitigation policies and actions in the LULUCF sector.

Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement										
Name	**Description**	**Objectives**	**Type of Instrument (Regulatory, Economic, Voluntary, other)**	**Status (Planned, adopted, Implemented)**	**Sector(s) affected**	**Gases affected**	**Start year of implementation**	**Implementing entity or entities**	**Estimates of GHG emission reductions (kt CO_2 eq) [j, k]** Achieved | Expected	
Strategy towards the attainment of 10% tree cover by 2022	A comprehensive approach to expand forest and tree cover across public and private lands through afforestation, reforestation and landscape restoration	To increase the country's tree cover to 10% by 2022	Regulatory Economic	Implemented	Forestry Agriculture	CO_2	2018	Ministry of Environment, Climate Change and Forestry Kenya Forest Service	NE	NE
National REDD+ Strategy 2021	Strategy for REDD+ implementation in Kenya	To Scale-up reforestation and enhance governance and policy; and mobilize finance for REDD+	Regulatory Economic	Planned	Forestry	CO_2	2021	Ministry of Environment, Climate Change and Forestry Kenya Forest Service (KFS) Development partners	NE	NE

2.4.5. Industrial Processes and Product Use (IPPU) Sector

The Government initiated the development of policies and measures in industrial processes and product use to enhance manufacturing sector resource efficiency and introduce a circular economy to reduce material extraction used in production. Further setting up structures for extended producer responsibility implementing the Sustainable Waste Management Policy 2021 and National Sustainable Waste Management Act 2022. Extended Producer Responsibility regulations 2024 have been developed to operationalize the policy and act. To enhance energy efficiency and in compliance with the Energy Management regulations of 2012.

The sector targets resource efficiency services for IPPU in energy efficiency, water, and wastewater management, circular economy, and carrying out process optimization and environmental compliance. The sector also aims to promote technology transfer and best practices in green technologies.

Industries prioritized for the GHG modelling include cement manufacturing, glass production, and lime production, and under the chemical sector categories, they are focused on soda ash production where activity data is available.

2.4.6. Waste Sector

To ensure the achievement of the NDC targeted goals under the waste sector, Kenya developed:

1. The National Sustainable Waste Management Policy, 2021 which aims to create an enabling regulatory environment for Kenya to effectively tackle the waste challenge it faces by implementing sustainable waste management that prioritizes waste minimization and contributes to a circular economy.
2. The Sustainable Waste Management Act, 2022 which contributes to emissions reduction by promoting the zero-waste principle which targets the reduction of volumes of waste from the environment among other critical principles.

In addition, the government is implementing a ban on the manufacture, sale, export and importation of plastic carrier bags (Gazette Notice number 2356, February 2017) which took effect in August 2017 and has made a major contribution to minimizing waste generation.

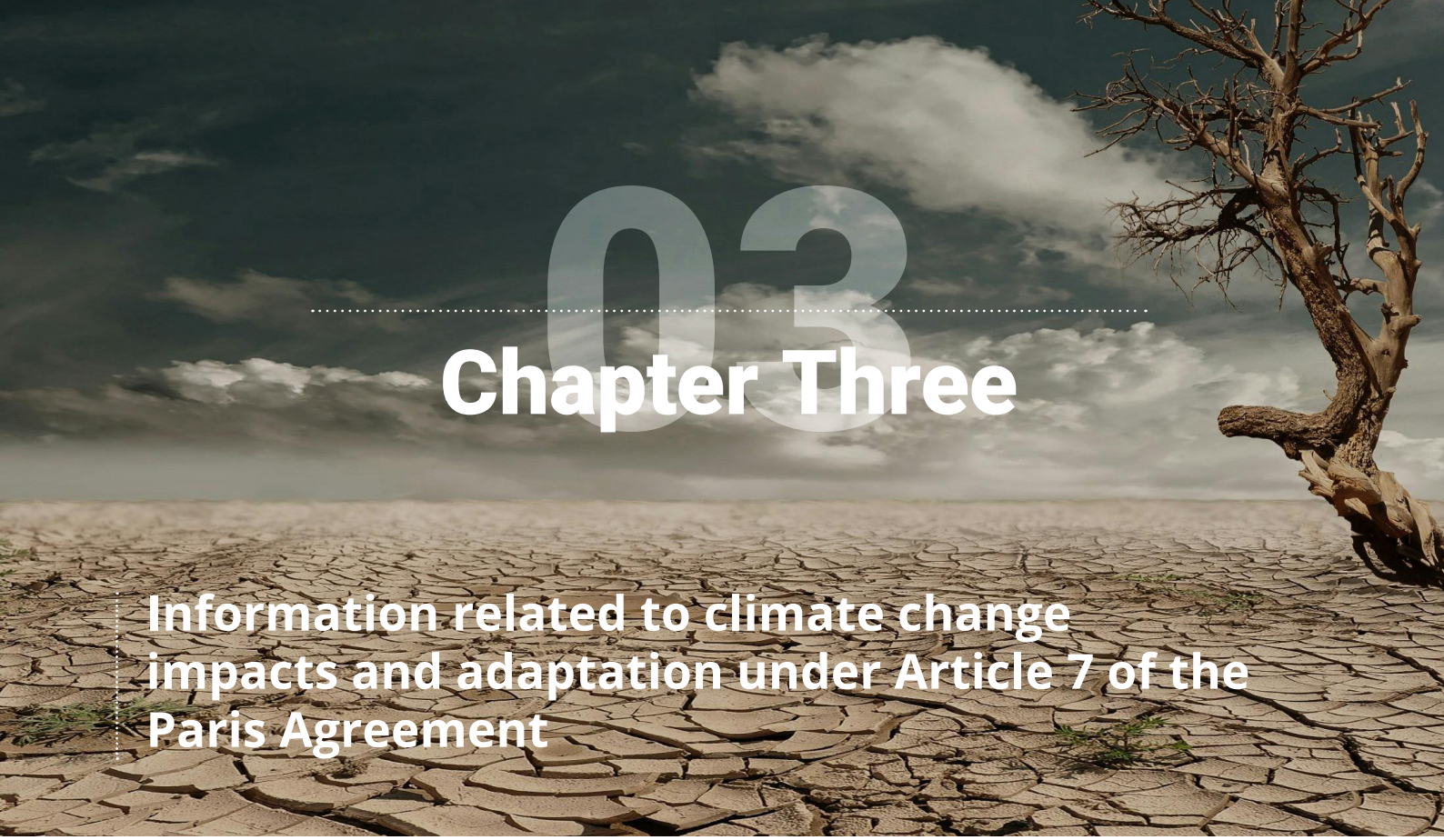
Table 2.10: Overview of the mitigation policies and actions in the Waste Sector.

Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement										
Name	**Description**	**Objectives**	**Type of Instrument** (Regulatory, Economic, Voluntary, other)	**Status** (Planned, adopted, Implemented)	**Sector(s) affected**	**Gases affected**	**Start year of implementation**	**Implementing entity or entities**	**Estimates of GHG emission reductions (kt CO_2 eq)** [j, k] Achieved	Expected
National Sustainable Waste Management Policy 2021	The policy recognizes that sustainable waste management is critical to delivering on Kenya's constitutional right to a clean and healthy environment, achieving sustainable development goals, and realizing the nation's leadership in the blue economy. reusing materials, effective and affordable waste collection, and proper treatment and disposal of residual waste in well-engineered and regulated landfills.	The policy aims to establish an enabling regulatory environment that prioritizes waste minimization and contributes to a circular economy. It also supports county governments' mandate to provide sustainable waste management services and provides the framework for coordinated action at the national level. In addition, the policy proposes a waste hierarchy that includes reducing waste generation,	Regulatory Economic	Adopted	Waste	CH_4, CO_2, N_2O	2021	National Government County Governments National Environment Management Authority (NEMA) Ministry of Environment, Climate Change and Forestry Private Sector	NE	NE

Mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement										
Name	**Description**	**Objectives**	**Type of Instrument (Regulatory, Economic, Voluntary, other)**	**Status (Planned, adopted, Implemented)**	**Sector(s) affected**	**Gases affected**	**Start year of implementation**	**Implementing entity or entities**	**Estimates of GHG emission reductions (kt CO_2 eq)** [j, k] Achieved | Expected	
Sustainable Waste Management Act, 2022	A legal and institutional Framework for the sustainable management of waste.	Promote sustainable waste management, improve the health of all Kenyans by ensuring a clean and healthy environment, reduce air, land, fresh water and marine pollution, promote and ensure the effective delivery of waste services, create an enabling environment for employment in the green economy in waste management, recycling and recovery, establish an environmentally sound infrastructure and system for sustainable waste management, promote circular economy practices for green growth, mainstream resource efficiency principles in sustainable consumption and production practice, and inculcate responsible public behaviour on waste and environment.	Regulatory	Adopted	Waste	CH_4, CO_2, N_2O	2022	National Government County Governments National Environment Management Authority (NEMA)	NE	NE

2.5. Summary of GHG emissions and removals

For a summary of greenhouse gas emissions and removals, see Chapter 1 of this BTR.



03 Chapter Three

Information related to climate change impacts and adaptation under Article 7 of the Paris Agreement

3.1. Introduction

Kenya is a signatory to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement that it adopted in 2015. The country recognizes the challenge associated with addressing the causes and impacts of climate change globally and locally. As such, Kenya through its Nationally Determined Contributions on adaptation (NDC) is committed to taking action to contribute to the implementation of the Global Goal on Adaptation of enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change. This chapter aims to communicate the country's progress towards all substantive aspects of the Paris Agreement regarding adaptation (under Article 7) and loss and damage (under Article 8).

Preparation of this chapter was guided by Decision 18/CMA.1 chapter IV of the UNFCCC as well as Kenya's National Adaptation Plan 2015-2030 (NAP) whose vision is "enhanced climate resilience towards vision 2030".[4] The communication in this chapter builds on Kenya's updated NDC, 2020 and draws on the recent adaptation technical analysis report (ATAR) for the National Climate Change Action Plan (NCCAP) III 2023-2027, NCCAP progress reports, and Kenya's draft Adaptation Communication to the UNFCCC.[5]

This chapter provides information on Kenya's national context, risk and vulnerability profile; national adaptation priorities and barriers; adaptation strategies, policies, goals and plans to integrate adaptation into Kenya's Climate Action; implementation progress, results evaluation and learning; and averting, minimizing and addressing loss and damage associated with climate change impacts.

3.2. National Context, Risk, and Vulnerability Profile

3.2.1. National Circumstances relevant to adaptation actions

Geographic Profile

Kenya is located in the East African region between latitude 5° North and 5° South and is bisected by the equator, and between longitudes 34°E and 42° East. It borders South Sudan, Ethiopia, and Somalia to the north; Uganda to the west; Tanzania to the south; and the Indian Ocean to the east. The total land area is 569,137 square kilometres. Mount Kenya is the highest point in Kenya at 5,199 metres above sea level and the lowest point is at sea level on the Indian Ocean. The country is situated within the Greater Horn of Africa which is a generally dry region characterised by frequent droughts that are punctuated by heavy rainfall events that often result in flash floods. (GoK, 2024a).

4 Government of Kenya (GoK). (2016). Kenya National Adaptation Plan: 2015-2030. Nairobi: Ministry of Environment and Forestry. https://www4.unfccc.int/sites/NAPC/Documents%20NAP/Kenya_NAP_Final.pdfGoK

5 Government of Kenya. (2024). Kenya's Adaptation Communication to the United Nations Framework Convention on Climate Change. Ministry of Environment, Climate Change and Forestry, Nairobi, Kenya.

Demographic Profile

The Kenya National Bureau of Statistic's 2019 Kenya Population and Housing Census determined that the country's population was 47,564,296 persons, with 23,548,100 males and 24,014,700 females. The urban population was about 28 percent. The census determined that Kenya had a population density of 82 persons per km^2. In 2019, Kenya youths under the age of 35 years made up 75 percent of the population and were comprised of children (0-14 years) - 18,541,982 (39.0 percent), adolescents (10-19 years) - 11,631,929 (24.5 percent), and youths (18-34 years) - 13,777,600 (29.0 percent). The elderly population (65+ years) was 1,870,493 persons (3.9 percent). The working age population (15-64 years) was 27,151,134 (57.1 percent) persons in 2019.[6]

Weather and Climate

Kenya is made up of seven agro-ecological zones which experience varying climates and weather patterns.[7] The arid regions of the country receive annual average rainfall of between 200 and 500 mm and annual temperatures range from 23°C to 34°C. The semi-arid areas experience an average annual rainfall of 600 to 1,000 mm and are slightly cooler in temperature. The arid and semi-arid lands are characterized by low and erratic rainfall, strong winds and intense sunlight for most of the year.[8] The coastal climatic zone, a band approximately 16 kilometres wide, is humid all year round with an average annual temperature range of 22°C to 30°C and an average rainfall of between 1,000 and 1,250 mm. The most temperate zones are the Central and Western highlands and parts of the central Rift Valley with annual rainfall levels averaging between 950 and 3,000 mm and average annual temperatures ranging between 14°C to 28°C.

Kenya Meteorological Department (KMD) data indicates that Kenya's temperatures vary, with the highlands experiencing considerably cooler temperatures than the coastal and lowland regions. The months of June to August are characterised by cooler temperatures while the highest temperatures are typically experienced during the month of March. Kenya's annual rainfall follows a bimodal seasonal pattern, commonly referred to as the "long rains" season occurring in March, April, and May, and the "short rains" season, occurring in October, November, and December. Another season takes place from June to August over the coastal region and the Highlands West of the Rift Valley.

Average annual precipitation in Kenya is typically 680 mm, ranging from less than 250 mm in parts of the northern arid and semi-arid land (ASAL) areas to about 2,000 mm in the high rainfall zone in the Western region, that includes the country's productive agricultural land.[9]

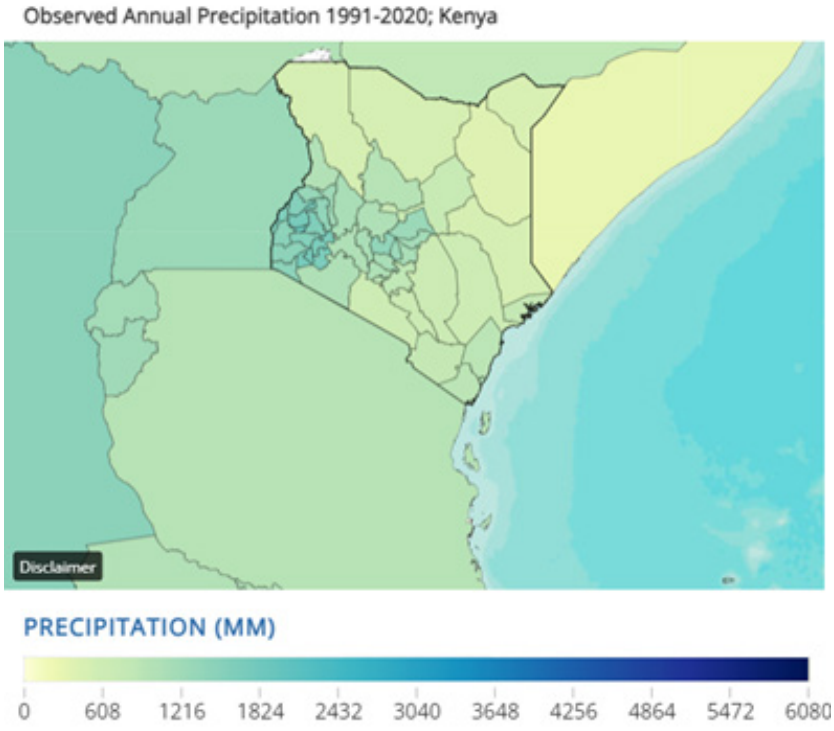


Figure 3.1: Observed Annual Precipitation in Kenya 1991 - 2020 (Source: WB Climate knowledge portal)

6 Kenya National Bureau of Statistics. (2020). The 2019 Kenya Population and Housing Census. https://www.knbs.or.ke/publications/
7 Government of Kenya (2018). National Climate Change Action Plan (NCCAP) 2018-2022. Nairobi: Ministry of Environment and Forestry. https://climate-laws.org/documents/national-climate-change-action-plan-nccap-2018-2022-volume-i_7d48
8 Nying'uro, P., Kimutai, J., Mwangi, K. & Khaemba, W. Climate change impacts in Kenya: What climate change means for a country and its people (2024).
9 Kenya Meteorological Department (KMD). (2021). State of the Climate-Kenya, 2020. https://meteo.go.ke/sites/default/files/downloads/STATE%20OF%20THE%20%20CLIMATE%202020_14042021.pdf

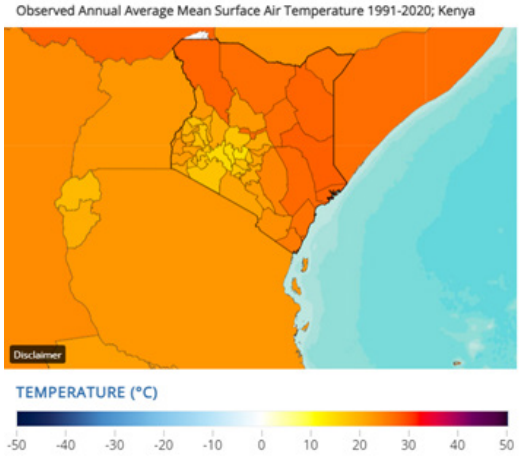


Figure 3.2: Observed Annual Average Mean Surface Air Temperature in Kenya 1991 – 2020 (Source: WB Climate knowledge portal)

Kenya's ASALs generally experience hostile weather and environmental conditions and frequently experience drought, [10]while the country's temperate zones are characterized by cool temperatures and relatively high rainfall. The tropical zones, predominantly the plateaus, receive moderate rain during the two main wet seasons and serve as transition zones between temperate and arid areas.[11] According to the World Bank's climate profile analysis for Kenya, the high rainfall temperate zone, which receives more than 1,000 mm of annual rainfall, is the productive agricultural land. It occupies less than 20% of the country's land area and carries approximately 80% of the population.[12]

The Adaptation Technical Analysis Report (ATAR 2023-2027) [13]reported that Kenya experienced below average rainfall in most areas and drought in the ASALs between 2014 and 2023. In early 2023, Kenya, like other countries in the Horn of Africa, experienced the longest and most severe drought on record, the result of a culmination of five consecutive failed rain seasons in most parts, the longest such sequence in 40 years.[14]

The severity of the drought was lessened with the onset of the 2024 long rains (March–May), which were heavier than average and caused loss of life and significant damage to property. Communities with high levels of climate vulnerability are particularly impacted by sequential climate events; where a subsequent climate hazard (i.e., extreme rainfall) impacts the socio-ecological system before full recovery from the previous hazard (i.e., drought). Compound drought-extreme rainfall events are occurring with greater frequency and intensity, reducing the available recovery time and eroding the capacity for resilience.

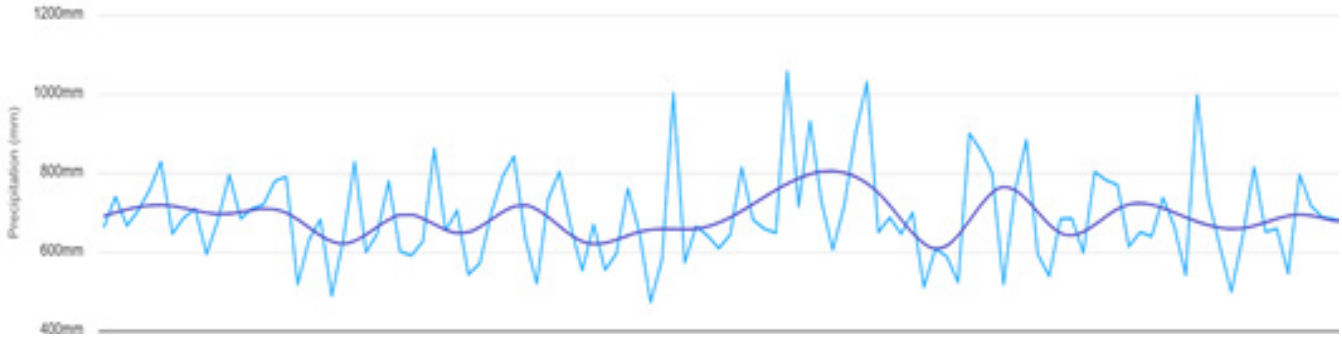


Figure 3.3: Observed Annual Precipitation of Kenya for 1901 -2022(Source: WB Climate knowledge portal)

Economic Profile

Kenya is a lower-middle-income economy and among the fastest-growing economies in Africa. Kenya's gross domestic product (GDP) was USD 115.08 billion and GDP per capita was USD 2,220 in October 2024.[15] The World Bank reported that Kenya's GDP increased by 4.8 percent in 2022 and 5.4 percent in 2023; but is expected to slow down to 5.0 percent in 2024. The poverty rate ($2.15 international poverty rate) is projected to decline from 35.1 percent in 2023 to 34.3 percent in 2024. Kenya has a favourable medium-term economic outlook with projected GDP growth of 5.2 percent for 2024-2026, although the economy is susceptible to climate-related risks, such as extreme weather conditions.[16]

The agricultural sector is the backbone of the economy, accounting for approximately 20% of Kenya's GDP.[17] The country's highlands host significant farmlands as well as the majority of the population. The highlands are relatively cool and agriculturally rich, and are largely dominated by commercial and small-holder farms. Principal cash crops include tea, coffee, flowers, vegetables,

10 Rathore, V. S., Tanwar, S. P. S., Kumar, P. & Yadav, O. P. (2019). Integrated farming system: Key to sustainability in arid and semi-arid regions. Indian J. Agric. Sci. 89, 181–192.
11 Nying'uro, et al., (2024)
12 World Bank. (2024). Climate Change Knowledge Portal. Kenya - Summary | Climate Change Knowledge Portal
13 Government of Kenya. (2023). National Climate Change Action Plan (Kenya) 2023–2027: Adaptation Technical Analysis Report (ATAR). Ministry of Environment, Climate Change and Forestry. Nairobi, Kenya.
14 Government of Kenya. (2023).
15 IMF. (2024). IMF Datamapper: Kenya Datasets. https://www.imf.org/external/datamapper/profile/KEN
16 The World Bank. (2023). Kenya Economic Update. June 2024. Edition No. 29. https://documents1.worldbank.org/curated/en/099060424051072317/pdf/P1797691bf301a04d1a4b6114cf28701d1e.pdf
17 International Monetary Fund (IMF). (2022). Kenya: IMF Country Report No. 22/382. https://www.imf.org/-/media/Files/ Publications/CR/2022/English/1KENEA2022003.ashx

pyrethrum. Wheat and maize, as well as livestock production is also practiced across the highlands, which lie at 1,500 m to 3,000 m above sea level.[18] It largely remains rainfed making it vulnerable to the changing climate.

The service and industry sectors are also major economic drivers, particularly tourism and manufacturing. There is rapid urbanisation with projections showing that over 50 percent of the population will live in urban areas by 2030.[19] Kenya is a member of the East African Community (EAC) regional economic bloc and the Common Market for Eastern and Southern Africa (COMESA) trade blocs.

Impact of the Country Profile on Adaptive Capacity

The geographical context of Kenya in the Greater Horn of Africa region exposes the country to a level of climate variability that presents significant economic risks. The country experiences frequent droughts that are punctuated by heavy rainfall events that often result in flash floods. More than 70% of disasters from natural hazards are estimated to be attributable to extreme climatic events.[20]These disasters include major droughts that occur every 10 years, and moderate droughts or floods every three to four years. The repeating cycles of floods and droughts have had devastating socioeconomic impacts and high economic costs, have eroded the adaptive capacity of communities and ecosystems, and have negatively impacted livelihoods and the overall economy of the country. The 2008 – 2011 drought is estimated to have cost Kenya USD12.1 billion, including USD 805.6 million for the destruction of physical and durable assets.[21] Droughts have affected more people than floods and have had the greatest economic impact (averaging 8% of GDP every five years).[22]Although droughts often affect the whole country, the most severe impacts are felt in the country's highly arid zones, which include many of the poorest counties. The local economies in these counties depend heavily on pastoralism and the resulting rangeland degradation and loss of livestock erodes their capacity to cope and adapt to further climate impacts.

In Kenya, agriculture is the main productive sector and is critical for food security and economic stability. The sector accounts for approximately 20% of Kenya's GDP and employs more than 40% of the total population and more than 70% of the rural population. It largely remains rainfed making it exposed and vulnerable to the changing climate. Drought and floods cause significant loss of livestock, crops, and harvest resulting to loss of income and livelihoods at household level, and episodes of acute food insecurity, particularly in the arid counties. Climate impacts on the agriculture sector heavily affect young people by reducing incomes and limiting their transformation towards climate-smart or modernized agriculture which is capital-intensive.

Socio-economic losses associated with climate change in Kenya over the past decade amounted to between 3% and 5% of GDP per annum.[23]Modelling estimates in the LTLED strategy suggest that Kenya's losses could rise to between 6.5% and 8.5% of GDP per annum between 2021-2050.[24]Kenya could lose up to USD 11 billion each year because of climate change, however the modelling indicates that about one-third of this loss can be averted through adaptation action.[25] As such, adaptation is a primary concern with respect to climate change.

3.2.2. Institutional Arrangements and Governance

IInclusion of diverse actors in climate change action, and particularly in adaptation supports compliance with the Constitution of Kenya 2010, the Climate Change Act, 2016, and other subsidiary legislation that provides for public participation in such matters. Below is a summary of key institutions and actors responsible for adaptation in Kenya and their roles.

The National Climate Change Council

The National Climate Change Council, established under the Climate Change Act, 2016 and chaired by the President, guides the implementation of adaptation action and receives at least bi-annual reports on the implementation of NCCAPs. The council's mandate is to provide legislative and policy direction, supervision, oversight and guidance on climate change across all levels of government. The Council will administer the climate finance mechanism (Climate Change Fund), including approving requests for funding, making funding allocation decisions, and improving the tracking and coordination of climate finance.[26]

The Climate Change Directorate

In Kenya, climate action is coordinated by the Climate Change Directorate (CCD), State Department of Environment and Climate Change, in the Ministry of Environment, Climate Change and Forestry. The CCD is the National Focal Point for the UNFCCC and works under the guidance of various climate change policies and legislative frameworks including the Climate Change Act, 2016. The Act designates CCD the lead agency of the government on national climate change planning and action, including coordination of adaptation planning.

The CCD has the central responsibility for coordination of reporting on adaptation, which requires coordination with other institutions with various mandates on reporting; expertise on data collection, processing and reporting; data flows; systems and tools for adaptation action monitoring and reporting; and stakeholder engagement.

18 Central Bank of Kenya. (2024). Agriculture Sector Survey, January 2024. https://www.centralbank.go.ke/uploads/market_perception_surveys/1273062951_Agricultural%20Sector%20Survey%20January%202024.pdf
19 World Bank (2024). Climate Change Knowledge Portal. Kenya - Summary | Climate Change Knowledge Portal [17 Nov 2024]
20 UN-Habitat. (2023). Kenya 2023: A better quality of life for all in an urbanizing world. https://unhabitat.org/sites/default/files/2023/07/kenya_country_brief_final_en.pdf
21 World Bank. (2023). Kenya Country Climate and Development Report. World Bank Group.
22 Government of Kenya. (2012). Kenya Post-Disaster Needs Assessment (PDNA) 2008-2011 Drought. Ministry of Finance / Global Facility for Disaster Reduction and Recovery. https://www.gfdrr.org/sites/default/files/publication/pda-2011-kenya.pdf
23 World Bank. (2023).
24 GoK. (2020). Updated NDC Technical Report.
25 GoK. (2023, in publication). Long-term Low Emission Development (LTLED) Strategy.
26 GoK. (2023, in publication). LTLED Strategy.

Sector Ministries

Sector Ministries lead on the implementation of adaptation action in their sectors, providing coordination with sector agencies and other key actors in their sectors as well as technical support in mainstreaming of climate adaptation actions in strategies and plans. The National Treasury, in the Ministry of Finance and Planning is host to the Climate Change and Green Finance unit, and plays a key role in climate financing, including adaptation finance. The National Treasury coordinates and facilitates activities related to climate finance, including leading the implementation of activities under the Financing Locally-led Climate Action program that has established county climate change funds in all 47 countries. The National Treasury is Kenya's Nationally Designated Authority for the Green Climate Fund.[27]

National Government Sector Agencies

These are tasked to integrate the National Climate Change Action Plan into their sectoral strategies, action plans and other implementation projects; and designate a unit with adequate staff and financial resources to coordinate the mainstreaming of the NCCAP and other climate change statutory functions and mandates into sectoral strategies for implementation. For example, the NDMA coordinates the Kenya Food Security Steering Group, a multi-agency team that carries out biannual assessments of the impacts of short and long rains on food and nutrition security with a view of informing drought response and resilience building activities including adaptation to drought risk across 23 ASAL counties.[28]The Authority is expected to report annually to the National Climate Change Council through the Climate Change Directorate on the status and progress of climate change adaptation and resilience in the ASALs.

County Governments

At the sub-national level, the 47 county governments are responsible for operationalising climate change planning and budgeting within their jurisdictions. All counties have designated a County Executive Committee member responsible for climate change and created a Climate Change Unit (CCU) to coordinate climate change action. Many counties also have county and ward climate change planning committees supporting locally-led planning and implementation of climate adaptation actions. The Ward Climate Change Planning Committees help communities to work in a participatory manner to analyse their resilience to present and future climate risks and use the findings to prioritise investments that the County Climate Change Funds (CCCFs) can support. County level committees help to refine the investment plans from Wards and support prioritization based on available resources; membership of the County Climate Change Planning Committees is drawn from county government departments, national government institutional offices in the counties (e.g., Kenya Meteorological Department and National Environmental Management Authority); non-governmental organisations (NGOs), community-based organisations, the private sector, and local communities.

Private sector

The private sector continues to engage and complement government efforts on climate change and have been an invaluable partner for adaptation action. Through the NAP Readiness Support Project (2018 – 2020) that was funded by the Green Climate Fund (GCF) and implemented through the Food and Agriculture Organization (FAO), the Kenya Private Sector Alliance (KEPSA) created the Climate Business Information Network-Kenya (CBIN-K) and the Private Sector Strategy on Climate Change Solutions in Kenya (2022-2030). [29]

Public Benefit Organizations (NGOs, INGOs, CBOs)

In Kenya, the civil society is known to be a powerful agent of change through public awareness creation, policy research and analysis, and advocacy on key socio-economic issues including climate change. They also undertake vulnerability assessments, baseline studies and research; advocacy, capacity building and awareness creation; policy development and promotion of good governance; information sharing; gender mainstreaming in climate change; monitoring and early warning systems; livelihood support; promotion of improved technologies and efficient use of energy; humanitarian support; and promotion of use of indigenous knowledge. They play similar roles in the implementation of adaptation actions.

Research and Academia

This group of actors plays a key role in building the country's adaptive capacity. They help to provide the evidence for knowledge-based decision making by the national and county governments, private sector, development partners and civil society amongst others. This is done through research conducted on different aspects of climate change adaptation and resilience, including improving the understanding of climate change attribution in Kenya and providing information on the appropriate mix of adaptation actions in order to avoid maladaptation.

27 Republic of Kenya (2016). National Policy on Climate Finance. The National Treasury.
28 Republic of Kenya (2016). National Policy on Climate Finance. The National Treasury.
29 GoK. (2016). The Climate Change Act (No. 11 of 2016). http://kenyalaw.org:8181/exist/rest//db/kenyalex/Kenya/Legislation/English/Acts%20and%20Regulations/C/Climate%20Change%20Act%20-%20No.%2011%20of%202016/docs/ClimateChangeAct11of2016.pdf

The Media

The media in Kenya provides vital information at times of emergency — from warning of imminent floods to explaining how to deal with drought emergencies and disease outbreaks. Media houses are actively involved in the dissemination of climate information, including progress on the implementation of adaptation activities. Strategic actions that improve climate change journalism can themselves be forms of adaptation because accurate, timely and relevant information is a critical component of resilience. During the Africa Climate Change Week and Summit in Nairobi in 2023, the media played a great role educating the public and disseminating progress and outcomes from the meeting.

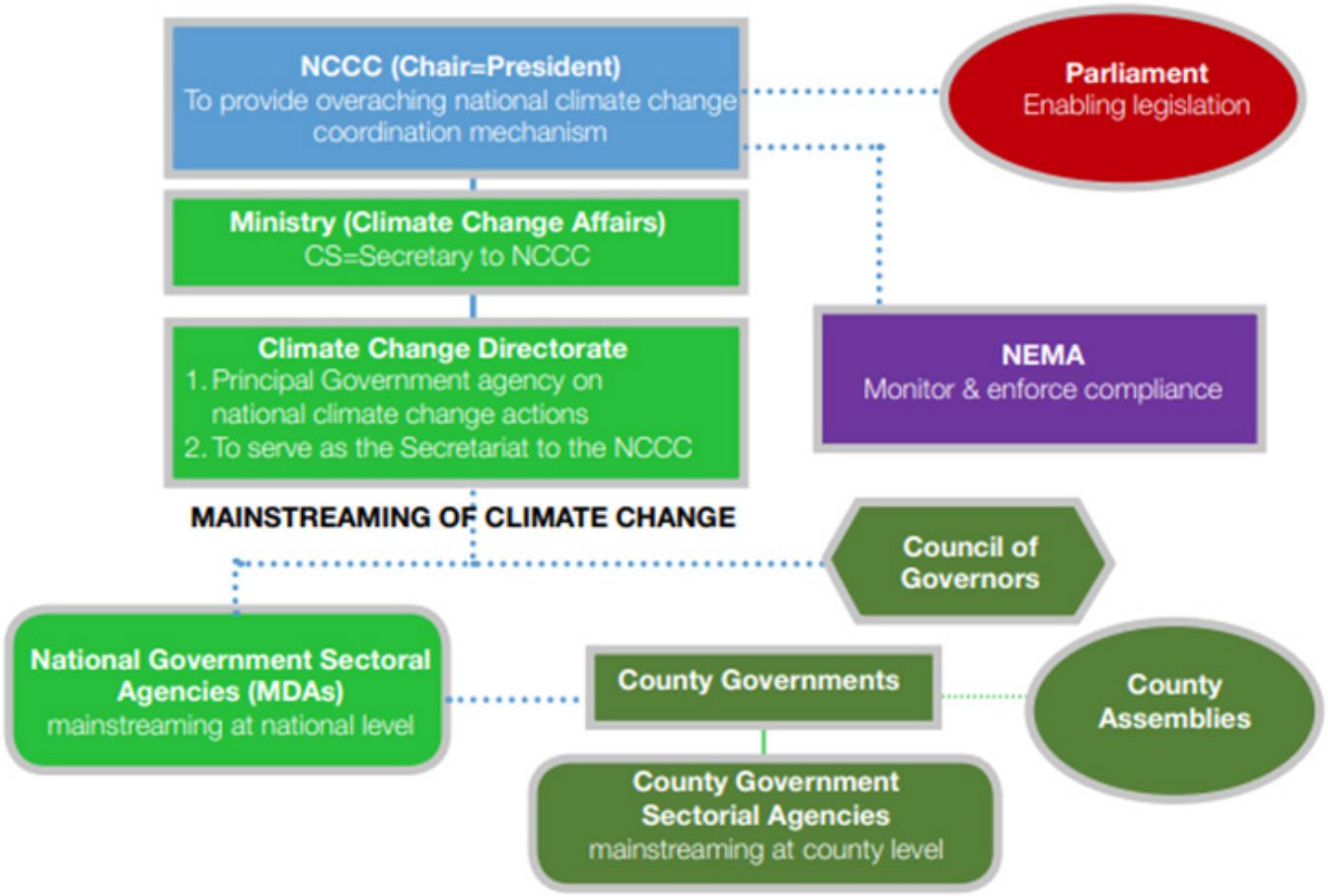


Figure 3.4: Climate Change Institutional Coordination Structures in Climate Change Act 2016 (Source: National Adaptation Plan, 2015)

3.2.3. Legal and Policy Frameworks, Strategies and Plans

Kenya has a strong history of climate change governance beginning with the enactment of the new constitution and development of the National Climate Change Response Strategy (NCCRS) in 2010. The policy and legal framework for adaptation includes three National Climate Change Action Plans (2013 - 2017, 2018 - 2022, 2023 - 2027), NAP (2015 - 2030), and Climate Change Act 2016. Kenya submitted her first Nationally Determined Contribution (NDC) in 2016 and an updated version in 2020. The NDC responds to both domestic needs and international obligations under the UNFCCC and Paris Agreement and includes a section on adaptation priorities that are aligned with the NAP and NCCAPs. As stated in the NCCAPs, NAP, and NDC, adaptation is the priority for Kenya.

In Kenya, climate change issues are given a high priority, as such the Ministry of Environment and Forestry was re-designated in October 2022 to include climate change, and is now referred to as the Ministry of Environment Climate Change and Forestry (MoECCF).

Laws and Policies

Table 3.1: Summary of the key legal and policy documents related to climate adaptation

Law	Description
The Constitution of Kenya, 2010	The mother law in Kenya. Article 42 establishes Kenyans' right to a clean and healthy environment including the right to have the environment protected for the benefit of present and future generations. A healthy environment calls for the sustainable use of ecosystems and consequently continued access to ecosystem goods and the services they provide which are critical for adaptation.
Climate Change Act, 2016	The Climate Change Act enacted in 2016 was the first comprehensive legal framework for climate change governance in Kenya with the objective of enhancing climate resilient development through among others promoting the uptake of technologies that support low carbon and climate resilient development; facilitating capacity development for public participation in climate change responses through awareness creation, consultation, representation and access to information; and providing incentives and obligations for private sector contributions towards climate resilient development. Additionally, the Act provides for and supports mainstreaming of climate adaptation actions into development planning, decision-making, and implementation. It sets out principles for climate change planning and implementation of measures, and recognises the complementary role of national and county governments. The latter is critical considering the local nature of adaptation. The 2023 amendment provided for the introduction and regulation of carbon markets in Kenya, which provide a potential source of finance for adaptation actions.
Urban Areas and Cities (Amendment) Act, 2019	The urban development legislation provides for the establishment and governance of urban areas (i.e., cities, municipalities, towns, and market centres). The legislation provides the legal mandate for planning and development in urban areas, and the implementation of key actions in these areas, which contributes to the balance between urbanisation and sustainable development. These bodies play a key role in integrating climate resilience considerations and adaptation actions in urban centres.
The National Drought Management Authority Act, 2016	Creates the National Drought Management Authority (NDMA) as a permanent institution with a specific mandate of managing drought in a more pro-active and sustainable manner. It recognises drought as the most important climate-related hazard for Kenya and the need to sustainably invest in building resilience to drought in a coordinated manner. The Act also establishes the National Drought Emergency Fund to finance timely responses to drought and to support capacity strengthening in drought management.
Environmental Management and Coordination (Amendment) Act, 2015	Emphasises maximum participation by stakeholders in the development and implementation of policies, plans, and processes for the management of the environment and provides for the relevant institutional framework for the coordination of environmental management including the NCCAPs. The Act provides for environmental protection through environmental impact assessment; environmental audit and monitoring; and environmental restoration orders, conservation orders, and easements.

Policy	Description
Nationally Determined Contribution, 2020	The updated NDC communicated the country's adaptation priorities and needs to the international community. The NDC prioritises adaptation and sets out adaptation actions and approaches that are aligned with Kenya's NAP and NCCAP. The adaptation goal is a climate resilient society that is to be achieved through mainstreaming climate adaptation in Medium Term Plans (MTPs) and Country Integrated Development Plans (CIDPs).
National Climate Change Framework Policy, 2018	Formulated to ensure the integration of climate change considerations into planning, budgeting, implementation, and decision-making at the national and county levels, and across all sectors. The goal is to promote climate resilient development through pursuing several objectives including providing an effective and efficient institutional framework for mainstreaming climate change; reducing vulnerability and catalysing the transition to climate-resilient development; incentivising private sector involvement; and providing a framework for resource mobilisation in support of adaptation
National Climate Finance Policy, 2018	Establishes the legal, institutional, and reporting frameworks to access and manage climate finance, consistent with the institutional structures and framework set out in the Climate Change Act, 2016. Interventions with respect to this policy include establishing a national Climate Change Fund, identifying climate financing sources, and creating a national system for tracking climate finance. Its operationalisation is meant to address the issue of inadequate finance for adaptation interventions.
National Urban Development Policy, 2016	The urban development policy, together with the Urban Areas and Cities (Amendment) Act, 2019, provide a framework for the establishment and governance of urban areas (i.e., cities, municipalities, towns, and market centres). The policy guides planning and development in urban areas, and the implementation of key actions in these areas, which contributes to the balance between urbanisation and sustainable development. These bodies play a key role in integrating climate resilience considerations and adaptation actions in urban centres.

Strategies and Plans

Table 3.2: Summary of national and sectoral strategy and planning documents related to climate adaptation

Strategy/Plan	Description
Nationally Determined Contribution, 2020	The updated NDC communicated the country's adaptation priorities and needs to the international community. The NDC prioritises adaptation and sets out adaptation actions and approaches that are aligned with Kenya's NAP and NCCAP. The adaptation goal is a climate resilient society that is to be achieved through mainstreaming climate adaptation in Medium Term Plans (MTPs) and Country Integrated Development Plans (CIDPs).

Strategy/Plan	Description
National Climate Change Action Plans (2013 - 2017); (2018 - 2022); (2023 - 2027)	A five-year iterative tool for mainstreaming climate actions across all sectors of the economy and the two levels of government. Mechanisms for mainstreaming climate change in priority sectors include the policies and strategies, coordination structures, planning cycles (guidelines and templates), investments, and financing. It is used for implementing both the NDC and NAP and most of the actions are adaptation. The NCCAP was updated in 2023. Updating and/or revision of the NCCAP is an inclusive process involving both levels of governments, private sector, research and academia, communities, CSOs, media, and other actors in climate adaptation.
Guidance on Climate-related Risk Management, 2021	This guidance, issued by the Central Bank of Kenya, aims to guide institutions licensed under the Banking Act on climate-related risk management. The guidance sets out basic requirements for financial institutions in regard to the identification, management, and reporting of climate-related risks, including physical risks that result from the impacts of climate- and weather-related events.
National Biodiversity Strategy and Action Plan, 2019 - 2030	Guides strategies aimed at addressing declining biodiversity and related challenges. It aims to reduce the loss of biodiversity, promote the value of biodiversity, and improve community livelihoods. Highlighted adaptation interventions include conservation of agricultural biodiversity through increased support to local communities in the production and sustainable utilisation of indigenous and/or traditional species for food and other uses; strengthening institutional and community capacity and linkages; promotion of gender equity in biodiversity management; and supporting and promoting the utilisation of indigenous knowledge, innovations, and practices among others.
Kenya Climate-Smart Agriculture Implementation Framework, 2018 - 2027	Provides guidelines for the implementation of the CSA strategy at national and county levels in support of food security and economic development. The national government is largely expected to lead on policy development and support capacity building, while county governments lead on implementation since agriculture is a devolved function.
Kenya Climate-Smart Agriculture Strategy, 2017 - 2026	Aims to improve productivity and build the resilience of agricultural systems while minimising greenhouse gas emissions. Recognises the high vulnerability of the agriculture sector and identifies priority interventions for building resilience of the sector through the implementation of Climate Smart Agriculture (CSA) practices in the crop, livestock, and fisheries sectors in support of food and nutrition security and poverty reduction.

Strategy/Plan	Description
Climate Risk Management Framework, 2017	The framework bridges climate change adaptation, disaster risk management, and sustainable development at national and county levels. The framework ensures that the three distinct entities are pursued as mutually supportive rather than stand-alone goals and that an integrated approach to climate risk management becomes a key component of policy and strategy for resilience building. The adaptation actions under this framework include analysing exposure and vulnerability to disasters, and capacity to respond; mobilising financial resources for climate risk management; designing and implementing pilot projects for climate risk management at county and national levels; enhancing research and dissemination of information about climate risk management; and building capacity at national and county levels for integrated climate risk management.
National Adaptation Plan 2015 - 2030	The long-term plan aims at consolidating the country's vision on adaptation by supporting macro-level adaptation actions that are aligned with the economic sectors and addressing county-level vulnerabilities to enhance long-term resilience and adaptive capacity. It is implemented through the five-year NCCAPs. The NAP highlights climate vulnerabilities and priority areas for building climate resilience. It presents adaptation actions that cover the time frame 2015 - 2030 and builds on the foundation laid by the National Climate Change Response Strategy (NCCRS) and the NCCAP 2013-2017. Furthermore, it is the basis for the adaptation component of Kenya's NDC.
National Climate Change Response Strategy, 2010	The NCCRS formally recognised the need for coordinated efforts in addressing climate change issues in Kenya. It recommended the development of a climate change policy and legislation on which adaptation activities were to be anchored. Consequently, a stand-alone climate change act and related governance structures and plans (e.g., NCCAP and NAP) were developed and supported coordinated adaptation action. Some of the priority adaptation actions highlighted in the climate change response strategy included: promoting orphan crops; agricultural produce post-harvest processing, storage, and value addition; breeding of animals from various agro-ecological zones that adapt well to climatic variances; providing special livestock insurance; establishing a national climate awareness campaign; and incorporating climate change in the school curriculum within Information and awareness building.

3.2.4. Sub-national Level Legal Frameworks, Policies and Strategies

The Climate Change Act, 2016 requires county governments to integrate climate change actions into their plans and policies. County governments have progressively been incorporating climate change initiatives into their plans and programmes as mandated, making use of the five- year County Integrated Development Plan (CIDP) process as the main instruments to mainstream climate change actions in development planning. Typically, the CIDPs integrate adaptation actions alongside mitigation and other types of climate resilience interventions including enabling actions like climate finance, which is now legally mandated in all 47 counties through climate change-specific policies and legislation.[30]

Some counties have also developed strategies and regulations to operationalise climate-related legislation. The County Climate Change Fund (CCCF) mechanism that aims to enhance access and channel climate finance to the community level is now established and operational in the 47 counties in Kenya. Through this mechanism, each county government sets aside a minimum of 1.5% of their development budgets for climate actions, allocated through the respective County Climate Change Fund. In addition, County Climate Change Action Plans are mainstreamed into the County Integrated Development Plans (CIDPs) that are implemented over five years through the Annual Development

30 Government of Kenya. (2024).

Plans (ADPs). Many counties have climate change governance structures down to the ward level which is the lowest administrative and planning unit. Local communities are facilitated to identify and prioritise mostly climate adaptation interventions through participatory processes, which are then financed using their CCCF. This is achieved with the support of the climate change planning committees at the county and ward levels, making use of relevant resilience planning tools and climate information.

Case study: CCCF Mechanism as a strategy for adaptation

The integration of climate information into planning and implementation has been supported through county-specific Climate Information Services (CIS) plans prepared by the Kenya Meteorological Department (KMD), working with other partners. These CIS plans support effective, locally-led adaptation because they are based on local needs and contribute to improved access and use of climate information at institutional and household levels. Designated agencies for disaster management also make use of climate information services at the sub-national level for preparedness and response. For example, the NDMA currently supports the 23 ASAL counties with Drought Early Warnings that are issued monthly to aid drought preparedness and early action.

The CCCF mechanism was initially piloted and operationalized in rural counties; however, the more complex urban contexts with projected exponential population growth required a tailored approach. Through urban policy and legislation, Kenya has 5 cities and over 70 municipalities with governance structures that support integration of local climate actions including the mainstreaming of climate-resilient development pathways in the provision of necessary urban infrastructure and services. Nairobi and Mombasa cities have just set up their CCCF mechanisms with support from FLLoCA programme.

3.2.5. Capacity-building and Capacity Gaps and Needs

Capacity building is concerned with enhancing the ability of institutions and communities to effectively carry out climate adaptation actions. Institutional and technical capacity development is critical in the delivery of proposed adaptation actions as prioritized in national planning documents and country plans. The Climate Change Act 2016 established a number of institutions and set mandates for existing institutions in regard to climate action in Kenya. Significant progress has been made on operationalisation and strengthening of the institutional structures set out in the Climate Change Act (Amendment, 2023), including the National Climate Change Council, CCD, National Environment Management Authority (NEMA), Climate Change Fund, Kenya Institute of Curriculum Development (KICD), Kenya School of Government (KSG), Council of Governors (CoG), and Climate Change Units both at national and county level. It is notable that to more effectively support climate action, including climate adaptation, the National Climate Change Fund became operational in 2022 and is managed by the National Treasury. Climate Change Units at both national and county government levels also have focal points, officers leading and coordinating on climate action. Gaps and needs on capacity building are further discussed in section 3.5.3 (3) on capacity needs.

Climate Change Hazards, vulnerabilities and impacts in Kenya

This section includes a summary of key climate hazards, vulnerabilities, and risks and impacts on different sectors of the economy. The information in this section draws on Kenya's Adaptation Communication (2024 draft), as well as county level Participatory Climate Risk Assessments facilitated through the Financing Locally-Led Climate Action (FLLoCA) program under the National Treasury & Economic Planning.

3.2.6. Climate Hazards

Analysis in the Kenya National Adaptation Plan (2015 – 2030) and the National Climate Change Action Plans demonstrates that Kenya is exposed to climate hazards and details the actual biophysical events that are driven by climate change. It is estimated that over 70% of natural disasters in Kenya are attributable to extreme climatic events – particularly flooding and droughts. Evidence shows that climate change increased the intensity of rainfall in the short rainy season in the Horn of Africa in 2023, leading to severe flash flooding in the eastern region which caused more than 300 deaths and displaced over a million people.[31]Studies have not reached consensus on whether droughts have been increasing or decreasing overall in East Africa since the 1950s; however, research indicates that since 2005, droughts have doubled in frequency from once every six years to once every three years in the region.[32] Typically, major droughts occur in cycles of approximately ten years, and moderate droughts or floods have become common every three to four years. Apart from eroding the capacity to adapt, the repeating cycles of flooding and droughts have socio-economic impacts and high economic costs.

For example, the 1998 to 2000 drought cost an estimated US$2.8 billion, principally due to crops and livestock loss, as well as forest fires, damage to fisheries, reduced hydropower generation, reduced industrial production and reduced water supplies.[33] Another severe and prolonged drought from 2008–2011 affected 3.7 million people, caused US$12.1 billion in damages and losses, and cost over US$1.7 billion in recovery and reconstruction needs.[34] Figure 3.5 below demonstrates the number of people affected by key natural hazards between 1980 and 2020.

31 Nying'uro et al. (2024).
32 Trisos, C.H. et al. (2022). Africa. in Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (eds. Pörtner, H.-O. et al.) (Cambridge University Press).
33 National Environment Management Authority (2015). Kenya- Second National Communication to the United National Framework Convention on Climate Change. URL: https://unfccc.int/sites/default/files/resource/Kennc2.pdf
34 Ministry of Environment and Natural Resources (2016). Kenya National Adaptation Plan, 2015–2030. URL: https://www4.unfccc.int/sites/NAPC/Documents%20NAP/Kenya_NAP_Final.pdf.

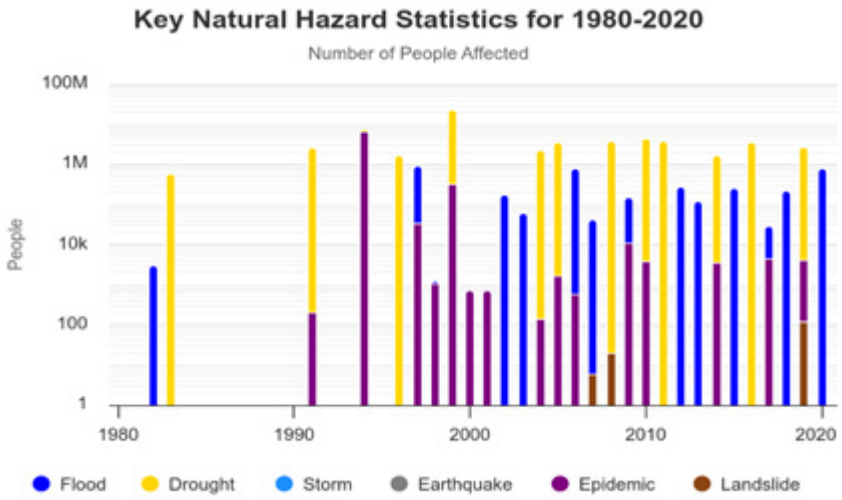


Figure 3.5: Key Natural Hazard Statistics for 1980 – 2020 (Source: WB Climate knowledge portal)

Major climate hazards in Kenya are categorised into two groups: acute climate hazards and chronic or slow onset hazards. These are presented below:

Table 3.3: Major climate hazards in Kenya

Acute Hazards	Chronic (Slow Onset) Hazards
• Extreme weather events	• Drought
• Floods	• Sea level rise and stronger storm surges
• Heat stress	• Ocean acidification
• Landslides	
• Wildfires	

The three most significant climatic hazards in Kenya are increasing temperatures, changing rainfall patterns, and sea level rise along the coast. These are analysed in the draft AdCom (2024) and summarised below.

a) Temperature Increase

The KMD estimates that Kenya's mean annual temperature has increased by 1.0°C since 1960, at an average rate of 0.21°C per decade and projects that it will continue rising by 1.7°C by the 2050s.[35] In the same report, the KMD reported that several weather stations in 2022 recorded maximum temperature values exceeding long-term averages, and minimum temperatures that were higher than long-term averages. Increased heat and extreme heat conditions will result in significant implications for human and animal health, agriculture, and ecosystems. Recent analysis by the World Bank presented in their climate knowledge portal demonstrates evidence of increased temperature in recent years (1990 – 2020), compared to the natural variability recorded over 1951-2020.

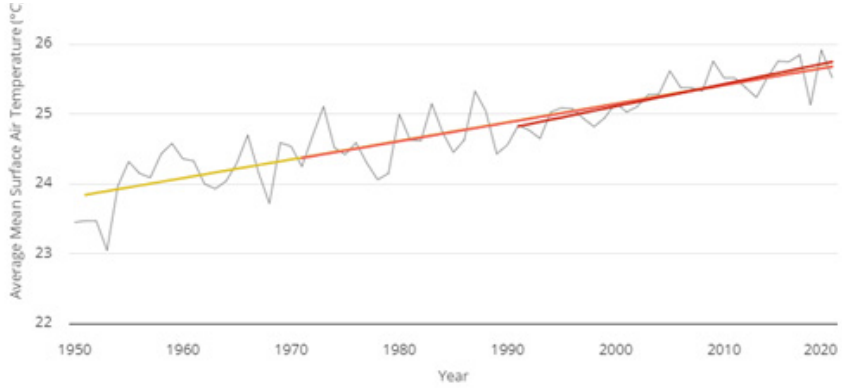


Figure 3.6: Average Mean Surface Air Temperature Annual Trends with Significance of Trend per Decade (1951 – 2020) [36]

35 Kenya Meteorological Department (KMD). (2021). State of the Climate-Kenya, 2020. https://meteo.go.ke/sites/default/files/downloads/STATE%20OF%20THE%20%20CLIMATE%202020_14042021.pdf

36 World Bank (2024). Climate Change Knowledge Portal. Kenya - Summary | Climate Change Knowledge Portal [17 Nov 2024]

b) Changing Precipitation Patterns

Precipitation trends in Kenya are projected to remain highly variable and uncertain, with significant geographical diversity in rainfall trends. Average rainfall is expected to increase by mid-century, particularly during the 'short rains', which occur between October and December.[37] Increased aridity and drought have been observed, with extreme rainfall events occurring with greater frequency and intensity. Extreme events from 2018 to 2024 in Kenya included flash floods, floods, landslides, and rising lake levels.[38] A climate change vulnerability assessment in the Upper Ewaso Nyiro basin (an ASAL ecosystem) showed that there has been high climate variability over 30 years especially within the long rains in March, April, and May. [39]

c) Sea Level Rise and Temperature Increase

Kenya is experiencing sea level rise, and the rate of sea level rise along the Western Indian Ocean is estimated to be 4.0mm/year compared to the global average of 3.4mm/year.[40] Sea levels are expected to continue to rise along Kenya's coast (Figure 3.7 illustrates the expected increase under Representative Concentration Pathway (RCP) 4.5, which is the Intergovernmental Panel on Climate Change's moderate scenario in which greenhouse gas emissions peak around 2040 and then decline). Increasing sea surface temperatures, marine heatwaves, and ocean acidification alongside rising sea levels and stronger storm surges impact marine life, lead to coastal erosion, and increase the risk of flooding in the five coastal counties (Kwale, Mombasa, Kilifi, Tana River, and Lamu). Global projections of 21–48 cm of sea level rise by the end of the 21st century compared with the 1980–1999 average could be devastating for Kenya.[41] A 30 cm increase in sea level rise could submerge 17% of the city of Mombasa, Kenya's second largest city and the largest seaport in East Africa.[42]

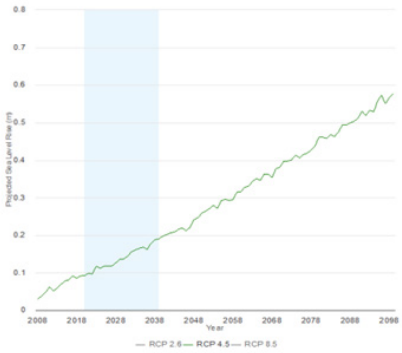


Figure 3.7: Projected Sea level rise along the Kenyan coast between 2008–2098 (RCP 4.5) (World Bank, 2024)

3.2.7. Climate Change Vulnerability

This section discusses Kenya's exposure, sensitivity and overall vulnerability to climate change and how it affects climate adaptation. The IPCC defines vulnerability as "the propensity or predisposition to be adversely affected and encompasses a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt."[43]The IPCC framework demonstrates that climate risks are the product of the interaction between climate hazards, vulnerability and exposure of the relevant systems, sectors or populations.

Kenya ranked 135th out of 187 countries in 2022 according to the Notre Dame Global Adaptation Initiative (ND-GAIN) index, which ranks countries on their level of vulnerability to climate change and readiness to implement adaptation solutions [44](See figure 3.8). it was the 135th most vulnerable country and the 146th most ready country – implying that it is very vulnerable to, yet unready to combat the impacts of climate change.[45]

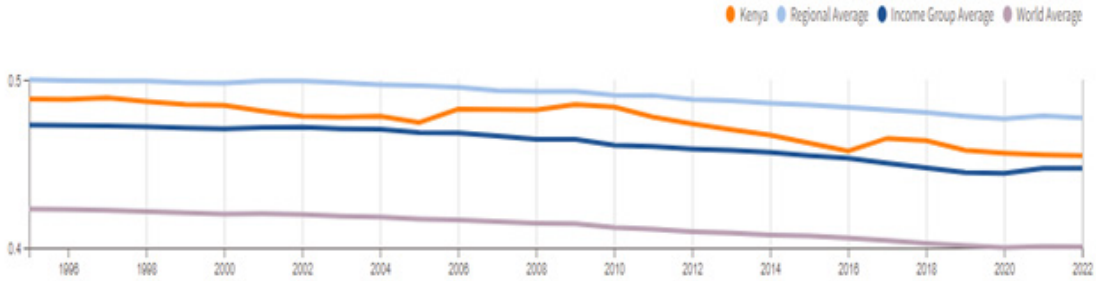


Figure 3.8: ND-GAIN Index for Kenya: Vulnerability Dimension (World Bank, 2024)

37 World Bank Group. (2021)
38 KMD. (2021).
39 Koech, G., Makokha, G. O., & Mundia, C. N. (2020). Climate change vulnerability assessment using a GIS modelling approach in ASAL ecosystem: a case study of Upper Ewaso Nyiro basin, Kenya. Modelling Earth Systems and Environment, 6, 479- 498. https://link.springer.com/article/10.1007/s40808-019-00695-8
40 KMD (2024). State of the Climate Kenya 2023
41 Nying'uro et al., (2024)
42 Awuor, C. B., Orindi, V. A. & Ochieng Adwera, A. (2008). Climate change and coastal cities: the case of Mombasa, Kenya. Environ. Urbanization 20, 231–242.
43 [1] IPCC. (2022). Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D. C. Roberts, M. Tignor, E. S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds). Cambridge and New York: Cambridge University Press. p. 43. https://report.ipcc.ch/ar6/wg2/IPCC_AR6_WGII_FullReport.pdf
44 ND-GAIN (Notre-Dame Global Adaptation Index). (2024). Kenya | ND-GAIN Index. https://gain-new.crc.nd.edu/country/Kenya
45 ND-GAIN Index. (2024). ND Gain Index: Rankings – Kenya. Rankings//Notre Dame Global Adaptation Initiative//University of Notre Dame

The summary in table 3.4 demonstrates that the high levels of climate vulnerability in Kenya are attributable to a number of key factors: a low-lying coastline; heavy dependence on rainfed agriculture; water scarcity; insecure land tenure; environmental degradation; and conflicts over natural resources like water and pasture during the very dry seasons.[46] Apart from low-lying coastal regions that are very exposed to sea level rise, communities and systems in the ASALs, which constitute up to 89% of the land area and 38% of the country's total population,[47] are particularly vulnerable to climate change because of high levels of poverty which limit their adaptive capacity and increase their exposure to recurring droughts. Crop and livestock production in the ASALS are impacted by droughts and flash flooding. The most affected counties with above-normal livestock mortality rates (5%) in 2023 were ASALs and included Marsabit, Kajiado, Isiolo, Samburu, Turkana, Wajir, and Mandera. The most vulnerable groups include pastoralist communities, hunters and gatherers, and fisher communities.[48] Women and children from these groups are particularly vulnerable to the impacts of climate change.

Communities vulnerable to flooding include the low-lying coastal areas of the Tana delta, Kano plains, and Budalang'i in western Kenya where displacement and loss of property and livelihoods have affected communities in the past few years.[49] Kenya's rapidly increasing population and subsequent migration to urban areas has also been identified as a factor that increases vulnerability to climate change. Over 51% of the urban population in Kenya in 2020 was considered poor and living in unplanned informal settlements without basic infrastructure and services, which increases their vulnerability for climate risks.[50] Inadequate planning, environmental management, and enforcement often contributes to flash flooding in informal settlements that occupy low lying riverine areas and floodplains.

Table 3.4: Summary of the key sources of vulnerability in Kenya and identifies the most vulnerable groups

Climate Change Vulnerability

Key Sources of Vulnerability

- Poverty, with 7.1% of the population considered poor in 2022 (living on less than USD 1.90 per day); with high levels of multi-dimensional poverty in the ASALs [51]
- Significant disparities between rural and urban areas, poverty rates in rural areas were 6.5 times higher than urban areas in 2022
- Population growth, with 75% of the population under the age of 35 in 2019
- Gender inequality
- High reliance of the national economy and local livelihoods on natural resources
- High dependence on rainfed agriculture and insufficient irrigation systems; 98% of agriculture production is rainfed
- Water scarcity and mismanagement of water resources
- Environmental degradation, including loss of forest cover
- Pastoral mobility
- Insecure land tenure and land fragmentation
- Migration to urban areas
- Poor urban and land-use planning; rapid and haphazard urbanisation
- Large number of informal settlements due to rural–urban migration
- Limited access to quality healthcare, particularly in rural areas
- Inadequate access to improved technologies
- Inadequate finance to address climate change priorities

Particularly Vulnerable Groups

- Pastoralist communities, hunters and gatherers, and fisher communities
- Women
- Children/Youth
- Persons with disabilities
- Elderly
- People with small landholdings and/or livelihoods dependent on natural resources
- People living in informal settlements

Particularly Vulnerable Regions

- Arid and Semi-Arid Lands (ASALs)
- Flood prone areas including low-lying coastal regions, floodplain and riverine areas like the Tana Delta, Kano Plains and Budalang'i
- Informal urban settlements in low lying riverine areas and floodplains
- Mountainous regions

46 Government of Kenya. (2024).
47 Ministry of East African Community (EAC), the ASALs and Regional Development. (2019). Message from the PS.https://www.asals.go.ke/#:~:text=The%20ASALs%20make%20up%20to,approximately%2038%25%20of%20Kenya%27s%20Population.
48 NDMA. (2023). National Drought Early Warning Bulletin: March 2023. https://www.ndma.go.ke/index.php/resource-center/national-drought-bulletin/send/39-drought-updates/6868-national-monthly-drought-updates-march-2023
49 Government of Kenya. (2024).
50 GoK. (2018). National Climate Change Action Plan 2018-2022. Nairobi: Ministry of Environment and Forestry. https://faolex.fao.org/docs/pdf/ken190169.pdf
51 KNBS 2024. Poverty Report: Based on the 2022 Kenya Continuous Household Survey. Nairobi, Kenya. The-Kenya-Poverty-Report-2022.pdf

3.2.8. Climate Change Risks and Impacts in Kenya

The LTLED Strategy (2017 – 2022) indicated that adaptation actions have the potential to reduce this loss by about one third over the same period highlighting the need to implement priority actions.

Table 3.5 below includes information on key climate risks and impacts based on NCCAP III priority areas.

Table 3.5: Key Climate Risks and Impacts in Kenya

Sector	Risks	Impacts
Disaster Risk Management	Severe drought	• Droughts cause decline in water levels affecting agricultural activities, livestock keeping, and in the worst cases causing loss of lives. • Droughts contributed to conflicts, deteriorating health conditions, and forced displacement in large parts of the ASALs.
	Heavy rainfall and flooding	• Flooding causes deaths, displacement of populations, property destruction, and disruption of agriculture and livelihoods. Floods in 2023 affected 38 counties across Kenya, resulting in loss of lives, injuries, displacements, and destruction of key infrastructure. An increase in contaminated water also led to secondary effects, including vector and waterborne disease outbreaks. 757,173 people (138,560 households) were affected since the onset of the short rains season between October and December 2023.[52] • In March 2023, heavy rains led to widespread flooding across several counties, including Mombasa, Kwale, Tana River, and others. These floods resulted in 36 fatalities and left 29 people injured, affecting a total of 139,135 individuals. Infrastructure damage, particularly to roads and homes, compounded the impact on affected communities.[53]
Food Nutrition and Security	Changes in temperature regimes and precipitation patterns (associated with insufficient availability of water, excessive moisture conditions, pests, diseases, and weeds)	• The 2014-2018 drought was declared a national emergency in February 2017, having affected 23 out of the 47 counties, with counties in ASALs being the most affected with at least 3.4 million people being severely food insecure.[54] • The cumulative impact of the below-average short rains in 2018 followed by the poor 2019 long rains season increased the number of people in Kenya affected by food insecurity.[55] from 0.7 million in late 2018 to 3.1 million in late 2019 • The biggest impacts are expected on maize and wheat production owing to their high vulnerability to heat stress. Maize is the staple food in Kenya while wheat-based foods are an important source of nutrition. • Heavy rainfall has led to increased flows on large rivers, such as the Tana, resulting in flooded farmlands, degraded soils and reduced farm output.[56] • Heavy rains in 2019 and 2020 created conditions conducive to the severe desert locust outbreaks in 2020 which affected the food supply of about 2.5 million people and livelihoods of some 3.5 million people. • Overall, between 2014 and 2023, when an estimated 5.1 million Kenyans (27% of the ASAL population) were facing high levels of acute food insecurity and in need of humanitarian assistance because of drought.[57] • Recurring droughts coupled by increased demand for land have forced an estimated 30% of livestock owners out of pastoralism over the past 20 years.[58] • From 2007 to 2017, losses in livestock populations due to drought-related causes amounted to about USD 1.08 billion.[59] • The effects of climate-related temperature rise on human labour is also linked to impacts on food and nutrition. High temperatures induce heat stress among farm workers, further reducing agricultural productivity.[60] • Even with ambitious action to reduce greenhouse gas emissions, the area of farmland optimal for tea production in Kenya is projected to decrease by 26% by 2050.

52 Government of Kenya. (2024).
53 MoEF/CCD. (2021). NCCAP Second Implementation Status Report
54 KMD. 2024. State of the Climate Kenya 2023
55 KMD. 2024. State of the Climate Kenya 2023
56 Nying'uro et al., (2024).
57 Kahumbu, P. (2017). Why we should not allow poachers to drive our elephants to extinction. Daily Nation. Opinion (4th August). https://www.savetheelephants.org/about-elephants-2-3-2/elephant-news-post/?detail=why-we-should-notallow-poachers-to-drive-our-elephants-to-extinction-kenya
58 Kenya Red Cross Society. (2021).
59 MALF&C and Ministry of Health. (2021). One Health Strategic Plan for the Prevention and Control of Zoonotic Diseases in Kenya (2021-2025). https://www.health.go.ke/wp-content/uploads/2022/04/One-Health-Strategic-Plan-_Kenya_2021-2025.pdf
60 Yengoh, G. T. & Ardö, J. Climate change and the future heat stress challenges among smallholder farmers in East Africa. Atmosphere 11, 753 (2020).

Sector	Risks	Impacts
Water, Fisheries, and the Blue Economy	Droughts, unpredictable rainfall patterns, prolonged dry spells, flooding.	• Decline in access to quality water in Kenya is exacerbated by climate change and its associated droughts. It has been estimated that between 1995 and 2019, the percentage of Kenyans living under water-stressed conditions increased from 14.8% to 33.2%, partly attributed to climate change impacts.[61] • Climate change impacts on water resources have affected agriculture through loss of crops, human health through water-borne diseases associated with flooding and destruction of key related infrastructure. • Increase in water demand from population growth and an expanding economy compounds the water availability challenges presented by climate change.[62]For example, during long dry spells like in 2018, many urban areas faced acute water shortages due to low water levels in rivers. • Changes in rainfall have increased water levels[63]in Kenyan lakes. The increase in the area of lakes in the Great Rift Valley, ranging from a 21% increase for Lake Naivasha to a 123% increase for Lake Solai, leadinghas contributed to changes in flora and fauna and affectingaffected local communities that rely on these natural aquatic resources.[64] • Sea level rise is a risk to the five coastal counties and their populations; an estimated 267,000 Kenyans will be at risk of coastal flooding by 2030 due to sea level rise. • Climate change is also causing storms and rougher seas, which prevents fisher communities from earning a living and obtaining fish for sustenance, especially in the months of May, June, and July. • Sea level rise is projected to increase the levels of salinity in coastal freshwater aquifers, which would exacerbate the current water supply issues. • Crop production may be hampered by salt stress brought on by the waterlogging of the soils. Additionally, because saline water intrusion impacts coastal ecosystems, the health of coastal inhabitants is at stake.[65] • Sea level rise is a risk to the five coastal counties and their populations; an estimated 267,000 Kenyans will be at risk of coastal flooding by 2030 due to sea level rise. • Sea level rise is projected to increase the levels of salinity in coastal freshwater aquifers, which would exacerbate the current water supply issues.
Forestry, Wildlife and Tourism	Rising temperatures and changing precipitation patterns; prolonged droughts and flooding	• Forest degradation, damage and transformation of forest areas, and changes in species composition. • Prolonged droughts weaken forests, making them more susceptible to pests, diseases, and forest fires, further contributing to their degradation. Wildfires are particularly common during dry seasons and destroy large forests areas whenever they occur. • Rainfall variability and prolonged drought are already altering wildlife migrations, affecting tourist visits on big nature reserves such as the Maasai Mara.[66]
Ecosystems and Biodiversity	Rising temperatures including warmer nights, changing precipitation patterns; prolonged droughts, flooding	• Ecosystems and critical ecosystem services in Kenya are deteriorating in quality and quantity. This affects the provision of water, food and timber; air purification; carbon sequestration; flood control; soil and habitats; and cultural, spiritual and recreational services. • Climate change facilitates the spread and establishment of many Invasive Alien Species (IAS) and creates new opportunities for them to become invasive with devastating impacts on the native species and biodiversity.[67] • Projections indicate that species richness along the Tana River basin – an economically important and ecologically diverse region – is projected to reduce significantly with just 2°C of global temperature rise with plants and birds most affected. And the impacts worsen with further warming. While 82% of the basin can offer protection for the majority of plant species with 1.5°C of warming, this figure reduces to 23% with 2°C of warming and to just 3% with 4.5°C of warming.[68] • There will be a substantial climate-driven shift in vegetation towards more shrubland (normally associated with arid lands) at the expense of savannahs, grasslands and forests. Consequently, protected areas in Kenya could lose between 16% and 50% of their forests, depending on future emissions.[69]

61 Nying'uro et al., (2024)
62 GoK. (2020). Updated NDC
63 GoK. (2020). Updated NDC
64 Olago, D. O. et al. Lentic-lotic water system response to anthropogenic and climatic factors in Kenya and their sustainable management. in Climate Change and Water Resources in Africa: Perspectives and Solutions Towards an Imminent Water Crisis (eds. Diop, S., Scheren, P. & Niang, A.) 193–218 (Springer International Publishing, Cham, 2021).
65 Government of Kenya. (2023).
66 Dube, K. et al. Tourism and climate change in Africa: informing sector responses. J. Sustainable Tourism, 1–21 (2023). In Nying'uro et al., (2024)
67 C Muhati, G. L., Olago, D. & Olaka, L. Participatory scenario development process in addressing potential impacts of anthropogenic activities on the ecosystem services of Mt. Marsabit forest, Kenya. Global Ecol. Conserv. 14 (2018). entre for Biodiversity. (2022). Coastal Biodiversity Conservation Unit.
68 Jenkins, R. L. M., Warren, R. F. & Price, J. T. Addressing risks to biodiversity arising from a changing climate: The need for ecosystem restoration in the Tana River Basin, Kenya. PLOS One 16,

Sector	Risks	Impacts
Health, Sanitation and Human Settlement	Rising temperatures, heatwaves and changing precipitation patterns such as more frequent and heavier rain events, water encroachment, over abstraction of groundwater, storm surges in coastal areas	• Climate change affects human health in Kenya by changing the severity or frequency of health threats that are already impacted by climate or weather factors; and by creating unanticipated health threats in places where they have not previously occurred. • Increase in malaria vectors and migration to new areas. Higher temperatures contribute to extending the risk of malaria to new areas. Approximately 13 to 20 million Kenyans are at risk of malaria, and vulnerable populations especially pregnant women, children, the elderly and those with pre-existing health conditions are particularly at risk. • Increase in acute respiratory infections for ASAL areas; emergence and re-emergence of Rift Valley fever and leishmaniasis, and malnutrition • The outbreak of water- and vector-borne diseases during periods of flooding is an established public health concern in Kenya impacting public health expenditure and driving mortality especially among infants. For example, as of 2nd October 2023, a total of twelve thousand, one hundred and twenty-three (12,123) vector-borne disease cases, with six hundred and twenty-seven (627) confirmed by culture, and two hundred and two (202) deaths were reported (Ministry of Health, 2023).[70] • Higher temperatures are projected to increase heat-related deaths especially among the elderly and contribute to extending the risk of malaria to new areas. Approximately 13 to 20 million Kenyans are at risk of malaria, and vulnerable populations especially pregnant women, children, the elderly and those with pre-existing health conditions are particularly at risk. • Weather-related deaths are a particular public health concern in informal settlements, with research finding an increase in child mortality and in deaths from non-communicable illnesses, such as cardiovascular and respiratory diseases, with increasing temperature. • Climate change has been identified as a factor contributing to the increased burden of zoonotic diseases in Kenya, such as Brucellosis, Anthrax and Rift Valley fever.[71] • Shifting climatic patterns and extreme weather events – such as more frequent and heavier rain events, water encroachment, over abstraction of groundwater, storm surges in coastal areas – damage and increase the risk of collapse of buildings and infrastructure.[72] • The impact on housing – in terms of its construction, cost, and longevity – is devastating in Kenya, where prolongedProlonged drought has negatively impacted the supply of building materials such as timber, while also reducing water levels, which then impacts the cost of electricity.[73]
Manufacturing	Declining water availability due to changing precipitation patterns and droughts	• In Agroagro-processing, the 2011 and 2017 droughts affected tea production across the country and resulted in diminished turnover in processed tea. Generally, teaTea producers may lose up to 30 percent% of their cash earnings due to climate variability, particularly drought.[74] • Manufacturing, including among small enterprises that are important for vulnerable households, is negatively affected by electric power instability as droughts lower water levels in the hydroelectric dams. • ManufacturingThe manufacturing sector's input supply comes from sectors like agriculture, forestry, or fisheries that are also vulnerable to climate risk; for example, decelerated growth in the manufacturing sector in 2022 (2.7% down from 7.3% in 2021) was partly attributed to low agricultural production due to drought, notably of food crops, which are the primary inputs for agro-processing. [75]

e0254879 (2021).
69 Nying'uro et al., (2024)
70 Egondi, T. et al. Time-series analysis of weather and mortality patterns in Nairobi's informal settlements. Global Health Action 5, 23–32 (2012).
71 GoK. (2018). NCCAP 2018-2022.
72 KMD. (2020). Extreme Weather Events in Kenya between 2011 and 2020.
73 Ministry of Energy. (2020). Kenya National Energy Efficiency and Conservation Strategy.
74 Government of Kenya. (2024).
75 Government of Kenya. (2023).

Sector	Risks	Impacts
Energy and Transport	Temperature increases and higher frequency and intensity of extreme weather events	• Extreme weather events damage energy and transport infrastructure thus increasing the risk of delays, disruptions, damage, and failure across land-based, air, and marine transportation systems. For example, the heavy rainfall experienced throughout the year 2023 resulted in destruction of roads across different parts of the country. Several roads were cut off by flash floods in Tana River, Garissa, Wajir and Mandera.[76] • The Kenya Highways Authority participated in a vulnerability assessment of the Horn of Africa Gateway project, a large road infrastructure project, that found projected increased rainfall is expected to increase the risk of flooding, erosion, washouts, and siltation, and to aggravate connectivity problems.[77] • Climate-related weather extremes also impact the design, construction, location, and operation of electricity generation and transmission infrastructure. For example, a vulnerability assessment of hydroelectric energy resources impacted by climate change in the Seven Forks project found that the catchment temperature is rising by 0.02°C annually while the rains are declining by 3.9 mm annually. • The rapid decline of Mount Kenya's glaciers is affecting hydropower generation, which is currently extremely reliant on the Mount Kenya region, with the Tana River contributing around 70% of Kenya's total hydropower generation.[78] • Masinga dam, one of the main Seven Forks reservoirs for hydroelectric power production along the Tana River, faces inflow drop of 0.74 cubic metres of water per second annually, leading to an average power output below capacity by up to 16-Gigawatt hours annually.[79]

3.3. National adaptation priorities and barriers

3.3.1. Priorities for Adaptation in Kenya

The NAP (2015-2030), NCCAP (2023-2027), and NDC (2020) identify priority adaptation actions that are based on climate impacts experienced and climate change projections going forward. The priorities cut across all the planning sectors and have been categorised as either short term (1-2 years), medium term (3-5 years) or long term to 2030 (>6 years). Table 3.7 includes a list of the planning sectors and the priority adaptation programmes as set out in Kenya's NAP and 2020 NDC.

Table 3.6: Sector Priorities for Adaptation in Kenya

Sector	Adaptation Programme
Disaster risk reduction	P1: Drought risk management, including drought early warning, preparedness, and response for enhanced drought resilience P2: Flood risk management incorporating nature-based solutions
Agriculture (crops, livestock and fisheries)	P3: Mainstream CSA 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. P4: Build resilience of the agriculture (crops, livestock and fisheries) systems through sustainable management of land, soil, water and other natural resources as well as insurance and other safety nets.
	P5: Strengthen communication systems on CSA extension and agro-weather issues

76 KMD. (2024). State of the Climate Kenya 2023
77 Government of Kenya. (2024).
78 Takase, M., Kipkoech, R. & Essandoh, P. K. A comprehensive review of energy scenario and sustainable energy in Kenya. Fuel Commun. 7, 100015 (2021).
79 Government of Kenya. (2024).

Sector	Adaptation Programme
Environment	P6: Rehabilitation and conservation of degraded forests
	P7: Establish at least 2,000 hectares to promote nature-based (non-wood forest products) enterprises across the country
	P8: Establish 150,000 ha commercial private forests plantations
	P9: Plant 350,000 agro-forestry trees in farmlands established
	P10: Greening of 14,000 ha of infrastructure (roads, railway lines, dams)
	P11: Enhance/strengthen governance of community structures in participatory resource management in coastal ecosystems
	P12: Conduct blue carbon readiness assessment for full integration of blue carbon /ocean climate actions into NDCs
	P13: Develop marine spatial planning and outline sustainable management approaches
	P14: Promote and expand opportunities for nature-based enterprises, including seaweed farming and mangrove ecotourism.
	P15: Integrate the use of nature-based solutions, including the implementation of national mangrove management plan, into national and county development plans
	P16: Strengthen early-warning and tailor-made climate information services through institutional strengthening of KMD and other information user institutions
	P17: Roll-out Early Action Protocols for forecast based financing
Infrastructure (energy)	P18: Develop and adopt guidelines on how to climate proof energy infrastructure using vulnerability risk assessments
	P19: Enhance climate proofing of energy infrastructure along the renewable energy supply chain
	P20: Increase the number of companies participating in energy efficient water-use initiatives by 40% from the baseline
Infrastructure (roads)	P21: Upscale the construction of roads to systematically harvest water and reduce flooding
	P22: Enhance institutional capacities on climate proofing vulnerable road infrastructure through vulnerability assessments
	P23: Promote the use of appropriate designs and building materials to enhance resilience of at least 4500km of roads to climate risk
Water and sanitation	P24: Conduct and implement recommendations on climate and risk assessments on water, sanitation and irrigation infrastructure.
	P25: Build resilience infrastructure for the protection of dams and dykes and river lines
	P26: Promote water harvesting and storage at county and household levels
	P27: Mainstream climate change into water catchment management plans.

Sector	Adaptation Programme
Health	P28: Conduct a vulnerability and risk assessment of different climate risks on human health
	P29: Develop a public awareness and social mobilization strategy on climate change and health impacts
	P30: Develop health programmes, protocols and guidance to manage new climate change related diseases and risks
	P31: Reduce the incidence of malaria, other vector borne disease and other health conditions
Population, urbanization and housing	P32: Introduce nature-based solutions in flood control especially around informal settlements and selected urban areas
	P33: Strengthen the enforcement of green building codes by national and county governments
	P34: Conduct climate risk and vulnerability assessments of building/housing infrastructure especially to flooding, and sea level rise
Tourism	P35: Develop and adopt guidelines of how to integrate adaptation across the tourism sector
	P36: Conduct a climate risk and vulnerability assessment of the tourism sector
	P37: Develop climate resilient action plans for the sector
Gender, youth and other vulnerable groups	P38: Develop social safety net structures for women, youth and other vulnerable groups within the CCCFs
	P39: Strengthening access of women, youth, other vulnerable groups to enterprise funds, climate finance and credit lines.
	P40: Promote gender responsive technologies and innovations in the private sector, through financing capacity building and start-up services
	P41: Consolidate successful technologies and develop a transfer strategy to women, youth and other vulnerable populations
Private Sector	P42: mobilize financial resources from capital markets and other financial instruments for green investments and implementation of the Green Business Agenda
	P43: Eco-label industrial products to promote green procurement especially by public procurement agencies
	P44: Climate-proof waste management infrastructure for waste management facilities in SEZ (effluent treatment plants)
	P45: Increase the number of companies participating in efficient water-use initiatives
Devolution	P46: Develop and adopt county adaptation guidelines for integration in CIDPs
	P47: Build the capacities of County CCUs on adaptation
	P48: Conducting vulnerability and risk assessments in counties
	P49: Develop county adaptation plans for the counties with CCCFs
Adaptation M&E system	P50: Refine and operationalize the adaptation M&E system at national and county levels

The priority actions identified in support of the above are geared at generating social, economic, and environmental benefits; and avoiding loss and damage in productive sectors. The priority actions were clustered into seven strategic areas in the NCCAP 2023-2027 to align with the government agenda and facilitate implementation. The seven strategic areas are disaster risk management; food and nutrition security; water, fisheries and the blue economy; forests, wildlife and tourism; health, sanitation and human settlements; manufacturing; and energy and transport. In addition, the NCCAP 2023-2027 includes enabling actions to enhance delivery of adaptation actions in the areas of policies and regulatory frameworks; finance; technology; and capacity building.

3.3.2. Barriers, Challenges and Gaps to Adaptation in Kenya

The table below presents the most important barriers, challenges and gaps that affect implementation of adaptation actions in Kenya. These barriers and challenges were identified through stakeholder consultation and informed by Kenya's NCCAP 2018–2022 Second

Implementation Status Report for the FY 2019/2020.

Table 3.7: Barriers, Challenges, and Gaps to Adaptation in Kenya

Area	Barriers and Challenges	Gaps	Key areas identified in the updated NDC as critical to bridging the adaptation implementation gaps Key areas identified in the updated NDC as critical to bridging the adaptation implementation gaps
Institutional arrangements and coordination	Weak or non-existent climate change coordinating units in the reporting institutions.	Inadequate technical staff in the various climate change Units (CCU) in MDAs	Strengthening of coordinating institutions such as CCD and CCUs at both national and county levels as well as non-state actors working on climate change. .[44] This is gradually ongoing through creation of coordination tools and procedures, increased collaboration and training of relevant officers. Recruitment and deployment of additional technical officers: Most counties and State Departments have staffed their Climate Change Units with more trained and experienced officers over the last few years whenever resources allow. Enhanced and strengthen reporting Mechanism Reporting Verification (MRV) systems.
	Poor coordination among the different actors leading to duplication of efforts and risk of double counting.	Inadequate understanding of the actions of non-state actors especially in disaster risk reduction. Lack of a clear plan for cooperation with other state actors such as regional development Authorities (RDAs) whose mandate spans across the country and have a stable footing at community level thereby providing suitable community entry points. Non-prioritization of climate change action and program. Lack of accountability mechanisms across institutions	
	Implementation and reporting process not fully streamlined.		
Accessing financial and other support	Inadequate financial resources to support adaptation planning and implementation at local level as counties face competing needs on their budgets and delays in readiness for receiving climate finance.	Inadequate resources to fund CCU activities SME sectors being classified as non-priority climate change areas hence difficulty to attract alternative funding	Financing locally-led climate change actions for enhanced resilience of local communities. seek alternative funding models to support climate related actions (Green bonds). Heightening investment in the blue economy
	Insufficient financial resources allocation for climate change activities at both national and county level		
Emerging Competing Risks & Priorities	The locust invasion and Covid-19 pandemic led to a diversion of resources to deal with the emergent challenges.	Inadequate disaster preparation and management for emerging risks.	The updated NDC has currently prioritized Droughts and Floods as the main hazards with significant impact to Kenya.

Area	Barriers and Challenges	Gaps	Key areas identified in the updated NDC as critical to bridging the adaptation implementation gaps Key areas identified in the updated NDC as critical to bridging the adaptation implementation gaps
Technical capacity (Risk and vulnerability assessment and risk management)	Limited skills and technical expertise to support climate change adaptation activities.		Developing and applying comprehensive climate risk management tools. Promoting uptake and use of relevant adaptation technologies especially targeting women, youth, and vulnerable groups that make use of scientific and indigenous knowledge. The planning process anticipates climate risk-responsive NCCAPs. The CCCF mechanism has included as part of its framework Participatory Climate Risk Assessment to support county level adaptation action planning, including training and guidance on how to conduct the assessment.
	Inadequate climate adaptation technologies to address the identified national needs.	Lack of financial resources to adopt new technologies	
	Inadequate knowledge (poor understanding of adaptation concepts) of options to reduce climate risks and lack of means to implement options.	Inadequate expertise on climate change risk assessment and action planning at local level.	
	Insufficient data on baseline and vulnerability assessment.	Most Counties and Wards are still building their capacity to conduct Participatory Climate Risk Assessments, and resilience assessments.	
Climate Information (Climate scenarios, science and translation to local context)	Poor access to functional data, climate information management systems, and clear documentation at the local level make it difficult to carry out the monitoring, evaluation, learning and planning of adaptation activities. KMD has however improved Climate Information Service provision substantially with Meteorological offices in each county, CIS Plans in several counties and increased numbers of weather station facilities.	Lack of early warning systems and advisories in support of health, buildings & Housing sectors Inadequate training on climate information/ data management	Enhancing access to and use of climate information in planning and decision making across sectors and counties
Access to resources	Low productive asset base (natural and man-made capital assets) limiting capacity to adapt.	This is particularly pronounced for women and youth who typically have low ownership and control of land in Kenya.	Strengthening adaptive capacity and climate resilience across all sectors of the economy at national and county levels

Area	Barriers and Challenges	Gaps	Key areas identified in the updated NDC as critical to bridging the adaptation implementation gaps Key areas identified in the updated NDC as critical to bridging the adaptation implementation gaps
Attitudes, values and motivations (Social and Cultural Norms)	Resistance to adapting climate change adaptive seeds, crops and livestock and food crops.	Social/cultural and institutional rigidity, including cultural norms that discourage change and innovation, and an emphasis on traditional means of reacting to climate stress and shock	Under devolution, the NDC anticipates conducting of vulnerability and risk assessments in counties as well as climate action planning. Locally-led climate adaptation planning under the CCCF mechanism and the FLLoCA programme emphasizes strong community participation, which is a means to changing attitudes and negative social norms towards climate change.
Monitoring, evaluation and learning	Assessments of adaptation do not capture actions of non-state actors	Lack of harmonized tools for data collection and collation The comprehensive MRV+ system for tracking mitigation and adaptation actions has not been fully operationalized Limited technical capacity among stakeholders supposed to be reporting	Multistakeholder platform to bring together state and non-state actors to understand their actions and implement reporting efforts. Such a platform has been established for the agriculture sector, but needs to be replicate in other relevant sectors

3.3.3. Synergies with Other Global Frameworks

Kenya is a party to many multilateral environmental agreements whose implementation has synergies with the actions to achieve the goals of the UNFCCC and its Paris Agreement. These agreements include:

- UN Agenda 2030 for Sustainable Development and the Sustainable Development Goals (SDGs);
- The other two Rio conventions (UN Convention on Biological Diversity and UN Convention to Combat Desertification and Land Degradation);
- Sendai Framework on Disaster Risk Reduction;
- Montreal Protocol on ozone-depleting substances; and
- Ramsar Convention on Wetlands.

The country has made significant strides in domesticating the multilateral environmental agreements and continues to implement resulting policies and strategies on the same. Examples of such efforts include development of the Climate Change Policy and Regulatory Framework; the National Policy for Disaster Management 2017; Climate Risk Management Framework 2016; and National Biodiversity Strategy and Action Plan 2019-2030. The local frameworks, policies, plans and their implementing institutions build from domesticated global frameworks and draw from them synergies that are essential for implementation of climate change adaptation action in Kenya. The most notable ones are presented in Table 3.9.

Table 3.8: Global Climate Adaptation Frameworks and their Synergy with Kenyan Frameworks, Policies, Plans and Institutions for Climate Adaptation

Frameworks	Synergy with local frameworks, policies, plans and institutions for Climate Adaptation
UN Sustainable Development Goals and 2030 Agenda for Sustainable Development	• The NCCAP 2023-2027 demonstrates systemic alignment with the SDGs and disaster risk reduction agendas through a shared vision for climate-resilient development stemming from the recognition that climate change is a threat to sustainable development in Kenya. The NCCAP 2018-2022 identified the SDG benefits of climate action, including climate adaptation, and the relevant SDG indicators. • Being a highly vulnerable country with a significant proportion of the population living below the poverty line and directly dependent on the natural resources, the adaptation actions in the NCCAP 2023-2027 have been framed in such a way that they address the multiple objectives of building resilience, reducing poverty, and supporting environmental sustainability. • An SDG Coordination Directorate was created under the State Department of Economic Planning, National Treasury and Economic Planning, to provide leadership in mainstreaming the SDGs in planning, policies, and budgeting at national and county levels. It also coordinates tracking and reporting on SDGs. This has ensured that the five-year MTPs and CIDPs mainstream the SDGs, climate change adaptation, and disaster risk management.[80]
UNFCCC Paris Agreement; Sendai Framework for Disaster Risk Reduction	• The Government of Kenya has taken significant steps to align efforts under the Paris Agreement and the Sendai Framework for Disaster Risk Reduction. Drawing from the two global frameworks, Kenya developed the Climate Risk Management Framework (2016) to foster stronger coordination among government institutions working on climate change adaptation, disaster risk management, and sustainable development at both national and sub-national levels. The framework focusses on hydrometeorological disasters considering their frequency and wide-ranging impacts on society and the economy. • Implementation of this framework is enhancing synergy, efficiency, and impact in climate adaptation and resilience building across institutions and the two levels of government, regionally and internationally.[81]

3.4. Adaptation strategies, policies, goals and plans to integrate adaptation into Kenya's Climate Action

Following the launch of Vision 2030 to guide Kenya's long-term development in 2008,[82] the country put in place the National Climate Change Response Strategy, 2010 in recognition of the impact of climate change on this vision. The strategy acknowledged the importance of coordinating efforts to address climate change challenges in Kenya and essentially advocated for the creation of a climate change policy and legislation to serve as the foundation for adaptation efforts. It called for and provided the foundation for the development of a standalone climate change act, as well as related governance structures and programmes (e.g., NCCAP and NAP).

In 2015, Kenya established its National Adaptation Plan (NAP) 2015–2030 drawing on the adaptation technical analysis of NCCAP 2013-2017. The NAP was submitted to the UNFCCC in early 2017; it aims to consolidate the country's adaptation vision by supporting macro-level adaptation initiatives aligned with economic sectors and addressing county-level vulnerabilities to improve long-term resilience and adaptive capability. Implemented through the five-year NCCAPs, the NAP identifies climate vulnerabilities and key areas for enhancing climate resilience. Importantly, the NAP serves as the foundation for Kenya's NDC's adaptation component. [83]

The Climate Change Act Number 11 of 2016 and Climate Change Act 2016 establish the legal architecture to guide climate change planning and implementation at the national and county levels. It provides the legal basis for mainstreaming climate change in national and county planning and establishes the institutional structures for coordination of climate change issues. It is a comprehensive legal framework for climate change governance, with the goal of enhancing climate-resilient development by, among other things, promoting the adoption of technologies that

80 The National Treasury & Economic Planning. (2021). SDGs Coordination Directorate. https://sdgs.planning.go.ke
81 NDMA. (2016). A Climate Risk Management Framework for Kenya. https://www.adaconsortium.org/images/publications/NDMA_BOOKLET_new_final.pdf
82 Government of Kenya. (2007). Kenya Vision 2030: A Globally Competitive and Prosperous Kenya. Nairobi: Government of Kenya
83 Government of Kenya. (2023).

support low carbon and climate-resilient development; facilitating capacity development for public participation in climate change responses through awareness creation, consultation, representation, and access to information; and providing incessant access to information. Furthermore, the Act calls for and encourages the incorporation of climate adaptation measures into development planning, decision-making, and execution. It establishes guidelines for climate change planning and implementation and acknowledges the complementary roles of national and county governments. Given the local character of adaptation, the latter is crucial.[84] Other legal, policy and planning instruments are summarised below:

- **Bottom-Up Economic Transformation Agenda (BETA):** Kenya's 2023–2027 planning period focuses on the BETA themes of Agricultural Transformation; Micro, Small and Medium Enterprises (MSME) Economy; Housing and Settlement; Healthcare; and Digital Superhighway and Creative Economy. Most of these themes fall within the priority sectors for adaptation in Kenya's NAP/NDC.
- **The National Climate Finance Policy approved by Parliament in 2018:** Establishes the institutional and reporting frameworks to access and manage climate finance.
- **The National Climate Change Framework Policy (NCCFP) approved by Parliament in 2018:** Ensures the integration of climate change considerations into planning, budgeting, implementation, and decision-making at the national and county levels and across all sectors.[85] The NCCFP complements the Climate Change Act 2016.
- **The National Biodiversity Strategy and Action Plan, 2019 – 2030:** Outlines approach for resolving problems with dwindling biodiversity and related issues, including building awareness of the importance of biodiversity on adaptation.
- **The Green Economy Strategy and Implementation Plan (GESIP) 2016–2030:**[86] This is Kenya's blueprint to advance toward a low carbon, resource efficient, equitable and inclusive socio-economic transformation. The GESIP is meant to guide national and county governments, private sector, civil society, and communities in adopting different development pathways that encourage higher green growth, cleaner environment, and higher productivity.

Box 1 – Case: Bottom-Up Economic Transformational Agenda's contribution to climate adaptation [87]

Agricultural Transformation and Inclusive Growth. This intervention aims at ensuring food security in the country through climate change mitigation and adaptation, thereby reducing the cost of living. The intervention also aims at creating jobs as agriculture has the highest employment multiplier effect owing to its strong forward and backward linkages to other sectors of the economy. It also focuses on developing Kenya's agricultural land through irrigation.

Micro, Small and Medium Enterprise (MSME). This entails correcting market and institution failure problems through schemes that will ensure that benefits of growth are fairly distributed. This will promote accessibility to affordable credit to most Kenyans at the bottom of the pyramid through the Hustlers Fund.

Housing and Settlement. This intervention aims at reducing proliferation of slums and hence preserving human dignity. Additionally, it aims to create quality jobs for over 100,000 youths. This will be done through, among other measures, facilitating delivery of 250,000 houses per annum and enabling low-cost housing mortgages.

Healthcare. This entails promoting access to quality and affordable healthcare through the Universal Health Coverage programme.

Kenya's NCCAP 2023-2027 sets out priority adaptation actions in seven strategic areas. These actions deliver on the contributions in the NDC and objectives of the NAP. The tables below include the strategic area goal to 2030; guiding laws, policies and plans; priority adaptation actions; and lead institutions.

84 GoK. (2016). Climate Change Act, 2016. Government of Kenya.
85 GoK. (2016b). Green Economy Strategy and Implementation Plan (GESIP) 2016–2030: A low carbon, resource efficient, equitable and inclusive socio-economic transformation. Government of Kenya. Nairobi. August 2016.
86 Government of Kenya. (2023).

3.4.1. Disaster Risk Management

Table 3.9: Disaster Risk Management

Strategic Area: Disaster (Drought and Flood) Risk Management	
Overall Sector Goal by 2030	Reduce risks that result from climate-related disasters, such as droughts and floods, to communities and infrastructure.
Climate Change Adaptation/-Related policy or Planlaws, policies and plans	1. Draft Disaster Risk Management Policy (2018) 2. Draft Disaster Risk Management Bill (2018) 3. Kenya's Disaster Risk Financing Strategy for Catastrophe Deferred Drawdown Option (2018–June 2023) 4. National Drought Emergency Funds (NDEF) 2021 regulations 5. Climate Risk Management Framework (2017) 6. Ending Drought Emergencies (EDE) Common Programming Framework 7. Public Finance Management Act 2012
Planned Priority Actions in NAP & NDC	
• Drought risk management including drought early warning, preparedness, and response for enhanced drought resilience. • Flood risk management incorporating nature-based solutions	
Lead Institution(s)	1. National Drought Management Authority 2. The National Treasury 3. Department of Interior, National Disaster Operations Centre
Key Actors	County Commissioners' Offices; County Governments; Public Benefit Organizations; County and Community level Disaster Management Structures

3.4.2. Food and Nutrition Security

Table 3.10: Food and Nutrition Security

Strategic Area: Food and Nutrition Security	
Overall Sector Goal by 2030	Increase food and nutrition security through enhanced productivity and resilience of the agricultural systems, in as low carbon a manner as possible.
Climate Change Adaptation/Related policy or Plan	1. Kenya Climate Smart Agriculture Strategy (2017–2026) 2. Agricultural Sector Transformation and Growth Strategy (2019–2029)
Priority Actions in NAP & NDC	
• Mainstream CSA 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 the agriculture (crops, livestock and fisheries) 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.	
Lead Institution	Ministry of Agriculture and Livestock Development
Key Actors	Farmer Cooperatives and other representative organizations; Private Sector; County Government departments on Agriculture and Food Security; National Irrigation Board; International Fund for Agricultural Development (IFAD), Food Agricultural Organization (FAO), and World Food Programme (WFP)

3.4.3. Water and the Blue Economy

Table 3.11: Water and the Blue Economy

Strategic Area: Water and the Blue Economy	
Overall Sector Goal by 2030	Enhance the resilience of the water sector by ensuring access to and efficient use of water for agriculture, manufacturing, domestic, wildlife, and other uses.
Climate Change Adaptation/Related policy or Plan	1. Water Act No. 43 of 2016 and (amendment) Bill (2023) 2. Water Harvesting and Storage Regulations (2021) 3. National Water Harvesting and storage Strategy 2020-2025 and National Water Resources Strategy 2020-2025 4. National Irrigation Services Strategy 2022–2026 Irrigation Act (2019) 5. National Irrigation Policy (2017)
Priority Actions in NAP & NDC	
• Conduct and implement recommendations on climate and risk assessment on water, sanitation and irrigation infrastructure. • Build resilience infrastructure for the protection of dams, dykes and river lines. • Promote water harvesting and storage at county and household levels. • Mainstream climate change into water catchment management plans	
Lead Institution	Ministry of Water, Sanitation and Irrigation
Key Actors	National Irrigation Board; County Government Water departments; Public Benefit Organizations working on WASH

3.4.4. Forestry, Wildlife and Tourism

Table 3.12: Forestry, Wildlife and Tourism

Strategic Area: Forestry, Wildlife and Tourism	
Overall Sector Goal by 2030	Increase forest cover to 10% of total land area, increase the resilience of the wildlife and tourism sectors, and rehabilitate degraded lands, including rangelands.
Climate Change Adaptation/ Related policy or Plan	National Forest Programme (2017) – chapter on climate change REDD+ Readiness Plan and analysis (2013–2018) Wildlife Strategy, 2018
Priority Actions in NAP & NDC	
• Rehabilitation and conservation of degraded forests. P9: Plant 350,000 agro-forestry trees in farmlands established • Establish at least 2,000 ha to promote nature based (non-wood forest products) enterprises across the country. • Establish 150,000 ha commercial private forests plantations. • Greening of 14,000 ha of infrastructure (roads, railway lines, dams). • Enhance/strengthen governance of community structures in participatory resource management in coastal ecosystem • 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 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. • 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.	
Lead Institution	Kenya Forest Service, Ministry of Environment and Climate Change and Forestry; Ministry of Wildlife and Tourism

Key Actors	Kenya Meteorological Department; Private Investors in Tourism and Forestry; Community Forest Association; Community Wildlife Conservation Associations and Public Benefit Organizations working on wildlife, tourism and forestry

3.4.5. Health, Sanitation and Human Settlements

Table 3.13: Health, Sanitation and Human Settlements

Strategic Area: Health, Sanitation and Human Settlements	
Overall Sector Goal by 2030	Reduce incidences of malaria and other diseases that are projected to increase because of climate change, encourage climate-resilient solid waste management, and promote climate-resilient buildings and settlements, including in urban centres, ASALs, and coastal areas.
Climate Change Adaptation/Related policy or Plan	1. Health Act (No. 21 of 2017) – section on environmental health and climate change (part VII, sections 68 & 69) 2. The Land Act (2012)
Priority Actions in NAP & NDC	
• 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 • 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 rise	
Lead Institution	1. Ministry of Health 2. Ministry of Lands, Public Works, Housing, and Urban Development
Key Actors	Public and private health institutions and facilities; PBOs;

3.4.6. Manufacturing

Table 3.14: Manufacturing

Strategic Area: Manufacturing	
Overall Sector Goal by 2030	Improve energy and resource efficiency in the manufacturing sector.
Climate Change Adaptation/ Related policy or Plan	1. Guidance on climate-related risk management (2021) 2. Kenya Sustainability Reporting Standards (KSRS): The Capital Markets Authority (CMA) in Kenya published the KSRS in 2020, providing guidance on Environmental, Social, and Governance (ESG) disclosure by listed companies. These standards cover indicators related to energy consumption, water use, waste management, and social and ethical practices.[87]
Priority Actions in NAP & NDC	
• 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 Special Economic Zones (effluent treatment plants). • Increase the number of companies participating in efficient water-use initiatives	
Lead Institution	Ministry of Industrialization

87 Environmental, Social & Governance Laws and Regulations Report 2024 Kenya
88 GoK. (2018). NCCAP 2018-2022.

Key Actors	Central Bank of Kenya

3.4.7. Energy and Transport

Table 3.15: Energy and Transport

Strategic Area: Energy and Transport	
Overall Sector Goal by 2030	Climate-proof energy and transport infrastructure, promote renewable energy development, increase the uptake of clean cooking solutions, and develop sustainable transport systems.
Climate Change Adaptation/Related policy or Plan	1. Green Hydrogen Strategy and Road Map for Kenya (2023) 2. Energy Act (2019) – Part 3, section 43; Part 4, section 74 (i), and Part 9 address climate change-related issues 3. National Energy Efficiency and Conservation Strategy (2020– 2027) 4. Bio-energy Strategy (2020–2027) 5. Kenya National Aviation Action Plan for International Civil Aviation Organisation (ICAO) and International Maritime Organisation (IMO) (2017)
Priority Actions in NAP & NDC	
• Develop and adopt guidelines on how to climate proof energy infrastructure using vulnerability risk assessment. • 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 • 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 buildings materials to enhance resilience of at least 4,500 km of roads to climate risk.	
Lead Institution	1. Ministry of Energy and Petroleum 2. Ministry of Roads and Transport
Key Actors	KENHA; KETRACO

3.5. Implementation Progress, Results Evaluation and Learning

In Kenya, multiple actors are involved in implementation of adaptation actions. The National and County governments and non-state actors including NGOs, CSOs, the private sector, research organisations, institutions of higher learning, and media, have undertaken several initiatives that are aligned with the country's NCCAPs.

This section presents progress on the implementation of adaptation actions in the NCCAP's seven strategic areas.

3.5.1. Progress on the implementation of adaptation action in Kenya

1. Disaster Risk Management

The adaptation actions in the disaster risk management (DRM) strategic area promote a proactive approach to addressing climate-related disasters through flood and drought early warning systems, improved social protection programmes, implementation of flood management plans, and community-level capacity building to raise awareness and education on disaster management and flood hazards.[88]

Progress and actions in the strategic area include:

- To increase the number of households and entities benefiting from devolved adaptive services, through government financing, the NDMA disbursed over KES 3.3 billion under the HSNP through more than 100,800 households out of which 60% of recipients were women in arid counties. The NDMA also disbursed drought shock responsive cash transfers to households as triggered by the drought severity index. During 2021–2023 drought, shock responsive cash transfers

benefitted 59,651 households in Turkana, Marsabit, Wajir and Mandera counties, with disbursement of KSh 409,074,30.[89]

- The government effectively coordinated more than KSh 70 billion drought response interventions during the 2021–2023 drought. The government contributed KSh 22 billion while non-state actors contributed KSh 48 billion.
- The National Drought Management Authority (NDMA) helps people cope with drought by producing and disseminating monthly county drought early warning bulletins that target the counties at risk of drought.
- The Government operationalized the National Drought Emergency Fund (NDEF), and gazetted and sensitized the members of the County Drought and Food Security Committees (CDFSC) for county level coordination in the 23 ASAL counties. So far, the Fund has received a total of KSh 345 million in funding from the National Treasury for the following components;[90]
    - **i.** Drought resilience and preparedness 50%,
    - **ii.** Drought response 40%,
    - **iii.** Drought recovery 5%, and
    - **iv.** Administrative costs 3%
    - **v.** Reserve 2%

As part of the plan to increase flood resilience, the government through KMD has increased the amount and timeliness of flood early warnings issued alongside weather forecasts during rain seasons.

- Disaster Management is now effectively coordinated through institutions including the National Disaster Operations Centre, NDMA, National Disaster Operations Unit, and National Safety Net Programme.
- The NDMA operates a web-based national Drought Early Warning System (DEWS) that supports stakeholders' decision making, which integrates remote sensed data with secondary and primary (revolving sample household) data on biophysical, and socioeconomic indicators. Also, NDMA coordinates national and county food security assessments, and after processing, disseminates resulting information to stakeholders.
- The Government of Kenya, with the support of development and humanitarian partners, prepared the Disaster Risk Management Policy in 2017. The policy establishes DRM institutions that address prevention, preparedness, relief, rehabilitation, mitigation, and prevention. The DRM policy also provides for a County Disaster Risk Management Committee in each county.
- For improved access to Climate Information Services to support risk-informed adaptation planning, the Kenya Meteorological Department (KMD) reached an additional 1,011,583 users with climate information services in the form of daily, weekly, monthly, and seasonal forecasts and advisories.[91]
- Anticipatory action approaches in dealing with drought and flooding are being developed by the Kenyan Red Cross Society with improved climate information services from the Kenya Meteorological Department; the CIS is critical for the effective management of climate-related disasters.
- County disaster management legislation, plans, and coordinating units/committees were established in six counties to improve coordination and management of climate-related risks.
- Relief assistance provided to persons affected by food insecurity as a result of floods and droughts in the year 2023/24. Over 1,463,354 persons benefitted from the relief assistance in the ASAL counties and Bomet, Bungoma, Busia, Elgeyo Marakwet, Homabay, Kiambu, Kirinyaga, Nairobi, Mombasa and Nakuru.

2. Food and Nutrition Security

Agriculture is a priority for Kenya because of the sector's importance to food security, rural livelihoods, and poverty alleviation. An increased incidence of drought and unreliable rainfall affect agriculture and contribute to food insecurity and poor nutrition in Kenya. The Kenya Climate Smart Agriculture Strategy (2017-2026) and Kenya CSA Implementation Framework (2018-2027) were developed with the objectives of increasing productivity, building resilience, and enhancing co-benefits along the diverse agricultural value chains. The strategy builds on the NCCAP and NAP and was largely driven by the important role of agriculture within the Kenyan economy and the high levels of vulnerability in the sector.

The National Agricultural (Crops, livestock and fisheries) Insurance Policy was developed to enhance the growth and development of agriculture insurance in the country including participation of the private sector. Agriculture insurance is one way to de-risk the agriculture sector and build the resilience of the food and nutrition security sector by minimising the vulnerability of farmers.

Projects and programmes targeting adaptation and resilience building in the food and nutrition security-related sectors have been implemented. Examples include Kenya Climate Smart Agriculture Project (KCSAP); Kenya Cereals Enhancement Programme–Climate Resilient Agricultural Livelihoods Window (KCEP-CRAL), Towards Ending Drought Emergencies: Ecosystem based Adaptation in Kenya's Arid and Semi-arid Rangelands (TWENDE), and National Agricultural Rural Inclusive Growth Project (NARIGP).

The KCSAP was a Government of Kenya project supported by the government and through a World Bank concessional loan and is an example of intervention with climate adaptation outcomes for food and nutrition security. KCSAP was implemented over a five-year period (2017- 2023) with key actions including improving crop productivity through implementation of CSA interventions, increasing crop productivity through improved irrigation, improving productivity in the livestock and fisheries sectors through implementation of CSA interventions, and diversification of livelihoods to adjust to a changing climate. Some key results from the project included

89 https://knowledgeweb.ndma.go.ke/Public/Resources/ResourceDetails.aspx?doc=b2f7ed7e-f344-4e7f-98a1-663276382f86
90 PFM (National Drought Emergency Fund Regulations 2018
91 Government of Kenya. (2021). National Climate Change Action Plan: Second Implementation Status Report for the FY2019/2020. Ministry of Environment and Forestry, Nairobi, Kenya.

farmers and livestock keepers accessing climate-oriented insurance, significant reductions in pre- and post-harvest losses, and rehabilitated rangelands. [92]

In summary, the following progress has been achieved on prioritised Adaptation Actions for the food and nutrition security priority area

- To improve crop productivity through implementation of CSA interventions, around 200,000 actors in the agriculture sector are now harvesting and storing water for irrigation. Similarly, the area under irrigation in Kenya has increased by over 5,000 Hectares.
- The annual ASALs water harvesting and storage capacity improved by 1,130,000 M3 from the 38 water pans, 6 subsurface dams constructed and 73 bore holes and shallow wells in 11 ASAL counties.[93]
- Close to 400,000 farmers have access to climate-oriented crop insurance. Likewise, the number of farmers accessing climate-oriented livestock insurance increased marginally as new farmer households insured over 90,000 cattle by the end of 2022. Similar to the crop and livestock sub-sectors, over 40,000 fishers adopted Insurance products for the fisheries sub-sector.
- There has also been increased uptake of fish farming cages, as a fish production alternative to traditional fishing.
- Under enabling actions, including technology and knowledge management, over 15 counties in Kenya now have Climate Information Service plans to guide climate information provision for adaptation purposes.
- Three counties (Kwale, Narok and Siaya) have developed Integrated Climate Risk Management Plans; more counties are conducting participatory climate risk assessments as part of their adaptation planning processes.
- The government has also supported close to 300,000 new households in Kenya to adopt diversified adaptive enterprises for sustained livelihoods and nutrition security. Examples of such enterprises include indigenous poultry, dairy goats, dairy intensification, tissue culture in banana production, and pasture seeds, among others
- Establishment of county and national level Climate Smart Agriculture Multistakeholder Platforms. To improve coordination in climate actions in the agriculture sector the government with support from non-state actors has established Climate Smart Agriculture Multistakeholder Platform (CSA-MSP).[94] The CSA MSP has more than 60 member organizations representing the national ministries and departments, county governments, private sector, research and academia, community groups and CSOs.
- Enhancing farmers' access to climate information services. KALRO's messaging system which links with the Kenya Agriculture Observatory Platform (KAOP) reached 6.2 million farmers with climate-informed agro-advisories.[95]
- Development of a Climate Smart Agriculture Investment Plan. A strategic document that outlines priority intervention areas, and identifies investment opportunities that can support advancement in food and nutrition security through CSA [96] development of climate risk profiles. Identification of climate risks and prioritization of adaptation interventions for agriculture value chains.[97]
- Innovative extension and knowledge sharing approaches. The CGIAR Livestock and Climate initiative, through activities of the International Livestock Research Institute, has been working with adaptation pioneer farmers in Nandi and Bomet counties to do peer-to-peer farmer learning exchanges of validated adaptation technologies and practices. To date they have reached 16,000 farmers.

3. Water and the Blue Economy

Kenya has been described as a water scarce country with per capita water availability of 647 m^3 against the global standard of 1,000 m3.[70] Climate change continues to exacerbate the decline in access to good quality water for domestic and productive uses. Climate change related fluctuations in rainfall have affected the water supply negatively impacting agriculture, hydroelectric energy production, and sanitation. The Ministry of Water, Sanitation and Irrigation through its sector institutions is implementing various water harvesting projects in the country with a view of increasing storage and making the country water secure.

Various actions have been implemented in Kenya to support adaptation and resilience in the water and blue economy priority area. Some of these are summarised below:

- The Kenya Integrated Water, Sanitation, and Hygiene Project (KIWASH, 2015-2020) supported by the United States Agency for International Development (USAID) was designed to accelerate and sustain improvements in water and sanitation access. KIWASH enabled nearly 900,000 Kenyans across nine counties to gain access to improved water security, sanitation, and hygiene services and assisted households in gaining access to irrigation and nutrition services. Additionally, KIWASH contributed to the quality of community water sources through catchment conservation and environmental awareness. The project supported sector institutions and 24 Water Resource Users Association to understand and plan for climate change risks and to date, has protected 68 springs and planted over 200,000 indigenous trees. [98]
- Over 55 hydrogeological surveys were undertaken across several counties in Kenya as efforts towards sustainable ground water abstraction. For example, the identification and mapping of locations for artificial ground water recharge to increase water supply took place in the Athi Basin. These actions helped to reduce food risks by identifying areas for managed aquifer recharge to utilize storm water.
- The Kenya Water Towers Agency, which is concerned with conservation, rehabilitation, and sustainable management of

92 Ministry of Agriculture, Livestock, Fisheries and Co-operatives (MALF&C). (2022). Kenya Climate Smart Agriculture Project. https://www.kcsap.go.ke/who-we-are
93 Government of Kenya. (2021).
94 https://hdl.handle.net/10568/118355
95 https://cgspace.cgiar.org/server/api/core/bitstreams/03c66a59-c5d0-4e7a-9f46-76fa63b2c43f/content
96 https://hdl.handle.net/10568/128309
97 https://ccafs.cgiar.org/resources/publications/kenya-county-climate-risk-profiles
98 Government of Kenya. (2024).

water towers, has initiated a number of adaptation initiatives mostly aimed at providing alternative sources of income and livelihoods to communities neighbouring the water towers. Examples of such initiatives include the establishment of Community-Based Tree and Bamboo Nurseries to help raise tree and bamboo seedlings to support in the rehabilitation of degraded areas in the water towers, bee keeping initiatives to provide alternative community livelihoods to water tower-dependent communities.[99]

- To increase water harvesting and water storage infrastructure, over 600 boreholes have been constructed to tap into groundwater resources in response to increased water scarcity resulting mainly from drought in the most vulnerable counties. Additionally, over 143 earth dams/pans were constructed, and 23 water supply schemes completed/ rehabilitated. Thousands of water tanks have been installed in institutions, mainly schools, for rainwater harvesting and storage mostly in arid counties that have made significant investments in the water sector. Rainwater harvesting reduces water wastage and environmental degradation by storm water.
- De-siltation of existing dams, extending water pipelines, and protecting water catchment areas and sources such as springs enhanced the availability of safe water and reduced distances travelled to access water. For example, Nyamira County reduced the distance of rural accessibility to water from 3 km to 1.3 km.
- In the coast of Kenya, over 600 Ha of mangrove forests were either planted or rehabilitated to protect the coastline and sustain ecosystem services for the coastal communities; this is key for their livelihood resilience and adaptation. The National Environment Management Authority (NEMA) through the Adaptation Fund project distributed 171,045 mangroves seedlings which were planted in both Gazi and Vanga mangrove ecosystems and supported rehabilitation of 2 acres of corals in Wasini.
- The Coastal Oceans Research and Development in the Indian Ocean-East Africa (CORDIO–EA) initiated identification and description of locally-relevant climate smart practices in marine community-based natural resources management (CBNRM) programmes. This area-based protection included, for example, community no-take zones and fishing gear restrictions (mesh size); these have been identified as approaches used in fisheries management that also double up as climate smart practices.
- Awareness and sensitization programmes on water use efficiency continued to be implemented across counties for the purpose of enhancing water harvesting and conservation. Regular inspection of water quality in Nyeri and Kericho counties led to a reduction in waterborne diseases in communities.

4. Forestry, Wildlife and Tourism

Climate change is likely to affect the growth and development of tree species, leading to reduced biodiversity and capacity to deliver important ecosystem goods and services that are necessary for livelihood resilience and climate adaptation. Climate change is also expected to shift wildlife species distribution, reduce population size, and lead to the extinction of some species.

Some key actions that have been implemented in this priority area are highlighted below:

- Kenya has increased forest cover from 6.99 % in 2010 to 8.83 % in 2021, equivalent to 5,226,191.79 Ha of forested area and increased tree cover to 12.13%.
- The Kenya Forestry Research Institute and the Japan International Cooperation Agency implemented an adaptation project between 2012-2017 that aimed to establish a production system of seedlings of indigenous tree species that would be drought-tolerant and suited to the drylands of Kenya. The project coverage was approximately 52.4 ha. The purpose of this project was to develop drought-tolerant native species, Melia volkensii and Acacia tortilis in particular, to contribute to the promotion of productive forestation for various uses. The project activities assisted with the establishment of two clonal seed orchards of Melia volkensii in Kitui and Kibwezi. Seed production from these two orchards produced 4,900 kg of fruit in 2016.
- The World Agroforestry Centre established the Kenya Rangelands Ecosystem Services Productivity Programme to improve the livelihoods of communities and their landscapes by enhancing the productivity of ecosystem services provided by rangelands for food, feed, and human and wildlife security in Laikipia, Samburu, Isiolo, and Baringo. The key activities included: characterisation and inventory of existing types of perennials, their uses as well as existing tree nurseries; establishing community tree nurseries to enable the production of multipurpose tree seedlings for planting by individuals, farmers, and local communities; promoting tree-based investments (such as aloe plants, honey, animal hides, dairy, and fruit trees like mangoes) and enterprises in agroforestry for pasture/feed and food security
- The Kenya Rangelands Ecosystem Services Productivity Programme is also applying findings from rangelands health mapping to identify suitable interventions and engage beneficiaries in implementing agroforestry for climate mitigation and adaptation; design and installation of rain and floodwater harvesting systems for growing trees and improving pasture on croplands and rangelands, and mobilisation of local stakeholders to rehabilitate degraded dryland forests. The key achievements included maps showing the terrain, land use, soils, tree cover, and climate. [100]
- To combat the devastating impacts of climate change in Kenya, the President launched a 15-billion tree campaign in 2022 which also marked the unveiling of the Green Army, an initiative that is engaging the youth in tree growing and environmental conservation.
- The Kenya Forest Service led rehabilitation and restoration of degraded natural forests was done through; enrichment planting of 19,600 Ha of degraded sites within the gazetted forest reserves of Aberdares, Mau, Cherengany, Mt. Elgon,

99 Government of Kenya. (2024).
100 Nation. (2022). Mission15B#JazaMiti: Kenya's President launches 15-billion tree campaign. Nation Media Group. https:// nation.africa/kenya/brand-book/mission15b-jazamiti-kenya-s-president-launches-15-billion-tree-campaign-4063614

Mt. Kenya and Mangroves areas at the Coast; temporary fencing of 1000 Ha of degraded forests and use of 120 community scouts to enhance natural regeneration.

- Similarly, 61,146 Ha of rangeland have been rehabilitated from Opuntia spp invasive species using biological control and 60 acres rehabilitated from Leleshwa (Tarchonanthus camphoratus)
- The Kenya Forest Service developed and deployed the 'Jaza Miti App', a species - site matching tool to enhance tree growing and enable achievement of the 30% tree cover by 2032.
- Over 214 km of firebreaks constructed in Aberdares, Lake Nakuru and Tsavo West National Park.
- Supported the establishment of 52,962 hectares of agroforestry through supply of seedlings and technical advice to farmers to enhance the provision of food, fodder, and fuel wood and livelihood improvement for rural communities in the country
- Kenya's tourism industry is largely based on her diverse and attractive wildlife. But the wildlife is faced with numerous challenges including climate-related impacts such as drought that has killed a significant number of animals and the increased incidences of wildfires; human wildlife conflict due to encroachment in conservation areas and wildlife migratory corridors; and invasive species, among others. Over 2,000 Ha of wildlife habitats have been conserved, so far out of an NCCAP target of 30,000 Ha. Around 80% of wildlife dispersal areas and migratory pathways have also been secured.
- A National Wildlife Climate Change Adaptation Strategy 2022-2032 has been developed to guide holistic adaptation efforts within the sector and to ensure that the country's wildlife is sustainably managed in the face of climate change and continues to support the tourism sector which employs a significant number of people and is a leading foreign exchange earner for the country.[101]
- State Department for Immigration and Citizen Services Introduction of a 3rd Generation electronic ID card and automation of the registration process end to end to replace the traditional paper-based modes of registration. 100 out of 1000 Registration Centres have been installed with Live Capture Units for online capture and transmission of applications for National IDs from field stations to the production centre at Nairobi headquarters.
- Tourism and wildlife policies have been aligned to integrate adaptation measures of climate change across the sector.
- Guidelines for eco-friendly practices, conservation efforts and community engagement have been developed. For example, Ecotourism Kenya Eco-rating Certification Guidelines on sustainability and adaptation to climate change developed
- A climate risk and vulnerability assessment of the tourism sector was conducted leading to a situational analysis report on adoption of sustainable tourism, climate change impact and climate change mitigation and development of Tourism Strategy for Kenya 2021-2025 integrating the adaptation of climate change in the tourism sector.

5. Health, Sanitation and Human Settlements

Climate change is expected to exacerbate the occurrence and intensity of climate-sensitive diseases and may increase their spread in some areas. Climate actions in the health sector is prioritised in the current and past NCCAPs where an integrated approach to climate actions that address sustainable human settlements and health and sanitation services. Actions identified in these priority areas scale up of malaria-control measures, managing other vector-borne diseases; improving planning and development of human settlements, for example by supporting formulation and implementation of urban spatial plans for ease of service delivery and healthy surroundings; and enforcement of climate smart/green cities and building codes and standards for all urban infrastructure.

The following specific actions have been achieved so far:

- To better understand adaptation actions that can improve the climate resilience of the health sector, the Kenya Red Cross Society has conducted a national assessment of climate change impacts, vulnerability, and adaptation for the sector.[102]
- Now Kenya has climate information included in its Integrated Disease Surveillance and Response system.
- Kenya has taken action to reduce the incidence of malaria and other vector-borne diseases that are impacted by climate change.
- Under urbanisation and human settlements, Kenya has prioritised implementation of the Building Climate Resilience for the Urban Poor initiative with a view to building resilience and enhancing adaptive capacity of the urban poor population in cities, municipalities and towns; the programme is progressing with collaboration of national government, county governments, private sector and other actors.
- The Building Climate Resilience for the Urban Poor initiative focusses on delineating and profiling vulnerable urban areas; preparing climate-resilient plans; improving human settlements and climate proofing of infrastructure; developing a green urban economy and livelihood strategies; and strengthening NDC urban dimensions.
- County governments, particularly in ASALs have been putting in place building codes to promote resilience under WASH. For example, building plans in Makueni County require a water harvesting component, which contributes to increased water availability and reduces run-of together with related impacts.
- Under this priority area, children's participation is also taken into consideration. A children's awareness and educational kit developed (Swahili and English versions) targeting school going children and focusing on impacts of solid waste pollution on marine environments and how best they can influence their peers and families.

101 Wildlife Research and Training Institute. (2022). National Wildlife Climate Change Adaptation Strategy 2022-2032.
102 Kenya Red Cross Society. (2021).

- Under human settlements, Slum & Informal Settlements Improvement Projects have been put in place in various urban areas. Through the Slum Upgrading Department, 79 informal settlements regularized; Continuous infrastructure improvements
- As part of the government manifesto, bottom-up development strategy, the affordable Housing Act was enacted in 2023; Currently 124000 houses are under various levels of construction for social, affordable & institutional housing.
- Development of green building guidelines for Kenya - The Government facilitated the 1st National Forum on Buildings and Climate Change in May 2024 that developed a National RoadMap and other adaptation action areas to accelerate and enforce green building code.

6. Manufacturing

The focus of the manufacturing sector is reducing the impacts of climate change on manufacturing activities as well as creating new economic and market opportunities through resource efficiency, sustainable production, and managing waste as a resource in the creation of new product lines from waste recovery and re-use. Overall, the manufacturing and trade sector are addressing adaptation through a variety of short-, medium-, and long-term strategies.

Some of the actions implemented include the following:

- CBIN-K is helping to build the private sector's capacity to invest in adaptation and assisting companies in identifying opportunities for climate-resilient products.
- Water and resource efficiency, sustainable production, and waste management are prioritised as climate adaptation programs in the manufacturing sector.
- The Ethical Tea Partnership, through the Kenya Tea Development Agency, supported 650,000 tea farmers to adopt CSA approaches. Over 40,000 farmers were trained at Farmer Field Schools on climate change impacts and agricultural practices to mitigate its effects. Farmers were supported to plant over half a million drought- and frost-resistant tea clones, which are more resilient to unpredictable weather patterns. Between 2016 and 2018, farmers planted over 1 million trees and a further 2,500,000 seedlings were being raised in tree nurseries.
- As documented in the NCCAP 2nd implementation progress report, Kenya Breweries developed a low-cost beer made from sorghum. This has created new market opportunities for the brewer as well supported over 47,000 farmers from marginal areas to transition from subsistence to sustainable commercial farming.[103]

7. Energy and Transport

The energy and transport sectors have been particularly vulnerable to the impacts of climate change, notably drought and flooding. This often leads to losses and damages that have informed the climate proofing of energy and transport infrastructure. The focus of adaptation actions in the energy sector includes the following:

- Optimising existing hydropower plants, improving water management, and conservation and rehabilitation catchment areas feeding the dams. For example, Kenya Electricity Generation (KenGen) has worked to increase the climate resilience of its hydropower operations by increasing the number of turbines and the storage capacity of dams.
- The Kenyan government has also been supporting the roll-out of off-grid renewable energy technologies to ensure energy is climate smart and used productively
- In the transport sector, the focus is on the establishment of efficient, sustainable, world-class transport systems and logistics services that withstand the projected impacts of climate change.[104]
- The transport sector the Kenya Urban Roads Authority and the Kenya National Highways Authority recognise climate change as a risk and at the subsector level and considerations for climate risk management are incorporated during planning and implementation of new projects.
- KPLC concrete pole usage stands at 22,516 which is a 20.5% of the total pole; replacement of wooden poles ongoing at the 132 kV Rabai - Kilifi transmission line.
- The Energy sector rehabilitated 2,500 Ha of forest that serves the hydro dams in the country, hence protecting the area feeding the dams, as the sector benefits from forestry related eco-benefits
- Climate risk and vulnerability assessments are implicit in the Environmental and Social Impact Assessment (ESIA) studies for proposed projects. Design for infrastructure factors historical extreme data instead of future extreme projections. Retrofitting of affected infrastructure done on need basis. Continuous monitoring of existing infrastructure
- The Kenya National Energy Efficiency Strategy Action Plan is operational, with support to the annual Energy Management awards, the Energy Efficiency Centre (at KAM) and the Public Institutional Lighting audits (133 schools audited across the country).

103 Ethical Tea Partnership. (2019). 3.6 trees and counting-tree planting programmes talks climate risks for tea farmers and counties. https://www.ethicalteapartnership.org/supporting-farmers-to-overcome-the-impacts-of-climate-change/
104 MoEF/CCD. (2021). National Climate Change Action Plan 2018-2022: Second Implementation Progress Report

3.5.2. Gender Mainstreaming in Climate Adaptation

In Kenya the impacts of climate change are not gender neutral. They affect women and men differently given their traditional roles, societal expectations, and livelihoods. Women have increased vulnerability to many impacts of climate change due to their lower incomes, less access to credit, limited decision-making authority, and limited control over resources.[105] For example, the vulnerability level of households in pastoral rangelands is largely determined by the gender and education level of the household head.[106]Women-headed households have been observed to be highly vulnerable to climate change due to lack of ownership and control over productive assets. The role of women as primary caregivers and providers of food and fuel makes them more vulnerable in the occurrence of hazards such as flooding and droughts, which are now common.

Factors such as social status, gender, poverty level, livelihood options, and access to and control of resources influence vulnerability and how different people experience climate change. For women, their vulnerability is reinforced by the existing gender inequalities they face across social, economic, political, and environmental systems, and in turn, this means that women are more likely to be disproportionately affected by climate change.[107] Women's dependence on natural resources for both reproductive and productive activities underscore their vulnerability in the face of increased climatic uncertainty. Kenya's climate risk profile reveals that the impacts of climate change on women are particularly acute in the agriculture and water sectors where they play significant roles.[108] For example, women comprise 75 % of the agricultural labour force in Kenya while across many communities, they are responsible for various domestic outdoor chores e.g., fetching water. During drought, they spend many hours and trek long distances to obtain water for domestic use; while during floods, they spend a significant amount of time searching for firewood. With such levels of vulnerability, instances have been reported where women have resorted to negative coping mechanisms because of hunger.[109]

Children and youth under 35 years of age, who constitute over 75% of the Kenyan population, are the other group particularly vulnerable to climate change hazards such as droughts, floods, and heat stress. Compared to adults, children are less likely to withstand and survive climate-related shocks; are susceptible to associated nutrition deficits; and are more likely to be affected by climate-sensitive diseases. Those with disability or facing displacement often experience additional challenges during extreme weather events.[87] The 2023 short rains assessment report found high malnutrition levels among children aged 6 to 59 months across ASALs due to the cumulative effects of previous five failed rain seasons, poor child feeding habits, and high disease burden.[110]

Women and other vulnerable groups (including orphans, persons living with disabilities, the aged, widows, widowers, internally and externally displaced persons, marginalised persons, and pastoralists living in ASALs) are particularly vulnerable to a changing climate and often have the least access to and control of resources (such as capital, credit, and land). Some vulnerable groups live in areas exposed to climatic hazards and risks (such as arid lands and urban poor areas) and are less able to cope with climate shocks and stresses.

The following progress has been made on priority adaptation actions and opportunities for GESI:

- Strengthening the adaptive capacity of vulnerable groups:
  - **a.** Indigenous knowledge has been incorporated in research-based innovations for livelihoods support among vulnerable populations facing negative impacts of climate change.
  - **b.** Through capacity building, the Regional Development Authorities encourage farmers to form farmers associations/cooperatives to ease supply of agricultural produce such as mangoes, rice, tomatoes, honey, milk production etc to their factories thereby reducing post-harvest losses. Cooperatives comprising women groups, youth and PWDs are given priority. [111]
- Awareness creation on indigenous people's issues in relation to climate change and meaningful participation in climate change planning:
  - **a.** Voice of change project to raise awareness of the issues of climate change in Baringo county.[112]
  - **b.** Highlight indigenous peoples' roles in managing climate risks in energy production and transport systems
- Securing land tenure system of indigenous people:
  - **a.** Registration of community lands Since a bulk of indigenous people occupy community land, it is prudent to facilitate registration of their land to enhance their tenure rights and autonomy of decision.
  - **b.** Foster community-driven participatory mapping and documentation of indigenous lands to protect against unwarranted project encroachment.
  - **c.** Pre-emptive and responsive actions to climate change:
  - **d.** Review of the agriculture sector gender policy to provide guidance on gender mainstreaming in climate change and food security interventions
- Enhance youth access to finance for climate change adaptation activities
  - **a.** Built capacity of youth in bankable proposal development
  - **b.** Provide start-ups for identified business opportunities / models
  - **c.** Supporting youth in agribusiness programs across the country[113]
  - **d.** Offer climate focused grants and subsidized loans to support youth led start-ups and innovative ideas in

105 MALF. (2016). Climate Risk Profile for Siaya. Kenya County Climate Risk Profile Series. https://cgspace.cgiar.org/rest/ bitstreams/119954/retrieve
106 Government of Kenya. (2023).
107 Opiyo, F. E., Wasonga, O. V., & Nyangito, M. M. (2014). Measuring household vulnerability to climate-induced stresses in pastoral rangelands of Kenya: Implications for resilience programming. Pastoralism, 4(1): 1-15.
108 undp-ndcsp-kenya-gender-analysis-report.pdf
109 World Bank Group. (2021). Climate Risk Profile: Kenya. https://climateknowledgeportal.worldbank.org/sites/default/ files/2021-05/15724-WB_Kenya%20Country%20Profile-WEB.pdf
110 MoEF/CCD. (2021). NCCAP Second Implementation Status Report.
111 GoK. (2018). National Climate Change Action Plan 2018-2022. Nairobi: Ministry of Environment and Forestry. https://faolex.fao.org/docs/pdf/ken190169.pdf
112 https://www.cgiar.org/news-events/news/voices-of-change-community-stories-of-climate-adaptation-in-baringo-kenya/
113 https://foundation.co-opbank.co.ke/pillars/youth-in agribusiness/#:~:text='Adoption%20of%20Agribusiness%20and%20use,is%20produced%2C%20distributed%20and%20consumed.

youth led manufacturing activities

- Support for youth innovations in climate change interventions towards entrepreneurship and creation of green jobs:
  - **a.** Develop entrepreneurship/incubation hubs for youths
  - **b.** The Enhancing Opportunities for Women's Enterprises programme including youth with the aim to boost development of women's businesses[114]

3.5.3. Support and Implementation Needs

1) Financial Needs

Kenya requires sustained investment in adaptation and resilience building going forward. Adequate and sustained finance is needed to allow for successful and best practices to be taken to scale. As per the updated NDC of 2020, the total cost of implementing the adaptation actions up to the year 2030 is estimated at USD 44 billion.[115] Out of this, Kenya's expects to mobilise approximately 13% from domestic sources while the balance requires international support. Climate finance provided in form of loans will be treated as domestic contributions.

Although Kenya has made progress to access international climate finance for adaptation, financing remains inadequate and unpredictable due to a number of challenges including complex and demanding climate finance access requirements and procedures; mitigation-centric international climate finance flows; and substituting Official Development Assistance (ODA) for adaptation finance. To facilitate adaptation finance access, Kenya is already implementing readiness actions towards enhancing mobilisation of predictable financial resources, such as through the FLLoCA program which supports counties with climate finance readiness. Other efforts include an enabling policy and legislative environment, and development of the Green Fiscal Incentives Policy Framework.

Additionally, apart from the financial needs required for the implementation of priority adaptation actions, financial support is required for Kenya's NAP process. This includes updating the NCCAP and NAP, undertaking climate risk and vulnerability assessments, coordinating adaptation action including stakeholder engagement and other related activities. The NCCAP 2023-2027 noted that the CCD requires approximately KES 500 million (about USD 3.8 million) annually to carry out its duties and functions to ensure effective coordination and delivery of NCCAP 2023-2027; previous NCCAPs have had huge gaps in financing for adaptation action.

Some specific financial needs are highlighted below:

- Under the Disaster Risk Management priority area, the need for enhanced support for early warning and early/ timely response to climate risks requires financial resources to expand early warning systems to other counties especially in non-ASAL parts. Financial support should be predictable for consistent climate action – current funding is focused on projects and short-term funding.
- For food and nutrition security, financial support is required to scale breeding and the use of improved agricultural inputs such as drought resistant livestock breeds and crop/feed varieties as well as to de-risk investments in the agriculture sector, for example, through tailored crop and index-based livestock insurance. There is also a gap in financing to downscale climate information services and early warning systems which have been identified as vital for climate-smart agriculture and assisting effectiveness of crop and livestock insurance as well as disaster risk reduction for the agriculture sector. Another area with significant funding gaps is research and development specifically tailormade research in livestock breeding, genetics, livestock diseases and feeds and feeding to guide on genotype environment matching. Similarly, the country is unable to commit sufficient financial resources to revitalize agricultural extension services.
- Under water, fisheries and the blue economy, funding estimated at Ksh. 250 billion is required to support climate resilient irrigation and water Infrastructure, and a similar amount for climate resilience building through, water supply and sanitation, Infrastructure estimated at Ksh 250 billion.
- The forestry sector is in need of financial resources to develop an MEL system for adaptation monitoring and evaluation, which remains a key gap.
- For the Tourism sector, financing for implementation of The Reviewed Strategic Plan for Tourism and Wildlife 2023-2027 which integrates adaptation of climate change in the sector.

2) Technology Development and Transfer Needs

Kenya carried out technology needs assessments in 2005 and 2015. The findings identified environmentally sustainable technologies such as solar dryers, drought tolerant crops, water harvesting, and efficient irrigation technologies.

Kenya is well-placed to build on its success with M-Pesa and other mobile money applications to improve farmers' access to credit for procuring adaptation technologies, to improve access to CIS, and to improve access to training. Kenya welcomes support to explore expanding this learning on mobile applications to other sectors and products.

Kenya has deployed adaptation technologies with some degree of success, but the rate and scale of adoption remains low due to a number of challenges including limited awareness, high cost of interventions, low investment, and inadequate installation and maintenance. Other challenges include weak policies and standards. Support is therefore required to support awareness, and development of and adapting the needed technologies to the local context. This will require continued capacity building for and engagement of the private sector.

114 https://a.storyblok.com/f/191310/a0b546360a/success-20stories-20flow_compressed.pdf
115 GoK. (2020). Updated NDC

Technology transfer needs for different priority sectors are summarised below:

- For disaster risk management, there is need for Limited Predictive Modelling and Analysis Tools. While advancements have been made, predictive models still struggle with accurately forecasting droughts due to their complex nature. This is particularly true for multi-year or prolonged droughts, where factors like climate variability (e.g., El Niño) add complexity.
- There is a need to create capacity for domestic earth observation data management for drought/climate early warning, to complement and eventually replace external open-source systems and data sources.
- Under food and nutrition security, there is increasing need for development or adoption of digital applications to support actions in the value chains that enhance climate adaptation and resilience by contributing to Climate Smart Agriculture.
- As climate change impacts the oceans through warming and other changes like sea level rise, the water and blue economy sector is in need of oceanographic and environmental monitoring technologies needed to monitor the health of Marine ecosystems and related resources for appropriate adaptive response.
- Under forestry, adoption of the 'JAZA MITI APP' on monitoring the progress of the planted trees was a great innovative idea which requires further scale up, particularly to local levels where communities and climate planning structure at the Ward levels can put it into use. The sector is also in need of development of technologies on dryland tree species, efficient utilization of wood and non- wood forest products to reduce pressure on forest ecosystems and enhance their adaptive capacity.
- For Manufacturing, Energy and Transport, there needs to be establishment of real-time, automated, and integrated early warning systems for climate-related hazards that cater to industrial operations, energy infrastructure, and transport systems. Deployment of advanced energy storage systems to enhance grid flexibility and support renewable energy integration is also seen as a gap in the energy sector which hampers the role of renewable energy in supporting adaptation.
- Promotion of affordable climate-smart and energy-efficient technologies for industries and decentralized renewable energy storage at the household, community levels and national levels
- Under manufacturing, there is a gap in access to technology for equipment design, prototyping and fabrication to serve the growing market and encourage local production with locally available suitable substitutes for machine parts for cost effective designs and reconditioning to fit purpose.

3) Capacity Building Needs

While key institutions and the related arrangements that support climate adaptation activities have been established, capacity development is still essential for these institutions as well as other relevant public and non-state actor institutions to deliver on adaptation actions. Towards this end, a critical mass of knowledge and lessons on climate risks and vulnerabilities is being accumulated through several initiatives. These include the Kenya County Climate Risk Profiles prepared for 45 counties by the by Ministry of Agriculture, Livestock, Fisheries and Co-operatives (MALF&C) with support of the International Center for Tropical Agriculture and the CGIAR Research Programme on Climate Change, Agriculture and Food Security; the Climate Risk Profile Kenya prepared by the World Bank in 2021; assessment of climate change impacts on health by the Kenya Red Cross, 2021; Kenya Climate Smart Agriculture Programme (KCSAP) and the evaluation and monitoring process of the CSA Multistakeholder Platform; and assessments at different levels undertaken by academia and research institutions.

Kenya has created a publicly accessible National Climate Change Resource Centre (NCCRC) that includes a robust and up-to-date climate change knowledge management system, and an updated climate change information portal with platforms for children, the youth, women, and marginalised and minority communities. The business plan for NCCRC was in place by the end of 2020 and the resource centre became operational in 20XX and was refitted in 20XX to enable access for persons with disabilities. Support is needed for continued capacity building for the individuals from national and county governments, CSOs, and the private sector that are engaged on adaptation planning and especially implementation of actions on the ground. Areas for capacity development include:

- Building capacities of climate change sector coordinating units at national and county levels on climate risk and vulnerability assessments, adaptation planning, and reporting.
- Building local capacity to implement adaptation actions and programmes, to reduce reliance on international organisations and consultants and enable local entities (government and non-government) to access climate finance and lead the implementation of adaptation projects and programmes.
- Establishing or strengthening monitoring, evaluation, and learning systems to support the tracking of progress on adaptation action at national and county levels, to improve understanding of the impacts of adaptation actions, and to improve the sharing and communication of learning on adaptation.
- Strengthening the capacity of relevant institutions to map, collect, and collate gender disaggregated information to inform the design and implementation of adaptation actions.
- There is a need for enhanced capacity for multi-channel dissemination and multi-dialect translations of climate information, adaptation plans and other key components for disaster risk reduction and adaptive capacity including accessibility to PWD.
- For effective disaster risk management, there is need to expand capacity for production and dissemination of monthly drought early warning bulletins for the traditionally non-ASAL

counties scaling up from the current 23 ASAL counties to reach the other 24 counties in the country.

- There is need to build the capacity for sharing lessons between counties towards scaling the development and roll out of tailored early warning systems e.g., monthly national drought early warning bulletins (ASALs).
- There is also great need to strengthen the capacity of extension services along the value chains for food and nutrition security, particularly for support to climate-smart agriculture in the face of intensifying risks. This would go hand in hand or contribute to the need to introduce capacity building programs for communities on climate-smart agricultural practices.
- Conducting capacity building in indigenous knowledge, livestock insurance schemes, early warning systems, livestock management and breeding have all also been identified as key for adaptive capacity in the agriculture sector.
- For enhanced capacity on adaptation, there needs to be established a climate change unit in the State Department for Tourism.
- In the Manufacturing sector, capacity development is required on project concept development to integrate adaptation needs as a way to unlock adaptation financing. The same is critical for the energy and transport sectors were participatory climate risk assessment for proposed projects in now an important need considering the impact of climate-related hazards in those sectors.
- The awareness and capacity of communities to participate in climate risk assessments and decision-making processes in industries, energy, and transport projects needs to be enhanced.

3.5.4. Monitoring and Evaluation of adaptation actions and processes

Monitoring, evaluation and learning (MEL) of adaptation is necessary to demonstrate that the benefits of adaptation interventions are being realised and that lessons learnt are assisting in the improvement of sector adaptation plans and programmes. The Climate Change Act 2016 provides for the coordination of Measurement, Reporting and Verification (MRV) processes by the CCD. NCCAP 2013–2017 provided a National Performance and Benefit Measurement Framework (NPBMF). The NPBMF was intended to be an integrated framework for MRV of mitigation action and monitoring and evaluating of adaptation actions, reporting on the synergies between them, and tracking support provided to undertake the actions. The system is also referred to as MRV+. Aspects of the system have been operationalised, including actions related to the MEL system for adaptation. The CCD prepared two reports on progress on the implementation of NCCAP 2018–2022, and an evaluation of the progress of implementation of the NAP in the agriculture sector.[115]

According to the report on the implementation of NCCAP 2018–2022, the adaptation M&E system was supposed to be fully functional by June 2023, setting out institutional structures and role of stakeholders in reporting; similarly, a climate registry for adaptation actions was supposed to be established with information publicly available. These actions have been slow in implementation based on capacity needs issues addressed in section 5.3. However, a short-list of county level adaptation indicators has been identified as part of the current NCCAP 2023 – 2027.[116]

3.5.5. Cooperation good practices, experience and lessons learned

Efforts to share information, good practices, experience and lessons learned:

- Science, planning and policies relevant to adaptation: Joint initiatives/ partnerships in adaptation science, planning and policy development have been implemented over the past years of adaptation implementation including:

a. The Adaptation Consortium brought together local organizations and international organizations working with county governments, NDMA and the Kenya Meteorological Department to make use of Climate Information Services to inform adaptation planning and financing through the County Climate Change Fund Mechanisms (CCCF).

b. Multistakeholder platforms have been established to champion dissemination of climate adaptation good practices. An example is the Agriculture (Food and Nutrition Security) sector where there has been documentation and sharing of experiences and lessons learned in Climate Smart Agriculture MSP.

c. Policy innovation and pilot and demonstration project: The Kenya Cereals Enhancement Programme (KCEP)–Climate Resilient Agricultural Livelihoods (CRAL) Window (KCEP-CRAL), a strategic Government of Kenya (GoK) partnership with European Union (EU) and International Fund for Agricultural Development (IFAD), Food Agricultural Organization (FAO), and World Food Programme (WFP) focused on the three leading rain-fed cereals (maize, sorghum and millet) and pulses (beans, cowpeas, green grams and pigeon peas) that account for 95% of the land under food crop production and 70% the value of food crops produced annually. Based on this programme, jointly implemented by these actors, some good practices were developed e.g. soil fertility management curriculum and training materials developed on the 3 crops that can be replicated in other crops. The experience demonstrated that

116 Government of Kenya. (2021). National Climate Change Action Plan: Second Implementation Status Report for the FY2019/2020. Ministry of Environment and Forestry, Nairobi, Kenya.

a more holistic programme/project design that addresses cross-sectoral adaptation needs is more impactful.

- Cooperation to share information and to strengthen science, institutions and adaptation: The ICPAC GHACOF and KMD Multi- stakeholder seasonal outlook forum is an example of cooperation for sharing of best available science for adaptation based on the good practice of structured downscaling and dissemination of weather and climate information accompanied with sector-specific advisories. One important lesson from this collaboration is that co-production of weather and climate information together with sector specific advisories makes the information relevant, acceptable and understandable. Production and dissemination of early warning information with sufficient lead time saves lives and livelihoods.
- Improving durability and effectiveness of adaptation actions: The County Climate Fund Mechanism (CCCF) piloting and its scale up through FLoCCA programme has provided a key framework and lessons on implementation of climate action through key local level multi-stakeholder partnerships that prioritise important grassroot structures and actors, particularly communities. Establishment of an enabling legal, policy and institutional framework on which adaptation actions are anchored both at the national and sub-national levels is a notable good practice that is now replicated across all the 47 Counties in Kenya. A multi-stakeholder collaboration involving both government and non-state actors working within existing governance structures at both national and sub-national levels armed with enabling policy environment is key for achievement of adaptation at scale.

Strengthening scientific research and knowledge related to adaptation:

- Climate, including research and systematic observation and early warning systems, to inform climate services and decision-making: Apart from the mentioned collaboration in climate information service provision through development and dissemination of forecasts, there is also a multisectoral approach in design, research and early warning systems in Kenya. Timely and accurate climate information important for sound decision making is now provided through County PSPs for seasonal forecasts and advisories. It has been learnt that downscaled advisories packaged in ways the end user can decipher is critical for efficient research, systematic observation and early warning systems across key sectors.
- Vulnerability and adaptation: Through the FLoCCA programme, the County Climate Fund Mechanism (CCCF) delivers climate finance based on sound resilience action planning informed by Participatory Climate Risk Assessments (PCRA). The participatory approach used is deliberate about including all actors including the marginalized groups in PCRA, planning and implementation of adaptation actions.
- Monitoring and evaluation: Participatory stakeholder engagement in the development and piloting of the CSA M&E framework and tool. Stakeholders such as the state departments, CSOs, private sector, and research organizations, provided input including in defining appropriate indicators and mapping various responsibilities in providing data on adaptation actions and achieved results.

3.6. Information related to averting, minimizing and addressing loss and damage associated with climate change impacts

3.6.1. Observed and potential climate change impacts, including those related to extreme weather events and slow onset events, drawing upon the best available science.

Heavy rains, floods, droughts, soil erosion, and sea level rise put both urban and rural infrastructure at risk, particularly for poor and vulnerable groups. Environmental degradation, altered water resources, and loss of biodiversity and ecosystem services constitute serious obstacles to the country's continued development, of particular relevance to the country's tourism sector. In addition, rising temperatures will have a negative impact on key parts of the economy, e.g. forestry, agriculture, and livestock. Changes in precipitation patterns can have far-reaching consequences for ecosystems and biodiversity, food production, the water industry and rivers. [117]

The majority of Kenyan agriculture relies on seasonal rains for production and the projected changes in precipitation patterns are expected to directly increase the likelihood of short-term crop failures and long-term production declines. Rain-fed agriculture remains the dominant source of staple food production and is the foundation of livelihoods for the majority of the rural poor in Kenya. The high inter-annual variability of precipitation is already having devastating consequences on rural livelihoods, with droughts and floods a frequent occurrence in both the arid and semi-arid lands and key agricultural zones.

3.6.2. Activities related to averting, minimizing and addressing loss and damage associated with the adverse effects of climate change

117 National Environment Management Authority (2015). Kenya- Second National Communication to the United National Framework Convention on Climate Change. URL: https://unfccc.int/sites/default/files/resource/Kennc2.pdf

Loss and damage refer to impacts of climate change that are unavoidable by adaptation, mitigation, and other strategies like disaster risk reduction. It is focused on long-term, irreversible losses, like the loss of life and means of subsistence, biodiversity, culture, etc. Loss and damage addresses effects that adaptation alone is unable to sufficiently address as a policy response.

Under the UNFCCC, loss and damage is categorised as the remaining costs that cannot be avoided even with adaptation and mitigation and can be further divided into economic loss and non-economic loss. These more specifically refer to the negative consequences of the unavoidable risks of climate change, like rising sea levels, prolonged heat waves, desertification, and extreme events, such as bushfires, species extinction and crop failures.[118] These have all been observed in Kenya and as the climate change progresses these events more frequent and their consequences will become more severe considering the high levels of vulnerability in the country.

A brief overview analysing the nature of Loss and Damage in Kenya highlights that the country has experienced various natural hazards that have resulted in huge losses and caused serious damage to the existing infrastructure, lives and livelihoods. Economic losses attributed to climate change impacts are estimated to be between 3% – 5% of the GDP per year with projections indicating it may rise to about 9% of the GDP per year in 2050. Table 3.18 summarises some activities being implemented across some sectors in Kenya that may help avert, minimise or generally address loss and damage:

Table 3.16: Loss and Damage per Priority Sector in Kenya

Sector	Loss & Damage
Disaster Risk Management	• Water levels of lakes in Kenya's Great Rift Valley increased significantly, hurting local communities and ecosystems. Losses and damages associated with the rising water levels in Kenyan lakes include submerging of land resulting in losses, damage to properties and businesses/livelihoods, and displacement of households. • Several sectors were affected by floods resulting from the March - April – May (MAM) rainfalls of 2024. Overall, 35 counties were affected, 315 people died, 188 people injured,35 people missing, 58,641 House Holds displaced, 412,763 people affected, 291 Internally displacement camps (IDP) were created, over 10, 131 people were rescued. • Preliminary livestock mortality estimates of 2.6 million deaths of assorted livestock was recorded at the peak of the 2021 – 2023 drought. During this period, drought response consumed over KSh .70 billion (GoK KSh. 22 billion; Non-state Actors KSh. 48 billion), a significant diversion of resources that would be otherwise support development and resilience/preparedness investments. • For this sector, the total estimated recovery budget for the sector is Ksh. 1,697,140,000 with agriculture and livestock budgets amounting to Ksh. 525,140,000 and Ksh. 1,172,000,000 respectively.
Food and Nutrition Security	• In the livestock sub-sector, the poor rains, combined with the effects of the prolonged dry spell and drought due to climate change have affected rangeland and water availability for pastoralists, resulting in diminished forage and livestock deaths, reduced household incomes, and increased food insecurity. • Recent flooding event during the 2024 MAM long rains led to total of 9,637 livestock being washed away in thirteen (13) Counties. These included 5,856 poultry, 372 cattle, 2,480 goats, 524 sheep, 2 donkeys, 22 camels and 318 pigs. • An estimated 298,673 acres of agricultural land was heavily affected by floods in 26 Counties. Over 52,707 households were directly affected by MAM 2024 Long Rains floods with an estimated loss of Ksh. 5,252,000,841 in agricultural investment.
Environment (Ecosystems and Biodiversity)	• Submerging of riparian vegetation due to water rise in Great Rift Valley lakes with dire impacts on the existing fauna and flora
Health, Sanitation and Human Settlements	• The rising water levels of the Rift Valley lakes led to loss of lives and livelihoods, injury, outbreak of diseases. • During the 2024 MAM rains, sixty-eight (68) Health facilities were affected in twelve (12) counties by flooding, road closures, leaking roofs, destroyed pit latrines, and collapsed perimeter walls. The health sector infrastructure affected, and the recovery cost is estimated at Ksh. 8,435,000.
Energy and Transport	• The Kenyan railway network consists of 592 km Standard Gauge Railway (SGR)and 2,046 km Meter Gauge Railway (MGR). Both were adversely affected by flooding at various points in 2023, including extensive erosion of embankments, cut slopes and culvert outlets. Total cost of damage for MGR was KSh 1,297,908,422. Total cost of damage for SGR was estimated at Ksh 851,347,200. • A total of 799 road sections/links have been severely damaged by flooding in 2023. The estimated cost of the damage to roads network was Ksh 26,805,056,121.

118 Government of Kenya. (2023)

Wildlife and Tourism	• Change in water levels rendered most parts of the Rift Valley lakes less aesthetic, hurting income from tourism. • Bursting of Telek river, Mara River and Sand River in recent 2024 flooding episodes caused submersion of hotels and lodges in Mara Game reserve while also destroying bridges connecting to settlement and tourist facilities. The flooding also affected 26 camps with minor destructions out of the over 150 camps in the Mara.

Activities related to averting, minimizing and addressing loss & damage

The loss and damage from rain-related flooding led to the formation of a National Floods Emergency Response Secretariat based at the National Disaster Operation Centre (NDOC) which was mandated to:

i. Document and report all flood disaster information from across the country.

ii. Provide Early Warning information, flood alerts, flood preparedness, safety and emergency response information to stakeholders and the public.

iii. Mobilize resources and combine capacities at all levels of government to respond to crises.

Other actions taken to address loss and damage include:

iv. Modernization of the NDOC to enhance Early Warning Systems taking advantage of widespread access to ICT and other technology that provides avenues for collection, collation, processing and timely dissemination of information done by July 2023.

v. Strengthened climate information dissemination by KMD. For example, during the MAM rainfall in 2024, KMD issued daily, weekly and monthly updates as well as 9 Flash Messages for emergency. Over 35 million Short Message Services (SMS) communications were also delivered for early warning targeting vulnerable areas.

3.6.3. Institutional arrangements to facilitate the implementation of the activities

In response to the pressing need to tackle loss and damage, Kenya proposes the establishment of National Loss and Damage Focal Points (or Focal Institutions). These entities, with advice and guidance from the Technical Expert Group (TEG), would be responsible for ensuring the operationalization of loss and damage initiatives on the ground. These initiatives would be aligned with thematic areas agreed upon in Decision 2/CMA.2.[119]

These include:

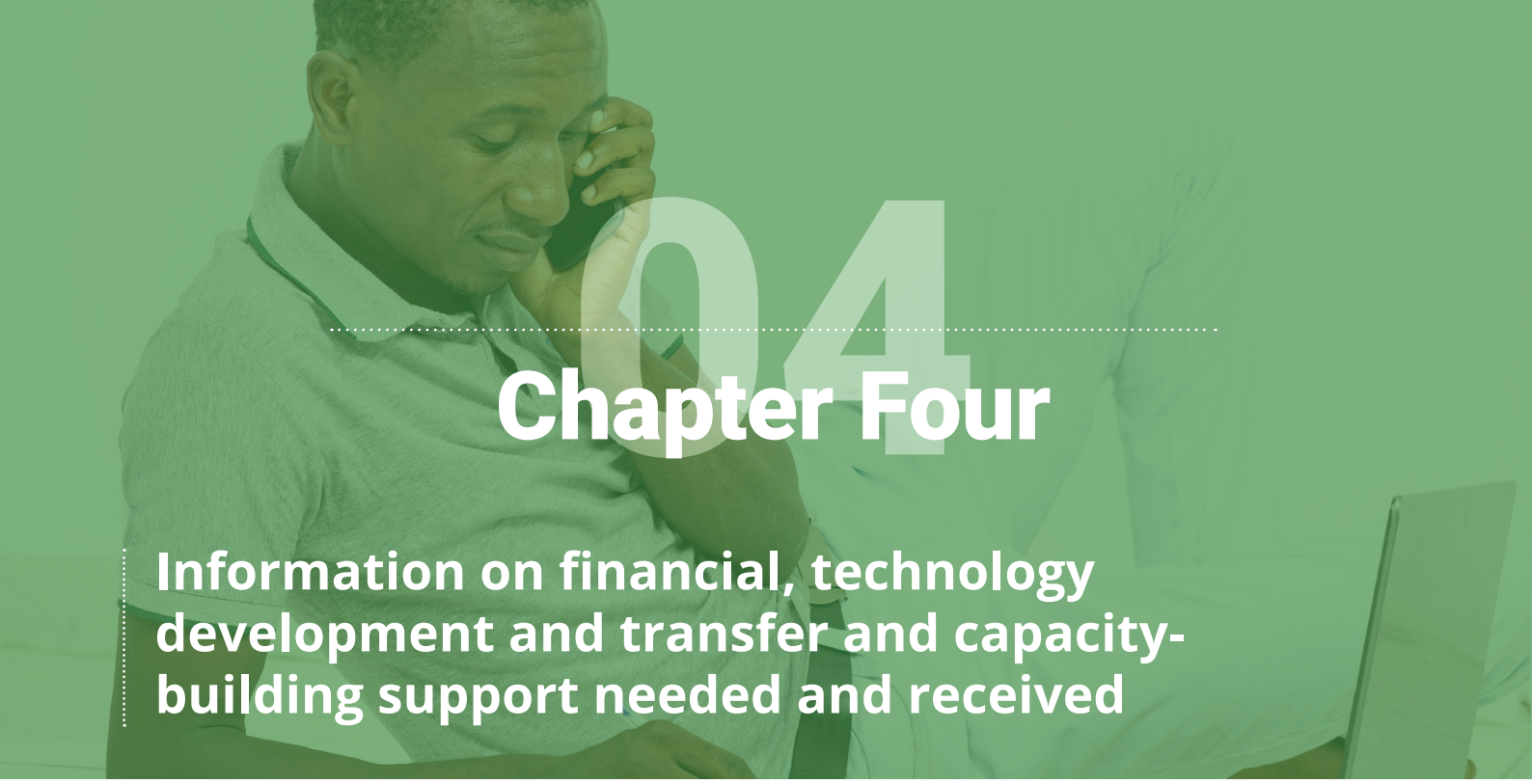
a. Risk assessments, including long-term risk assessments, of climate change impacts.

b. Approaches to averting, minimizing and addressing loss and damage associated with the risk assessments referred to in (a).

c. Resources available for supporting such approaches.

d. Monitoring systems for assessing the effectiveness of these approaches.

119 Decision 2/CMA.2 Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts and its 2019 review | UNFCCC



04 Chapter Four

Information on financial, technology development and transfer and capacity-building support needed and received

4.1. National circumstances, institutional arrangements and country-driven strategies

National Circumstances

Kenya is highly vulnerable to climate change largely due to the climate-sensitive nature of its economy with the agriculture, water, energy, tourism, and wildlife sectors being critical in overall economic output. Several environmental, physical, economic and social factors contribute to Kenya's high climate vulnerability. These include declining natural resources such as water, insecure land tenure, environmental degradation and inadequate environmental management actions, varying ecological zones with different exposure levels, inadequate social safety nets, increased social conflicts over increasingly limited natural resources like water and pasture during dry seasons and high reliance on natural and weather factors for productivity across various economic sectors. These are amplified further by socio-economic factors such as high poverty levels, rapid population growth and fiscal constraints.

Climate change significantly increases Kenya's exposure to risks resulting in multiple and evolving climate change needs. In addition to adaptation and mitigation needs, Kenya faces loss and damage, and just transition needs. Impacts of response measures of developed countries are continually having a bearing on Kenya's economy.

Drought and floods are the main climate hazards, negatively impacting lives, livelihoods, economic output and human health increasingly being at risk. Extreme climate events cause significant loss of life, adversely affecting the national economy. Sea level rise is already affecting coastal towns and communities and is expected to impact communities with coastal erosion and wetlands loss characterizing negative impacts in coastal areas.

Kenya requires USD 62 billion for mitigation and adaptation actions across sectors up to 2030. Kenya will mobilize resources to meet approximately 13% of this budget, requiring international support for the balance. The international support required is in the form of finance, technology development and transfer, and capacity building to fully realize her NDC. Kenya will consider any climate finance in terms of loans as part of its domestic contribution.

Institutional arrangements

The Climate Change Act, 2016 established a robust institutional framework for Climate Change governance in Kenya. At the apex, the Act established a National Climate Change Council chaired by the President of the Republic of Kenya to provide an overarching national climate change coordination mechanism and ensure the mainstreaming of climate change functions by the national and county governments. The Climate Change Directorate is the lead agency of the government on national climate change plans and actions to deliver operational coordination.

The National Climate Change Action Plans. which are periodically reviewed, serve as the strategic blueprint guiding Kenya's mitigation and adaptation efforts, ensuring alignment with Nationally Determined Contributions (NDCs) under the Paris agreement. Each state department and national government public entity is mandated to integrate the Climate Change Action Plans into sectoral strategies and action plans and report on sectoral greenhouse gas emissions for the national inventory. County governments are equally mandated to integrate and mainstream climate change actions into their planning processes, taking into account national and county priorities. A County Executive Committee Member appointed by the Governor coordinates climate change affairs at the County level and is reporting for reporting on progress of implementation of climate change actions to the County Assembly and the Climate Change Directorate.

Further, the National Policy on Climate Finance (2018) and The National Green Fiscal Incentives Policy provides clear direction on mechanisms for enhanced mobilization of climate finance from all sources. The Climate Finance and Green Economy Unit at the National Treasury and Planning is responsible for coordinating climate finance mobilization and reporting in the country.

Country-driven strategies

Kenya's country driven approach is embedded within Kenya's climate change legal and policy frameworks that set national climate change priorities identified through sectoral needs' assessments and stakeholder consultation processes. The frameworks designate sector level actions that require support and form the basis for to address climate change.

The country recognizes the importance of developing needs-responsive interventions that enhance adaptive capacities, build resilience to climate change and reduce greenhouse gas emissions. In principle, all climate actions must be country driven, and country owned, developed in a manner that is in line with national climate plans and priorities in consultation with national and county governments' institutional structures, and stakeholders.

Kenya underscores the crucial importance of means of implementation in driving successful implementation of climate action in line with national commitments. The country explores and adopts technologies as well as requisite capacity strengthening efforts to facilitate effective delivery of impactful actions. Examples of these technologies include drought-resistant crops and renewable energy solutions, access to which is facilitated by collaboration with international partners. There are still technological gaps across sectors and a need for further technology transfer to enable the full implementation of the NDC and a just transition

Kenya also undertakes capacity–building efforts which are equally crucial for climate action. Training programs, technical assistance, and community engagement initiatives are designed to enhance the adaptive capacity of local institutions and communities. These efforts ensure that climate actions are sustainable and locally driven. However, capacity building initiatives often struggle with inadequate funding, lack of infrastructure, insufficient human resources and inadequately address institutional capacity gaps.

Financial resources are critical to Kenya's adaptation and mitigation strategies. The country has made significant strides in mobilizing climate finance from both domestic and international sources. However, there remains a huge gap between finance needed and what is availed. This gap leads to delays and comprises the effectiveness of efforts to address climate change. Additionally, Kenya.

4.2. Underlying assumptions, definitions and methodologies

In determining support received, Kenya makes the following:

Assumptions

1. On-budget and off-budget support was considered in this BTR, acknowledging existing limitations in off-budget support tracking and data compilation that require more complex and detailed tracking practices to be developed over time. On-budget support refers to financial support received directly into Kenya's budget from international sources. Off-budget refers to financial and in-kind (technological and technical assistance) resources received by the government through non-governmental channels or offered directly to government agencies without direct financial input to the national budget.
2. Following the explanation above, we assume that Kenya received the full sum of indicated amounts within the January 2021 to December 2022 period into the national budget.

Definitions and methodologies

3. Only core climate change support is considered as support received. In this BTR, Kenya considers support received from projects whose main(core) objective is climate change mitigation and adaptation that are designated under the NDC. Development projects with climate benefits have not been considered due to challenges in determining additionality.
4. The BTR report only considers finance received and expended (used) in contributing to the objectives of the NDC.
5. In principle, concessional loans received to support core climate change projects shall count as Kenya's climate finance contribution. Kenya does not count market-rate loans (commercial loans) as climate finance.
6. Financial resources from the ex-chequer (internal budgetary allocation) are counted as Kenya's own contribution.
7. To avoid double counting, this report has not considered information on support provided to Kenya based on the OECD/DAC data. This data will, however, be considered in future reports after Kenya develops an elaborate tracking system for climate finance.
8. Information on non-monetized climate support received has not been included in the report. This is due to a lack of adequate information and data.
9. The average exchange rate for the dollar for the reporting period is Kshs.109.

4.3. Information on financial support needed

Kenya conducted a technical analysis of the resources required to meet the country's NDCs' targets. The technical analysis evaluated the national and sectoral policies, plans, and strategies including identified priority actions to inform data driven decisions based on evidence and analytics. To complement the technical analysis, data from available sectoral reports was assessed allowing for the extraction of meaningful insights to better understand Kenya's priorities in scaling up climate action in meeting our NDC targets.

The NDC targets cut across different sectors including disaster risk reduction, agriculture (crops, livestock, and fisheries), environment, gender, youth, and other vulnerable groups, as well as devolution.

Overall, Kenya requires USD 62 billion until 2030 to support implementation of NDC targets. Of this amount, mitigation actions for the period 2020-2030 require an estimated total of USD 17,725 million with designated sectoral financial totals as follows: Energy USD 8,890 million, Agriculture 250 million, Transport and infrastructure USD 4,240 million, LULUCF USD 4126 million, and waste USD 39 million. Of the total mitigation finance needed, Kenya intends to shoulder 21% (3,725 million USD) from domestic sources subject to national circumstances, while the balance of USD 14,000 million (79%) is to be covered by international support. Adaptation remains a key priority for Kenya. To meet its adaptation costs for the period 2020-2030, Kenya requires an estimated USD 43,927 million. Subject to national circumstances, Kenya intends to mobilize 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.

4.4. Information on financial support received

Kenya has received a total of about USD 508 Million in this BTR period. This constitutes both on-budget and off-budget support. The on-budget support accounts for 89% of the total sum which is USD 457 Million. USD 53 Million was delivered as grants, USD 365 million was in loans. In line with Kenya's NDC definition of climate finance, the USD 365 million received as loans (both concessional and commercial) shall be counted towards Kenya's contribution. Off-budget support amounted to USD 51 Million. This amount is not representative of the full support received during this period due to limitations in tracking various bilateral initiatives in Kenya. Kenya acknowledges the need to design and strengthen off-budget tracking mechanisms and the importance of international support towards this objective within the scope of availing support for reporting and building Monitoring, Reporting and Verification systems.

4.5. Information on technology development and transfer support needed

Kenya's technology development and transfer support needed is included in sectoral costs indicated in section 4.3 as estimated finance needed to support technology development, and adoption. However, the methodology does not distinctly separate specific support needed for various technologies from the earmarked priority actions. Therefore, this BTR does not include specific finance needed for technology development and transfer.

Kenya considers the development of a Technology Action Plan as an important intervention to assess the technological costs of various technologies identified in the NDC.

4.6. Information on technology development and transfer support received

Kenya has received technology-specific support through the Kenya Industrial Research and Development Institute (KIRDI), the National Designated Entity for the technology mechanism of the UNFCCC. The financial support received for the period 2021 to 2022 for technology development and transfer is USD 816,860.80. Details of the projects are provided in the Common Tabular Format tables.

4.7. Information on capacity-building support received

The support required for capacity-building initiatives during this BTR period is included in the total support needed (USD 62 billion) as outlined in section 4.3. Specific costing of capacity building needs across each NDC target sector was not available.

4.8. Information on capacity-building support received

Kenya has received a total of USD 5.6 million towards capacity-building initiatives in this BTR period which was majorly from the GCF Readiness support. A total of USD 4.5 million was delivered as grants/technical assistance.

4.9. Information on support received for the implementation of Article 13 of the Paris Agreement and transparency-related activities, including transparency-related capacity-building

Kenya received support from different sources to facilitate the implementation of Article 13 of the Paris Agreement in 2024. The Global Environment Facility (GEF) funding under the Enabling Activities was Kenya's only direct funding to prepare the first Biennial Transparency Report (BTR1). Kenya received an additional $250,000 for an existing National Communication Project, which was previously supported with $500,000. This brings the total support for preparing the NC/BTR report to $750,000. The GEF funding enabled Kenya to compile NC3 and BTR. Due to internal administrative challenges that affected the disbursement of project funds from UNEP, the GEF implementing entity supporting Kenya, Kenya could not receive the required resources within time to prepare the reports. The contributions from the Transparency Accelerator Initiative, GIZ, NAP-Global, CIAT, Fauna & Flora and CBIT-GSP through technical assistance contributed to compiling the NC3 and BTR1.

The Common Tabular Formats have been submitted electronically to the UNFCCC.

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05 Chapter Five

Information on Flexibility

One of the guiding principles of the modalities, procedures and guidelines (MPGs) for the enhanced transparency framework used in the preparation of this inventory document is the provision of flexibility to those developing country Parties that need it in the light of their capacities. Below is a summary table of the flexibility provisions applied.

Table 5.1: Summary of flexibilities applied

MPD flexibility provision (18/CMA.1)	Description of the flexibility application	Clarification of capacity limitation	Deadline for capacity improvement	Progress made to address areas for improvement
Para 85	Estimates of expected GHG emissions for actions, policies, and measures	Lack of capacity to estimate expected GHG emission reductions for identified priority actions, policies and measures	2030, Subject to the availability of support	NA
Para 92, 95 and 102	Projections of GHG gas emissions and removals	Lack of capacity to report projections	2028, Subject to the availability of adequate support	NA

06 Chapter Six

Improvements in Reporting Over Time

Kenya has developed a detailed improvement plan for the GHG report annexed in the National Inventory Document. For the chapter on NDC tracking, improvement plans will prioritize projections and emission estimation for actions, policies and measures. Since Kenya's NDC has an emissions indicator, implementing the inventory improvement plan is critical for addressing the gaps in the NDC tracking chapter.

Annex

Annex 1: National GHG Inventory Document.

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