REPUBLIC OF KENYA

MINISTRY OF ENVIRONMENT
AND FORESTRY

NATIONAL CLIMATE CHANGE ACTION PLAN (NCCAP) 2018-2022

VOLUME I

Towards Low Carbon Climate Resilient Development



2018

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H.E. Uhuru Kenyatta, C.G.H.
President and Commander in Chief of the Defence Forces of the Republic of Kenya

Foreword

Climate change is a major threat to Kenya's socio-economic wellbeing. Climate change, indeed, has the potential to roll back the development gains made over the years, and threatens the attainment of our *Vision 2030* and my Government's Big Four Agenda.

In line with our responsibility to mitigate the effects of climate change, and in keeping with the objective of the *Paris Agreement,* my Government promulgated the *Climate Change Act, Number 11 of 2016.* This *Act* provides the legal framework for enhanced response to climate change at both the National and County Government levels. Consequently, climate change is now recognised as a crosscutting thematic area in our planning process. Further, the *Act* recognises the *National Climate Change Action Plan (NCCAP)* as a five-year iterative tool for the integration of low carbon climate resilient initiatives across our different socio-economic sectors.
This *National Climate Change Action Plan (NCCAP) 2018-2022* builds on the strong foundation laid during the implementation of the *National Climate Change Action Plan (NCCAP) 2013-2017,* and the *Climate Change Act. NCCAP 2018-2022* sets out bold measures to ensure that our development remains sustainable in the event of any adverse climate change impacts, including droughts, floods, and other extreme climate events that have in the recent past occasioned far-reaching negative implications on our economy.

A key action during the 2018-2022 medium-term planning period is increasing our forest cover to at least 10%. This action will contribute to the protection of our water towers and associated ecosystem services, which will then translate to tangible benefits for our citizens across the different sectors. It will also contribute to the achievement of our Nationally Determined Contribution under the *Paris Agreement.*

The collective contributions of the National and County Governments, the private sector, the civil society, faith-based organisations, other non-state actors, and individual citizens to this *National Climate Change Action Plan* will help deliver the expected transformational outcomes. The *Plan* will also require the support of our development partners and other well-wishers to ensure its effective implementation for the benefit of the present and future generations.

I personally commit to be at the forefront of these efforts, as Chair of the National Climate Change Council, so as to ensure that our aspiration of a low carbon climate resilient and, prosperous Kenya is realised.

Kazi iendelee!

May God bless the Republic of Kenya!



Mr. Keriako Tobiko, CBS, SC
Cabinet Secretary for
Environment and Forestry

Acknowledgements

The development of *NCCAP 2018-2022* was guided by a Taskforce that was appointed and gazetted. It also involved the participation of State Departments and Agencies of the National Government, County Governments, civil society, the private sector, and the academia. A wide range of individuals and institutions participated in the development *NCCAP 2018-2022.* I take this early opportunity to recognise their efforts.

Technical inputs to *NCCAP 2018-2022* were enriched through the Adaptation and Mitigation Thematic Working Groups, whose membership was inclusive and drawn from the National and County Governments, civil society, the academia, and the private sector. Contributions from members of the Taskforce and the Thematic Working Groups, both at individual and corporate levels, are greatly appreciated. The Ministry of Environment and Forestry (MEF) is also grateful to the national and international climate change experts that provided valuable technical inputs to the process.

I wish to commend the Principal Secretary for Environment and Forestry for ably chairing the Taskforce, and coordinating the entire process of developing *NCCAP 2018-2022,* including managing contributions from contracted experts. I recognise the experts for their professionalism and diligence throughout the process of developing *NCCAP 2018-2022.*

NCCAP 2018-2022 was prepared through an extensive consultation process. Over 1,000 stakeholders, including representatives from the National and County Governments, civil society, the academia, women's groups, youth groups, marginalised and minority groups, and the private sector, were consulted. These are gratefully acknowledged for their candid views that form the basis of this *Plan.* It is appreciated that effective implementation of *NCCAP 2018-2022* will require continued input from these stakeholders, and increased partnerships and enhanced support from development partners.

The development of *NCCAP 2018-2022* would not have been possible without the support of development partners. These include the Government of Germany through the GIZ NDC Assist Project, and the Government of the United States of America through the Low-

Emission, Climate-Resilient Development Project, which is managed by the United Nations Development Programme. Other support was also received from the Government of the United Kingdom through the Deepening Democracy Programme, NDC Partnership, Transparency International, Pan-Africa Climate Justice Alliance, Friedrich-Ebert Stiftung, and Sustainable Environmental Development Watch (SusWatch) Network. The Kenya Red Cross through the Partner for Resilience project funded by the Dutch Government. I thank all these institutions for their invaluable support.

NCCAP 2018-2022 will be distributed widely to National and County Government institutions, and amongst non-state actors so that it guides their envisaged roles in the implementation. Development partners will particularly find the information provided in the *Plan* very helpful in their alignment of funding preferences with Kenya's aspirations to attain a low carbon climate resilient economy. We remain grateful to their commitment to walk alongside Kenya in this journey.

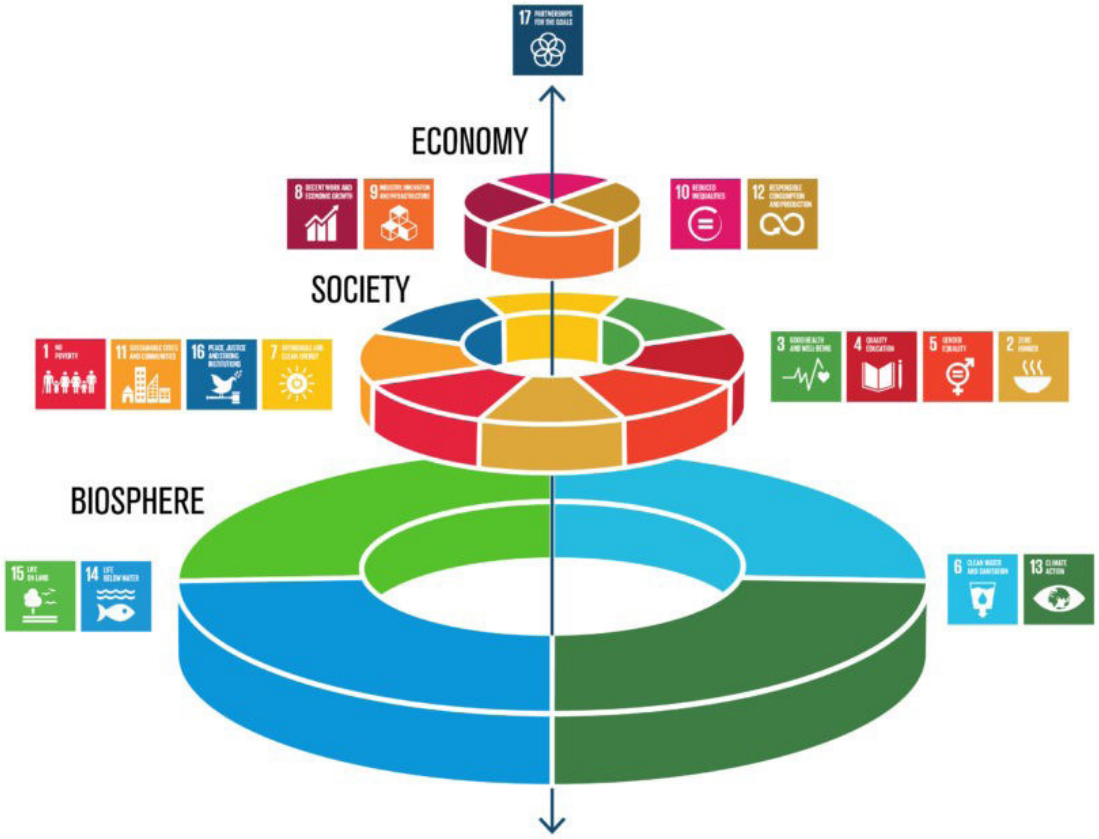
The Ministry of Environment and Forestry is committed to the implementation of this *Plan,* and will lead efforts to increase our forest cover to at least 10% of Kenya's land. We will work with the National Climate Change Council to ensure a coordinated and effective approach that will involve the National and County Governments, and other stakeholders across the Kenyan society in this initiative, and on other planned actions.

National Climate Change Action Plan Taskforce

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Environmental conservation and protection is the foundation to low carbon and climate resilience development.

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Abbreviations and Acronyms

AF	Adaptation Fund
AFR100	African Forest Landscape Restoration Initiative
ASAL	Arid and Semi-Arid Land
ATAR	Adaptation Technical Analysis Report
BRT	Bus Rapid Transit
CBIT	Capacity Building Initiative for Transparency
CBS	Chief of Burning Spear
CCCF	County Climate Change Fund
CCD	Climate Change Directorate
CEC	County Executive Committee
CDM	Clean Development Mechanism
CF	Contingencies Fund
CFA	Community Forestry Association
CGs	County Governments
CGH	Chief of Golden Heart
CIDP	County Integrated Development Plan
CIS	Climate Information Services
CO2	Carbon dioxide
CoG	Council of Governors
COP	Conference of the Parties
CPEBR	Climate Public Expenditure and Budget Review
CS	Cabinet Secretary
CSA	Climate Smart Agriculture
CTCN	Climate Technology Centre and Network
DPs	Development Partners
EAC	East African Community
EDE	Ending Drought Emergencies
ERC	Energy Regulatory Commission
FAO	Food and Agriculture Organization
GCF	Green Climate Fund
GDC	Geothermal Development Corporation
GDP	Gross Domestic Product
GEF	Global Environment Facility
GESIP	Green Economy Strategy and Implementation Plan
GHG	Greenhouse gas
GIS	Geographical Information Systems
GNI	Gross National Income
GoK	Government of Kenya
HFCs	Hydrofluorocarbons
ICAO	International Civil Aviation Organisation

IC-FRA	Improving Capacity in Forest Resources Assessment in Kenya
ICRAF	World Agroforestry Centre
ICT	Information Communication and Technology
IDD	International Disaster Database
ILRI	International Livestock Research Institute
IMO	International Maritime Organisation
IPCC	Inter-Governmental Panel on Climate Change
KAA	Kenya Airports Authority
KALRO	Kenya Agriculture and Livestock Research Organization
KAM	Kenya Association of Manufacturers
KCAA	Kenya Civil Aviation Authority
KCCWG	Kenya Climate Change Working Group
KCEP	Kenya Cereal Enhancement Programme
KCSAIF	Kenya Climate Smart Agriculture Implementation Framework
KCSAS	Kenya Climate Smart Agriculture Strategy
KEBS	Kenya Bureau of Standards
KenGen	Kenya Electricity Generating Company Ltd.
KENHA	Kenya National Highways Authority
KEPSA	Kenya Private Sector Alliance
KeRRA	Kenya Rural Roads Authority
KES	Kenya Shilling
KETRACO	Kenya Electricity Transmission Company
KFS	Kenya Forest Service
KFSSG	Kenya Food Security Steering Group
KIRDI	Kenya Industrial Research and Development Institute
KMA	Kenya Maritime Authority
KMD	Kenya Meteorological Department
KMFRI	Kenya Marine and Fisheries Research Institute
KNBS	Kenya National Bureau of Statistics
KPA	Kenya Ports Authority
KQ	Kenya Airways
KR	Kenya Railways
KURA	Kenya Urban Roads Authority
KWS	Kenya Wildlife Service
LECRD	Low Emission Climate Resilient Development
LULUCF	Land Use, Land-Use Change and Forestry
M&E	Monitoring and Evaluation
MALFI	Ministry of Agriculture, Livestock, Fisheries and Irrigation
MEF	Ministry of Environment and Forestry
MITC	Ministry of Industrialisation, Trade and Cooperatives
MOE	Ministry of Energy
MOTIHUD	Ministry of Transport, Infrastructure, Housing and Urban Development
MRV	Measurement, Reporting and Verification
MRV+	Measurement, Reporting and Verification Plus

MSME	Micro, Small and Medium Enterprise
MTAR	Mitigation Technical Analysis Report
MTP	Medium Term Plan
MWS	Ministry of Water and Sanitation
N2O	Nitrogen Oxide
NAMA	Nationally Appropriate Mitigation Action
NAMATA	Nairobi Metropolitan Area Transport Authority
NAP	National Adaptation Plan
NARIG	National Agricultural Rural Inclusive Growth Project
NCA	National Construction Authority
NCCAP	National Climate Change Action Plan
NCCC	National Climate Change Council
NCCRC	National Climate Change Resource Centre
NDA	National Designated Authority
NDC	Nationally Determined Contribution
NDE	National Designated Entity
NDEF	National Drought Emergency Fund
NDMA	National Drought Management Authority
NEMA	National Environment Management Authority
NF3	Nitrogen trifluoride
NFRA	National Forest Resources Assessment in Kenya
NHIF	National Hospital Insurance Fund
NIE	National Implementing Entity
NMT	Non-Motorised Transport
NPBM	National Performance and Benefit Measurement
NSNP	National Safety Net Programme
NTSA	National Transport and Safety Authority
PESTEL	Political, Economic, Social, Environmental, and Legal
PFCs	Perfluorocarbons
REA	Rural Electrification Authority
REDD+	Reducing Emissions from Deforestation and Degradation
SCCF	Special Climate Change Fund
SDG	Sustainable Development Goal
SGR	Standard Gauge Railway
SLEEK	System for Land-based Emissions Estimation in Kenya
StARCK+	Strengthening Adaptation and Resilience to Climate Change in Kenya
UN	United Nations
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value Added Tax

WRA	Water Resources Authority
WRUA	Water Resource Users Association

Units and Symbols

CH_4	Methane
ha	Hectare
m^3	Cubic metre
$MtCO_2e$	Million tonnes of carbon dioxide equivalent
MW	Megawatt
N_2O	Nitrogen Oxide
NF_3	Nitrogen trifluoride
SF_6	Sulphur hexafluoride
CO_2	Carbon dioxide

Definition of Terms

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

Adaptive capacity refers to the ability of systems, institutions, humans, and other organisms to adjust to potential damage, take advantage of opportunities, or respond to consequences.

Carbon credit or offset is a financial unit of measurement that represents the removal of one tonne of carbon dioxide equivalent from the atmosphere. Carbon credits are generated by projects that deliver measurable reductions in greenhouse gas emissions.

Carbon market is a market created from the trading of units of greenhouse gas emissions.

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

Global warming refers to the observed or projected gradual increase in global surface temperature. It is one of the consequences of climate change.

Greenhouse gases (GHGs) are gases that absorb and emit radiant energy within the thermal infrared range. The main GHGs measured in a GHG inventory are, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorocarbons (PFCs), hydrofluorocarbons

(HFCs), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3).

Mitigation refers to human interventions to prevent or slow down atmospheric GHG concentrations by limiting current or future emissions, and/or enhancing potential sinks for greenhouse gases.

$MtCO_2eq$ or $MtCO_2e$ is an abbreviation for million tonnes of carbon dioxide equivalent. It is the amount of GHG emissions expressed as an equivalent of concentrations of carbon dioxide.

Ocean acidification refers to the reduction in the potential of Hydrogen (pH) of the ocean over an extended period of time, caused mainly by the uptake of carbon dioxide from the atmosphere.
REDD+ is the acronym for 'Reducing Emissions from Deforestation and Forest Degradation'. It is a mitigation mechanism that creates financial value for the carbon stored in forests by avoiding deforestation, and increasing the carbon stock in existing forests.

Resilience refers to the capacity of social, economic and environmental systems to cope with a hazardous event, trend, or disturbance. It is manifested through responding or reorganizing in ways that assert the essential function, identity, and structure of the system, while also maintaining the capacity for adaptation, learning and transformation

Vulnerability refers to the propensity or predisposition to be adversely affected. It encompasses a variety of concepts and elements, including sensitivity or susceptibility to harm, and lack of capacity to cope and adapt.





Executive Summary



Photo: *Unisplash*

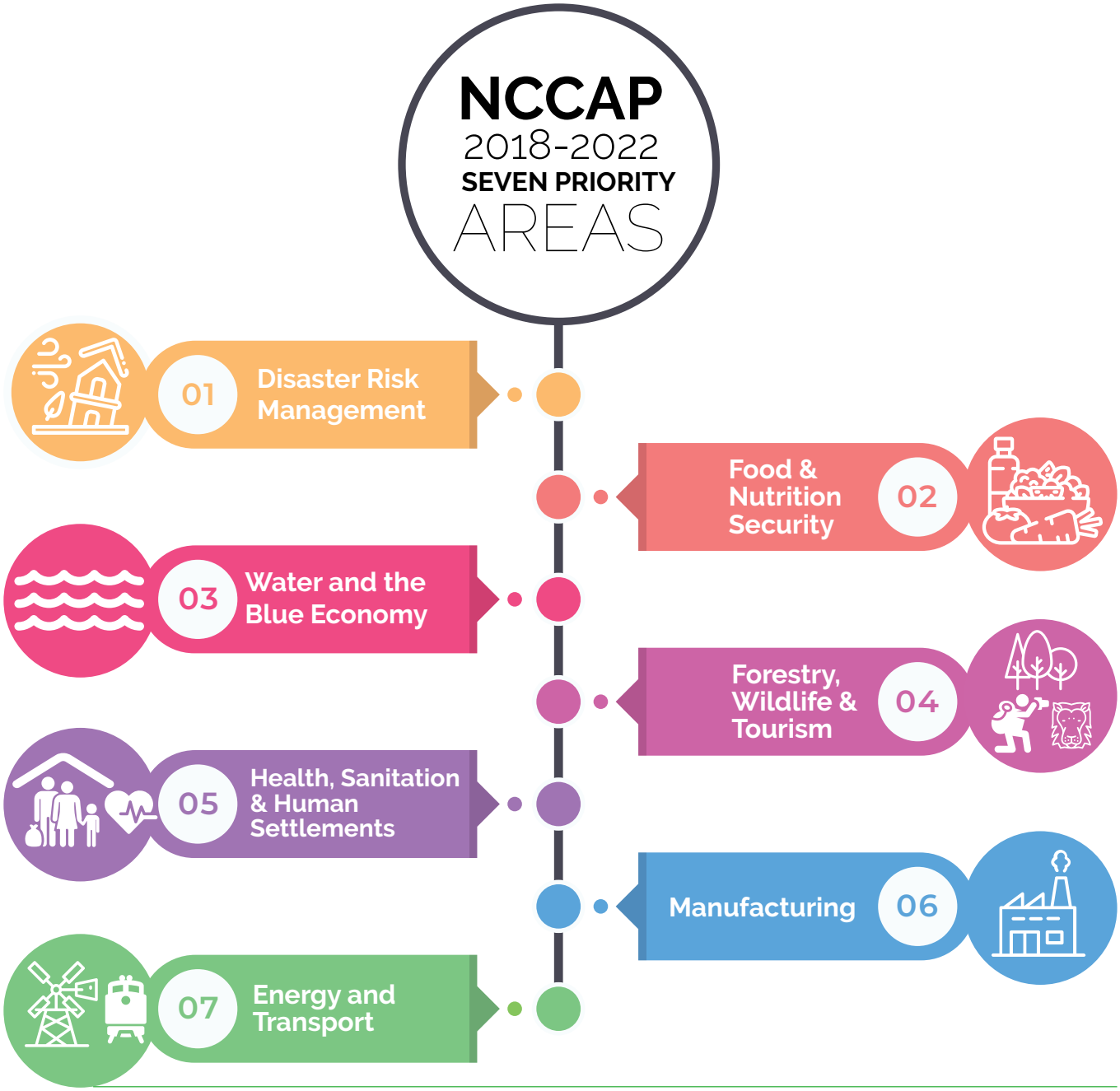
This *National Climate Change Action Plan (NCCAP) 2018-2022* is a five-year plan to steer Kenya's climate change action. The Plan derives from the *Climate Change Act (Number 11 of 2016),* which requires the Government of Kenya (GoK) to develop Action Plans to guide the mainstreaming of climate change into sector functions. ***NCCAP 2018-2022* will further the achievement of Kenya's development goals by providing mechanisms to realise low carbon climate resilient development.** It emphasises sustainability, while prioritising adaptation and enhanced climate resilience for vulnerable groups, including women, youth, persons with disabilities, and marginalised and minority communities.

NCCAP 2018-2022 was developed at a time when significant changes in Kenya's climate were evident. Climate-related disasters, particularly droughts and floods, were frequent, and their impacts adversely affected the economy and livelihoods in the country. The frequency of cold days and nights, and frost, had greatly increased. Temperature rise spanned across all seasons, and rainfall patterns had changed. With an economy that is dependent on climate-sensitive sectors, such as agriculture, water, energy, tourism, wildlife, and health, these changes in the country's climate were singled out as severe threats to the well-being of Kenyans. The economic cost of floods and drought in the country created a long-term fiscal liability equivalent to between 2% and 2.8% of the country's Gross Domestic Product, every year. Kenya's responsibility for global climate change is very little, as the country's greenhouse gas (GHG) emissions represent less than 1% of total global emissions. Climate change is a global problem, and Kenya participates actively in the international response founded on the *United Nations Framework Convention on Climate Change (UNFCCC).*

Kenya's priority climate actions are in the six mitigation sectors set out in the *UNFCCC;* agriculture, energy, forestry, industry, transport, and waste. The actions are expected to lower GHG emissions, and help Kenya meet its Nationally Determined Contribution goal of abating the emissions by 30% by 2030, relative to business as usual. *NCCAP 2018-2022* aligns sectors in Kenya to support this goal. The *Plan* was developed through an extensively consultative process led by a Taskforce that conducted over 1,000 stakeholder consultations, supported by the Adaptation, and Mitigation Thematic Working Groups that collated and interpreted collected views in light of the political, economic, social, technological, environmental, and legal environment in Kenya. The Working Groups produced the *Adaptation Technical Analysis Report (ATAR) 2018-2022* and the *Mitigation Technical Analysis Report (MTAR) 2018-2022,* respectively, which are part of *NCCAP 2018-2022.*

Seven priority areas underpin *NCCAP 2018-2022;* Disaster Risk Management; Food and Nutrition Security; Water and the Blue Economy; Forestry, Wildlife, and Tourism; Health, Sanitation, and Human Settlements; Manufacturing; and Energy and Transport. Through these priority areas, climate change action is aligned to the Government's Big Four Agenda, and the *Sustainable Development Goals (SDGs). NCCAP 2018-2022* seeks to increase the number of households and entities benefiting from devolved adaptive services; improve the ability of people to cope with drought and floods; improve the coordination and delivery of disaster management response; improve crop productivity through roll out of actions in the *Kenya Climate Smart Agriculture (KCSA), 2017-2026;* improve crop productivity by increasing the acreage under irrigation; increase productivity in the livestock and fisheries sectors through implementation of relevant actions in *KCSA;* diversify livelihoods to adjust to the

changing climate; increase annual per capita water availability through development of water infrastructure; climate proof water harvesting and water storage infrastructure, and improve flood control; promote water efficiency through monitoring, reducing wastage, re-using, recycling, and modelling; improve access to good quality water; improve the climate resilience of coastal communities; afforest and reforest degraded and deforested areas in Counties; implement initiatives to reduce deforestation and forest degradation; restore degraded landscapes in arid and semi-arid lands, and rangelands; promote sustainable timber production on privately-owned land; conserve land area for wildlife; reduce incidences of malaria and other vector-borne disease; promote recycling to divert collected waste away



from disposal sites; climate proof landfill sites; control flooding in human settlements; promote green buildings; increase energy efficiency; improve water use and resource efficiency; optimise manufacturing and production processes; promote industrial symbiosis in industrial zones; increase renewable energy for electricity generation; increase captive renewable energy; improve energy efficiency and conservation; climate proof energy infrastructure; promote the transition to clean cooking with alternative clean fuels in urban areas, and clean biomass cookstoves and alternatives in rural areas; develop an affordable, safe, and efficient public transport, including a Bus Rapid Transit System in Nairobi; reduce fuel consumption and fuel overhead costs, including electrification of the Standard Gauge Railway; encourage low carbon technologies in the aviation and maritime sectors; and climate-proof transport infrastructure. These actions are to be mainstreamed in the Third Medium Term Plan (MTP III), and in County Integrated Development Plans (CIDPs), to ensure that they are taken up in Counties and in all sectors in the country.

Thirty-eight crosscutting enabling actions will be implemented to equip government and other stakeholders with the knowledge, skills, technologies, and financing needed to deliver and report on the planned climate change actions. The enabling actions comprise of supporting policy and regulatory framework, capacity development and knowledge management, technology and innovation, climate finance, and Measurement, Reporting, and Verification Plus (MRV+). These actions are important to the successful delivery of *NCCAP 2018-2022,* alongside effective institutional structures and oversight responsibilities.

The *Climate Change Act* sets out the institutional structures and responsibilities in the oversight and management of NCCAPs, including this *NCCAP 2018-2022.* The National Climate Change Council (NCCC) is responsible for overall coordination, while the Cabinet Secretary responsible for climate change affairs submits NCCAPs for approval, and reports to NCCC and Parliament on their implementation. Implementation of *NCCAP 2018-2022* is supported by a number of National, County, and sectoral policies and plans that have been developed, such as the *National Climate Change Response Strategy (2010),* the *National Adaptation Plan (NAP 2015-2030), the Kenya Climate Smart Agriculture Strategy (2017-2026)* and the *National Climate Finance Policy (2017).* County Governments are enacting regulations to allocate a portion of their development budgets to support climate change action. State departments and national public entities are required to establish climate change units to integrate *NCCAP 2018-2022* into their strategies and implementation plans, and to report to NCCC on an annual basis. County Governments are to integrate actions in *NCCAP 2018-2022* into their CIDPs for the 2018-2022 period, and designate a County Executive Committee member to coordinate climate change affairs.

NCCAP 2018-2022 requires the National and County Governments, the private sector, civil society, faith-based organisations, other non-state actors, individual citizens, and development partners to contribute in its implementation between 2018-2022 broken down as follows; KES 1,784,309 million; KES 289,093 million in the 2018/2019 fiscal year, KES 408,424 million in the 2019/2020 fiscal year, KES 486,013 million in the 2020/2021 fiscal year, KES 352,044 million in the 2021/2022 fiscal year, and KES 248,335 million in the 2022/2023 fiscal year.

In addition to the above, KES 11 billion will be required for the implementation of the enabling actions. This brings the total approximated cost to KES 1.8 Trillion.

The Journey in climate change action

1992 United Nations Framework Convention on Climate Change
UNFCCC Adopted

1994
Kenya ratified the *UNFCCC*

1997 KYOTO PROTOCOL
Kyoto Protocol adopted

2005
Kenya ratified Kyoto and implemented CDM projects

2010
National Climate Change Strategy

2013
NCCAP 2013-2017

2014
Ratified Doha Ammendments to *Kyoto Protocol*

2015
Kenya's NDC submitted

2015 COP21 · CMP11 PARIS 2015 UN CLIMATE CHANGE CONFERENCE
Paris Agreement Adopted

2015
National Adapation Plan
NAP 2015-2030

2016
Kenya ratified *Paris Agreement*

2016
Climate Change Act

2017-2018
National Climate Change Fund

2018
Climate Finance Policy

2018
NCCAP 2018-2022

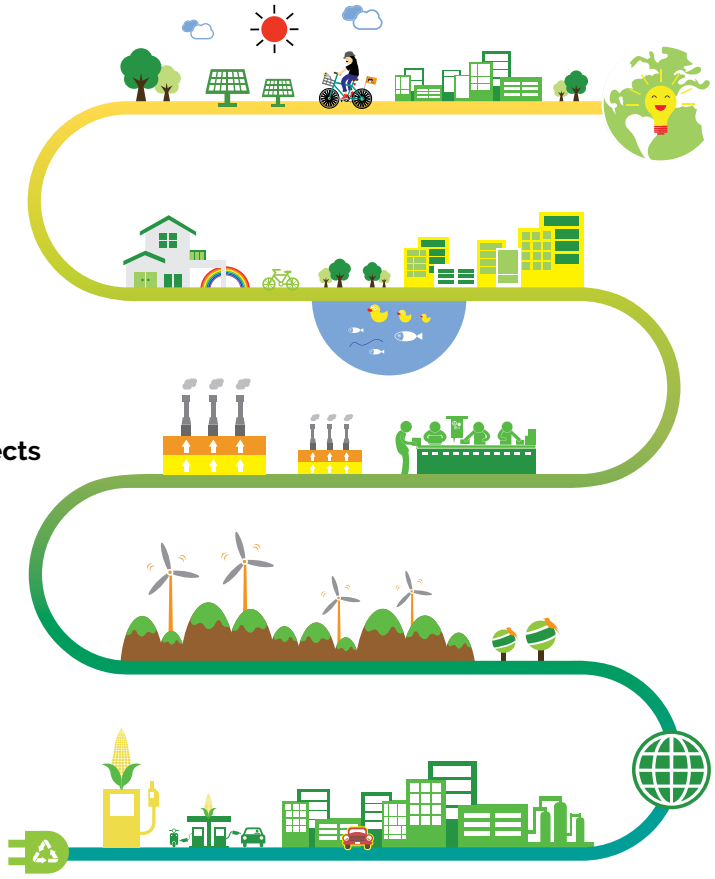


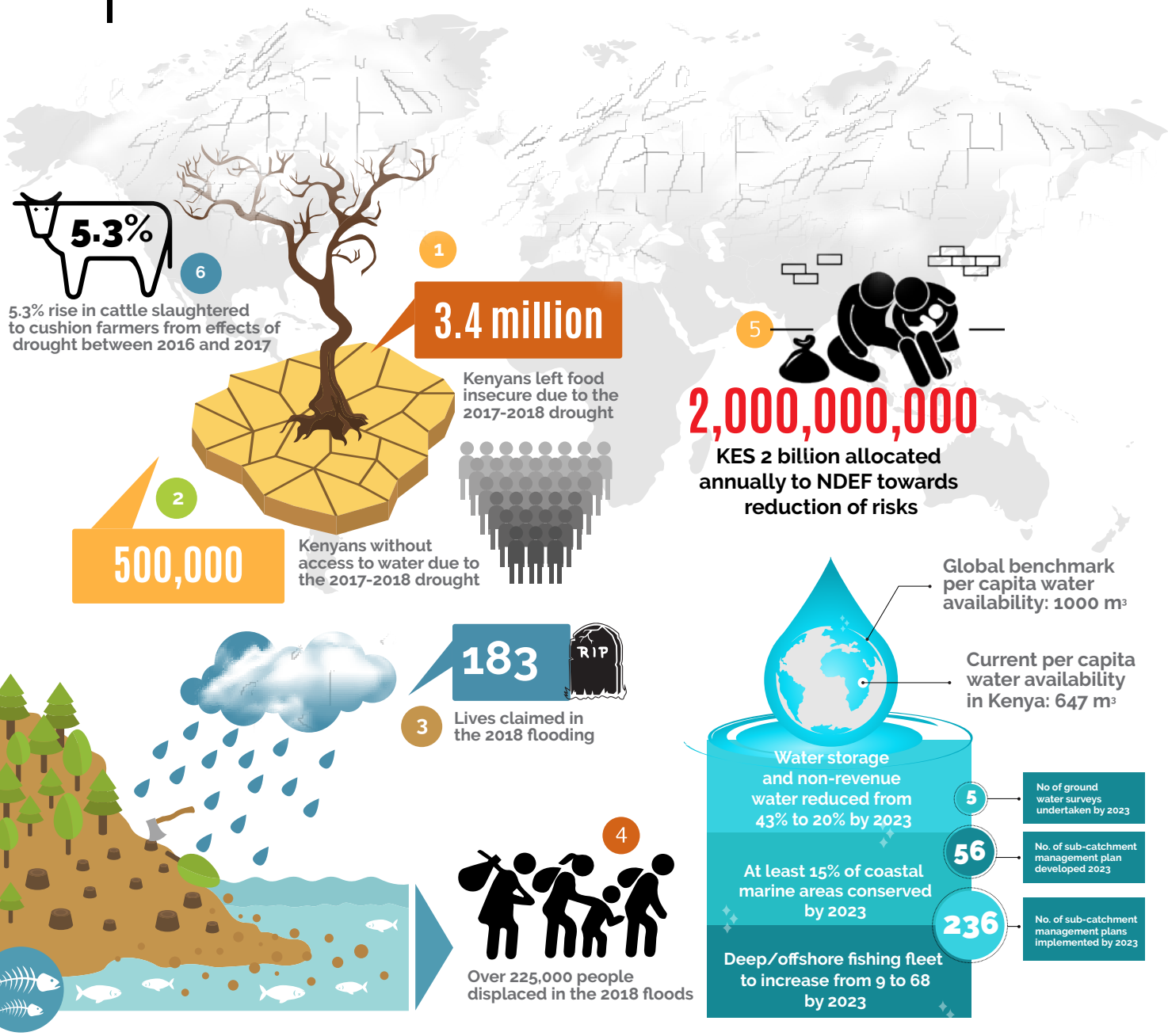


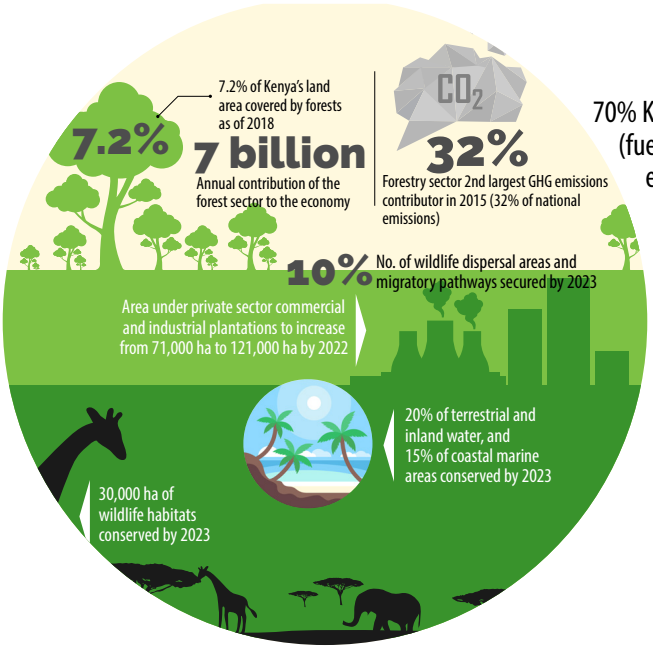
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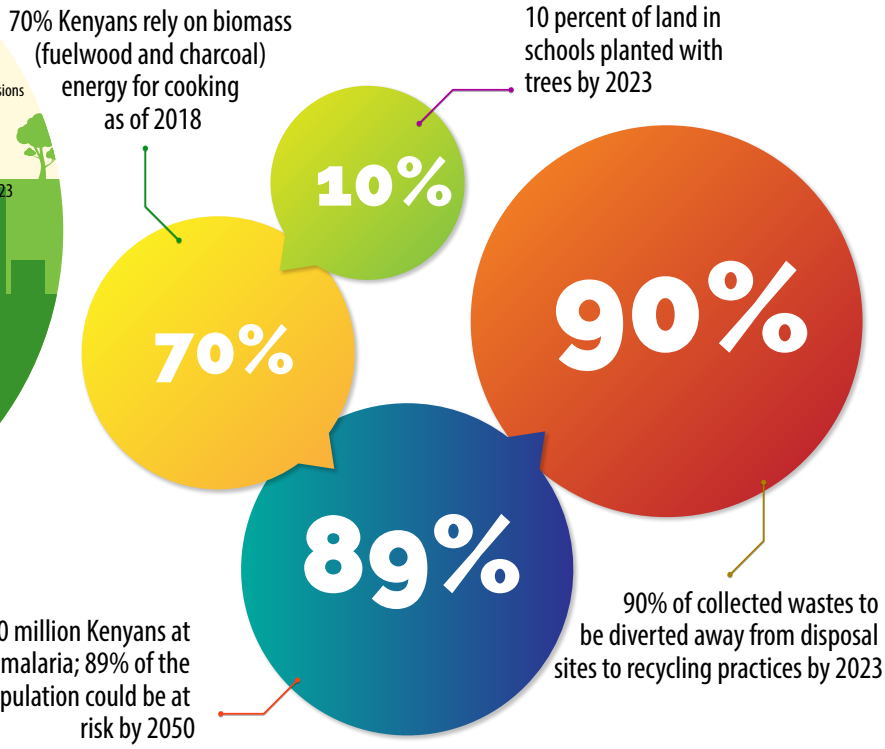
CHAPTER ONE

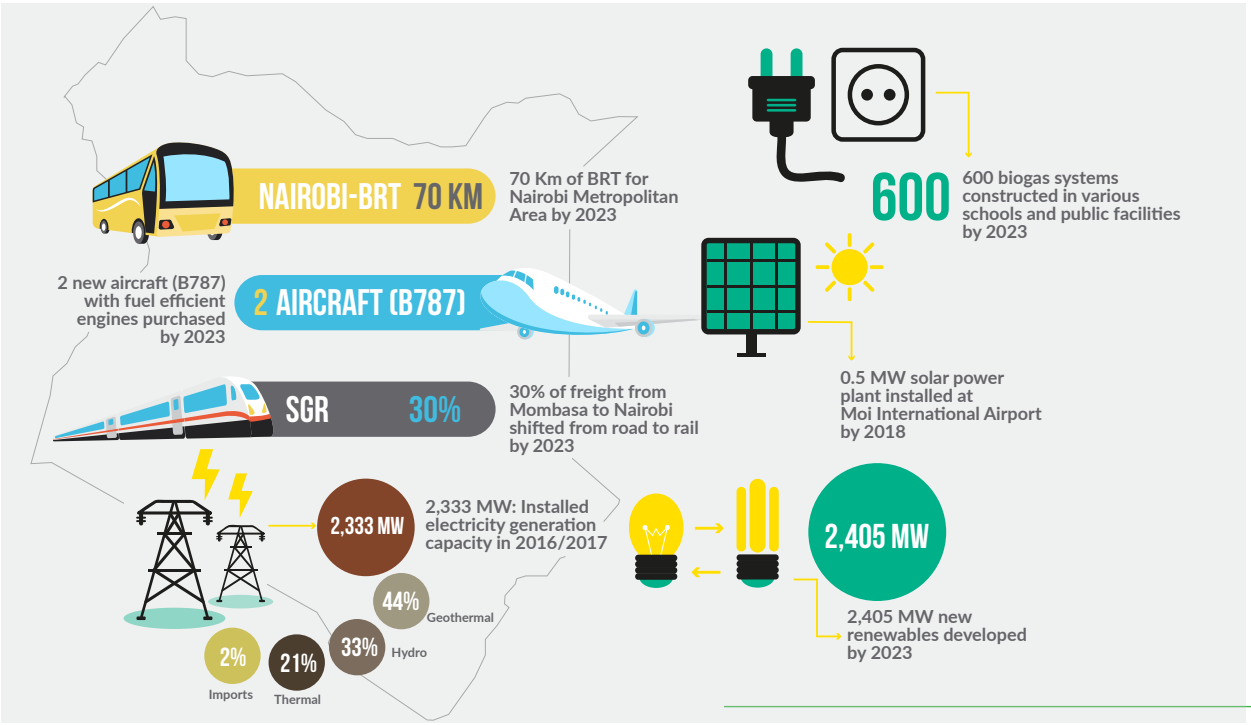
Background and Context

Facts & Figures




7.2%
7.2% of Kenya's land area covered by forests as of 2018
7 billion
Annual contribution of the forest sector to the economy
CO2
32%
Forestry sector 2nd largest GHG emissions contributor in 2015 (32% of national emissions)
10%
No. of wildlife dispersal areas and migratory pathways secured by 2023
Area under private sector commercial and industrial plantations to increase from 71,000 ha to 121,000 ha by 2022
20% of terrestrial and inland water, and 15% of coastal marine areas conserved by 2023
30,000 ha of wildlife habitats conserved by 2023


70% Kenyans rely on biomass (fuelwood and charcoal) energy for cooking as of 2018
10 percent of land in schools planted with trees by 2023
10%
70%
90%
89%
90% of collected wastes to be diverted away from disposal sites to recycling practices by 2023
13 to 20 million Kenyans at risk from malaria; 89% of the population could be at risk by 2050


NAIROBI-BRT 70 KM
70 Km of BRT for Nairobi Metropolitan Area by 2023
600
600 biogas systems constructed in various schools and public facilities by 2023
2 new aircraft (B787) with fuel efficient engines purchased by 2023
2 AIRCRAFT (B787)
0.5 MW solar power plant installed at Moi International Airport by 2018
SGR 30%
30% of freight from Mombasa to Nairobi shifted from road to rail by 2023
2,333 MW
2,333 MW: Installed electricity generation capacity in 2016/2017
2,405 MW
2,405 MW new renewables developed by 2023
44% Geothermal
33% Hydro
21% Thermal
2% Imports

1.1 Introduction

This National Climate *Change Action Plan 2018-2022 (NCCAP 2018-2022)* presents detailed actions that Kenya will embark on to address climate change, during the 2018-2022 medium-term planning period. Climate change has increased the frequency and magnitude of extreme climate events in Kenya. These events have led to loss of lives, diminished livelihoods, reduced crop and livestock production, and damaged infrastructure, among other adverse impacts. The torrential rains and severe flooding that were witnessed in the country from March to May 2018, which devastated communities, most of which were already struggling to recover from a prolonged drought, are an example of these events. Climate change is therefore a significant threat to Kenya's future development, including achievement of the Kenya Vision 2030 goals, and the Government's Big Four Agenda for 2018-2022 that focuses on enhanced food and nutrition security, affordable housing, increased manufacturing, and universal healthcare.

Kenya takes climate change seriously. This is demonstrated by its enactment of the *Climate Change Act (Number 11 of 2016).* This *Act* is the first climate change-dedicated legislation in Africa. It provides the regulatory framework for enhanced response to climate change, and mechanisms and measures to transition to low carbon climate resilient development (see Box 1). This pathway emphasises sustainable development, while prioritising adaptation, and recognising the importance of enhancing the climate resilience of vulnerable groups, including children, women, youth, persons with disabilities, the elderly, and marginalised and minority communities.

BOX 1: Kenya's low carbon climate resilient development pathway

A low carbon climate resilient development pathway for Kenya emphasises:

Sustainable Development
Achieving sustainable development is at the forefront of all climate actions. This is because climate change and development are intricately linked;

Mitigation
Taking actions, where possible, to encourage greenhouse gas emissions that are lower than business-as-usual practice; and to reduce human causes of emissions by moving toward a resource efficient economy that is as low carbon as possible. Mitigation or low carbon actions should only be considered as priority climate change actions if they also have climate resilience or significant sustainable development benefits.



Adaptation
Reducing vulnerability to avoid or cushion from the impacts of climate change, as well as enabling people to respond to climate risks by moving toward a climate resilient society;

Source: *National Climate Change Action Plan, 2013-2017, page 25.*

Section 13 of the *Climate Change Act, 2016* provides for the development of *National Climate Change Action Plans (NCCAPs)* to prescribe measures and mechanisms to mainstream adaptation and mitigation actions into sector functions of the National and County Governments. The *Act* requires the Cabinet Secretary responsible for climate change affairs to review and update the NCCAP every five-years. The first NCCAP was for the period 2013-2017. *NCCAP 2018-2022* is Kenya's second Action Plan on climate change. It builds on *NCCAP 2013-2017* by which considerable progress was made. This progress includes, the establishment of climate change funds in five counties, expanding geothermal power, establishment of the National Climate Change Resource Centre, and improvement of the legal and policy framework (see Chapter 2 for more details). *NCCAP 2018-2022* is a framework for Kenya to deliver on its Nationally Determined Contribution (NDC) under the *Paris Agreement* of the *United Nations Framework Convention on Climate Change (UNFCCC).*

Climate change is a shared responsibility between the National Government and County Governments. The National Government led and guided the process of developing *NCCAP 2018-2022,* and worked with County Governments during this process. Implementation of the Plan is coordinated by the two levels of government, in line with the Constitution of Kenya (2010). *NCCAP 2018-2022* coincides with the second generation of County Governments. County Governments are responsible for a number of devolved functions whose actions will contribute to the achievement of *NCCAP 2018-2022,* and the Big Four Agenda.

NCCAP 2018-2022 guides the climate actions of the National and County Governments, the private sector, civil society, and other actors, to enable Kenya transition to low carbon climate resilient development.

1.2 Goal of *NCCAP 2018-2022*

NCCAP 2018-2022 seeks to further Kenya's development goals by providing mechanisms and measures to achieve low carbon climate resilient development, in a manner that prioritises adaptation, and recognises the essence of enhancing the climate resilience of vulnerable groups, including children, women, youth, persons with disabilities, the elderly, and marginalised and minority communities.

The Plan helps to further Kenya's development aspirations by seeking to:

- Align climate change actions in the country with the Government's development agenda, including the Big Four Agenda;
- Encourage participation of the private sector, civil society, and vulnerable groups within society, including children, women, older members of society, persons with disabilities, youth, and members of minority or marginalised communities;
- Provide the framework to deliver Kenya's NDC for the 2018-2022 period; and
- Provide a framework for mainstreaming climate change into sector functions at the National and County levels.

In order to achieve climate change actions that simultaneously advance economic and sustainable development objectives, *NCCAP 2018-2022* is guided by the following principles:

- **Responsiveness** – responding to actual adaptation and mitigation needs in Kenya through taking of measures that reduce the adverse effects of climate change, and preventing or minimising the causes of climate change;
- **Equity and social inclusion** – addressing the needs of vulnerable groups within society, including those of children, women, older members of society, persons with disabilities, youth, and members of minority or marginalised communities, through an inclusive approach to climate change action;
- **Consultation and cooperation** – implementing actions through consultation and cooperation between the National and County Governments, and in consultation and cooperation with civil society and the private sector; and
- **Fairness** – ensuring that climate actions do not create competitive disadvantage for the Kenyan private sector, relative to its trading partners.

The Ministry of Environment and Forestry (MEF) led the development of *NCCAP 2018-2022,* through the NCCAP Taskforce that was appointed and gazetted by the Cabinet Secretary.

Photo: *KenGen*



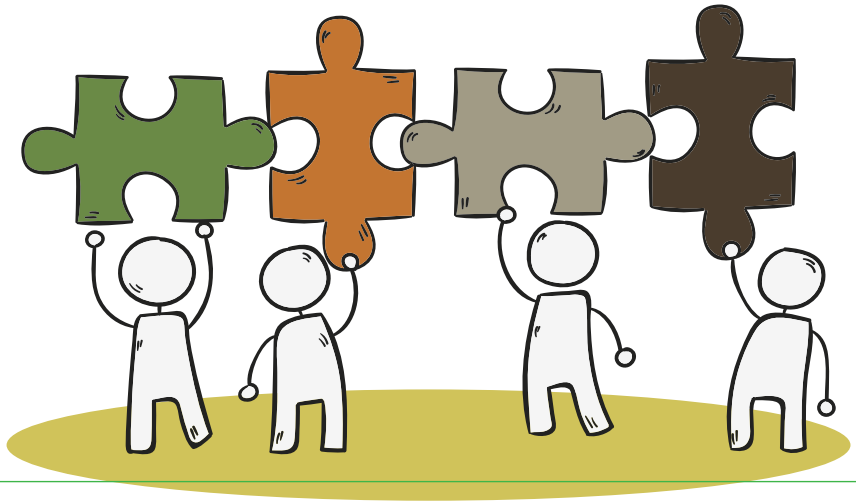
1.3 Approach Used in Developing *NCCAP 2018-2022*

The Ministry of Environment and Forestry coordinated the development of *NCCAP 2018-2022* through the NCCAP Taskforce that was gazetted by the Cabinet Secretary via gazette notice number 10943 of 19th September, 2017. The Taskforce comprised of experts from the National and County Governments, civil society, and the private sector; and was supported by the Adaptation and Mitigation Thematic Working Groups that developed the Adaptation Technical Analysis Report (ATAR): Volume II and Mitigation Technical Analysis Report (MTAR): Volume III that are part of *NCCAP 2018-2022.* The Climate Change Directorate (CCD) situated in MEF led the technical analyses, and organised extensive consultations to ensure that *NCCAP 2018-2022* reflected the inputs and priorities of a wide range of stakeholders (see Box 2).

Box 2: Stakeholder consultations in the development of *NCCAP 2018-2022*

The climate change actions in this NCCAP were identified through extensive consultations with over 1,000 stakeholders from:

- Departmental Committee on Environment and Natural Resources, National Assembly
- Senate Standing Committee on Land, Environment and Natural Resources
- National Government sector ministries and state departments
- County Governments and Council of Governors
- Civil society
- Youth
- Women
- Vulnerable groups, including persons with disabilities, pastoralists, fisher communities and forest resource users
- Private sector
- Development partners



1.4 Underpinning Contexts

1.4.1 Kenya's Positioning

Kenya is a commercial, transportation, and communications hub for eastern Africa. It has experienced moderate economic growth over the past five years, and also witnessed improved indicators of human development in areas, such as education, and declining birth rates[1]. In 2016, Kenya was the ninth-largest economy in Africa, and became a lower middle-income country with gross national income (GNI) per capita of US $1,380[2]. The country has an estimated population of 50 million Kenyans, about 52% being women and 48% men. Close to 45% of the population lives below the poverty line, and poverty is slightly higher in female-headed households[3]. 54% of rural and 63% of urban women and girls are estimated to live below the poverty line, which makes them more vulnerable to impacts of climate change[4].

Kenya is equatorial with a complex and variable climate that ranges from warm and humid in the coastal region, to arid and very arid in the interior. The central and western highlands, which make up about 18% of Kenya's land area, are bisected by the Rift Valley, and have a temperate climate with medium to high rainfall. These highlands are the productive zones of the country, having high to medium agricultural potential. Low and unevenly distributed rainfall over much of Kenya means that about 82% of the country receives less than 700 mm of rain per year (see Figure 1). 23 out of Kenya's 47 Counties are considered arid or semi-arid lands (ASALs). Counties in arid lands are predominantly pastoral, while those in the semi-arid lands are agro-pastoral, with integrated crop/livestock production systems[5].

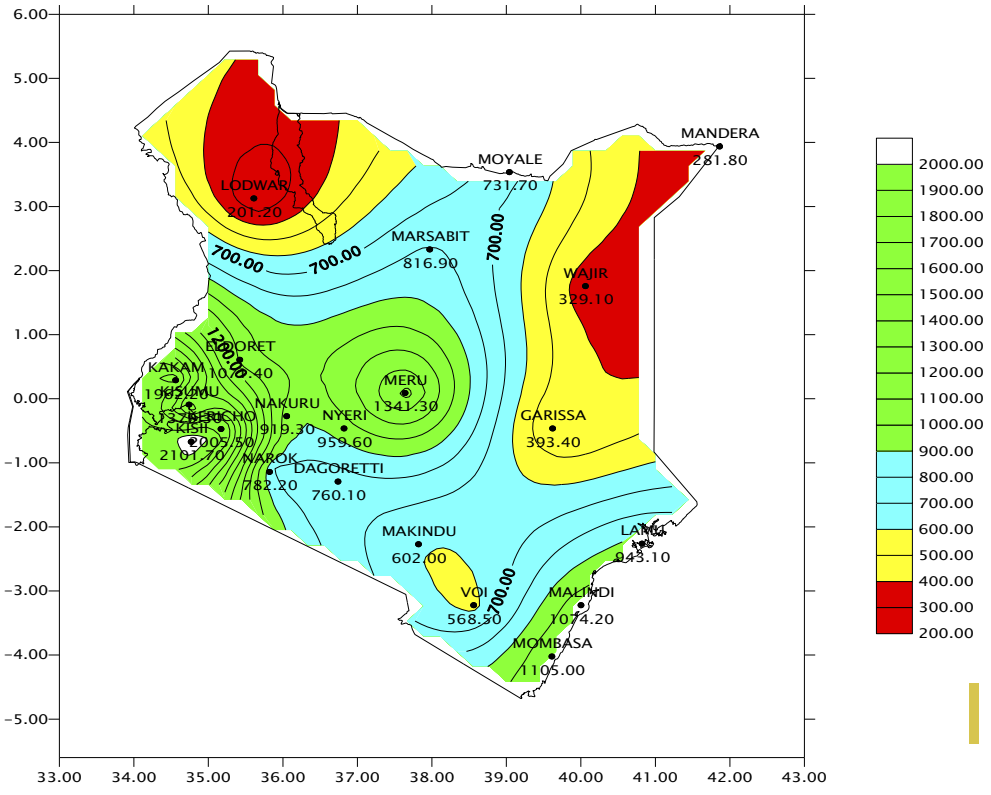


Figure 1: Distribution of annual rainfall in Kenya[6].

Kenya is frequently affected by weather-related disasters, particularly droughts. These profoundly impact the country's economy and the well-being of Kenyans. Floods are however seasonal and more localised, and mainly affect areas around the Lake Victoria basin and Tana River drainage basin, as well as coastal settlements. Flooding normally occurs across the entire country in years with above-normal rainfall, as well as those with heavy rainfall storms. 2018 is an example of this, with some of the highest level of rainfall totals in the long rain season (March-April-May) recorded since 1950.[7]

1.4.2 Kenya's Climate is Changing

Kenya's climate is already changing. The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) presents strong evidence that surface temperatures across Africa have increased by 0.5 – 2 ˚C over the past 100 years, and from 1950 onwards, climate change has altered the magnitude and frequency of extreme climate events.[8] The frequency of cold days, cold nights, and frost, has decreased; while the frequency of hot days, hot nights, and heat waves, has increased. Temperature rise has been observed across all seasons in Kenya (see Figure 2), but particularly from March to May. Variations exist between locations, with a lower rate of warming observed along the coast.[9] The surface temperature trends of Nairobi and its environs show warming of more than 2.5 ˚C in the past 50 years.[10]

Rainfall patterns have also changed. The long-rain season has become shorter and drier, and the short-rain season has become longer and wetter. Overall annual rainfall remains low, with the long rains declining continuously and, droughts becoming longer, more intense, and tending to continue across rainy seasons. The frequency of rainfall events that cause floods has also increased, not just in Kenya, but in the entire East African region, from an average of less than three events per year in 1980s, to over seven events per year in 1990s, and ten events per year from 2000 to 2006. The frequency of droughts and heavy rainfall has also significantly increased in the East Africa region in the last 30-60 years.



Photo: *Min. of Environment*

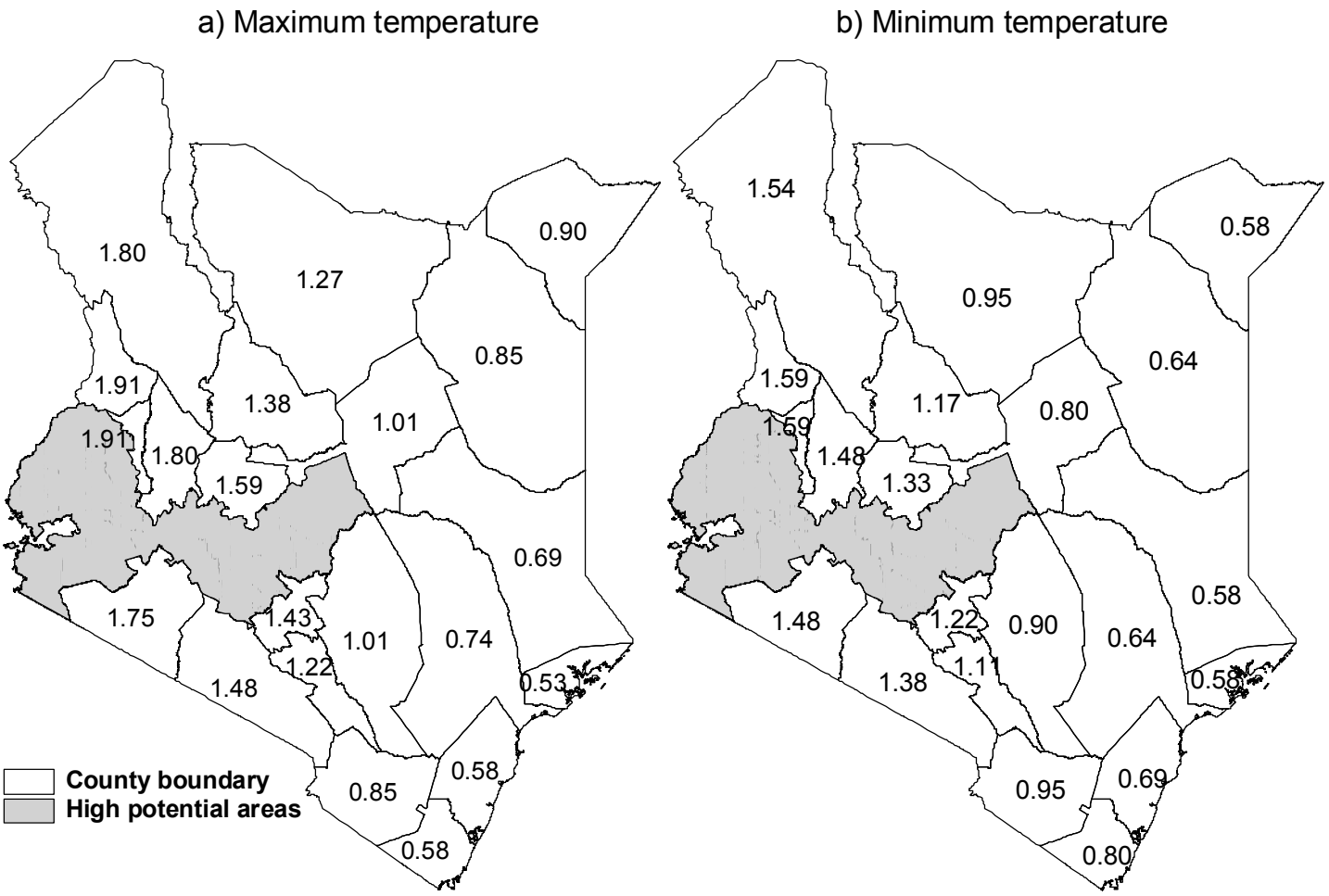


Figure 2: *Temperatures changes in Kenya's 21 arid and semi-arid Counties between 1960 and 2013.*[13]

Rising annual temperatures are a trend that is expected to continue in Kenya in all seasons. This concurs with the IPCC Fifth Assessment Report, which indicated that during this century, temperatures in the African continent would rise more quickly than in other land areas, and that this would particularly be observed in more arid regions. Climate modelling for the East Africa region using a high-emissions scenario suggested that mean annual temperatures would increase by 0.9 ˚C by 2035, 2.2 ˚C by 2065 and 4.0 ˚C by 2100.[14]

IPCC reports that precipitation projections are more uncertain than temperature projections; suggesting that by the end of the 21st century, the East African region will have a wetter climate, with more intense wet seasons and less severe droughts. The proportion of rainfall occurring in heavy events is expected to increase. Regional climate model studies however suggest drying over most parts of Kenya in the months of August and September, by the end of the 21st century.[15]

1.4.3 Impacts of Climate Change in Kenya

Climate change is causing rise in average global temperatures and sea levels. This is triggering major environmental and economic disruptions. In Kenya, heat, drought, and floods are negatively impacting lives, with human health increasingly being at risk. Extreme climate events cause significant loss of life, and adversely affect the national economy. In the 1997-2016 period, the country experienced an average of 57.95 deaths per year, and GDP losses of 0.362% per year, due to extreme climate events.[16] The Kenyan economy is dependent on climate-sensitive sectors, such as agriculture, water, energy, tourism, wildlife, and health, whose vulnerability is increased by climate change (see Table 1 for other sources of vulnerability). Increased intensities and magnitudes of climate-related disasters in Kenya aggravate conflicts, mostly over natural resources. They are a threat to Kenya's security.

Table 1: *Climate risks and sources of vulnerability.*

Climate risks	Key Sources of vulnerability
■ High levels of multi-dimensional poverty, particularly in ASALs ■ Gender inequality ■ Environmental degradation, including loss of forest cover ■ High reliance of the national economy and local livelihoods on rain-fed agriculture ■ High level of water scarcity, and mismanagement of water resources ■ Insecure land tenure, and land fragmentation ■ Population growth, and migration to urban areas ■ Heavy disease burden, and limited access to quality health care, particularly in rural, and remote areas	■ Rising temperatures ■ Uncertain changes in rainfall patterns ■ Rising sea levels, and stronger storm surges ■ Greater risk of extreme climate events (droughts, floods, and landslides) ■ Melting glaciers ■ Ocean acidification

(a) Social Impacts

Floods have caused huge disruptions to human lives in Kenya. The floods experienced in early 2018 claimed over 183 lives, displaced more than 225,000 people, including over 145,000 children, and led to closure of over 700 schools.[17] They have been associated with cholera outbreaks in at least five Counties, and people experiencing upsurges in mosquito-borne diseases, such as malaria, and dengue fever.[18] Between 1990 and 2015, a total of 43 flood disasters happened in Kenya. This is equivalent to an average of 1.65 flood disasters per year. On average, each flood disaster affected 68,000 people.[19] Estimates show that 267,000 Kenyans will be at risk from **coastal flooding** by 2030, because of sea level rise.[20] An increase of 30 centimetres of sea water at the Kenyan coast is capable of submerging Mombasa and 17% of coastal areas.[21] This could be a threat to the country's economy, and to the movement of imports and exports by Kenya and countries that use the port of Mombasa, as the area supports tourism and fishing industries, and has the largest seaport in East Africa.

On average, droughts in Kenya affect about 4.8 million people.[22] Droughts have destroyed livelihoods, triggered local conflicts over scarce resources, and eroded the ability of communities to cope. The 2014-2018 drought was declared a national emergency in February 2017. At that time, it had affected 23 out of the 47 Counties, with Counties in ASALs being the most affected. At least 3.4 million Kenyans were severely food insecure, and an estimated 500,000 people did not have access to water.[23] An estimated 482,882 children, mainly from 23 ASAL Counties, required treatment for acute malnutrition. School attendance dropped in the Counties that were impacted by the drought.[24] Droughts also cause changes in the migratory patterns of animals, and increase conflicts between people and large mammals like elephants.

From a geographical perspective, Kenya's ASALs are particularly vulnerable to the impacts of climate change. The highest incidence of poverty is found in these areas. Women and men in ASALs experience greater competition over resources than in other areas. Kenyan ASALs are experiencing rising populations and in-migration from the country's densely-populated highlands and, lower access to infrastructure, such as potable water, electricity, and telecommunication facilities.[25] The ASAL economy is highly dependent on climate-sensitive activities, yet it supports more than 70% of the national livestock population, and 90% of wildlife that is the backbone of the country's tourism sector.[26]

Cross-border and cross-County conflicts could be exacerbated by climate change. Furthermore, as temperatures rise and rainfall patterns change,



some areas become less conducive for livestock, particularly cattle, which leads to reductions in herd numbers. Counties, such as Laikipia, which have favourable conditions, could enter into resource-use conflicts when pastoralists from other Counties move their animals to them in search of water and better conditions of pasture.[27] Cross-border conflicts could increase with neighbouring countries, such as Ethiopia, and Tanzania, when pastoralists compete for food, water, and grazing lands.

There is evidence of migration of vulnerable groups in Kenya that is linked to climate change. The migration is mainly due to reliance on resource-based livelihoods by the groups. Reduced agricultural productivity is a key trigger for rural-urban migration, and settlement in risk-prone areas and informal settlements. Resource scarcity, which often couples with historical land conflicts, could also lead to displacements. Floods, droughts, and landslides also contribute to movement of people,[28] which affects effective planning. Groups that are most vulnerable include, pastoralist communities, hunters and gatherers, and fisher communities. These are affected by climate change because of environmental degradation, and growing competition for land and water.[29] Persons with disabilities, children, and the elderly, are also vulnerable because of potential impacts of climate change on their health, which is often related to their limited mobility. Many artisanal fisher communities suffer from severe poverty, and are impacted by climate change-induced storms, and heavy rainfall that cause seas to get rough, especially in May-June-July periods, when they are unable to fish or risk their lives attempting to earn income. Concern has also been expressed over the vulnerability of the poor that live in urban slums.

Women are vulnerable to climate change. Their role as primary caregivers and providers of food and fuel makes them more vulnerable when flooding and droughts occur. Drought compromises hygiene for women and girls, as the little water available is used for drinking and cooking. It also negatively effects women's time management in the household. When nearby wells and water sources run dry, women travel long distances to search for water. Longer dry seasons mean women have to work harder to feed and care for their families. In both urban and rural areas, women have multiple demands in the home, workplace, and community, which leave less time for their political involvement and active participation in decision-making processes. Women in traditional communities may be subject to cultural beliefs that deny them equal opportunities and rights. Women are also more likely to experience poverty, less likely to own land, and have less socioeconomic power than men, which makes it difficult for them to recover from climate disasters that affect infrastructure, jobs, and housing.



Photo: *Unisplash*

(b) Environmental Impacts

Droughts are large-scale disasters in Kenya. The International Disaster Database reported that a total of ten droughts occurred in Kenya between 1990 and 2015. This translates to one drought disaster every two and a half years. An assessment conducted by the Kenya Food Security Steering Group on the 2017 long-rain season in Kenya's ASAL Counties found that spatial and temporal distribution of rain was poor across the entire country.[30] The assessment also established that rains began late in most parts of the country, resulting in a shortened rainy season.[31] Most areas were reported to have received 50-90% of normal rainfall.[32]

Rising sea temperatures in the Western Indian Ocean influence the coastal conditions associated with Kenya. IPCC reports that sea temperatures have increased by 0.6 ˚C between 1950 and 2009, triggering mass coral bleaching and mortality on coral reef systems over the past two decades. This is likely to change the abundance and composition of fish species, with a negative impact on coastal fisheries.[33]

Rising sea levels are also a concern for Kenya's coastline consisting of mangroves, coral reefs, sea grass and, rocky, sandy, and muddy shores. IPCC reports that over the 1901-2010 period, global mean sea level rose by 0.19 metres, as a result of thermal expansion of the ocean due to warming, and addition of water from the loss of mass from melting glaciers and ice sheets. The annual rise over the past 20 years has been 3.2 millimetres per year, which is roughly twice the average speed observed in prior 80 years. Globally, sea levels are expected to rise from 26 cm to 82 cm by 2080s.[34] The rate of sea level rise along Africa's Indian Ocean coast is expected to be greater than the global average. This will lead to greater levels of, and more frequent coastal flooding, changing patterns of shoreline erosion, increased salinity of coastal aquifers, and modification of coastal ecosystems, including beaches, coral reefs, and mangroves.[36]

IPCC reports that the ocean has absorbed about 30% of the emitted anthropogenic carbon dioxide, causing seawater to become more acidic.[37] Ocean acidification is expected to impact many ocean species, and to cause decline of species. This would negatively impact fisher communities, who rely on these species for food and livelihoods. Marine species, such as corals, which dependent on calcium carbonate to build their shells and skeletons, are highly vulnerable. Little is known about ocean acidification in the Western Indian Ocean because long-term observations and relevant experiments have not been carried out.[38] Research is underway to determine the economic and social impacts of ocean acidification on coastal communities and fisheries in Kenya.[39]

Glaciers are declining on Mount Kenya. They have been projected to disappear in the next 30 years, largely because of climate change.[40] The Lewis Glacier shrunk by 23% from 2004 to 2010, while the Gregory Glacier disappeared.[41] The ice volume of Lewis Glacier decreased from about 7.7 km3 in 1978 to about 0.3 km3 in 2004, with an average thickness loss of almost one metre of ice per year.[42] The glaciers are melting because of lack of precipitation, particularly, diminished snowfall on the mountain peaks to sustain them. Mount Kenya is one of Kenya's water towers, and the source of numerous rivers and streams.



Desertification in ASALs is also a major environmental impact attributable to climate change, besides human activities. It is intensifying and spreading, and reducing the productivity of land, which negatively affects communities.[43] Climate change is also a major contributor to land degradation, which encompasses changes in the chemical, physical and biological properties of the soil. Human activities however pose the greatest threat through unsustainable land management practices, such as destruction of natural vegetation, over-cultivation, over grazing, and deforestation.[44] Restoration of degraded land seeks to achieve neutrality in land degradation, and maintain or enhance the land resource base, or the stocks of natural capital associated with land resources and the ecosystem services that flow from them. Restoration of degraded land has important climate benefits, including the sequestration of carbon dioxide, and improved climate resilience through recovery of lost ecosystems. Kenya launched an ambitious land restoration programme in 2016, which targets restoration of 5.1 million hectares of degraded and deforested landscapes by 2030.[45]

Climate change is contributing to the loss of Kenya's biodiversity. The Inter-Governmental Science-Policy Platform on Biodiversity and Ecosystem Services reported that climate change could result in significant losses of many African plant species, some animal species, and decline in the productivity of fisheries in Africa's inland waters during the 21st century.[46] Dozens of animals died in 2017 as a result of lack of water and pasture in national parks and reserves; a direct impact of drought. Kenya Wildlife Services (KWS) has reported that in some years, more animals die from drought than poaching in Kenya. Climate change has the potential to alter migratory routes and timings of species, such as migratory birds that use seasonal wetlands, and herbivores that track seasonal changes in vegetation. Climate change significantly affects marine ecosystems, and could lead to large-scale shifts in patterns of marine productivity, biodiversity, community composition, and ecosystem structure.


Photo: *Min. of Environment*

Kenya lost about 12,000 hectares of forest annually, from 1990 to 2005, through deforestation. At independence in 1963, Kenya had a 12% forest cover. Due to population pressure for settlements, infrastructure, demand for wood products, and conversion to agriculture, forest cover had been reduced to about 6.9% in 2017.[49] Deforestation is a major cause of climate change, because clearing forests releases huge amounts of greenhouse gases. Deforestation and forest degradation in Kenya largely results from human activities. Climate change could affect the growth, composition, and regeneration capacity of forests, which would result in reduced biodiversity, and diminished capacity to deliver important forest goods and services. Rising temperatures and long periods of drought could lead to more frequent and intense forest fires, while rising temperatures could extend the ecosystem range of pests and pathogens. Climate change impacts tree growth, survival, yield, and quality of wood and non-wood products. Rising sea levels could submerge mangrove forests in low-lying coastal areas.[50]

Other climate-related environmental hazards in Kenya include, landslides, and forest fires. Landslides are associated with heavy rainfall in regions with steep slopes, such as Murang'a County, Counties in Western Kenya, and the North Rift Valley.[51]

(c) Economic Impacts

The economic cost of floods and droughts in Kenya is estimated to create a long-term fiscal liability equivalent to between 2% and 2.8% of the country's GDP every year.[52] Specifically, the costs of floods are estimated to be about 5.5% of GDP every seven years, while droughts account for 8% of GDP every five years.[53]

The economic impacts of floods are severe; in 2018, rain and flooding wiped out resources worth billions of shillings. Roads and infrastructure were damaged, seasonal crops across an estimated 8,500 hectares of land destroyed, and over 20,000 livestock drowned. The Government allocated over KES 75 billion to combat floods and fix the roads destroyed by the rains.[54] The El Niño-induced floods in 1997/1998 caused losses and damages of between US$ 800 million and US$ 1.2 billion in Kenya.[55]

Droughts have had the greatest climate change-related economic impacts in Kenya. On average, a 0.6 percentage point decline in GDP growth is observed in years of poor rains (see Figure 3).[56] This is because most of the country's growth sectors are climate-sensitive. The agriculture sector, for example, grew by a mere 1.6% in 2017, compared to 4.7% in 2016. This is because drought suppressed production of crops, and adversely affected livestock production.[57] From 2007 to 2017, losses in livestock populations due to drought-related causes amounted to about US$ 1.08 billion.[58]

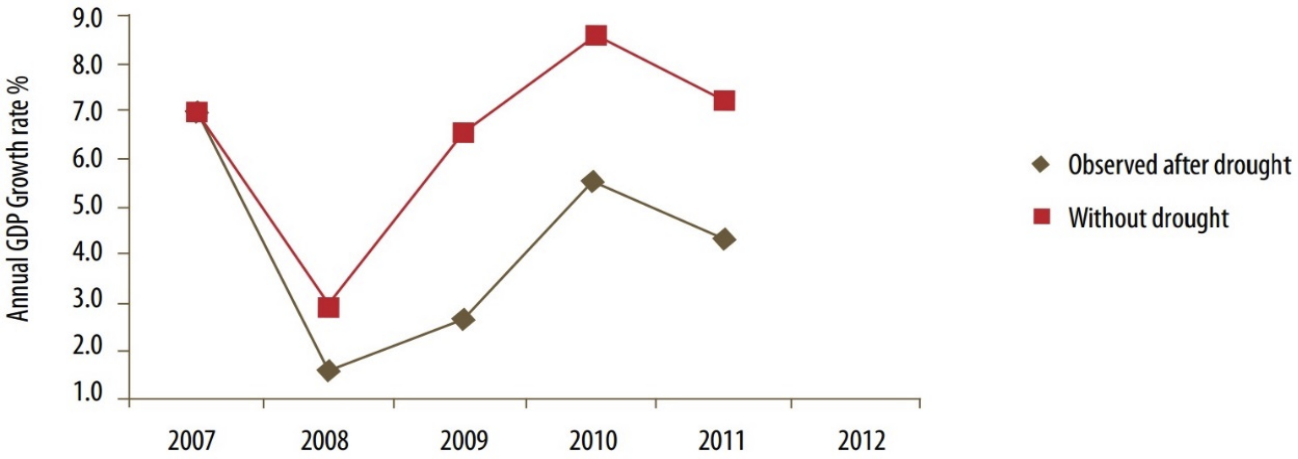


Figure 3: *Growth rate in GDP in Kenya in 2007-2011, with and without drought.*[59]

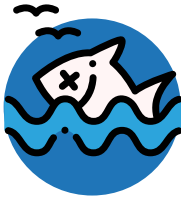
The 2008-2011 drought is estimated to have cost the Kenyan economy KES 968.6 billion; KES 64.4 billion for the destruction of physical assets, and KES 904.1 billion for losses in the flows of the economy. Along with other internal and external shocks, the severe droughts between 2008 and 2011 contributed to the reduction in Kenya's GDP growth rate, from an average of 6.5% in 2006/2007 to an average of 3.8% between 2008 and 2012.[60] The drought also depressed generation of hydroelectricity, leading to an increase in generation from thermal sources that are more costly and produce GHG emissions.

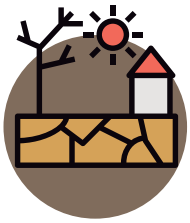
The impacts of drought are felt at the household level, and are particularly devastating for pastoralists in ASALs, where livestock production, specifically, semi-nomadic pastoralism, is the key source of income. The share of income from livestock, in total

household economic income, ranges from 25% to 80% in Mandera, Marsabit, Turkana, and Wajir, with the share being larger for poorer families. Drought could weigh heavily on pastoralists because animals often perish. Over 70% of livestock mortality in ASALs is caused by drought. Droughts therefore cause significant disruptions in income streams, and loss of assets in the areas. Kenya risks losing about 1.7 million cattle, which is equivalent to 52% of the total cattle population in ASALs, in the next ten years, because of drought and effects of climate change. Livestock farmers risk losing between KES 34 and KES 68 billion in the ten-year period, with the largest impacts projected to be in Garissa, Wajir, Tana River, and Turkana.[61]

Sea level rise is also a climate change-induced phenomenon that affects the Kenyan economy by impacting coastal towns and communities. The National Museums of Kenya is constructing a KES 500 million sea wall to protect Fort Jesus in Mombasa from the erosion caused by rising sea levels and storm surges.[62] Coastal flooding from sea-level rise is projected to affect 10,000–86,000 people a year, and lead to coastal erosion and wetland loss at an annual cost of between US$ 7 and US$ 58 million by 2030, and rising to between US $ 31 and US$ 313 million by 2050.[63] The projected impacts of climate change by sector are elaborated in the Adaptation Technical Analysis Report (ATAR) 2018-2022, and summarised in Table 2.

Table 2: *Summary of likely impacts of climate change by sector in Kenya.*[64]

Sector	Likely impacts of climate change
 Crops	■ Greater food insecurity ■ Decline in overall crop yields in most areas, due to insufficient availability of water, excessive moisture conditions and, more pests, diseases, and weeds ■ Reduced production in ASALs, due to temperature increases, and lower precipitation, which lead to reduced soil moisture ■ Uncertainty regarding the impact on the production of specific crops, but likely reduction in the yields of maize and beans, and potential reductions of export cash crops, such as tea, coffee, horticulture ■ Higher temperatures in highland areas may have a positive impact on agricultural production
 Livestock	■ Livestock deaths, caused by drought ■ Decline in production, due to lack of pasture, reduced access to water, and heat stress ■ Changes in disease patterns, and potential for re-emergence of climate related diseases and pests
 Fisheries	■ Thinning of species, and biomass abundance, owing to effects of temperature increase on nesting and feeding grounds ■ Increased risk from alien invasive species

Sector	Likely impacts of climate change
 Coastal Zones / Blue Economy	■ Submergence of low-lying areas, and increased water-logged areas ■ Salt water intrusion along the coast, due to sea level rise, with implications for domestic, industrial, and agricultural uses and, coastal ecosystems ■ Destruction of coral reefs ■ Negative impact on the economic benefits of investments in the blue economy, including declining fisheries, damage to coastal ecosystems, and tourism and, damage to ports due to sea level rise and storm surges ■ Declines in fisheries and livelihoods, due to ocean acidification, and warming oceans
 Drought and Flood Management	■ Increased frequency and intensity of droughts, especially in ASALs and, decreased ability of ASAL people to cope ■ Increased frequency and intensity of flooding, which could decrease people's ability to cope ■ Increased number of food insecure and malnourished people ■ Increased number of people without access to water ■ Declines in school attendance, and rising dropout rates
 Energy	■ Decline in forest productivity, which restricts availability of fuelwood ■ Reduction in the capacity for hydroelectric generation, due to decline in water flows in rivers, particularly during dry seasons and, increased reservoir siltation ■ Increased demand for energy, as high temperatures encourage the use of air conditioners and refrigeration ■ Damage to infrastructure
 Environment	■ Increased likelihood of contestation and conflict over diminishing natural resources ■ Increases in invasive species, and new pests and diseases ■ Increase in stagnant air days, which aggravates air pollution
 Forestry	■ Increased exposure to fire, pathogens, and invasive species ■ Reduced provision of environmental resources and benefits, and forestry-associated economic activities
 Health	■ Shifts in the geographic range of malaria to higher altitudes ■ Increase in incidences of malaria, Rift Valley Fever, malnutrition, scabies, chiggers, and lice infestations ■ Increase in water-borne diseases, such as cholera, and typhoid

Sector	Likely impacts of climate change
 Housing and Buildings	■ Increase in risks from collapse, declining health of buildings, and loss of value, due to more frequent and heavier rain events, water encroachment, and storm surges in coastal areas ■ Safety risks associated with existing buildings that do not meet standards and codes
 Manufacturing	■ Reductions in hydroelectric generation, which could cause energy fluctuations or blackouts because of energy supply interruptions ■ Greater resource scarcity, such as water and raw materials that are inputs in manufacturing processes ■ Greater risk of plant, product and infrastructure damage, and supply chain disruptions from extreme climate events ■ Higher costs to companies, including for insurance
 Security	■ Increased likelihood of conflicts within and between countries, Counties, and communities ■ Political and financial instability, resulting from supply line disruptions, and increased risks of doing business
 Tourism and Wildlife	■ Tourist facilities affected by reduced availability of water, and lack of access due to damaged roads and infrastructure ■ Adverse impacts on ecologically-sensitive tourist destinations ■ Potential for migration of wildlife populations, with implications for park boundaries and human-wildlife conflict ■ Potential for species extinction
 Transport	■ Damage to infrastructure, including roads and bridges, during storms ■ Interruptions to maritime, road, rail, and air networks, because of flooding, and heavy rainfall events ■ Softened and expanded pavements, creating rutting, and potholes and, warping of rail tracks because of increased temperatures ■ Disruption of access to work, markets, education, and healthcare facilities, due to damaged infrastructure and transport services.
 Water	■ Reduced availability of surface water for activities, such as irrigation, livestock production, household use, wildlife, and industry ■ Increased water loss from reservoirs, due to evaporation ■ Continued retreat of glaciers on Mount Kenya that feed the Tana and Ewaso Ng'iro Rivers, leading to lower water levels, particularly during dry seasons

1.4.4 Contribution to Climate Change by Kenya

Kenya has little historical or current responsibility for global climate change; the country's GHG emissions represent less than 1% of total global emissions. Nonetheless, the amount of greenhouse gases (GHGs) that humans release into the atmosphere has increased every year since the Industrial Revolution, and is now at disturbing levels. As carbon dioxide and other GHGs build up in the atmosphere, they trap heat, which causes climate change. While adaptation is the priority for Kenya, action is needed to reduce GHG emissions that are projected to increase due to population and economic growth (see Figure 4). Kenya's mitigation or low-carbon actions seek to help to keep GHG emissions lower than the projected trajectory, and to deliver co-benefits, including sustainable development, green growth, and resource efficiency. The low-carbon actions also contribute to achieving the Government's Big Four Agenda.

Actions in the six mitigation sectors set out in the UNFCCC; agriculture, energy, forestry, industry, transport, and waste, lead to lower emissions than in the projected baseline, and could help meet Kenya's mitigation Nationally Determined Contribution (NDC). The forestry sector has large potential to reduce GHG emissions in Kenya, because forests act as "sinks" through carbon sequestration (see the green wedge in Figure 5).

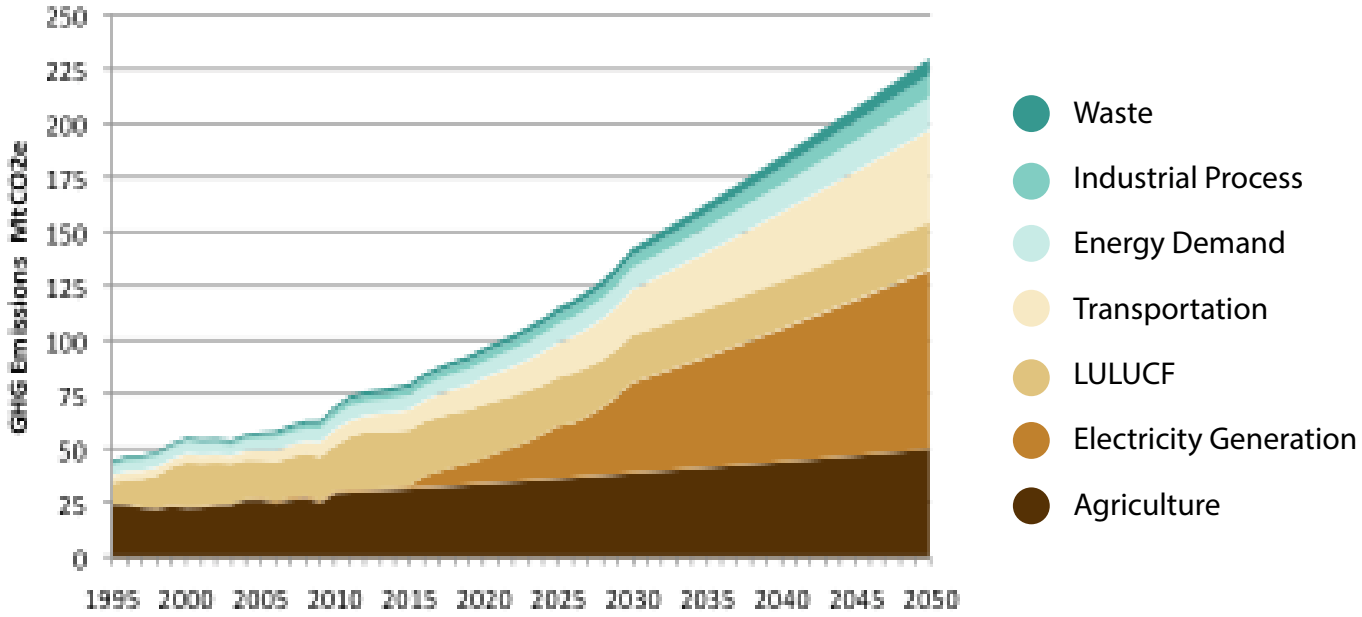


Figure 4: *Baseline projection of greenhouse gas emissions in Kenya ($MtCO_2e$).*[65]

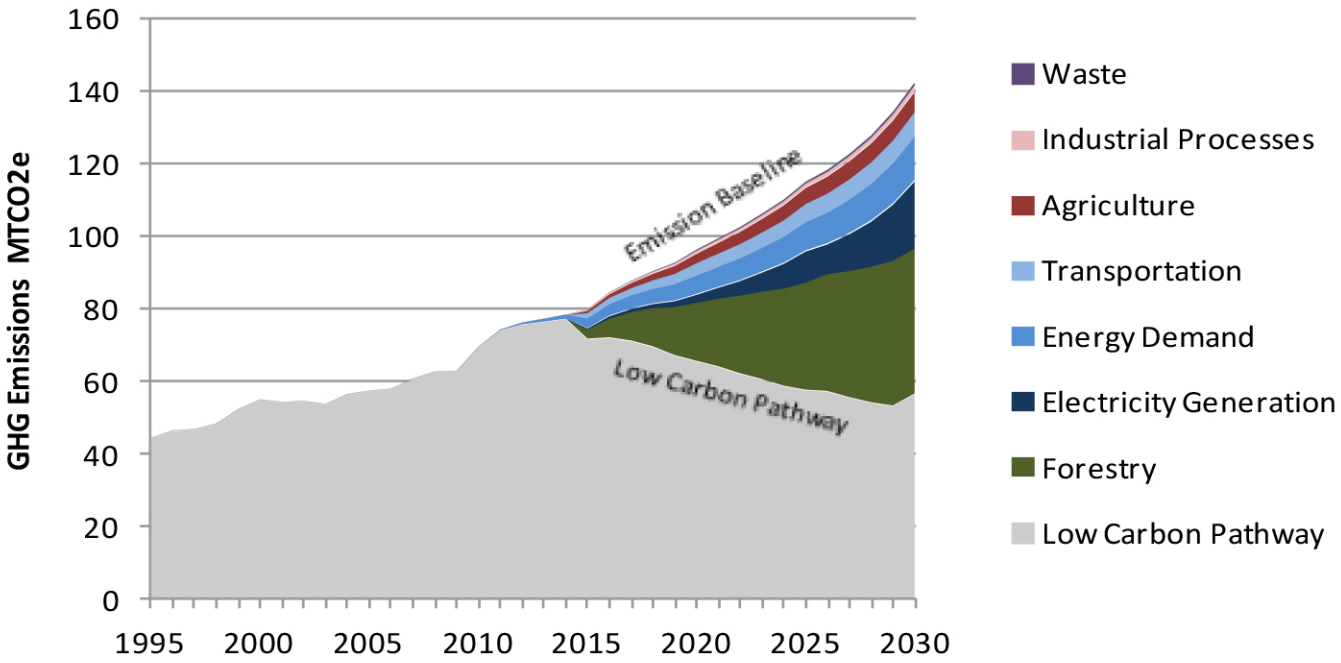


Figure 5: *Composite abatement potential for all sectors in Kenya (technical potential) in $MtCO_2e$.*[66]

1.4.5 Summary on the Implementation of NCCAP 2013-2017

The Government of Kenya made substantial progress in implementing its first NCCAP, which was operational from 2013 to 2017. NCCAP 2013 - 2017 helped the country to deliver on domestic goals, and international obligations under the UNFCCC. It identified 38 priority actions, including nine mitigation actions, and twenty-nine enabling actions in the areas of climate finance, knowledge management, legislation and policy, and performance measurement. Seven actions were completed, twenty-five were progress as of May 2018, and many have been carried over to NCCAP 2018-2022. Six actions did not progress, five of which were under the National Performance and Benefit Measurement subcomponent.[67]

(a) Progress on Adaptation

Priority actions on adaptation were summarised in NCCAP 2013-2017, and elaborated in *the National Adaptation Plan (NAP) 2015-2030.* Over the 2013-2017 period, GoK and its partners took action to reduce climate change-related vulnerabilities, and build adaptive capacity. Emphasis during the period was on disaster risk-reduction, humanitarian action, preparedness and response actions, and other priorities identified in the NAP.[68] Adaptation actions have however not yet been reviewed in detail, given that only 2 years have passed since *NAP 2015-2030* was approved.

At the National level, many actions in *NAP 2015-2030* were undertaken through the National Drought Management Authority (NDMA), including ending drought emergencies, establishment of the National Drought Emergency Fund (NDEF), and initiatives in ASALs aimed at helping the most vulnerable in times of drought. Coping strategies of the poorest people in Turkana, Wajir, Mandera, Marsabit, and other ASAL Counties were enhanced through provision of support during droughts.

Adaptation actions supported by development partners were on adaptation within the agriculture sector, including irrigation projects, enhancing the climate resilience of pastoralists, and sustainable land management. Considerable progress was made in improving access to climate information services, providing loans for smallholder farmers to invest in resources that increase their climate resilience, and establishing insurance schemes for smallholder farmers. Adaptation actions also helped to improve climate risk management, and natural resource-related knowledge in ASALs and, built the capacity of government to enable adaptation-related actions. Kenya also made considerable progress on increasing the availability of freshwater sources, and improving the resilience of water towers.

Adaptation action at community levels was supported through the Integrated Programme to Build Resilience to Climate Change and Adaptive Capacity of Vulnerable Communities in Kenya, which was supported by the *UNFCCC* Adaptation Fund, and implemented by the National Environment Management Authority (NEMA) in its role as the National Implementing Entity (NIE) to the Adaptation Fund. The initiative focused on food security, water management, coastal ecosystem management, and environmental management.

At county level, many County Governments integrated climate change in their 2013 County Integrated Development Plans (CIDPs); acknowledging that climate change poses threats to their sustainable development.[69] As indicated in Box 3, Garissa, Kitui, Makueni and Wajir County Governments passed regulations to establish County Climate Change Funds (CCCFs). Legislation on the County Climate Change Fund (CCCF) was developed in Isiolo, County and was awaiting approval by the County Assemblies as of September 2018. Other Counties, such as Kisumu, established institutional structures to mainstream climate change in plans and programmes.

The private sector was an active partner in the implementation of adaptation-related actions. It provided technologies, insurance products, and climate information services; many of which are facilitated by smart-phone applications. Various companies have also been active in building the climate resilience of farmers in their supply chains.

Box 3: County Climate Change Funds

Five County Governments, namely, Garissa, Isiolo, Kitui, Makueni, and Wajir have established County Climate Change Funds (CCCFs) that identify, prioritise, and finance investments to reduce climate risk and attain adaptation priorities. This is achieved through community-level planning committees that identify adaptation needs, guided by transparent decision-making criteria. CCCF investments aimed at building climate resilience have largely focused on livestock, water, natural resource governance and climate information services.

CCCFs work through the government's established planning and budgeting systems, and will be linked with the Climate Change Fund established under the *Climate Change Act (2016).* The CCCFs are structured to blend resources from international climate finance, development partners, the private sector, and National Government and County budgets.

Climate change fund legislation was enacted in Makueni, Wajir Garissa, and Kitui Counties in 2015, 2016, 2018 and 2018 respectively. Makueni and Kitui County regulations obligate the setting aside of 1% of annual development budgets for climate change action; while the legislation in Wajir and Garissa Counties require an annual allocation of 2% of their development budget. This amounts to approximately KES 85 million in the 2017/18 fiscal year for each of Wajir and Garissa; KES 75 million for Makueni; and KES 117 million in the 2018/2019 fiscal year for Kitui.

Murphy, D. & Orindi, V. (2017). Snapshot: Kenya's County Climate Change Funds. County Brief 2B: NAP Global Network

(b) Progress on Mitigation

NCCAP 2013-2017 identified six priority action areas for emission reductions, and had quick-win or short-term actions that would trigger the process of meeting the long-term goals. These short-term actions included the development of funding proposals, and improving the measurement of GHG emissions and sinks. A key quick-win achievement was the approval of a grant of Euro 20 million from the International Nationally Appropriate Mitigation Action (NAMA) Facility for Nairobi's Bus Rapid Transit (BRT) system, which will be implemented as part of *NCCAP 2018-2022.*

While reducing GHG emissions is critical, Kenya prioritised mitigation actions that have adaptation and sustainable development benefits. An example was in the forestry sector, where actions to sequester carbon, such as reforestation, are expected to bring development benefits, including protected watersheds, and improved livelihoods. MEF and Kenya Forestry Service (KFS) worked with County Governments and private land holders to plant trees, and developed actions on the Reduction of Emissions from Deforestation and forest Degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+).

Electricity generation from geothermal energy sources reduced GHG emissions, and lessened the vulnerability of the energy sector to climate change. The total installed geothermal capacity at the end of 2016 was about 630 MW, which is an increase of about 380 MW from the 250 MW of geothermal power generation reported in June 2013.[70] In the 2016/2017 fiscal year, installed capacity was 2,333 MW, with geothermal accounting for 44% of the electricity generation in the mix, hydro 33%, thermal 21%, and imports 2%.[71] The capacity of renewable energy was increased under *NCCAP 2013 – 2017* through geothermal projects in Olkaria, wind projects in Turkana and Ngong Hills, and several decentralised energy projects, such as mini-grids and solar photovoltaic systems for off-grid public schools.

The private sector was a critical partner, with companies generating electricity using renewable energy sources, including solar, biogas and bagasse. Companies also manufactured solar panels and established pay-as-you-go solar lighting systems for households. The Kenya Association of Manufacturers (KAM) worked with the Ministry of Energy to support energy audits, and efficiency improvements, aimed at reducing GHG emissions. The cement sector introduced energy efficiency and process improvements, while efforts to reduce energy demand at household levels embraced improved cookstoves, biogas and solar lighting.

Action to reduce emissions in the transport sector included completion of the Mombasa-Nairobi Standard Gauge Railway (SGR). This has helped to shift container freights from road to rail. Furthermore, the requirement that all containers for Nairobi and beyond use the inland container depot at Embakasi is expected to ensure that at least 40% of freights move from trucks to the SGR.

Regarding participation in the Clean Development Mechanism (CDM), Kenya registered sixteen CDM projects, and sixteen Programmes of Activities in such sectors as reforestation, energy efficiency, geothermal, wind, and hydro. Kenya was also active in the voluntary carbon market; hosting the Kasigau Wildlife Corridor REDD project, which is the first activity to issue voluntary forestry carbon credits and, the Kenya Agriculture Carbon project, which is the first project in Africa to issue carbon credits for sequestering carbon in soil.

(c) Progress on Enabling Actions

NCCAP 2018-2022 builds on the foundation established through enabling actions implemented under *NCCAP 2013-2017,* as summarised in Box 4. A key accomplishment was enactment of the Climate Change Act, 2016, which provides the regulatory framework for enhanced response to climate change, and provides for the mainstreaming of approaches for low carbon climate resilient development. *The National Climate Change Policy (2018)* was approved by Parliament, the Climate Change Directorate (CCD) put in place, and the National Climate Change Resource Centre (NCCRC) established.

Box 4: Highlights of progress on Enabling Actions under NCCAP 2013-2017



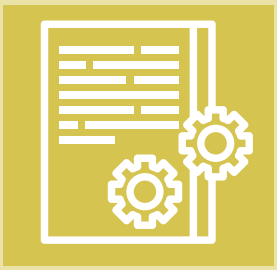
Technology Development and Transfer

- Technology Needs Assessment completed in 2013.
- Kenya Industrial Research and Development Institute (KIRDI) appointed as the National Designated Entity (NDE) for the Climate Technology Centre and Network (CTCN), the operational arm of the *UNFCCC* Technology Mechanism.
- KIRDI, Kenya Agricultural and Livestock Research Organisation (KALRO), Kenya Forestry Research Institute (KEFRI), Kenya Marine and Fisheries Research Institute (KMFRI) and other institutions supported the development and transfer of climate change technologies.
- Kenya Climate Innovation Centre, KAM Centre for Energy Efficiency and Conservation, and Kenya National Cleaner Production Centre provided technology- and innovation-related services to the private sector.



Knowledge Management and Capacity Development

- National Climate Change Resource Centre (NCCRC) established in 2015.
- Kenya Climate Information Portal, with sections for children and youth, launched in 2018.
- Kenya Meteorological Department (KMD) improved its climate observation network, including the installation of automated weather stations, and established the National Climate Diagnostic Laboratory to improve climate knowledge and information management.
- MEF, in collaboration with the Kenya School of Government and the COG, developed a training programme on *Climate Change Policy, Planning and Budgeting at National and County Levels.*



Enabling Policy and Regulatory Framework

- Climate Change Directorate established.
- *Climate Change Act (No. 11 of 2016)* enacted in May 2016.
- *National Climate Change Policy* approved by Parliament in February 2018.
- Climate change fund regulations enacted in Garissa (2018), Kitui (2018), Makueni (2015), and Wajir (2016).

Climate Finance

- *National Climate Finance Policy* approved by Parliament in 2018.
- The National Treasury appointed as the National Designated Authority (NDA) for the Green Climate Fund (GCF) and implemented a programme of GCF readiness.
- NEMA appointed as the National Implementing Entity (NIE) for the GCF and Adaptation Fund under the UNFCCC.

National Performance and Benefit Measurement Framework

- Prototype registry of climate change actions developed in 2017.
- Kenya's Second National Communication, including an updated GHG inventory, submitted to the *UNFCCC* in 2015.
- CCD established a GHG inventory unit to manage data and reporting on GHG emissions and removals.
- National Forest Inventory developed and the System for Land-based Emissions Estimation in Kenya (SLEEK) established to improve estimations of land-based GHG emissions.
- Climate change indicators handbook developed to improve the monitoring and evaluation (M&E) of climate change actions.

Source: *Adapted from the Government of Kenya (2016), Addressing Climate Change: Success Stories from Kenya, Nairobi: MENR; and Murphy, D. & Chirchir, D. (2017), Review of the Implementation of the Kenya National Climate Change Action Plan 2013-2017, Nairobi: StARCK+ Technical Assistance to the Government of Kenya Component*



Photo: *Benard Omwaka*

(d) Lessons Learned

Lessons learned while implementing *NCCAP 2013-2017* guided the development of *NCCAP 2018-2022.*[72] These lessons included:

Emphasis on adaptation and mitigation actions. While priority enabling actions are important because they support the achievement of adaptation and mitigation goals. It is essential to focus attention on the priority actions identified in the priority sectors, such as, agriculture, clean energy, biodiversity conservation and use, and disaster risk reduction.

Successful climate change actions are vulnerable group-centered. Identifying vulnerable groups, including women, older members of society, persons with disabilities, children, youth, and members of minority and marginalised communities and, working with and for them, is important to success of climate change action.

A robust legal framework, like the one established through the *Climate Change Act, 2016* encourages mainstreaming, which is essential for effective implementation of NCCAPs. This ensured that Kenya's Third Medium Term Plan (MTP III) includes climate change as a crosscutting issue, and that climate change is easily being mainstreamed in the relevant sectors.

Effective coordination of climate change action is an important element of success. The *Climate Change Act, 2016* defines a coordination role that is overseen by the National Climate Change Council (NCCC) and delivered by CCD.

The process of developing NCCAPs requires adequate consultation. Climate change is a cross-cutting issue with impacts across sectors. Adequate consultations enable views and perspectives of different stakeholders to be accounted for, including those expressed by individuals and representatives of communities, Counties, business associations, civil society, and vulnerable members of society.

Engagement of County Governments ensures ownership and buy-in. Since many of the climate change actions are to be delivered at County levels, inputs from the Counties should inform the development of NCCAPs.

Reporting on climate actions needs to account for devolution and the role of State Departments and Counties, as set out in the *Climate Change Act, 2016.* This will enhance successful delivery of NCCAPs.

An appropriate Measurement, Reporting and Verification Plus (MRV+) system that includes adaptation and mitigation actions could be introduced in a phased approach over the lifespans of respective NCCAPs. *NCCAP 2018-2022* actions should lead to adaptation and mitigation benefits that can be measured, with baseline information and specific, measurable, attainable, realistic and time-bound (SMART) indicators. National level indicators could be identified to provide a snapshot of progress on climate change. These could, for example, highlight the number of people receiving drought relief payments, and percentage of renewable energy in the electricity mix. Enhanced data collection and management is important for successful climate change action, because it helps to improve reporting on climate results.

1.4.6 The Political, Economic, Social, Technological, Environmental, and Legal Situation

(a) Political Environment

Effective delivery of *NCCAP 2018-2022* requires a supportive political, economic, social, technological, environmental, and legal environment. The country's political environment is favourable, as the political leadership at the National and County levels is supportive of climate change action.

(b) Economic Environment

A supportive economic environment is key to successful delivery of NCCAP 2018-2022. The planned actions require resources that depend on a supportive economy. While the Kenyan economy is steadily growing, a number of the country's planned development projects, including some that relate to actions in NCCAP 2018-2022, do not receive adequate budgetary allocations due to competing demands for the revenues collected by Government. Measures to raise revenues may also sometimes impinge on planned climate change actions. An example is the reduction in the subsidy for households to access liquefied propane gas (LPG). The Government's commitment to low carbon climate resilient development is nonetheless clear from the budgetary allocations to projects that support climate change mitigation, like the Standard Gauge Railway (SGR), and Bus Rapid Transit. The war on corruption is also helpful because it will ensure resources are applied to their intended purposes, which is beneficial to *NCCAP 2018-2022.*

(c) Social Environment

The country's social situation is key to the success of *NCCAP 2018-2022.* A significant number of Kenyans live below the poverty line. Their energy use is dominated by wood-based fuels that emit substantial GHGs and particulate matter during cooking. This category of Kenyans is also closely associated with the high unemployment, and health complications linked to use of energy sources that are not clean.

(d) Technological Environment

Actions relating to technology and innovation are important enablers of success for the adaptation and mitigation actions described in Chapter 4. The overall objective is to support the sectors to promote appropriate technologies for delivery of adaptation and mitigation actions, such as water harvesting, climate information services, and clean lighting and cooking technologies. This will be achieved through technology development and transfer that is defined by IPCC as "a broad set of processes covering the flows of know-how, experience, and equipment for mitigating and adapting to climate change amongst stakeholders such as governments, private sector entities, financial institutions, civil society, and academia".[73] Kenya is well known for technological innovations, such as MPESA. Given the disruptions that are expected in technological innovations in what has been termed as the 4th Industrial revolution,[74] the country's technological capability will be a valuable tool in the delivery of *NCCAP 2018-2022.*

(e) Environmental Situation

Efforts are underway in the country to restore and improve the environment for posterity. These include restoration of the country's water towers, enforcement of prohibitions on manufacture and use of thin plastic bags, tree planting, and improvement in waste management. These are helpful to *NCCAP 2018-2022.*

e) Legal Environment

The *Climate Act (No. 11 of 2016)* sets the legal framework on which all climate action in Kenya is anchored. A comprehensive presentation on this is in Chapter 2.



CHAPTER TWO



Photo: *Min. of Environment*

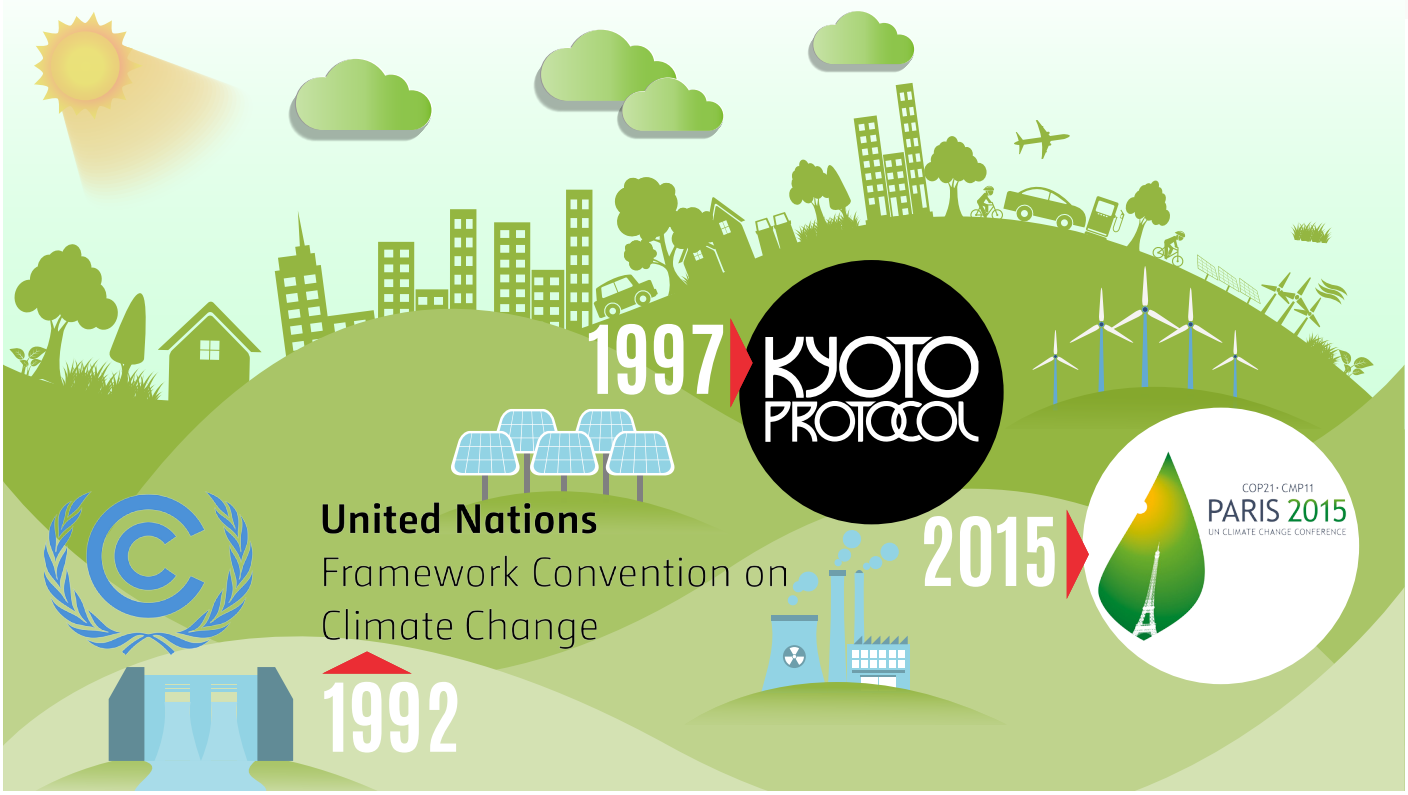
Enabling Policy and Legal Framework

2.1 The Global Perspective

Climate change is a global problem that demands a global solution, and Kenya is an active player in international efforts. The international response to climate change is founded on the ***United Nations Framework Convention on Climate Change (UNFCCC)*** that entered into force in 1994. Kenya signed the UNFCCC on 12th June 1992, and ratified the Convention on 30th August 1994. The country is a key player in the global climate change governance system, and participates in meetings of the Conference of the Parties (COP) to the *UNFCCC*, articulating the national interest, and the country's position, during international negotiations.

The objective of the *UNFCCC* is set out in Article 2, which states:

> *The ultimate objective of this Convention is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate systems. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.*[75]



The ***Kyoto Protocol,*** a GHG emissions reduction treaty linked to *UNFCCC*, was adopted by the COP in 1997, and entered into force in 2005. The *Kyoto Protocol* is an international agreement that commits developed countries, and countries in transition to market economics, to reduce their overall GHG emissions. *The Kyoto Protocol* created the Clean Development Mechanism (CDM), under which projects of developing countries, which reduced GHG emissions, and contributed to sustainable development, earned credits that could be sold to countries or companies with a commitment to reduce GHG emissions. More than 1.5 billion tonnes of carbon dioxide were avoided through CDM, and US$ 9.5-13.5 billion in direct benefits went to host counties from the sale of credits, as of 2012. The first commitment period started in 2008, and ended in 2012.[76] Parties to the *Kyoto Protocol* adopted an amendment in 2012, which has yet to enter into force. Kenya ratified the *Kyoto Protocol* on 25th February, 2005.

The ***Paris Agreement*** entered into force internationally on 4th November, 2016, thirty days after 5th October, 2016, the date on which the threshold for entry into force was achieved after surpassing the threshold for entry of at least 55 Parties to the *Paris Agreement*, accounting for at least an estimated 55% of the total global GHG emissions.

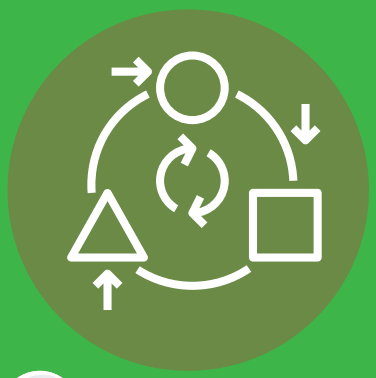
The *Paris Agreement* was ratified by Kenya on 26th December, 2016, under section 9(1) of the *Treaty Making and Ratification Act (Number 45 of 2012),* and entered into force for Kenya on 27th January, 2017. Kenya's NDC sets out the country's actions to contribute to achieving the global goal set out in the *Paris Agreement* (see Box 5). As set out in Article 2(6), and read with Article 94(5) of the *Constitution of Kenya (2010),* the *Paris Agreement* now forms part of the law of Kenya.

The *Paris Agreement* aims at strengthening the global response to the threat of climate change, by keeping rise in global temperature during this century to well below 2 ˚C above pre-industrial levels. Additionally, the *Agreement* aims at strengthening the ability of countries to deal with the impacts of climate change. To reach these ambitious goals, appropriate financial flows, a new technology framework, and an enhanced capacity building framework will be put in place to support developing countries.



Photo: *Min. of Environment*

Box 5: Kenya's Nationally Determined Contribution



Adaptation contribution - ensure enhanced resilience to climate change towards the attainment of Vision 2030 by mainstreaming climate change into the Medium Term Plans (MTPs) and implementing adaptation actions.

Mitigation contribution - seek to abate GHG emissions by 30% by 2030 relative to the business as usual scenario of 143 $MtCO_2eq$.



Achievement of the NDC is subject to international support in the form of finance, investment, technology development and transfer, and capacity development.

The **Green Climate Fund** (GCF) is an operating entity of the Financial Mechanism of the *UNFCCC* that serves the *Paris Agreement* and supports projects, programmes, and other activities in developing countries. The Fund aims for a 50:50 balance between investments in mitigation and adaptation, and engages directly with the private sector through its Private Sector Facility. As of May 2018, 43 governments had made pledges to GCF, totalling US$ 10.3 billion.[77] **The Global Environment Facility (GEF)** manages contributions from donors through trust funds to help developing countries meet the objectives of international environment conventions, including the *UNFCCC.* The trust funds include, the Adaptation Fund, Special Climate Change Fund, and Capacity Building Initiative for Transparency (CBIT).

Kenya is signatory to the ***United Nations Convention on Biological Diversity (UNCBD) (1992)*** and the ***United Nations Convention to Combat Desertification (UNCCD) (1994).*** Kenya became Party to *UNCBD* on 24th October, 1994, and ratified *UNCCD* on 25th June, 1997. These two conventions, plus the *UNFCCC,* are known as the *Rio Conventions* and, are intrinsically linked because they address interdependent issues, such as sustainable land management, and land degradation neutrality.

Kenya is a signatory to the *Vienna Convention for the Protection of the Ozone layer and its* ***Montreal Protocol on Substances that Deplete the Ozone Layer,*** a global agreement with universal ratification to protect the stratospheric ozone layer by phasing out the production and consumption of ozone-depleting substances. The *Protocol* entered into force on 1st January, 1989. Kenya ratified the *Montreal Protocol* on 9th November, 1988. *The Kigali Amendment* seeks to phase down the production and usage of hydrofluorocarbons. At the end of 2014, over 98% of controlled ozone-depleting substances had been eliminated. A very significant co-benefit is emission reductions of 135,000 $MtCO_2e$ from 1989 to 2013.[78]

The ***Stockholm Convention on Persistent Organic Pollutants*** is an international environment treaty that entered into force in May 2004. The *Convention* aims at eliminating or restricting the production and use of persistent organic pollutants. Kenya ratified the *Stockholm Convention* on 24th September, 2004. Climate change has potential impacts on the releases, transport, distribution, and toxicity of persistent organic pollutants, which could lead to higher health risks for human populations, and risks to the environment.

The ***Minamata Convention on Mercury*** aims at protecting human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. The *Convention* was adopted and opened for signature in October 2013; 94 countries had ratified the agreement by June 2018. Kenya is in the process of pre-ratification procedures for the Convention. Both the *UNFCCC* and *Minamata Convention* place a significant onus on emissions from coal combustion.

The ***United Nations Convention on the Law of the Sea (UNCLOS) of 10th December, 1982*** seeks to establish a comprehensive set of rules governing the oceans. Kenya ratified the *UNCLOS* on 2nd March, 1989. The interface between climate change and this international law includes changes to the existing boundaries of maritime zones because of sea level rise, and requirements to regulate emissions from aircraft and marine vessels. There is discussion around the dispute settlement mechanism established in the *UNCLOS*, eventually attracting claims relating to climate change.[79]

The International Civil Aviation Organization *(ICAO) Assembly Resolutions A37-19 (2010) and A38-18 (2013)* set global aspirational goals to ensure carbon neutral growth from 2020, and a 2% annual increase in fuel efficiency up to 2050. In 2015, Kenya set a target to achieve an annual average fuel efficiency improvement of 2%, which is equivalent to 2.86 $MtCO_2e$, until 2030, and an aspirational fuel efficiency improvement rate of 2% per annum, from 2031 to 2050. Kenya ratified the *Convention on International Civil Aviation on* 1st May, 1964.

Kenya has been a member of the ***International Maritime Organization (IMO)*** since 1973. IMO adopted an initial strategy in 2018 to reduce total annual GHG emissions from ships by at least 50% by 2050, compared to 2008. The *Protocol to the International Convention for the Prevention of Pollution from Ships, 1997,* known as *MARPOL Annex VI,* regulates air emissions from ships. Compliance with IMO regulations has mitigated

GHG emissions from international shipping. Jomo Kenyatta University of Agriculture and Technology hosts the regional Maritime Technology Cooperation Centre for the Africa region that aims at helping to mitigate the harmful effects of climate change. The Kenya Ports Authority has initiated a *Green Port Strategy.*

The Climate and Clean Air Coalition to Reduce Short-lived Climate Pollutants, founded in February 2012, is a voluntary partnership of 60 governments, intergovernmental organisations, businesses, scientific institutions, and civil society organizations that are committed to improving air quality, and protecting the climate, through actions to reduce short-lived climate pollutants. These pollutants include, emissions of black carbon (soot), methane, tropospheric ozone, and some hydrofluorocarbons. Kenya became a partner of the coalition in 2012.

The Sendai Framework for Disaster Risk Reduction 2015-2030 is a voluntary agreement that recognises that the State has the primary role to reduce disaster risk, but that responsibility should be shared with other stakeholders, including local governments, the private sector, and other stakeholders. It aims at the following outcome: "The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries."[80] Kenya adopted the *Sendai Framework* in 2015.

Kenya is committed to the ***2030 Agenda for Sustainable Development*** that was adopted by world leaders, including the President of the Republic of Kenya, in September 2015 at the United Nations (UN) Sustainable Development Summit. On 1st January, 2016, the ***17 Sustainable Development Goals*** (SDGs) (see Box 6) officially came into force.

Box 6: Sustainable Development Goals



Source: *United Nations (2018). Sustainable Development Knowledge Platform. https://sustainabledevelopment.un.org/sdgs*

While the SDGs are not legally binding, governments are expected to take ownership, and establish national frameworks for their achievement. The *2030 Agenda* includes dedicated goals for climate change (SDG 13), protecting, restoring, and promoting sustainable use of terrestrial ecosystems (SDG 15), and mainstreaming climate change impacts and climate actions across all the SDGs. The Agenda introduces the overriding objective of "leaving no one behind" that has strong implications for the definition, and selection of climate actions. This objective prioritises the poorest and most marginalised people, so that they progress at a higher rate than those that are better off. To ensure that no one will be left behind, world leaders committed to end extreme poverty, and curb inequalities by 2030 and, underscored that no goal of the *2030 Agenda* will be met until it is met for everyone.[81]

2.2 The Regional Legal and Policy Framework

At the regional level, the ***African Union's Agenda 2063*** commits to climate change action that prioritises adaptation and calls on member countries to implement the Programme on Climate Action in Africa, including a climate resilient agricultural development programme. *Agenda 2063* commits to building climate resilient economies and communities, and notes that participation in global efforts for climate change mitigation will support and broaden the policy space for sustainable development.

The **East African Community (EAC)** Secretariat developed a *Climate Change Policy and Strategy (2010)* to guide Partner States and other stakeholders on the preparation and implementation of collective measures to address climate change in the region. The Policy prescribes statements and actions to guide adaptation and mitigation, reduce the vulnerability of the region, enhance adaptive capacity, and build socioeconomic resilience of vulnerable populations and ecosystems. EAC is developing a climate change bill and forest policy and strategy, and exploring the establishment of an alliance on carbon markets and climate finance.

The **Lake Victoria Basin Commission** developed a *Climate Change Adaptation Strategy and Action Plan (2018-2023)* that presents a roadmap for addressing and adapting to climate change impacts.

The African Forest Landscape Restoration Initiative *(AFR100)* seeks to bring 100 million hectares of land in Africa into restoration by 2030. The commitments announced under AFR100 also support the *Bonn Challenge* adopted in 2011, whose overall objective is to restore 150 million hectares by 2020, the New York Declaration on Forests that stretches the goal to 350 million hectares by 2030, and the *African Resilient Landscapes Initiative* that promotes integrated landscape management to promote adaptation to, and mitigation of climate change. In 2016, Kenya committed to restore 5.1 million hectares of forest land by 2030.

2.3 The National Legal and Policy Framework

A robust framework of policies, plans, and institutions is being progressively established at the National and County levels in Kenya to address climate change. The foundation of the institutional and legal framework for climate change action is the *Constitution of Kenya (2010).* Article 10 sets out national values and principles of governance, such as sustainable development, devolution of government, and public participation, which are mandatory when making or implementing any law or public policy decisions, including those relating to climate change. Article 42 provides for the right to a clean and healthy environment for every Kenyan, which includes the right to have the environment protected for the benefit of present and future generations through legislative and other measures.

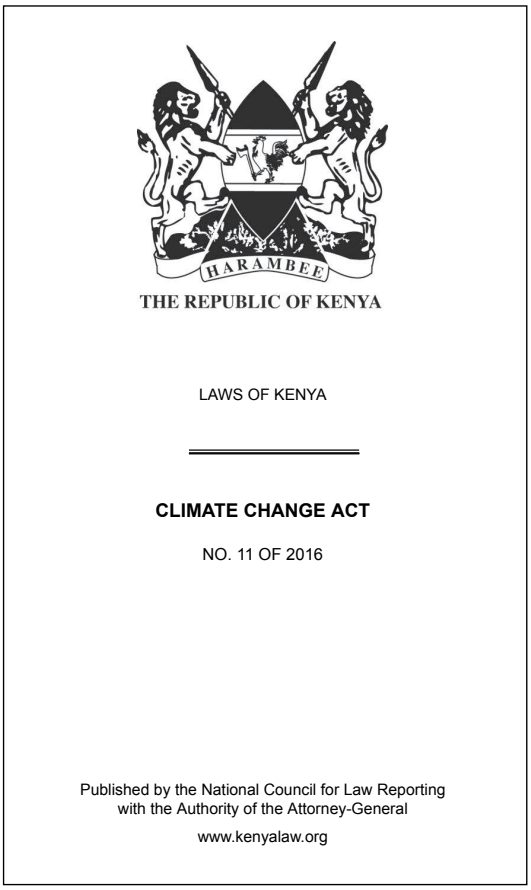
The *Constitution of Kenya (2010)* created the devolved system of government comprised of the National Government and 47 County Governments. The concept of devolution goes beyond mere decentralisation of government services, providing a form of self-governance at the local level, and a process of equitable sharing of resources. County Governments have a key delivery role in implementing the *Climate Change Act, 2016,* having jurisdiction, as set out in the Fourth Schedule (Part 2) of the *Constitution,* over sectors relevant to climate change action, such as agriculture, soil and water conservation, forestry, water and sanitation, tourism, and health. Article 203(2) of the *Constitution* requires that County Governments be allocated a minimum of 15% of national revenue received annually, but the allocation often surpasses this minimum, which gives County Governments considerable scope to influence investments in climate change action.

The *Constitution of Kenya (2010)* advances gender equality, stating in Chapter 4, the Bill of Rights that "women have the right to equal opportunities in political, economic, and cultural spheres," and in order to achieve that equality, requires that government puts in place, and implements affirmative action that delivers equity for women. This commitment to gender equality and implementation of gender equity is taken up in section 7(6) of the *Climate Change Act, 2016* that requires the President to ensure compliance with the two-thirds gender principle when appointing members to the *National Climate Change Council (NCCC).* Further, section 8(2)(c) of the Climate Change Act, 2016 obligates the Cabinet Secretary responsible for climate change affairs to formulate and implement a national gender- and intergenerational-responsive public education and awareness strategy.

The Climate Change Act, 2016 is the key legislation guiding Kenya's climate change response. It is the legal basis for mainstreaming climate change considerations and actions into sector functions, and provides the legal foundation for NCCAPs. *NCCAP 2018-2022* responds to provisions in the *Climate Change Act, 2016* that require the updating of the NCCAP every five years (see Box 7).



Box 7: The Climate Change Act (No. 11 of 2016)



HARAMBEE

THE REPUBLIC OF KENYA

LAWS OF KENYA

CLIMATE CHANGE ACT

NO. 11 OF 2016

Published by the National Council for Law Reporting
with the Authority of the Attorney-General

www.kenyalaw.org

The Climate Change Act (2016) is a national legislation that provides for an enhanced response to climate change, and provides mechanisms and measures to achieve low carbon climate resilient development. The Government of Kenya, led by the Ministry of Environment and Forestry, worked with stakeholders from civil society, the private sector, national and county governments to develop this climate change legislation. The Act adopts a mainstreaming approach that includes integration of climate change considerations into all sectors and in County Integrated Development Plans. The Act establishes the National Climate Change Council, chaired by His Excellency the President. The Council is responsible for overall coordination and advisory functions. The Act also establishes the Climate Change Fund – a financing mechanism for priority climate change actions and interventions.

The main policies, plans, and frameworks that influence and guide climate change actions in Kenya are briefly described in Table 3, and elaborated in Chapter 2 of the *Adaptation Technical Analysis Report (ATAR): NCCAP 2018-2022 Volume II.*



Photo: *Unisplash*

Table 3: Kenya's legal and policy framework for national climate change action.

National Framework	Description
***Kenya Vision 2030 (2008)* and its Medium Term Plans**	*Kenya Vision 2030,* the country's development blueprint, recognised climate change as a risk that could slow the country's development. Climate change actions were identified in the Second Medium Term Plan (MTP) (2013-2017). The Third Medium Term Plan (2018-2022) recognised climate change as a crosscutting thematic area, and mainstreamed climate change actions in sector plans.
***National Climate Change Response Strategy* (2010)**	*Kenya's National Climate Change Response Strategy* was the first national policy document on climate change. It sought to advance the integration of climate change adaptation and mitigation into all government planning, budgeting, and development objectives.
***National Climate Change Action Plan* (2013-2017)**	*Kenya's National Climate Change Action Plan, 2013-2017* was a five-year plan that sought to further Kenya's development goals in a low carbon climate resilient manner. The plan set out adaptation, mitigation, and enabling actions.
***National Adaptation Plan* (2015-2030) (NAP)**	Kenya's *National Adaptation Plan 2015-2030 (NAP)* was submitted to the *UNFCCC* in 2017. NAP provides a climate hazard and vulnerability assessment, and sets out priority adaptation actions in the 21 planning sectors in MTP II.
Kenya's Nationally Determined Contribution (NDC) (2016)	Kenya's NDC under the *Paris Agreement* of the *UNFCCC* includes mitigation and adaptation contributions. In regard to adaptation, "Kenya will ensure enhanced resilience to climate change towards the attainment of Vision 2030, by mainstreaming climate change into Medium Term Plans (MTPs), and implementing adaptation actions." The mitigation contribution "seeks to abate Kenya's GHG emissions by 30% by 2030, relative to the business as usual scenario of 143 MtCO2eq." Achievement of Kenya's NDC is subject to international support in the form of finance, investment, technology development and transfer, and capacity development.
Climate Change Act (No. 11 of 2016)	The *Climate Change Act (No. 11 of 2016)* is the first comprehensive legal framework for climate change governance in Kenya. The objective of the Act is to "Enhance climate change resilience and low carbon development for sustainable development of Kenya." The Act establishes the National Climate Change Council (Section 5), Climate Change Directorate (Section 9), and Climate Change Fund (Section 25).

National Framework	Description
Kenya Climate Smart Agriculture Strategy (2017-2026)	The objective of the Kenya *Climate Smart Agriculture Strategy (KCSAS)* is to adapt to climate change and build the resilience of agricultural systems, while minimising GHG emissions. Planned actions will lead to enhanced food and nutritional security, and improved livelihoods.
Climate Risk Management Framework (2017)	The *Climate Risk Management Framework for Kenya* integrates disaster risk reduction, climate change adaptation, and sustainable development, so that they are pursued as mutually supportive rather than stand-alone goals. It promotes an integrated climate risk management approach as a central part of policy and planning at National and County levels.
National Climate Change Framework Policy (2018)	The *National Climate Change Framework Policy* aims at ensuring the integration of climate change considerations into planning, budgeting, implementation, and decision-making at the National and County levels, and across all sectors.
National Climate Finance Policy (2018)	The *National Climate Finance Policy* promotes the establishment of legal, institutional, and reporting frameworks for access to, and management of climate finance. The goal of the policy is to further Kenya's national development goals through enhanced mobilisation of climate finance that contributes to low carbon climate resilient development goals.
Big Four Agenda (2018-2022)	The Government of Kenya's Big Four Agenda establishes priority areas for 2018 to 2022 of ensuring Food and Nutrition Security, Affordable Housing, Enhanced Manufacturing, and Universal Health Coverage. Sector plans and budgets are to be aligned to the Big Four Agenda.

At the national level, several ministries and departments have established climate change units and climate change-related plans and policies to guide them in mainstreaming climate actions in their sectors. Some of these are listed in Table 4.

Table 4: National climate change strategies, plans, and regulations for various sectors in Kenya.

Sector	Climate Change-relevant Plan	Ministry/Department
Agriculture	■ *Kenya Climate Smart Agriculture Strategy (KCSAS) 2017-2026* ■ *Kenya Climate Smart Agriculture Implementation Framework (KCSAIF) 2018-2027*	■ Ministry of Agriculture, Livestock, Fisheries, and Irrigation
Blue Economy (fisheries, coastal zones, marine transport)	■ *Blue Economy Strategy (2017)*	■ Ministry of Agriculture, Livestock, Fisheries and Irrigation ■ Ministry of Transport, Infrastructure, Housing and Urban Development
Disaster Risk Management	■ Kenya's Disaster Risk Financing Strategy (2018-2022) ■ *National Disaster Risk Management Policy (2017)*	■ National Treasury and Planning ■ Ministry of Interior and Coordination
Drought Management	■ *National Drought Management Authority Act (No. 4 of 2016)* ■ Ending Drought Emergencies Strategy ■ *Public Finance Management (National Drought Emergency Fund) Regulations, 2018*	■ National Drought Management Authority
Energy	■ Energy Bill (2017) Part 3, section 43; Part 4, section 74 (i); and Part 9 address climate change-related issues	■ Ministry of Energy
Environment	■ *Environmental Management and Coordination Act, 1999 (Cap. 387)* ■ Green Economy Strategy and Implementation Plan (GESIP 2016-2030) ■ Kenya Strategic Investment Framework on Sustainable Land Management (2017-2027)	■ Ministry of Environment and Forestry

Sector	Climate Change-relevant Plan	Ministry/Department
Forestry	■ National Forest Programme (2017) - chapter on climate change ■ REDD+ Readiness Plan and analysis (2013-2017)	■ Kenya Forest Service ■ Ministry of Environment and Forestry
Health	■ *Health Act (No. 21 of 2017)* - section on environmental health and climate change (Part VII, sections 68 and 69)	■ Ministry of Health
Infrastructure	■ Kenya Building Research Centre: Strategic Plan, 2017/18 - 2021/22	■ Ministry of Transport, Infrastructure, Housing and Urban Development
Land Management	■ National Spatial Plan (2015-2045)	■ Ministry of Lands and Physical Planning
Transport	■ Action Plan to Reduce CO2 Emissions from Aviation (2015) ■ Executive Order: The Nairobi Metropolitan Area Transport Authority (2017) ■ Kenya National Aviation Action Plan for International Civil Aviation Organisation (ICAO) and Mitigation plan for International Maritime Organisation (IMO) (2017)	■ Ministry of Energy
Water	■ Water Act (No. 43 of 2016) – establishes National Water Harvesting and Storage Authority ■ Draft Water Harvesting and Storage Policy (2018)	■ Ministry of Water and Sanitation

County Governments have begun to develop regulatory frameworks for climate change (see Table 5). All County Governments are required by the *Climate Change Act, 2016* to mainstream climate change in their CIDPs.

Table 5: *Climate plans and regulations at County Government levels in Kenya.*

County Framework	Description
County Integrated Development Plans (2013)	County Governments are required to mainstream climate change in their CIDPs. All the 47 CIDPs developed in 2013 mentioned the impacts of climate change, and many identified actions to address these impacts. Adaptation actions were a priority for most County Governments.
Makueni Climate Change Fund Regulations (2015)	The regulations establish the Makueni County Climate Change Fund, to provide funding for climate change actions identified in the Makueni CIDP. They mandate the County Government of Makueni to set aside 1% of its annual development budget for climate change action.
Wajir County Climate Change Fund Act (No. 3 of 2016)	The *Wajir Climate Change Fund Act (No. 3 of 2016)* established a Climate Change Fund to facilitate and coordinate finance for community-initiated adaptation and mitigation projects, and for connected purposes. The Act mandates the County Government of Wajir to set aside 2% of its annual development budget for climate change action.
Garissa Climate Change Fund Act (2018)	The *Garissa Climate Change Fund Act* requires the County Government of Garissa to set aside 2% of its annual development budget for a special fund for climate change action. The fund will undertake programmes to assist local people to adapt to climate change.
Public Finance Management Act (Kitui County Climate Change Fund) Regulations (2018)	The *Public Finance Management Act (Kitui County Climate Change Fund) Regulations (2018)* requires the County Government of Kitui to set aside 1% of its annual development budget for the Kitui County Climate Change Fund. The Fund will finance approved climate change resilience projects.



CHAPTER THREE



Photo: *Min. of Environment*

Priority Climate Change Actions for 2018-2022

3.1 Identification of Priority Climate Change Actions

NCCAP 2018-2022 takes cognisance of the impacts of climate change on Kenya's socio-economic sectors. It identifies strategic areas where climate change action over the next five years will be linked to the Big Four Agenda (see Box 8); recognising that climate change could limit the achievement of the Agenda. The destruction of tens of thousands of hectares of crops, and loss of livestock in the floods of March-May 2018, are recent examples of the negative impacts of climate change in Kenya. Other negative impacts include, an increase in vector-borne diseases, such as malaria and cholera; damage to infrastructure in homes, schools, hospitals, and public places; and high prices of electricity due to reliance on thermal generators when reservoir levels are too low to sustain adequate electricity generation from hydro sources.

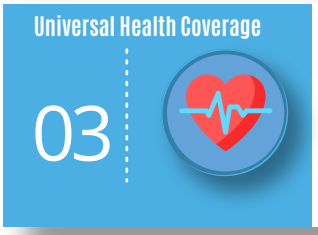
Box 8: The Big Four Agenda



Over the next five years the government shall invest heavily in securing our water towers and river ecosystems to harvest and sustainability exploit the potential of our water resources. We shall provide, together with other actors, key enablers within the farming process that will address distribution, wastage, storage, and value-addition of agricultural commodities.



Over the next five years, we will create 500,000 new home owners through facilitation of affordable housing, and a home ownership programme that will ensure every working family can afford a decent home by injecting low-cost capital into the housing sector. Reforms will be undertaken to lower the cost of construction and improve accessibility of affordable mortgages.



Over the next five years, we will target 100% Universal Healthcare Coverage for all households by ensuring that 13 million Kenyans and their dependents are beneficiaries of the National Hospital Insurance Fund (NHIF) scheme. This will be achieved through a complete reconfiguration of the NHIF and reform of the laws governing private insurance companies.



Over the next five years, we will grow the manufacturing sector and raise its share of the nation's cake from 9% to 15%, by reducing power tariffs charged to manufacturers by 50% between the hours of 10:00 pm and 6:00 am. This is in line with our 24-hour economy policy.

Source: *The Official Website of the President sets out the Big 4 Action Plan. See: http://www.president.go.ke*

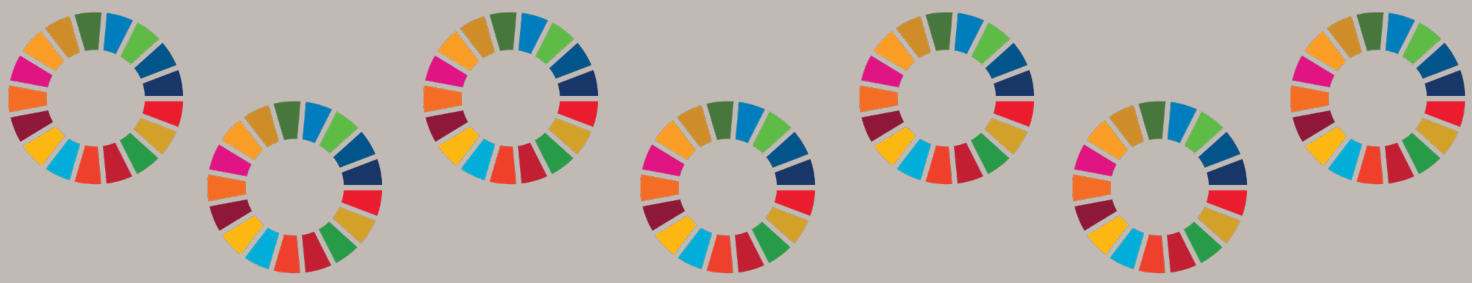
Adaptation actions are prioritised in *NCCAP 2018-2022* because of the devastating impacts of droughts and floods in Kenya, and the negative effects of climate change on vulnerable groups, including children, women, older members of society, persons with disabilities, the youth, and members of minority and marginalised communities. The actions will be undertaken, where possible, in a way that limits GHG emissions, so as to ensure that the country achieves its NDC under the *Paris Agreement* of reducing GHG emissions by 30% by 2030, relative to the business-as-usual scenario of 143 $MtCO_2e$.

The priority climate change actions in *NCCAP 2018-2022* contribute to achieving sustainable development benefits (see Box 9). They reflect inputs received from the National and County Governments; vulnerable groups, including women, the youth, persons with disabilities, and members of marginalised and minority communities; the private sector; civil society; and sector experts. The actions are mainstreamed in the Third Medium Term Plan in all sectors, and in CIDPs, to ensure they are taken up across the country, and in all relevant sectors. They will benefit vulnerable groups directly and indirectly through, for example, increased agricultural productivity, and improved access to water. They also provide benefits for women through access to clean cooking, and forest restoration and agroforestry actions that assure increased access to affordable cooking energy, and water.

Box 9: Climate change-SDG impact assessment

MEF examined the impacts of climate change mitigation and adaptation actions on the SDGs and the Big Four Agenda to foster alignment and synergies. Particular attention was given to the way climate change actions address the overriding objective of the 2030 Agenda to "leave no one behind." This objective seeks to prioritise the poorest and most vulnerable in the pursuit of sustainable development, so as to end extreme poverty and curb inequalities by 2030. The MEF analysis systematically assessed the impact of all climate actions on SDG 1 on poverty eradication, SDG 5 on gender equality, and SDG 10 on reducing inequalities.

The analysis indicated that implementation of *NCCAP 2018-2022* could provide a significant contribution to the attainment of the Big Four Agenda, including the achievement of food and nutrition security for all Kenyans. Climate change actions are essential to efforts aimed at reducing the vulnerability of the manufacturing, housing, health, and agriculture sectors. *NCCAP 2018-2022* therefore generates opportunities to boost the productivity of the agriculture and manufacturing sectors and supports improved health outcomes.



The MEF assessment found that adaptation and mitigation actions in *NCCAP 2018-2022* directly address or provide likely benefits for all the SDGs. The benefits with the greatest potential were found to relate to: -

Sustainable agriculture and food security (SDG 2 and the Big Four Agenda on Food and Nutrition Security)

Sustainable and renewable energy (SDG 7 and the Big Four Agenda on Enhanced Manufacturing)

Ecosystem restoration and preservation (SDG 15 and Big Four Agenda on Food and Nutrition Security)

Water availability (SDG 6 and the Big Four Agenda on Food and Nutrition Security)

Sustainable growth and industry (SDG 8 and Big Four Agenda on Enhanced Manufacturing)

Sustainable transport (SDG 9 and Big Four Agenda on Enhanced Manufacturing)

Sustainable waste management (SDG 11 and Big Four Agenda on Universal Health Coverage)

Human health (SDG 3 and the Big Four Agenda on Universal Health Coverage)

Low-carbon energy sources; ecosystem-based solutions like climate smart agriculture, rangeland restoration and agroforestry; and the development of sustainable public transport systems have sizeable win-win benefits necessary for boosting employment and manufacturing capacity, protecting the environment, and narrowing inequalities.

Government of Kenya (2018). Report on the Impact Assessment of the Second National Climate Change Action Plan on the Big Four Agenda of the Government of Kenya and the National Implementation of the Sustainable Development Goals (SDGs). Nairobi: MEF.

3.2 Priority Climate Change Actions

This section outlines the priority climate change actions envisaged in *NCCAP 2018-2022* for implementation in Kenya from 1st July, 2018 to 30th June 2023. The actions:

- Enable all sectors in Kenya to work toward achieving climate change adaptation and mitigation objectives;
- Support achievement of the Big Four Agenda, and *SDGs;*
- Enhance the adaptive capacity and resilience of communities, with emphasis on vulnerable groups within society;
- Require to be undertaken, where possible, in a way that limits GHG emissions, to ensure that the country achieves its mitigation NDC under the *Paris Agreement;* and
- Require climate action in Kenya to be undertaken in an integrated manner when addressing several priorities. For example, actions to plant trees to be implemented in a framework that appreciates they also contribute to disaster risk management, water, and food security objectives.

The priority climate change actions are summarised in Table 6, and described in this chapter. Further details on the priority actions and all other climate change actions identified by stakeholders are included in ATAR and MTAR.

Table 6: *Priority climate change actions.*

Priorities	Objectives
Disaster Risk (Floods and Drought) Management	Reduce risks that result from climate-related disasters, such as droughts and floods, to communities and infrastructure.
Food and Nutrition Security	Increase food and nutrition security through enhanced productivity and resilience of the agricultural systems, in as low-carbon a manner as possible.
Water and the Blue Economy	Enhance the resilience of the water sector by ensuring access to, and efficient use of water for agriculture, manufacturing, domestic, wildlife, and other uses.
Forestry, Wildlife and Tourism	Increase forest cover to 10% of total land area, increase the resilience of the wildlife and tourism sectors, and rehabilitate degraded lands, including rangelands
Health, Sanitation and Human Settlements	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

Priorities	Objectives
Manufacturing	Improve energy and resource efficiency in the manufacturing sector.
Energy and Transport	Climate-proof energy and transport infrastructure, promote renewable energy development, increase the uptake of clean cooking solutions, and develop sustainable transport systems.

For each priority action, information is included on the problem being addressed, the action required to address the problem, expected results, national-level indicators, alignment with the Big Four Agenda, alignment with *SDGs,* and relevant institutions to deliver the actions. *NCCAP 2018-2022* recognises that certain actions are enabling, and cut across the strategic priorities. These are, improving the legal and policy framework, building capacity and enhancing knowledge management, promoting technology and innovation, increasing access to climate finance, and measuring and reporting on climate actions. These actions are described in Chapter 4.

3.2.1 Climate Change Priority 1: Disaster (Drought and Flood) Risk Management

Climate-related disasters, such as drought and floods, could prevent the achievement of the Big Four Agenda by adversely impacting the Kenyan society and economy. This requires proactive approaches in dealing with the disasters.

(a) Impacts of Climate Disasters on Kenyan Societies and the Economy

Impacts of climate-related disasters are felt at the household levels through food insecurity, damage to property, and increased prices of food and fuel. At the national level, scarce government resources are re-allocated to address the impacts of floods and drought, at the expense of social programmes, such as health, and education. Climate shocks also have significant impacts on the national GDP.

Prolonged and chronic droughts in Kenya are increasing due to poor or failed rains, which results from climate change. Drought conditions in the late 2017 and early 2018 left 3.4 million people severely food insecure, and an estimated 500,000 people without access to water.[82] The cyclical nature of drought disasters, and the incomplete recovery from them means that some households have become increasingly vulnerable, losing their ability to spring back.[83] Prolonged droughts lead to crop failure, shrinking of productive crop areas, and loss of livestock, which leads to reduced food security

and increased malnutrition, with impacts that are particularly weighty for pregnant women, lactating mothers, children, and the elderly. Droughts also increase water scarcity, with negative impacts for communities, especially for women and girls who have to travel long distances in search of water and, have less water for their hygiene. Droughts also mean that women have to work harder to feed and take care of their families and, take up roles that used to be the preserve of men, who often migrate to take up paid work in urban areas.

Droughts have negative impacts on pastoralists in ASALs, including livestock deaths due to lack of forage and water, and increased insecurity and conflicts within Kenya and across national borders. Many pastoralists keep large livestock herds for cultural reasons, but also to cushion themselves from the adversities of drought,[84] that can have negative impacts on rangeland management. A significant number of people from marginalised and minority groups in ASALs rely on emergency assistance during droughts. Droughts also negatively impact businesses through reduced water for manufacturing processes, increased costs of inputs in the agro-processing sector, and increased prices of electricity due to shifting to diesel generators for electricity generation because of declining water in reservoirs used for hydroelectric generation.

Floods have more immediate, and often large-scale impacts. An example is the flooding witnessed in Kenya in early 2018 that claimed over 183 lives and displaced more than 225,000 people,[85] and the Solai dam disaster in Nakuru County in May 2018 that claimed 47 lives; more than half of who were women and children. Children, persons with disabilities, and the elderly are particularly at increased risk during floods and disasters, because they may be left behind or abandoned during evacuation. Figure 8 is a map showing the flood-prone areas in Kenya.

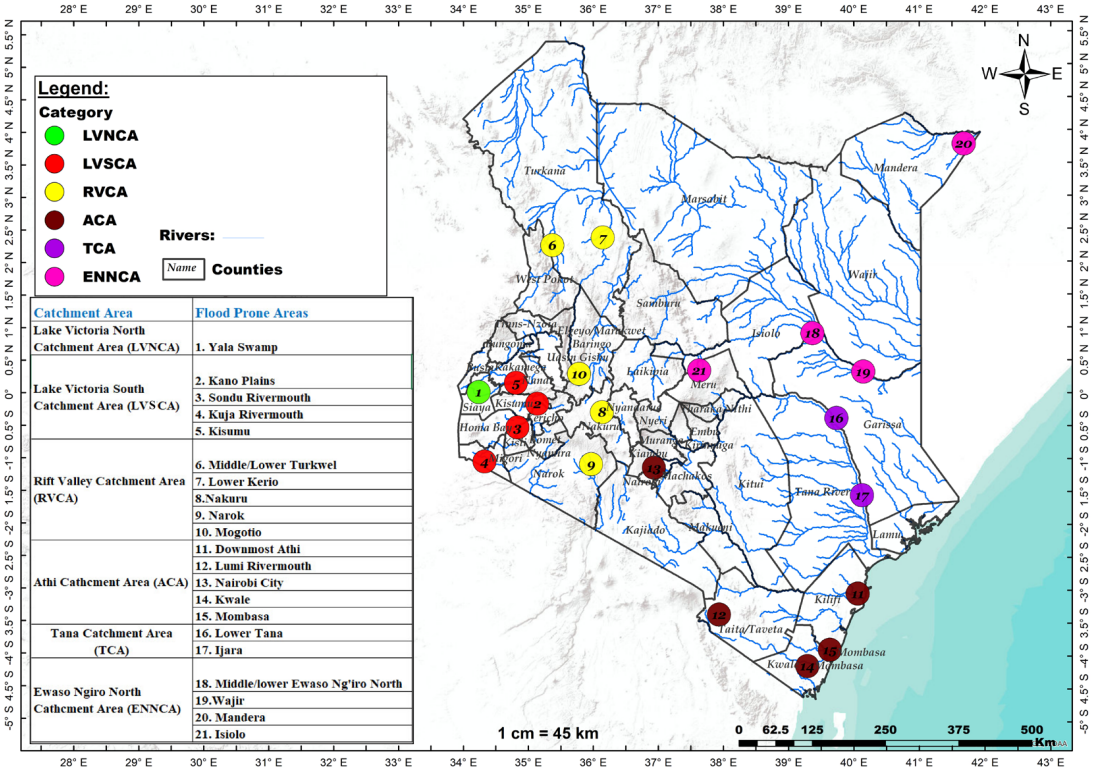


Figure 6: Flood-prone areas in Kenya.[86]

(b) Proactive Approaches to Tackling Climate-Related Disasters

The priority actions in *NCCAP 2018-2022* promote proactive, rather than reactive approaches to climate-related disasters. They seek to ensure that climate disasters are curtailed, and do not result in emergencies. They also seek to build the capacity of people to cope with impacts of climate change. The priority actions include flood and drought early warning systems, including at the community level; improved social protection programmes for chronically food-insecure populations; implementation of flood management plans that include water storage, drainage networks, reforestation and rehabilitation of riparian areas, construction of dams, and land use restrictions;[87] CCCFs for locally-identified priority adaptation actions; and community-level capacity building to raise awareness and educate people on disaster management and flood hazards. In particular, women, as central players in disaster response are to be provided with resources and support to effectively carry out these roles.

Some of the priority climate actions will be implemented under the *National Disaster Risk Management Policy* that was approved by Cabinet in 2018, and the National Drought Emergency Fund (NDEF) established in 2018. NDEF has an annual allocation of KES 2 billion from the Exchequer, which is aimed at supporting action against climate-induced risks, such as drought risk management, resilience and preparedness measures, response interventions, and recovery interventions that include protecting the most vulnerable populations.[88] The Contingencies Fund that is established by the *Constitution of Kenya (2010)* is also in place to address urgent and unforeseen needs, and could be used to support disaster relief. Other systems and programmes that are in place to deliver climate change actions include the National Drought Management Authority (NDMA), Ending Drought Emergencies (EDE), Hunger Safety Net Programme (HSNP), National Safety Net Programme (NSNP), and the CCCFs.

The climate change actions prioritised under *NCCAP 2018-2022* seek to proactively manage climate-related disasters in a way that results in:

- **Adaptation -** Increased number of households benefiting from social protection systems and CCCFs, with emphasis on reaching the poor, and marginalised and minority groups; improved ability to cope with droughts and floods through early warning systems, and water harvesting and storage; and implementation of integrated flood management plans.
- **The Big Four Agenda -** Enhanced progress toward the achievement of all four pillars of the Agenda by ensuring that climate-related disasters do not divert resources.
- **Sustainable Development -** Reduced exposure and vulnerability of the country, especially of the poor and vulnerable groups, to climate disasters and shocks.

Strategic Objective 1

Reduce risks to communities and infrastructure resulting from climate-related disasters, such as droughts and floods.

Issue/ problem:

Floods and droughts have national economic consequences, and extensive socio-economic effects at the household and community levels, especially for vulnerable groups, such as women, older members of society, persons with disabilities, children, youth, and members of marginalised and minority communities. Current responses are reactive rather than proactive, and impeded by inadequate early warning systems, lack of disaster management coordination, and limited support to build disaster preparedness.

Big 4 Pillars:


Food and Nutrition Security


Universal Health Coverage


Affordable Housing


Enhanced Manufacturing

SDGs:



National-level Indicators:

- Number of deaths, missing persons, and persons directly affected, which could be attributed to disasters (per 100,000 people);
- Proportion of county governments that adopt and implement local disaster risk reduction strategies, in line with national strategies; and
- Number of households receiving food aid and cash transfers.

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
1. Increase the number of households and entities benefiting from devolved adaptive services	■ Number of beneficiaries of social protection mechanisms, and other safeguards (under the Hunger Safety Net Programme) increased from 100,000 to 150,000 for regular beneficiaries; and from 90,000 to 130,000 for scalability to beneficiaries; ■ Number of households better able to cope with climate change because of receiving benefits from CCCFs increased from 300,000 households in 2018 to 800,000 households. ■ CCCFs address local adaptation priorities that are identified and monitored by community committees comprised of women and men; and	Adaptation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
	■ Number of beneficiaries under the National Safety Net Programme increased from 4,017,759 beneficiaries in 2017 to 4,280,000. *Note: number of beneficiaries increases because the expanded scope of programmes means that more Kenyans are eligible for support*	
2. Improve the ability of people to cope with droughts	■ Drought early warning systems improved, including the promotion of people-centred systems at the National and County levels; ■ Number of recipients of climate information services who use the information in their risk management decisions increased from 1,000,000 to 2,000,000; ■ Water harvesting and storage *(see expected results under Climate Action 3: Water and the Blue Economy);* and ■ Operationalise NDEF.	Adaptation
3. Improve the ability of people to cope with, and infrastructure to withstand, floods	■ Flood early warning systems improved, taking advantage of widespread access to mobile technology that provides avenues for dissemination of information; ■ The existing 11 integrated flood management plans, for example, water storage, drainage networks, reforestation and rehabilitation of riparian areas, construction of dams, and land use restrictions, implemented; ■ Dam Safety Control Systems established, including a needs assessment, and development of safety manuals and codes of practice; ■ Capacity development of at least 50 Water Resources Users Associations (WRUA) that are rights-based groups or community-based organisations with female and male membership; and ■ Water and flood control, including dams/dykes, drainage systems, and water storage: *(see expected results under Climate Action 3 – Water and the Blue Economy).*	Adaptation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
4. Improve the coordination and delivery of disaster risk management	Improve the coordination of disaster risk management, including of floods, droughts, disease outbreaks, landslides, and other disasters by enacting and implementing the *Disaster Risk Management Act* that includes the establishment of: ■ A National Disaster Risk Management Authority to coordinate disaster response; ■ Engendered County Disaster Risk Management Committees to coordinate disaster response at County levels; ■ A Disaster Risk Management Fund to provide funds for disaster preparedness, mitigation of disaster impacts, and disaster recovery measures, particularly for vulnerable groups.	Enabling
Enabling (legal)	■ Implement the mandate of the National Water Harvesting and Storage Authority under the 2016 *Water Act,* to undertake strategic water emergency interventions during drought, on behalf of the National Government.	Enabling
Enabling (finance)	■ Contingency Fund allocations to address urgent and unforeseen needs.	Enabling
Enabling (technology)	■ Expertise developed to customise and manage satellite-generated vegetation condition index used for drought early warning and response	Enabling
Enabling (capacity development)	■ Research on migration as an adaptation strategy.	Enabling

RELEVANT INSTITUTIONS:
Relevant Institutions: County Governments, CoG, NDMA, The National Treasury and Planning, KMD, Water Resources Authority (WRA), WRUAs, community groups, civil society, the private sector. All sectors identify actions to realise the strategic objective.

3.2.2 Climate Change Priority 2: Food and Nutrition Security

Climate change has the potential to prevent achievement of the Big Four Agenda item on food and nutrition security. This sub-section highlights how food insecurity is increased by climate change and, the win-win solutions for the climate, agriculture, and food security.

(a) Increased Food Insecurity due to Climate Change

Climate shocks significantly impact annual growth rates of the agriculture sector, as shown in Figure 7. This growth (or decline) has a large impact on the national economy. The agriculture sector is highly susceptible to climate vagaries, including temperature rise, changes in precipitations, and extreme climate events.

It is projected that climate change could negatively impact crop yields in Kenya, with yield reductions of up to 45% expected for maize, rice, and soybean crops by 2100, and yield losses of up to 40% for tea and coffee because of the reduction in suitable areas for cultivation, caused by temperature increases. It is also projected that livestock numbers could decline as water resources become increasingly scarce. Dry weather conditions in 2017 led to declines in the production of most agricultural commodities, with real gross value added in the agriculture sector growing at a decelerated rate of 1.6%, from KES 879.6 billion in 2016 to KES 893.3 billion in 2017.[89] Impacts of the 2017 drought included:

- 7% decrease in tea production between 2016 and 2017, despite the area under tea production having been increased;[90]
- 6.3% decline in maize production between 2016 from 2017;
- 5.3% rise in the number of cattle slaughtered from 2016 to 2017, which was attributed to drought, as farmers and pastoralists slaughtered animals to cushion themselves from losses;[91]
- The quantity of fish from fish farming decreased from 15.0 thousand metric tonnes in 2016 to 12.4 thousand metric tonnes in 2017, because farmers did not re-stock fish ponds due to high prices of inputs, and the drying up of ponds due to drought;[92] and
- The overall Import Dependency Ratio of the Food Balance Sheet increased from 29.4% in 2016 to 42.7% in 2017 because of increased imports of vegetable products, caused by food deficits due to drought.[93]

At the household level, drought caused high food prices. In 2017, the prices of maize, sugar, rice, and milk hit record highs.[94] The price of one kilogram of sugar increased from an average of KES 118 in 2016 to KES 138 in 2017.[95] These high prices particularly impacted the rural areas of Kenya, where households spent more than 60% of their income on food in 2017, compared to 49% by their counterparts in core-urban areas.[96]

Pastoralists are negatively impacted because extreme climate events lead to reduced pasture and availability of forage, degradation of the environment, and increased poverty. Strong winds and dust storms erode top soil, making grass and rangeland regeneration difficult even when it rains. Recurring droughts have forced an estimated 30% of livestock owners out of pastoralism in the past 20 years.[97]

Fisher communities report that increasing temperatures impact fish breeding and fish distribution. In the coastal areas, fish are moving from in-shore to deeper waters, whereas artisanal fisher communities lack the technologies to safely fish in deeper waters. 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.[98]

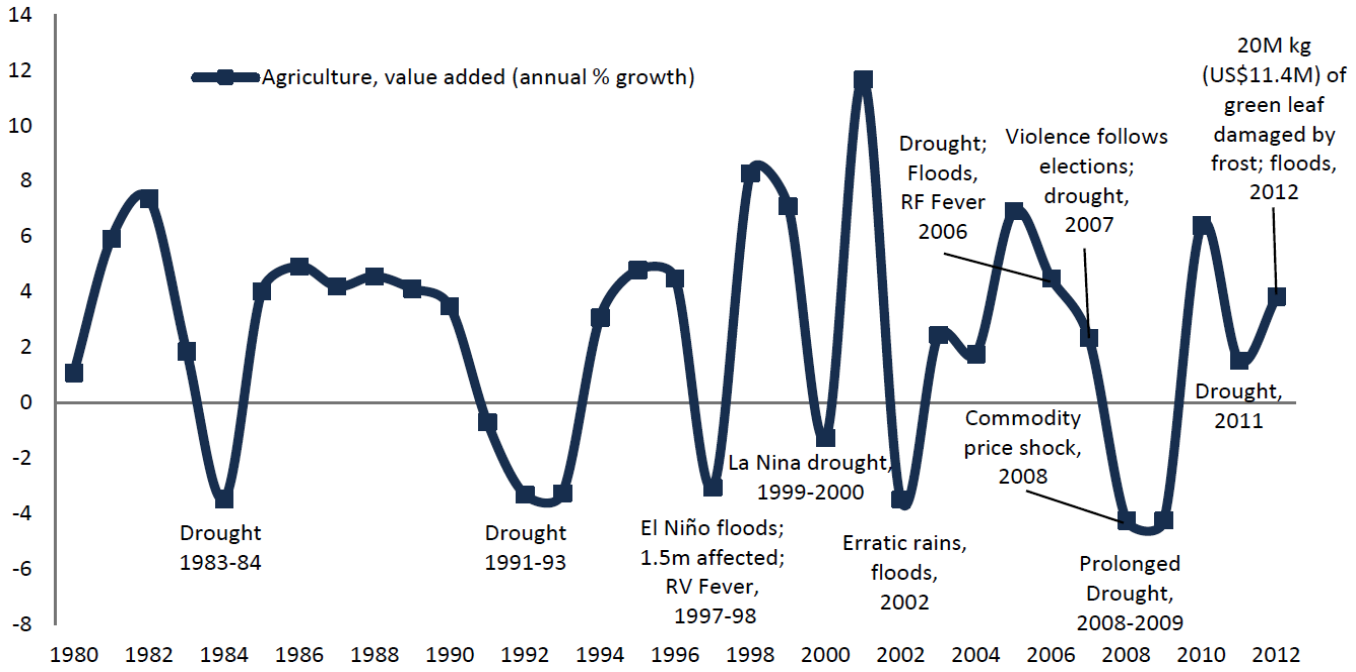


Figure 7: *Historical timeline of major shocks in agricultural production in Kenya, 1980-2012.*[99]



Photo: *Unisplash*

(b) Win-Win Solutions for the Climate, Agriculture, and Food Security

Most climate change-response actions aimed at increasing food security take place in the agriculture sector, including action relating to crops, livestock and fisheries. Agriculture is a priority for the people of Kenya because of the sector's importance on food security, rural livelihoods, and poverty alleviation. The agriculture sector contributed 31.5% of GDP in 2017,[100] provided about 75% of total employment in Kenya, and supported over 80% of the rural population.[101]

NCCAP 2018-2022 provides a range of actions to transform Kenya's agriculture sector. Increasing production in a changing climate will be necessary for the achievement of the Big Four Agenda pillar of food and nutrition security over the next five years. This will be achieved by enhancing large-scale production, driving smallholder productivity, and reducing the cost of food. Adaptation actions are thus a priority, and food and nutrition security takes precedence over the mitigation of GHG emissions.

Many of the actions in the agriculture sector reduce GHG emissions, including agroforestry, sustainable land management, and efficiency in livestock management. Reducing GHG emissions in the sector, where possible, is important because agricultural emissions accounted for approximately 40% of total national emissions in 2015.[102] The main action in the sector will be the implementation of the *Kenya Climate Smart Agriculture (CSA) Strategy, 2017-2026* that seeks to enhance the adaptive capacity and resilience of farmers, pastoralists and fisher communities, and minimise GHG emissions from agricultural production systems. Actions with measurable goals over the next five years are included in the table below, with others set out in *ATAR 2018-2022;* Volume II of *NCCAP 2018-2022,* and *MTAR 2018–2022;* Volume III of *NCCAP 2018-2022.*

To be successful, these actions will include focused interventions to address gender because women account for 75% of labour in the agriculture sector.[103] Many impoverished women are also farmers that suffer the impacts of climate change more than men because of lack of input in decision-making, insecure land tenure, limited access to land, and limited access to livestock and technology. Farmer field schools are a participatory and effective way of transferring knowledge to, and learning from, women farmers. Gender-aware agricultural extension services are therefore essential to ensuring that women receive, use, and benefit from vital information, such as climate information services. These services are also important for pastoralists. To be effective, the information needs to be made available in local languages.

Climate smart actions to increase food and nutrition security will be supported through on-going initiatives, including the *KCSA Strategy,* and the KCSA Implementation Framework. In addition, the following programmes will also support climate smart actions: The Kenya CSA Project, National Agricultural Rural Inclusive Growth Project (NARIG), Kenya Cereal Enhancement Programme (KCEP), Climate Resilient Agricultural Livelihoods Project (CRALP), insurance pilot programmes, and partnerships with the World Agroforestry Centre (ICRAF) and the International Livestock Research Institute (ILRI).

The climate change actions to improve food and nutrition security result in:

- **Adaptation -** Maintained or increased productivity and enhanced resilience of the agricultural systems through livelihood and crop diversification, increased water harvesting and storage, increased irrigation, sustainable land management, reduction in post-harvest losses, and uptake of insurance;
- **Mitigation -** GHG emissions of 2.61 $MtCO_2e$ by 2022 through agroforestry, minimum tillage systems, manure management, and efficiency in livestock management;
- **The Big Four Agenda -** Enhanced progress toward the achievement of food and nutrition security; and
- **Sustainable Development** - Improved agricultural, livestock, and fish productivity; increased food and water security; improved incomes and livelihoods of pastoralists and small-holder farmers; improved health with healthier food available; and better management of ecosystems and their biodiversity.



Photo: *Shutterstock*

Strategic Objective 2

Increase food and nutrition security by enhancing productivity and resilience of the agricultural sector in as low-carbon manner as possible

Issue/ problem:

Climate change is negatively impacting agricultural productivity and the resilience of value chain actors, including households. An increase in the severity and frequency of climate change-related disasters, such as droughts and floods poses, threats to food security, and negatively impacts small-scale and large-scale farmers, pastoralists, and fisher communities.

Big 4 Pillars: Food and Nutrition Security

SDGs:



National-level Indicators:

- GDP growth of agricultural sector;
- Livestock deaths from drought / number of livestock slaughtered due to drought;
- Agricultural land under irrigation (acreage); and
- GHG emissions in the agriculture, forestry, and other land use sectors.

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
1. Improve crop productivity through the Implementation of CSA interventions	■ Number of institutions/value chain actors and households harvesting water for agricultural use/ production increased to 500,000; ■ Agricultural pre- and post-harvest losses reduced from 40% to 15%; ■ Number of beneficiaries accessing climate-oriented crop insurance increased from 280, 000 farmers to 3,500,000 farmers; and ■ Number of farmers accessing subsidies for appropriate agricultural inputs increased from 239,000 to 311,300.	Adaptation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
	■ Number of households and acreage under sustainable land management (SLM) increased for agricultural production: • Support for the reclamation of 60,000 hectares of degraded land; • Area under integrated soil nutrient management increased by 250,000 acres; • Farm area under conservation agriculture increased to 250,000 acres, incorporating minimum/no tillage; and • Total area under agroforestry at farm level increased by 200,000 acres.	
2. Increase crop productivity through improved irrigation	■ Acreage under irrigation increased from 202,000 hectares to 486,000 hectares. ■ Production efficiency from irrigated fields increased from 50% to 90%.	Adaptation
3. Improve productivity in the livestock sector through the Implementation of CSA interventions	■ Improved productivity of pastoralists: • 10,000 hectares of rangelands re-seeded in 23 ASAL counties; • Annual ASAL's water harvesting and storage increased by 25%, from 16 million cubic metres (m3) to 20 m3 via small dams and water pans, and 700 m3 through large multipurpose dams; and • Animal disease control and surveillance improved. ■ Number of customers/ beneficiaries farmers accessing climate-oriented livestock insurance increased from 18,000 to 105,750.	Adaptation
	■ Efficiency in dairy management improved for 267,000 households; and ■ Manure management improved through the adoption of biogas technology by 80,000 households, and at least 200 abattoirs.	Mitigation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
4. Improve productivity in the fisheries through Implementation CSA interventions	■ Insurance packages piloted and developed for the fisheries sub-sector; and • Aquaculture production increased: • Number of cages for fish farming increased from 3,450 to 8,000; • Number of fish ponds increased by 16,000; and • Number of farmers using low-carbon (recirculating) aquaculture systems increased from 20 to 180.	Adaptation
5. Diversify livelihoods to adjust to a changing climate	■ At least 521,500 households supported to adopt diversified adaptive enterprises/value chains for sustained livelihoods and nutrition security; and ■ Small-scale famers, pastoralists, and fisher communities supported to transition to specialised and market-oriented output in 13 priority value chains, including drought-tolerant values chains.	Adaptation
6. Enabling Action – technology and knowledge management	■ Number of counties developing and implementing climate information service plans increased from 9 to 47. Linked to Action 1: Disaster Risk Management and Enabling Action T4	Enabling

RELEVANT INSTITUTIONS:
County Governments, CoG, Ministry of Agriculture, Livestock Fisheries and Irrigation (MALFI), Ministry of Water and Sanitation (MWS), WRA, Kenya Forest Service (KFS), KMD, Kenya Agriculture and Livestock Research Organisation (KALRO), Private sector, ICRAF, ILRI, farmer organisations, fisher organisations, pastoralist organisations. All sectors identify actions to realise the strategic objective.



3.2.3 Climate Change Priority 3: Water and the Blue Economy

NCCAP 2018-2022 addresses one of Kenya's largest challenges, which is water scarcity. The decline in access to quality water in the country is exacerbated by climate change, and its associated droughts and reduction of glaciers. Lack of access to quality water has the potential to undermine achievement of the Big Four Agenda. Water is also linked to the Blue Economy, which refers to the "sustainable use and economic development of both aquatic and marine spaces, including oceans, coasts, lakes, rivers and underground water."[104]

(a) Increased Water Scarcity: A Major Challenge for Kenya

Kenya is a water-scarce country, with per capita water availability of 647 m^3. This is very below the global benchmark of 1000 m^3 per capita, and indicates chronic water scarcity. Water coverage in the country now stands at 55%, meaning that approximately 45% of Kenyans have inadequate access to clean and safe drinking water. Kenya's per capita surface water storage is 103.1 m^3; with only 3.1 m^3 available for domestic, livestock, industrial, and irrigation use, and the balance being for hydroelectric power generation.[105] The water-scarcity situation in Kenya is made worse by climate change, and compounded by deforestation, low storage capacity, a growing demand for water, and sharing of over half the rivers, lakes, and aquifers with neighbour countries. Many of the rivers are drying up, lake levels are receding, dams and water pans are silting, and water quality is deteriorating.

Erratic rains due to climate change have affected water supply, with severe impacts on food production. In early 2018, many urban areas faced acute water shortages following a prolonged dry spell, and many rivers dried up, which impacted rural and urban areas. Rural women are particularly affected because of impacts on their households and small-scale agribusinesses, and the need to walk longer distances to obtain water. Women and girls are primary collectors of water for domestic use and could be exposed to potential risks during times of water scarcity.

Climate change also impacts the Blue Economy. Extreme climate events negatively impact maritime and shipping activities. Rise in sea levels, and storm surges flood coastal settlements, and damage coastal infrastructure, such as ports. In the longer term, ocean acidification could have negative impacts on fisher communities through declines of fish populations and their movement to deeper waters because of warming ocean waters. The economic cost of impacts of climate change on fisheries and aquaculture is estimated to reach 3% of GDP per annum by 2030, and possibly 5% by 2050.[106] Maritime transport is a contributor to climate change, accounting for approximately 2.7% of annual global carbon dioxide emissions in 2014, and potentially rising to 10% of total global GHG emissions by 2050 if other sectors make significant reductions.[107]

(b) A Comprehensive Plan for Ensuring Access to Quality Water for All

NCCAP 2018-2022 seeks to increase annual per capita water availability from 647 m^3 to 1000 m3. To achieve this target, the Plan proposes concrete actions to enhance the resilience of the water sector, by ensuring adequate access to, and efficient use of water for agriculture, manufacturing, domestic use, wildlife, and other uses. The planned water-related climate change actions involve women who help to reduce water wastage at the household level, and to some extent, also support water agencies to reduce wastage. The actions also promote the Blue Economy by encouraging low-carbon actions in the maritime sector, ensuring coastal infrastructure that better withstands projected rise in sea level and storm surges, and assisting coastal fisher communities to cope in a changing climate.

Many of the actions planned in this sector will be implemented under existing initiatives, such as the African Initiative for Combatting Desertification; the Kenya Integrated Water, Sanitation and Hygiene Project; and the Water Sector Trust Fund. The climate actions are expected to result in:

- **Adaptation -** Increased water availability through water harvesting and storage, improved water efficiency, and improved water availability;
- **The Big Four Agenda** - Progress toward the achievement of food and nutrition security; and
- **Sustainable development** - Reduction in water scarcity through improved water harvesting and greater water use efficiency, improved human health and well-being, and protection of coastal and marine ecosystems.



Photo: *Shutterstock*

Strategic Objective 3

Enhance the resilience of the Blue Economy and water sector by ensuring adequate access to, and efficient use of, water for agriculture, manufacturing, domestic use, wildlife, and other uses.

Issue/ problem:

Access to, and quality of, water is projected to decline because of climate change impacts, particularly droughts and reduction of glaciers. Coastal areas are impacted by rise in sea level, storm surges, rise in ocean temperatures, and ocean acidification.

Big 4 Pillars:


Food and Nutrition Security


Universal Health Coverage


Affordable Housing


Enhanced Manufacturing

SDGs:



National-level Indicators:

- Water storage per capita;
- Water coverage;
- Per capita water availability; and
- Coverage of protected areas in relation to marine area.

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
1. Increase annual per capita water availability through the development of water infrastructure (mega dams, small dams, water pans, untapped aquifers)	■ Increased annual per capita water availability (harvested, abstracted and stored) from 647 m^3 to 1000 m^3, achieved through: • Construction of 12 multipurpose dams (Thwake, Thiba, Radat, Gogo, Thuci, Kaiti, Lowaat, Rupingazi, Thambana, Maara, Kithino, Kamumu) (under construction in 2018), accounting for projected climate impacts (climate-proofed infrastructure); • Undertaking national hydrogeological survey to identify major strategic aquifers; • Identifying two locations and mapping for direct artificial groundwater recharge to increase the supply of ground water;	Adaptation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
	• Five ground water surveys to establish abstraction levels against recharge; and • 56 sub-catchment management plans developed, and 236 sub-catchment management plans implemented to assist local communities to protect wetlands, lakes, and other water catchment areas.	
2. Increase livelihoods system climate proofing, water harvesting, and water storage infrastructure, and improve flood control	■ The annual number of climate-proofed water harvesting, flood control, and water storage infrastructure increased from 700 to 2,000, through: • Integrated catchment approach and ecosystem-based adaptation structural/ mechanical design, such as structural catchment protection, especially in the upper catchments; • Coastal sea walls; and • Development of flood early warning systems in areas susceptible to floods *(Linked to Climate Action 1: Disaster Risk Management).*	Adaptation
3. Increase gender-responsive affordable water harvesting-based livelihood resilience programmes	■ Enhanced household access to water, and food security through water harvesting, including: • 300,000 farm ponds installed; • Livelihood systems improved on 60,000 hectares of degraded land through the development of water pans and ponds; and • Water utility creditworthiness index developed, and tool kits on commercial lending to the water and sanitation sector to attract Public-Private-Partnerships designed.	Adaptation
4. Promote water efficiency (monitor, reduce, re-use, recycle and modelling)	■ Water wastage and non-revenue water reduced from the current 43% to 20% through, for example: • Innovation in water tracking and the identification and reporting of leakages; and • Awareness programme for water efficiency.	Adaptation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
5. Improve access to good quality water	■ Number of people and entities accessing good quality water for domestic, agricultural, and industrial use increased from 58% to 65% through: • Large-scale installation of water meters; and • Regular inspection of water quality.	Adaptation
6. Improve resilience of coastal communities	■ Deep/offshore fishing fleet increased from 9 to 68 to improve coastal fisheries by: • Addressing overcapacity of artisanal fishing vessels; • Rehabilitating and restoring mangrove forests; and • Conserving at least 15% of coastal and marine areas, especially areas of importance for biodiversity and ecosystem services.	Adaptation
7. Climate-proof coastal infrastructure	■ Implement the "Greening of the Mombasa Port" plan, and build resilience and mitigate GHG emissions through: • Installation of solar panels; • Waste management; and • Rain water harvesting.	Adaptation/ Mitigation
8. Enabling actions (policies and regulations)	■ Develop the Blue Economy Master Plan (BEMP) to provide a blue print to guide the long-term holistic development of the Blue Economy; ■ Implement the Water Act 2016 and enact relevant regulations and strategies to ensure universal access to clean drinking water; ■ Zero rate taxes on water harvesting and storage equipment; ■ Develop a water harvesting policy for institutions and households; ■ Review by-laws that prohibit water harvesting in urban areas, such as Nairobi; and ■ Formulate a policy for recycled water pricing and beneficiary sectors, such as construction, watering flower beds, and car washes.	Enabling

RELEVANT INSTITUTIONS:
County Governments, CoG, MWS, MOTIHUD, The National Treasury and Planning, Attorney General and Department of Justice, Ministry of Tourism and Wildlife (MoTW), KFS, KEFRI, WHSA, WRA, WRUA, Kenya Water Towers Agency (KWTA), Kenya Maritime Authority, Kenya Ports Authority (KPA), civil society, private sector, fisher organisations. All sectors identify actions to realise the strategic objective.

3.2.4 Climate Change Priority 4: Forests, Wildlife and Tourism

Sustainable and productive management of land and land resources are enshrined in Chapter 5 of the *Constitution of Kenya (2010).* The *Constitution* stipulates, among other things, that the state will work to achieve and maintain a tree cover of at least 10% of total land area.[108] *NCCAP 2018-2022* will contribute to the restoration, preservation, and sustainable management of forests and other ecosystems that play an essential role in Kenya's economy.

(a) Highly Valuable, but Fragile Ecosystems

Kenya is composed of seven different agro-ecological zones, as shown in Figure 8. 82% of the country is arid and semi-arid land (ASAL), while 18% is humid to semi-humid land, which means that the country is home to several ecosystems that provide various services.

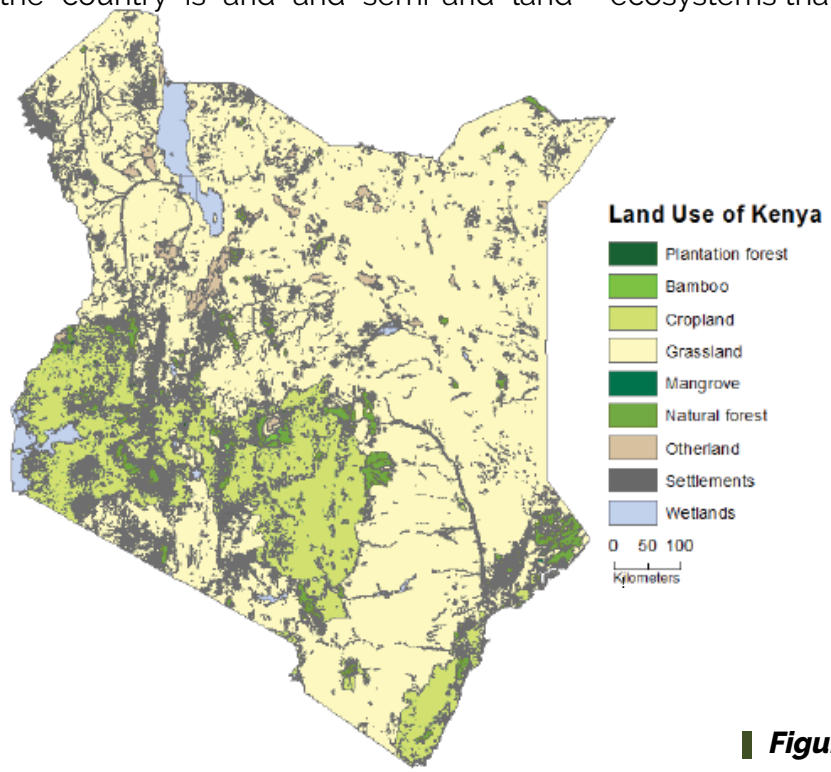


Figure 8: Land use in Kenya.[110]

Kenya's forest area covered 7.4% of land area in 2018,[111] comprised of natural forests, plantation forests, open woodlands, and a small amount of mangrove forests on the coast. Grasslands are common in ASAL areas, with scattered natural forests that are small.[112] The forestry sector is central to Kenya's economy, and the country's future. Forests are important national assets in terms of their economic, environmental, social, and cultural values. The forest sector is estimated to contribute about KES 7 billion to the economy annually and, employs over 50,000 people directly and another 300,000 indirectly.

Five forests are the country's main water towers, as they regulate 75% of the country's renewable water supplies. More than 80% of the energy used in Kenya comes from fuelwood.[113] Forests therefore offer water catchments, biodiversity and conservation functions, and are home to, and provide a variety of goods that support the subsistence livelihoods of many communities, including forest resource users.[114]

Deforestation and forest degradation are major problems in Kenya, releasing large amounts of GHGs. Deforestation and forest degradation are driven mainly by clearance for agriculture, due to rural poverty and rapid population growth; unsustainable utilisation of forest products, including timber harvesting, charcoal production, and grazing in forests; and past governance and institutional failures in the forest sector.[115] The negative impacts of deforestation, such as soil erosion and increased flooding, are exacerbated by climate change.

Climate change is likely to affect the growth and development of tree species, resulting in reduced biodiversity and capacity to deliver important forest goods and services. Climate change also impacts biodiversity and wildlife, with subsequent impacts on tourism. Of concern to Kenyan tourism, climate change is projected to shift the distribution of wildlife species, reduce the population sizes of species, and lead to extinction of some others.



Photo: *Min. of Environment*

(b) Multiple Benefits of Sustainable Management of Forests

Actions to increase forest cover and prevent deforestation and forest degradation have important benefits, including improved livelihoods of majority of Kenyans, while enhancing the country's climate resilience. Forests provide ecosystem services that contribute to reduction in the vulnerability of people and wildlife. Mangroves, for example, protect coastal areas against storms and waves that are projected to become even more intense with climate change and climate-induced sea-level rise. Forest products provide safety nets to local communities when climate variability causes crop failures. Women and forest resource users play a key role in managing forests, and are crucial to integrating forest conservation activities in livelihoods.

Forests also provide hydrological ecosystem services, such as regulation of storm waters. Upper watersheds could increase infiltration of rainwater, reduce surface run-off, and control soil loss, thus decreasing the destructive impacts of floodwaters. By storing run-off, forests also act as natural water recharge areas because the stored run-off replenishes stream flows. Any actions to combat deforestation and speed up restoration of degraded lands will contribute to economic growth, poverty reduction, and greater food and nutrition security and, help communities to adapt to climate change.

Forests also mitigate the harmful effects of GHG emissions by acting as "sinks" through carbon sequestration. The forestry sector is however the second largest contributor to Kenya's GHG emissions after agriculture, accounting for 32% of emissions in 2015, largely due to deforestation.[116]

While reducing GHG emissions is critical, mitigation actions that have adaptation and sustainable development benefits are prioritised in *NCCAP 2018-2022*. Work is needed to measure the results and benefits of actions in the forestry and land-use sectors, requiring linking of SLEEK with the Measurement, Reporting and Verification Plus (MRV+) system (see Enabling action M3 in Section 4). Actions in other sectors also contribute to increased forest cover and sustainable ecosystem management, including sustainable charcoal production (climate change priority 6) and the promotion of clean cooking (climate change priority 7).

The planned actions in the forests, wildlife, and tourism sectors will result in:

- **Adaptation -** Sustainably managed forests, increased forest cover, improved management of rangelands and grasslands, reduced coastal erosion through mangroves conservation and restoration, and maintenance of ecosystems for wildlife and linking of protected areas;
- **Mitigation -** GHG emission reductions of 10.4 $MtCO_2e$ by 2023 through forest restoration, afforestation, reforestation, and reduction of deforestation;
- **The Big Four Agenda –** Progress toward the achievement of food and nutrition security; and
- **Sustainable Development -** Restored and protected forests and rangelands, and their ecosystems and biodiversity; increased forest cover; improved food, nutrition, and water security; improved livelihoods of forest resource users; healthy wildlife populations and viable tourism operations; reduced poverty and inequality; and opportunities for timber industries and housing construction.

Strategic Objective 4

Increase forest cover to 10% of total land area; rehabilitate degraded lands, including rangelands; and increase resilience of the wildlife and tourism sector

Issue/ problem:

Unplanned development, such as agricultural expansion, settlements, and infrastructure development and, overreliance on biomass for cooking, leads to deforestation and forest degradation, with negative impacts on wildlife and, increased GHG emissions.

Big 4 Pillars: Food and Nutrition Security

SDGs: 5 Gender Equality; 6 Clean Water and Sanitation; 7 Affordable and Clean Energy; 13 Climate Action; 15 Life on Land

National-level Indicators:

- Forest cover as a % of total land area;
- Area of land used for private forestry;
- Proportion of land that is degraded over total land area; and
- Deaths of big wildlife animals, such as elephants and rhinos, as a result of drought.
- Hectares of land conserved for wildlife habitats

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
1. Afforest and reforest degraded and deforested areas in Counties	■ An additional 100,000 hectares of land afforested or reforested, including via agroforestry; ■ Planting of one million trees per county per year through such initiatives as: • Annual National Tree Planting Day; • Revived Green Schools Programme (GSP) – 10% of school land areas planted with trees; • Increased tree nurseries and production and availability of seedlings; • Tree planting (with appropriate species, including indigenous species); • Forest management and planning; • Silviculture interventions;	Adaptation/ Mitigation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
	• Promotion of agroforestry - *linked to climate change priority 1: Food and Nutrition Security;* • Expansion and protection of mangrove forest cover (for coastal adaptation and blue carbon sequestration) including implementation of the National Mangrove Ecosystem Management Plan - *linked to Action 3: Water and Blue Economy;* and • Fast-tracking the signing and implementation of respective Transition Implementation Plans (TIPs)	
2. Reduce deforestation and forest degradation	■ Deforestation and forest degradation reduced through enhanced protection of an additional 100,000 hectares of natural forests through such initiatives as: • Community/participatory forestry management; • Limiting access to forests; • Preventing disturbances through improved enforcement and monitoring; • Developing alternative technologies to reduce demand for biomass, such as clean cooking, briquetting, and efficient charcoal production). *Linked to climate change priority 6: Sustainable charcoal production and climate change priority 7:* Promotion of clean cooking; • Carbon stock enhancement (enrichment planting) in existing forests; • Financial innovations, including payments through ecosystem services and carbon markets; and • Development of the REDD+ architecture through multi-stakeholder engagements, including a national strategy and investment plan, safeguards information system, National Forest Monitoring System (NFMS) and Forest Reference Level (FRL) for improved forest monitoring and measurement	Adaptation/ Mitigation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
3. Restore degraded forest landscapes (ASALs and rangelands)	■ Restoration of up to 200,000 hectares of forest on degraded landscapes in ASALs and rangelands through such initiatives as the GCF Dryland Resilience Project, including: • Enhanced natural generation of degraded lands through conservation and sustainable management; • Ecosystem-based adaptation through rangeland and forest landscape restoration and sustainable management. (sites include rangelands, woodlands/forests, wetlands, and croplands); • Initiation of restoration processes on 33% of land area in seven Counties. • Analysis of priority landscapes and existing restoration successes; and • Economic analysis of restoration options, and identification of financing options to scale up landscape restoration.	Adaptation/ Mitigation
4. Promote sustainable timber production on privately-owned land	■ Area under private sector-based commercial and industrial plantations increased from 71,000 hectares to at least 121,000 hectares.	Mitigation
5. Conserve land areas for wildlife	■ At least 20% of terrestrial and inland water, and 15% of coastal and marine areas, especially areas of importance for biodiversity and ecosystem services, conserved. *(linked to Water and the Blue Economy);* ■ 30,000 hectares of wildlife habitats conserved to support a broad range of wildlife and plant species under changed climate conditions; ■ Human wildlife conflict reduced by 50% from the 2018 baseline; and ■ 20% of dispersal areas and migratory pathways for wildlife that have been identified in the National Wildlife Dispersal Corridor Report (NWDCR) secured.	Adaptation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
6. Enabling action (technology)	■ MRV+ technologies, including remote sensing and global positioning systems, and computer tagging and tracking systems, adopted and used in all sectors.	Enabling
7. Enabling action (policy and regulatory)	■ Standards and regulations, including social and environmental safeguards, for sustainable forestry management (voluntary moving to regulated), developed; ■ Guidelines and standards for establishment of green zones, as required by the Forest Act 2016, developed, which requires linkage with County physical planning and development control functions; ■ An adaptation strategy for the tourism sector developed; ■ A wildlife climate change strategy that includes the impacts of climate change on wildlife, human-wildlife conflict, and locations suitable for harvesting flood waters and drilling of boreholes, developed; ■ Land use planning and zoning done to segregate and identify forest areas for conservation; and ■ Climate change mainstreamed into environment audits, environmental impact assessments, and strategic environmental assessments.	Enabling
8. Enabling action (capacity development)	■ Build the capacity of county level institutions for the efficient transfer and implementation of the devolved function with respect to community forests	Enabling

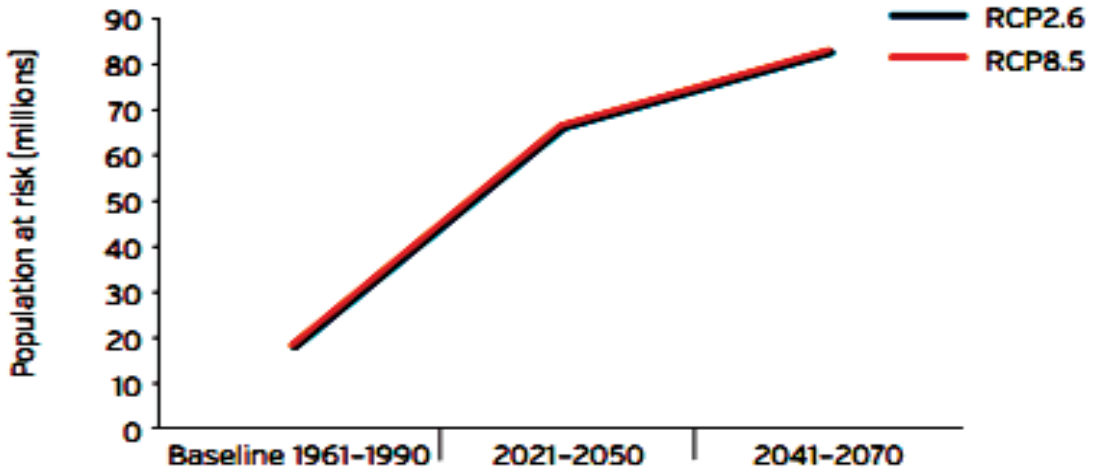
RELEVANT INSTITUTIONS:
County Governments, CoG, MEF, MALFI, The National Treasury and Planning, MoTW, KFS, KWS, NEMA, NDMA, WRA, KEFRI, Kenya Wildlife Conservancies Association (KWCA), Community Forestry Associations (CFAs), community institutions, tea industry, farmer organisations, private sector, and civil society. All sectors identify actions to realise the strategic objective.

3.2.5 Climate Change Priority 5: Health, Sanitation and Human Settlements

Sustainable human settlements and sanitation services are essential for human health, which is a pillar of the Government's Big Four Agenda. *NCCAP 2018-2022* proposes an integrated approach to climate actions that addresses sustainable human settlements and health, and sanitation services.

(a) Climate-Related Threats to Human Health

As shown in Figure 9, the risk of malaria and other vector-borne diseases is projected to increase due to changing climate conditions. Approximately 13 to 20 million Kenyans are at risk from malaria, with the percentage of those at risk potentially increasing because climate change facilitates the movement of malaria transmission up the highlands. Rising temperatures would likely lead to greater incidences of malaria at higher altitudes of the Kenyan highlands, and potentially increase the number of Kenyans at risk to about 89% by 2050. In areas where malaria already occurs, transmission intensity is projected to increase along with the length of the transmission season. Communities living at altitudes above 1,100 meters are more vulnerable to malaria due to lack of immunity, lack of preparedness, climate variability, and other factors. Children under five years and pregnant women are the most vulnerable to infection by malaria.[117]



Towards 2070, under both high and low emissions scenarios about 83 million people are projected to be at risk of malaria. Population growth can also cause increases in the population at-risk in areas where malaria presence is static in the future.

Figure 9: *Population at risk from malaria in Kenya (in millions)*

Climate change increases risks for human health by impacting human settlements. The cities of Nairobi, Kisumu, and Mombasa have concentrated populations, economic activities, and built environments, which increases their risk from flooding, heat waves, and other climate hazards. The most affected populations are the urban poor, who tend to live along river banks, on hillsides and slopes prone to landslides, near polluted grounds, in unstable structures that are vulnerable to collapse during heavy rains, and along waterfronts in coastal areas. This is especially true in informal settlements and other low-income areas, where high population density and lack of infrastructure aggravate these problems. Coastal areas are also very vulnerable, with communities prone to flooding from rises in sea levels and surging storms. Improving the resilience of the built environment in human settlements is needed, including flood control, green building technologies, and waste management.

Building the climate resilience of waste disposal systems and facilities is also of great importance. The volume of solid wastes that is generated across Kenyan urban centres increased from 4,950 tonnes per day in 2011 to 5,990 tonnes per day in 2014; a rate that is faster than that of the country's urbanisation. Improperly managed solid wastes could accumulate in areas otherwise intended for water runoff and flood control, and make cities and towns vulnerable to floods and contaminated water from moderate rainfall, let alone the intense and heavy rains projected due to climate change. Solid waste dumping sites are open in Kenya, and often exposed to run-off during heavy rains. This leads to contamination of water resources and negative health impacts. The need for adequate waste treatment is accentuated by the growing industrialisation of Kenya's economy, coupled with the current state of inappropriately disposed solid waste and wastewater that pollutes air, water, and soil, causing significant health and environmental problems. The waste sector contributes to climate change, accounting for about 3% of total national GHG emissions in 2015.[120] This is a very small contribution in comparison to other sectors such as agriculture, forestry, and energy. This notwithstanding, the Government of Kenya takes waste management seriously. The main guiding approach is the "zero waste principle" as set out in the National Solid Waste Management Strategy (NSWMS). Recycling, composting, waste minimisation, and industrial symbiosis, are important elements of this strategy that seeks to protect human health and the environment.

Studies into the effects of climate change on health in Kenya have reported increased acute respiratory infections for ASAL areas, emergence and re-emergence of Rift Valley Fever and leishmaniasis and, malnutrition. More severe and frequent flooding displaces communities and increases the risks of water-borne diseases, such as cholera, dysentery, and typhoid, which already affect large numbers of Kenyans.[121] Higher temperatures are projected to increase heat-related deaths in the elderly.[122] Short-lived climate pollutants, including black carbon or soot and methane, are released through inefficient use and burning of biomass and fossil fuels. Household air pollution is a big health challenge, leading to about 21,560 deaths annually in Kenya. Women and children are particularly impacted. Exposure to household air pollution almost doubles the risk for childhood pneumonia, and women exposed to high levels of indoor smoke are more than two times as likely to suffer from chronic obstructive pulmonary disease than women who use cleaner fuels and technologies.[123]

The planned climate actions in the waste sector will result in:

- **Adaptation –** Reduced incidence of malaria, climate-proofed landfill sites, and flood control in urban settlements;
- **Mitigation** – GHG emission reductions of 0.72 $MtCO_2e$ by 2022 through mitigation actions to reduce and recycle solid waste, green buildings, and exploring options for methane capture and power generation;
- **The Big Four Agenda** – Improved health services and affordable housing;
- **Sustainable Development** – Improved human health, reduced burden of disease for households, and greater individual productivity; improved engagement of women as community health workers; improved and sustainable waste management; more sustainable human settlements; reduced health impacts from inappropriate waste disposal and biomass cookstoves; and improved surveillance and monitoring of climate change-related diseases, including monitoring of deaths resulting from indoor air pollution.



Photo: *Min. of Environment*

Strategic Objective 5

Mainstream climate change adaptation into the health sector, and increase the resilience of human settlements, including through improved solid waste management in urban areas.

Issue/ problem:

Kenya's improvements in the control of malaria, water-borne diseases, respiratory diseases, infant mortality, and malnutrition are at risk from setbacks relating to climate change. Inappropriate waste management could contribute to increased GHG emissions, and enhance negative health impacts.

Big 4 Pillars:


Universal Health Coverage


Affordable Housing

SDGs:



National-level Indicators:

- Malaria incidence per 1,000 population;
- Percentage of urban solid waste regulatory collected and well managed; and
- Proportion of urban population living in slums, informal settlements or inadequate housing.

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
1. Reduce the incidence of malaria and other vector-borne disease	■ Community-level interventions on malaria control scaled up country-wide, with emphasis on women as community health workers. ■ Uptake and utilisation of malaria treatment services increased in new malaria areas to reduce the incidence of malaria.	Adaptation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
2. Promote recycling to divert collected waste away from disposal sites.	■ A circular economy solid waste management approach that diverts at least 90% of collected waste away from disposal sites toward various recycling practices in Nairobi implemented. ■ Options for methane capture and power generation at landfill sites, such as in Eldoret and, waste incineration for energy generation, explored.	Adaptation/ Mitigation
3. Climate proof landfill sites	■ Existing dumpsites in two major urban areas screened for vulnerability to climate change, and plans developed to adapt to extreme climate patterns.	Adaptation
4. Control flooding in human settlements	■ Floodways (manmade channels to divert flood water) constructed in select urban centres.	Adaptation
5. Enabling Action (technology and capacity building)	■ The surveillance and monitoring of climate-related diseases improved; and ■ The health impacts of transition to clean cooking tracked *(linked to Climate Action 7): Promotion of clean cooking),* with the aim of reducing the number of household deaths related to biomass energy use from 21,560 annually (49% of total deaths) to 20%.	Enabling
6. Enabling action (capacity building)	■ The awareness of community health workers and volunteers strengthened by developing materials on climate-related health risks, including disaster risk management, and the impacts on women, children, and persons with disabilities.	Enabling

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
7. Enabling Action (policy and regulation)	■ Five county-based waste management plans and regulations that are consistent with the NWMS and other relevant policies developed; ■ A national resettlement policy framework that sets out safeguard mechanisms against involuntary resettlement and forced evictions from homes when land is acquired for development projects developed and implemented; ■ Alternative approaches to land acquisition, other than compulsory acquisition, implemented, where possible; ■ Policy for green building and, green building codes and regulations that account for climate information, developed; ■ A national framework for waste water management developed; and ■ Laws on urban planning and storm water management in urban areas, such as desilting of drainage and, riparian protection enforced.	Enabling

RELEVANT INSTITUTIONS:
County Governments, CoG, MEF, MALFI, The National Treasury and Planning, MoTW, MoH, KFS, KWS, NEMA, NDMA, WRA, KEFRI, Kenya Wildlife Conservancies Association (KWCA), Community Forestry Associations (CFAs), community institutions, tea industry, farmer organisations, private sector, and civil society. All sectors identify actions to realise the strategic objective.



3.2.6 Climate Change Priority 6: Manufacturing

Climate change could prevent achievement of the Big Four Agenda's goal of increasing manufacturing to 15% of GDP by 2022. *NCCAP 2018-2022* supports the manufacturing sector by reducing the impacts of climate change on manufacturing activities, and creating new economic and market opportunities.

(a) Impacts of Climate Change on Manufacturing

Manufacturing is capital intensive, with many long-life fixed assets, long supply chains, and significant water requirements. These are negatively impacted by floods, droughts, and extreme climate events whose intensities and frequencies have increased due to climate change. Climate change increases resource scarcity, such as water and raw materials that are used as inputs in manufacturing. An example is reduction in crop production that negatively impacts the agro-manufacturing sector. The 2017 drought significantly affected tea production and resulted in diminished turnover in processed tea. Reductions in the production of other crops also caused slow-downs in the manufacturing processes that rely on those particular crops.

While being impacted by climate change, manufacturing also produces GHG emissions. The sector emitted about 7% of Kenya's total emissions in 2015.[124]



Photo: *Min. of Environment*

(b) Win-Win Solutions for Low Carbon Climate Resilient Impact, Greater Productivity, and Competitiveness

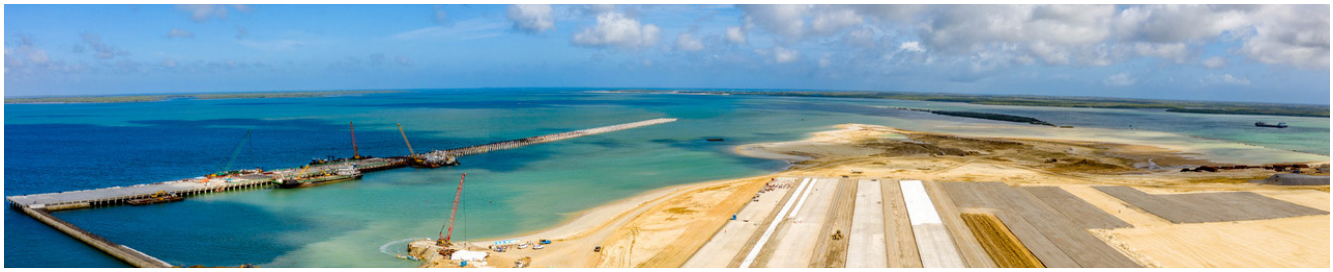
Climate actions to promote a green manufacturing sector focus on resource efficiency, sustainable production, and managing waste as a resource in the creation of new product lines from waste recovery and re-use. Moving toward green manufacturing will require innovation and the promotion of micro, small and medium enterprises started by entrepreneurs, including in the areas of urban and rooftop agriculture, and sustainable briquettes for cooking.[125]

The climate actions also focus on improving energy and resource efficiency, including in the industrial sector. They also seek to reduce emissions from industrial processes. A priority action area is charcoal production, which currently uses very inefficient technologies. Actions to improve the efficiency of charcoal kilns, and to formalise the sector to reduce deforestation and forest degradation, are closely linked to Climate Change Priority 4: Forestry, Wildlife and Tourism. Actions to formalise the charcoal sector could draw on the innovation of the youth, and create roles for women in the value chain processes.

Actions delivered under the Green Economy Strategy and Implementation Plan (GESIP) are critical to the achievement of green manufacturing, and are complementary to the manufacturing actions in this *NCCAP*.[126] Some of the actions will be implemented under such existing programmes as the Kenya Association of Manufacturers (KAM) Centre for Energy Efficiency and Conservation; and will complement programmes like the Kenya National Cleaner Production Centre's SWITCH, Africa Green-Industrial Symbiosis Project (AGISP), and the Green Growth and Employment Programme (GGEP).

The climate actions are expected to result in:

- **Adaptation -** Improved efficiency in water use and, industrial symbiosis;
- **Mitigation -** GHG emission reductions of 0.45 $MtCO_2e$ by 2022, through sustainable briquettes and charcoal production, industrial energy efficiency, and industrial symbiosis;
- **The Big Four Agenda** - Progress toward the achievement of the goals of the pillar on enhanced manufacturing; and
- **Sustainable Development -** Promotion of sustainable production and green industries, renewable energy, greater efficiency in the energy and water sectors, improved productivity in manufacturing, reduced deforestation and forest degradation, development of green industries and jobs, and promotion of innovation among the youth and women.



Strategic Objective 6

Promote energy and resource efficiency in the manufacturing sector

Issue/ problem: Scarcity of resources, including water, electricity, and other inputs in manufacturing processes, which arises due to climate change and, inefficient energy use in the manufacturing sector, such as unsustainable charcoal and cement production, increases GHG emissions.

Big 4 Pillars:  Enhanced Manufacturing

SDGs:



National-level Indicators:

- Reduction in GHG emissions through adoption of efficiency and conservation of energy; and
- Number of industrial parks adopting waste diversion practices.

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
1. Increase energy efficiency	■ Number of companies participating in energy efficiency initiatives doubled to 1,000 (including 1,000 energy audits); and ■ Minimum Energy Performance Standards developed for five more appliances, and existing testing facilities up-scaled to include these five appliances.	Mitigation
2. Improve water use and resource efficiency	■ Number of companies participating in water efficiency initiatives increased to 200 (including 200 water audits).	Mitigation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
3. Optimise manufacturing and production processes	■ Optimisation of manufacturing processes promoted; and ■ A sustainable charcoal system promoted by encouraging the uptake of efficient kiln technologies to increase yields to 30-42% and, the establishment of a charcoal certification and labelling scheme.	Mitigation
4. Promote industrial symbiosis in industrial zones	■ Scale-up of industrial symbiosis and environmentally sound technologies and practices in existing and upcoming Industrial Zones in Nairobi, Machakos, Mombasa, Kilifi, and Kwale Counties through waste diversion, and energy and transport efficiency measures, which will contribute to avoided GHG emissions and GHG emission reductions. *Linked to climate action 5: Health, sanitation, and human settlements and, climate action 7: Energy and transport.*	Adaptation/ Mitigation
5. Enabling (capacity development) *Linked to Enabling Actions T4*	■ Innovation promoted through a Sustainable Consumption and Production Networking Facility (SCPNF) for Micro, Small and Medium Enterprises (MSME), with emphasis on women and the youth. *Linked to Enabling Action T4;* and ■ Awareness raising undertaken to promote resource efficiency within the private sector.	Enabling
Enabling (policy and regulatory)	■ Application of special economic zones legislation and planning laws that encourage clustering of industries into zones to enhance symbiosis and increase shared industrial efficiency measures enhanced; and ■ The regulatory framework governing treatment and management of industrial (trade) effluent reviewed and enhanced to encourage waste water recycling, including through industrial symbiosis.	Enabling

RELEVANT INSTITUTIONS:
County Governments, CoG, Ministry of Industry, Trade and Cooperatives (MITC), MWS, KIRDI, Kenya Bureau of Standards (KEBS), NEMA, KIRDI, the private sector, charcoal producers, the academia, civil society, youth organisations. All sectors identify actions to realise the strategic objective.

3.2.7 Climate Change Priority 7: Energy and Transport

Clean, sustainable and affordable energy and transportation systems are essential for Kenya's sustainable development. They are also key infrastructure enablers for the Big Four Agenda.

(a) Major Impacts of Climate Change on the Energy and Transport Sectors

Climate change, including temperature and sea level rise, and a greater number of, and more such severe and extreme climate events as heavy rains that result in floods, damage energy and transport infrastructure. These impacts increase incidences of delays, disruptions, damages, and failures across land-based, air, and marine transportation systems. The impact of drought on hydro-generated electricity is well understood in Kenya. Low water levels in the country's hydro-generation reservoirs, which was caused by drought in early 2017 led to increased use of diesel-powered generators, and a connected increase in the price of electricity.[127] The early 2018 floods caused extensive damage to Kenya's road network.

These, and other climate change impacts have consequences for the design, construction, location, and operations of energy and transport infrastructure. Climate-proofing or proactive adaptation could be cost-effective for energy and transport infrastructure with a long lifespan. Climate-proofing as a means of addressing infrastructure-related climate change impacts is a key recommendation of Kenya's *NAP*, and is necessary to maximise potential development benefits. Climate-proofing of infrastructure requires the factoring in of additional costs associated with the burden of climate change in the design, implementation, and maintenance of infrastructure.

Reducing GHG emissions in the energy and transport sectors is required to achieve Kenya's mitigation NDC. The contribution of the country's energy sector to GHG emissions was expected to increase sharply between 2015 and 2030. The energy sector, excluding transport and industry, accounted for 7.1% of total emissions in 2015, a figure that is projected to rise to 29.7% of the country's total emissions in 2030. The transport sector is a significant source of GHG emissions, directly accounting for about 13% of Kenya's total GHG emissions in 2015. GHG emissions in the transport sector are increasing at a rate that is faster than in other sectors, and are projected to rise to 17% of the country's total national emissions in 2030.[128]

(b) Strong Opportunities for Transforming the Energy and Transport Sectors

Implementation of NCCAP 2018-2022 could drive major transformations in Kenya's energy and transport systems, support achievement of the Big Four Agenda, and provide strong benefits for poverty reduction and sustainable development. The draft 2015 Energy and Petroleum Policy indicates that rapid growth in the Kenyan economy over the past decade is partly attributed to increased investment in the energy sector, particularly the

electricity sub-sector. In 2016/2017, installed electricity generation capacity was 2,333 MW, with geothermal accounting for 44% of the generation mix, hydro 33%, thermal 21%, and imports 2%.[129] An estimated 6.7 million households formed the off-grid and decentralized electricity market in 2013,[130] with supply consisting of micro- and pico-systems, mini-grids, and stand-alone systems, and solar, wind, and hydro being the main resources in use.

Electricity generation based on renewable energy also has impacts for the transport sector, particularly the electrification of the Standard Gauge Railway (SGR) that is expected to take place by 2022.

In regard to energy demand, transition to clean cooking is a priority action. It presents an opportunity for technological leapfrogging on savings in energy, and reducing GHG emissions and, delivery of health and cost-saving benefits compared to the business-as-usual incremental improvements. Clean cooking is an opportunity for investment in innovation and technology development in the biomass energy sub-sector. A key action is to develop programmes that encourage product availability and affordability through a robust pipeline of businesses to manufacture and sell products, and provide services at affordable prices.

The transition to clean cooking through uptake of LPG, ethanol, and other alternative fuels in urban areas, and uptake of briquettes and improved biomass cookstoves in rural areas is about more than just energy; it improves the health of women and children, and protects forests. About 70% of Kenyans rely on biomass (fuelwood and charcoal) energy for cooking, which is a significant driver of deforestation and forest degradation.[131] The use of raw biomass fuels for cooking is a pressing health, social, and environmental problem. About 21,560 Kenyans die every year from health conditions that could be traced back to indoor air pollution.[132] Use of LPG to replace charcoal could reduce 55 deaths per year per 25,000 households, and save up to 30 trees per household each year.[133] Clean cooking, including the use of briquettes, could also save money at the household level. Charcoal briquettes cost KES 3 to cook a meal of maize and beans for a family of five, compared to KES 26 for charcoal and KES 45 for kerosene.[134]



Women and children are disproportionally affected by the challenge of using raw biomass for cooking, suffering from toxic smoke, time poverty, and the consequences of deforestation. The use of clean cooking technologies should be integrated into community development initiatives, and activities involving women. Women are the most affected by lack of clean cooking technologies, and have the potential to drive the achievement of the desired outcomes.

The climate actions in the energy and transport sector result in:

- **Adaptation –** Climate-proofed energy and transport infrastructure;
- **Mitigation**
  - Electricity supply - GHG emission reductions of 9.2 $MtCO_2e$ by 2022 through development of geothermal and other renewable energy sources of electricity supply, energy efficiency, and use of clean coal technology;
  - Energy demand - GHG emission reductions of an estimated 7.1 $MtCO_2e$ by 2022, through uptake of alternative fuels and efficient cookstoves; and
  - Transport - GHG emission reductions of between 1.93 and 4.69 $MtCO_2e$ by 2022 and 2030, respectively, through electrification of the SGR, extension of the SGR, construction of the Bus Rapid Transit system in the Nairobi metropolitan area, low carbon technologies in the aviation and maritime sectors, and pilot projects on electric vehicles.
- **The Big Four Agenda –** progress toward the achievement of the Agenda through the provision of efficient energy and transport services; and
- **Sustainable Development –** sustainable and renewable energy, new business opportunities for clean energy and transport sectors, protection of water catchment areas, reduction of deaths from indoor air pollution from 49% of Kenya's total annual deaths (21,560 in 2017) to 20%, and reduced deforestation, forest degradation and stress on forests.

Actions with significant GHG emission reductions are included in the table below, and the full list of energy and transport actions included in MTAR.



Photo: *Min. of Environment*

Strategic Objective 7a

Ensure an electricity supply mix that is based mainly on renewable energy, is resilient to climate change, and promotes energy efficiency and, encourage transition to clean cooking to reduce demand for fuelwood.

Issue/ problem:

Supply of renewable and affordable electricity needs to increase to meet the energy demands of Kenya's growing population, and industrial aspirations. 70% of Kenyans depend on biomass for primary energy, most of which is non-renewable. This leads to indoor air pollution, deforestation, and GHG emissions.

Big 4 Pillars:

- Food and Nutrition Security
- Universal Health Coverage
- Affordable Housing
- Enhanced Manufacturing

SDGs:

1 NO POVERTY; 2 ZERO HUNGER; 3 GOOD HEALTH AND WELL-BEING; 5 GENDER EQUALITY; 7 AFFORDABLE AND CLEAN ENERGY; 8 DECENT WORK AND ECONOMIC GROWTH; 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 11 SUSTAINABLE CITIES AND COMMUNITIES; 13 CLIMATE ACTION; 15 LIFE ON LAND

National-level Indicators:

- Percentage share of renewable energy in the total electricity generation mix;
- Percentage of households using biomass for energy;
- Percentage of households using LPG; and
- Percentage of freight moved by rail.

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
1. Increased renewable energy for electricity generation, in a manner that is climate resilient and accounts for the needs of rural areas	■ 2,405 MW new renewables developed, including: • Geothermal – prioritised as baseload generation that is climate resilient; • Biomass / Co-generation; • Hydro; • Solar; and • Wind.	Adaptation/ Mitigation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
2. Increased generation capacity for captive renewable energy	■ Captive renewable energy generation plants developed, where such electricity as direct use of geothermal resources to power various industrial applications like boilers and dryers is used by the developers.	Mitigation
3. Improved energy efficiency and energy conservation	■ Losses in electricity transmission and distribution reduced from 18% to 14%; ■ 3.3 million Compact Fluorescent Light (CFL) distributed to households through CFL initiative; ■ Energy efficiency and conservation projects delivered, which focus on: • Efficient lighting; • Energy efficiency in buildings; • Minimum energy performance standards; and • Distribution of clean lighting.	Mitigation
4. Climate proofed energy infrastructure	■ Concrete poles replace wooden poles; ■ Existing hydropower plants optimised, and water management and conservation improved; and ■ 1000 hectares of water catchment areas conserved and rehabilitated by protecting the areas feeding hydro-generation reservoirs. *Linked to climate change priority 3 – Forestry, wildlife and tourism.*	Adaptation
5. Transition to clean cooking with such alternative fuels as LPG, ethanol, and other clean fuels promoted in both rural and urban areas	■ Number of households using LPG, ethanol, or other cleaner fuels for cooking increased to 2 million, through a programme that promotes: • Development of a depot with LPG storage tanks, bottling machines, and stock cylinders of various sizes; • Loan programme through micro-finance institutions to assist with up-front costs of cookers and cylinders; • Local manufacture and servicing of clean cookers;	Mitigation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
	• Tax-relief incentives for manufacturers; • Training and loans for local service; • Local businesses stocking and delivering LPG to consumers; • Engagement of women and youth groups to brand cooking cylinders procured by government; and • Increased production of such non-forest biomass fuel briquettes as agricultural waste, sawdust and human waste, with emphasis on women and the youth. *Actions linked to climate change priority 3: Forestry, Wildlife, and Tourism; climate change priority 5: Health, Sanitation and Human Settlements, and climate change priority 6: Manufacturing.*	
6. Uptake of clean biomass (charcoal and wood) cookstoves, briquettes, and other clean cooking alternatives promoted in rural areas	■ Number of households using improved biomass cookstoves increased by 4 million through a programme that promotes: • Loan programme through micro-finance institutions to assist with the up-front cost of cookstoves; • Local manufacture and servicing of clean cookstoves, through tax-relief incentives for manufacturers, and training and loans for local service providers; and • Local businesses that stock improved cookstoves, with an emphasis on women-led businesses. ■ Biogas technology scaled up to increase access to clean energy through the construction of 6,500 digesters for domestic use and 600 biogas systems in various schools and public facilities. ■ Increased production of such non-forest biomass fuel briquettes as agricultural waste, sawdust, and human waste, with emphasis on women and the youth. *Actions linked to climate change priority 3: Forestry, Wildlife, and Tourism; climate change priority 5: Health, Sanitation and Human Settlements, and climate change priority 6: Manufacturing.*	Mitigation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
7. Enabling Actions (technology)	■ Climate change resilient technologies, such as modern coolers and scrubbers promoted; and ■ Research undertaken on new and emerging energy technologies that would reduce GHG emissions in the energy sector.	Enabling
8. Enabling Actions (capacity development)	■ Training and public awareness on climate change adaptation and mitigation mechanisms; ■ Working with civil society organisations (CSOs) to train of *jua kali* artisans to produce improved cookstoves; ■ Training of 100 students per year by Kenya Power International (Institute of Energy Studies and Research) on renewable energy technologies; and ■ Training of 60 participants per year at the United Nations University's Geothermal Training Programme.	Enabling
9. Enabling Action (policy and regulations)	■ Develop a policy to guide in the management of vegetation, wayleaves acquisition, and corridors for energy infrastructure; and ■ Explore the use of fiscal and tax policies and regulations to encourage uptake of clean cooking.	Enabling

RELEVANT INSTITUTIONS:
Ministry of Energy (MOE), MITC, The National Treasury and Planning, MoH, CCD, KFS, Attorney General and Department of Justice, CoG, County Governments, Energy Regulatory Commission (ERC), Kenya Power, Kenya Electricity Generating Company (KenGen), Geothermal Development Corporation (GDC), Kenya Power, Rural Electrification Authority (REA), Kenya Electricity Transmission Company (KETRACO), KIRDI, Correctional Services, Kenya Climate Innovation Centre (KCIC), micro-finance institutions, the private sector, civil society, women's groups, youth groups. All sectors identify actions to realise the strategic objective.

Strategic Objective 7b

Establish efficient, sustainable, world-class transport systems and logistics services that withstand projected impacts of climate change.

Issue/ problem: Operational inefficiency, heavy traffic congestion, heavy fuels, and high fuel consumption lead to high levels of GHG emissions.

Big 4 Pillars: Food and Nutrition Security; Universal Health Coverage; Affordable Housing

SDGs: 1 No Poverty; 3 Good Health and Well-being; 7 Affordable and Clean Energy; 9 Industry, Innovation and Infrastructure; 10 Reduced Inequalities; 12 Responsible Consumption and Production; 13 Climate Action

National-level Indicators:

- Percentage of freight moved by rail instead of by road.

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
1. Develop an affordable, safe and efficient public transport	■ 70 km of BRT for Nairobi Metropolitan Area designed, constructed and implemented in 5 routes; ■ Use of electric hybrid vehicles (buses) piloted and appropriate incentives provided for their use; ■ SGR extended from Nairobi to Naivasha; ■ Feeder public transport to BRT, commuter rail, and SGR developed and provided for the public; and ■ 150 km of non-motorised transport facilities constructed, including pedestrian and bicycle access within, and to town centres and transit stations.	Mitigation

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
2. Reduce fuel consumption and fuel overhead costs	■ SGR from Nairobi to Mombasa electrified; ■ 30% of freight from Mombasa to Nairobi shifted from road to rail; ■ Roadmap for the improvement of heavy-duty truck efficiency developed, including increased use of low-rolling resistance tyres, super structure fittings etc. and, development of vehicle standards; and ■ Light-duty vehicle fuel economy improved through labelling, promotion of fuel-efficient driving, and improved traffic management.	Mitigation
3. Encourage low-carbon technologies in the aviation and maritime sectors	■ Shore power infrastructure for four berths installed to provide power to ships while at berth instead of using their engines; ■ 2 new aircraft (B787) which have fuel efficient engines purchased; ■ Service Charter on Sustainable Aviation Fuels (certification and use of biodiesel production for captive use at the airports) implemented by 2020; and ■ 0.5 MW solar power plant installed at Moi International Airport and commissioned by 2018.	Mitigation
4. Climate proof transportation infrastructure	■ Climate information used in infrastructure planning, and transport resilience plans developed; ■ Feasibility study on constructing roads that systematically harvest water and mitigate floods undertaken; and ■ 4,500 km of roads climate-proofed.	Adaptation
5. Enabling (technology)	■ Domestic technology development for electric modes of transport encouraged; and ■ Research on the use of renewable energy for powering different modes of transport undertaken.	Enabling

Action	Expected Results by 30th June 2023	Adaptation/ Mitigation
6. Enabling (capacity development)	■ Awareness built on the fuel economy and electric mobility options, including exploring infrastructure needs for electric mobility.	Enabling
7. Enabling (policy and regulation)	■ *The Integrated National Transport Policy (2009)* reviewed and implemented by 2021; ■ The international standards on aviation *(ICAO Annex 16 Vol 4),* and the Maritime (*MARPOL Annex VI)* domesticated and implemented by 2021 and 2020, respectively; ■ Standards for electric cars and two-wheelers developed and implemented by 2019; ■ Standards for climate proofing of transport infrastructure developed; and ■ Planning and building control regulations to encourage compact development, mixed use, and reduced provision of parking near MRT stations updated and implemented.	Enabling

RELEVANT INSTITUTIONS:
MOTIHUD, MOE, CCD, County Governments, Nairobi Metropolitan Area Transport Authority (NAMATA), Kenya Railways Corporation (KRC), National Transport and Safety Authority (NTSA), Kenya Civil Aviation Authority (KCAA), Kenya Airports Authority (KAA), Kenya Civil Aviation Authority (KCAA) , Kenya Airports Authority (KAA), ERC, KETRACO, KENGEN, KEBS, Kenya Urban Roads Authority (KURA), Kenya National Highways Authority (KENHA), Kenya Rural Roads Authority (KERRA), National Construction Authority (NCA), Kenya Ports Authority (KPA),Kenya Maritime Authority (KMA), Kenya Airways (KQ), the private sector, the academia, research institutions, civil society. All sectors identify actions to realise the strategic objective.



3.3 Climate Change Priority Actions in the Counties

Successful implementation of the actions planned for in this *NCCAP* will require the efforts of Kenya's 47 counties. County Governments are the main implementing agents of many of the climate actions set out in Section 3.2, and will implement the actions in such locally-appropriate ways as would bring on board the unique needs of local populations.

County Governments will play critical roles in such areas as:

1. **Disaster Risk Management -** Response measures to address drought, floods, and other climate-driven disasters;
2. **Food and Nutrition Security -** Agriculture, including crop and animal husbandry; livestock sale yards; County abattoirs; plant and animal disease control; and fisheries;
3. **Water and the Blue Economy -** Water management and implementation of policies established by the National Government on water conservation;
4. **Forestry, Wildlife and Tourism -** Implementation of policies on natural resource and environmental conservation, and the management of community and private forests.
5. **Health, Sanitation and Human Settlements -** County health facilities and promotion of primary health care, refuse removal and dumping, solid waste disposal, housing, and management systems for storm water;
6. **Manufacturing -** Planning and development; and
7. **Energy and Transport -** Electricity and gas reticulation, energy regulation, and County transport.

The *Climate Change Act, 2016* requires that County Governments mainstream climate change actions and interventions in their CIDPs, while taking into account National and County priorities. In 2013, all 47 CIDPs mentioned the impacts of climate change in their areas of jurisdiction, and many identified actions to address these impacts. The main climate change impact mentioned in the CIDPs was increased temperatures that resulted in prolonged dry spells and droughts. Erratic rainfall, flooding, and unpredictable climate patterns were also noted. The CIDPs pointed out that climate change negatively impacted economic activities, leading to reduced food and livestock production, scarcity of potable water, increased spread of diseases, and increased conflicts (human/human and human/wildlife).[135] Impacts of, and responses to, climate change vary across the Counties, as noted during the consultations with the six County Economic Blocs (CEBs) shown in figure 10.



Photo: Benard Omwaka

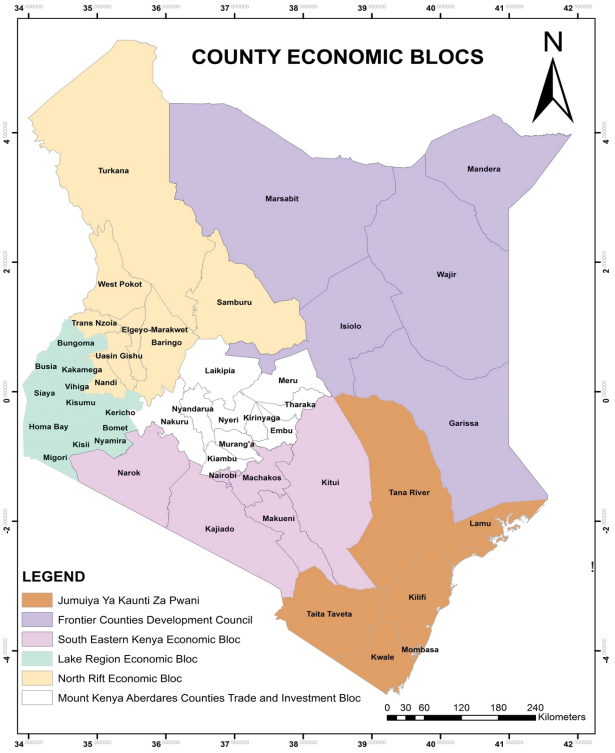


Figure 10: *Kenya: County Economic Blocks.*[136]

The Counties in each of the Economic Blocs are listed hereafter:

- **Frontier Counties Development Council:** Comprised of Garissa, Isiolo, Mandera, Marsabit, and Wajir counties;
- **Jumuiya Ya Kaunti Za Pwani:** Comprised of Kilifi, Kwale, Lamu, Mombasa, Taita Taveta, and Tana River counties;
- **Lake Region Economic Bloc:** Comprised of Bungoma, Busia, Homa Bay, Kakamega, Kericho, Kisii, Kisumu, Migori, Nandi, Nyamira, Siaya, Trans Nzoia, Vihiga, and Bomet counties;
- **Mount Kenya and Aberdares Counties Trade and Investment Bloc:** Comprised of Embu, Kiambu, Kirinyaga, Laikipia, Meru, Murang'a, Nakuru, Nyandarua, Nyeri, and Tharaka-Nithi counties;
- **North Rift Economic Bloc:** Comprised of Baringo, Elgeyo-Marakwet, Nandi, Samburu, Trans Nzoia, Turkana and Uasin Gishu, and West Pokot counties; and
- **South Eastern Kenya Economic Bloc:** Comprised of Kajiado, Kitui, Machakos, Makueni, Nairobi, and Narok counties.

All the six County Economic Blocs identified two main climate change issues requiring action in drought and floods. Other impacts of climate change identified by the Counties through the consultative meetings with their respective County Economic Blocs are listed in Box 10.

Box 10: Climate change impacts identified by the Counties

- Drought
- Flooding
- Declining agricultural productivity
- Declining livestock productivity
- Food and nutrition insecurity
- Negative health impacts for humans and livestock
- Land and ecosystem degradation
- Water scarcity
- Displacement of populations
- Intra-and inter-community conflict
- Human-wildlife conflict
- Landslides and erosion

The Counties also identified issues that were not caused by the impacts of climate change, but which could be addressed through mitigation actions to reduce GHG emissions. These include, tree planting, and addressing deforestation and forest degradation to achieve 10% tree cover. A coordinated approach to forest management includes the priority actions identified by the Counties: Protecting forests, planting trees, addressing charcoal production and unsustainable logging, and promotion of clean cooking, including use of efficient cookstoves, briquettes, biogas, and LPG alternatives. Counties also identified the need to promote renewable energy, including improved biomass, wind, and solar.

Improvement of waste management systems was also noted as a priority for many Counties. Climate change actions to reduce GHG emissions in the area of waste management included waste to energy, capture of methane from landfill sites, and promotion of a circular economy approach to waste management, which encourages recycling and re-use. Adaptation actions related to waste management included proper siting of landfill sites to account for such projected impacts of climate change as heavy rainfall and flooding.

The actions identified by the Counties focus on needs at the local level, reflecting the realities and priorities of local communities. Most of the actions have sustainable development benefits to improve the lives of vulnerable groups in society, including children, women, the youth, and marginalised and minority communities. The actions, where appropriate, also address the needs of smallholder farmers that form the bulk of Kenya's agricultural sector, fisher communities that are the backbone of coastal communities and communities near such major water bodies as Lake Victoria, and pastoralists, whose livelihoods are severely impacted by climate change.

A summary of the priority climate change actions that were identified through the consultations with the County Economic Blocs is provided in Table 7. A fuller description of the actions submitted by the County Economic Blocs could be accessed from the reports of County Consultations available at: http://www.kcckp.go.ke.



Photo: *Min. of Environment*

Table 7: *Adaptation, mitigation, and enabling actions identified by County Economic Blocs.*

ADAPTATION

DROUGHT

- Establishment of early warning systems
- Diversification of livelihoods
- Harvesting of flood water
- Food and nutritional supplements, such as school feeding programmes

FLOODING

- Establishment of early warning systems
- Protection of riparian areas along rivers
- Strategic placement of dams / dykes
- Drainage systems for storm waters / storm water harvesting
- Insurance systems

FOOD SECURITY CROPS

- Farm forestry / agroforestry
- Drought tolerant crops
- Climate-smart agriculture
- Establishment of irrigation systems, such as construction of dams for irrigation, and up-scaling drip irrigation
- Improved agricultural extension services
- Soil and water conservation / conservation agriculture
- Water efficient technologies
- Crop diversification
- Climate information services for farmers
- Urban agriculture
- Promotion of such non-rain-fed agricultural practices as greenhouse farming

LIVESTOCK

- Proper management of pasture lands / controlled grazing / fodder banks
- Drought-resistant breeds
- Adoption of new animal husbandry techniques
- Livestock insurance

FISHERIES

- Fish farming
- Fish harvesting
- Controlled mangrove harvesting
- Research on coral bleaching
- Protection of fish breeding sites

WATER

- Water harvesting
- Dams, boreholes, and water pans
- Protection of springs and water catchment areas
- Water storage
- Water treatment
- Capture of water run-off on roads
- Management of ground waters

ECOSYSTEM DEGRADATION

- Restoration of water catchment areas
- Soil conservation and control of erosion (terracing, gabions)
- Promote the conservation of natural resources
- Protection of wetlands
- Rehabilitation of degraded rivers

INFRASTRUCTURE

- Climate proofing of infrastructure through use of concrete for poles, bridges, dykes, and roads
- Construction of raised ports and jetties

HEALTH

- Vaccination / immunization campaigns
- Disease surveillance and reporting
- Mosquito nets
- Promotion of family planning

ADAPTATION/MITIGATION

FORESTRY

- Farm forestry / agroforestry
- Drought tolerant crops
- Climate-smart agriculture
- Establishment of irrigation systems, such as construction of dams for irrigation, and up-scaling drip irrigation
- Improved agricultural extension services
- Soil and water conservation / conservation agriculture
- Water efficient technologies
- Crop diversification
- Climate information services for farmers
- Urban agriculture
- Promotion of such non-rain-fed agricultural practices as greenhouse farming

MITIGATION

MANUFACTURING

- Regulations and laws on charcoal production
- Promotion of the briquetting industry

ENERGY

- Renewable/ green energy (wind, solar, biogas, briquettes)
- Promotion of briquettes and efficient cookstoves

TRANSPORT

- Legal and policy instruments to promote high efficiency vehicles

WASTE MANAGEMENT

- Waste to energy
- Proper waste management, including recycling

ENABLING

EDUCATION

- Enhance community awareness
- Increase access to learning materials and tools
- Improve network reception
- Synchronize school calendar with climate-related events

DISASTER MANAGEMENT

- Establishment of disaster response units
- Establishment of disaster management fund / recovery "kitty" for post-drought and post-floods

HUMAN SETTLEMENTS

- Proper planning of towns / County spatial planning / land use planning

HUMAN-WILDLIFE CONFLICT

- Sensitise communities on the benefits of wildlife
- Provide water in national parks

CONFLICT RESOLUTION

- Strengthen conflict resolution mechanisms

CLIMATE MONITORING AND INFORMATION

- Establish a climate monitoring infrastructure

CLIMATE CHANGE REGULATORY FRAMEWORK

- Establish institutional and legal frameworks for climate change
- Establish CCCFs and ward development funds to address local problems



CHAPTER FOUR

Delivering *NCCAP 2018-2022*

4.1 Enablers

A range of crosscutting enabling actions are required to effectively deliver the adaptation and mitigation actions set out in the seven priority climate change areas described in Chapter 3. The actions equip government and stakeholders with the finance, knowledge, skills, and technologies needed to deliver and report on the adaptation and mitigation actions.
The enabling actions take place in five areas:

- Enabling policy and regulatory framework;
- Technology and innovation;
- Capacity development and knowledge management;
- Climate finance and resource mobilisation; and
- Transparency, Measurement, Reporting, and Verification Plus (MRV+).

This section provides brief descriptions of the priority enabling actions to be completed from 1st July 2018 to 30th June 2023. The descriptions indicate whether the actions were continued from *NCCAP 2013-2017*, identify the relevant institutions, and set out process indicators to measure progress and achievements.

4.1.1 Enabling Policy and Regulatory Framework

Development of a comprehensive policy and regulatory framework for climate change is well underway in Kenya. The process is articulated in the *Climate Change Act, 2016,* and the *National Climate Change Policy, 2018.* A key requirement of the *Climate Change Act* is the development of regulations to provide further interpretation on some of its provisions, and to support the operationalisation of such administrative aspects of the Act as reporting requirements. At the County level, support is needed to develop appropriate legislation, including climate fund regulations that are informed by local contexts, aligned to County systems, and conform to national public finance policies and laws. This legal and policy framework will guide the development and utilisation of CCCFs, and enable climate finance to address County-specific local issues. The two enabling actions are described in Table 8.



Table 8: *Priority enabling actions: Enabling policy and regulatory framework*

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
P1	■ Prioritise, develop and implement the needed regulations to effectively implement the *Climate Change Act, 2016* through a multi-stakeholder process that includes women, the youth, and marginalised and minority groups. *Action continues from NCCAP 2013-2017: Enabling Policy and Legal Framework 5*	■ The National Treasury and Planning ■ Office of Attorney General and Department of Justice ■ CCD	**By 30th December 2020** Assessment of needed regulations complete. **By 30th June 2023** Two regulations developed and operationalised.
P2	■ Support the alignment of County legislation to *the Climate Change Act, 2016.* ■ Assist County Governments to develop County Climate Change Fund (CCCF) regulations that are linked to the NCCF, and building on the examples of Makueni, Wajir, Garissa, Isiolo and Kitui Counties	■ CoG ■ County Governments ■ The National Treasury and Planning ■ CCD	**By 30th December 2020** Five County Governments have developed CCCF regulations. **By 30th June 2023** An additional ten County Governments have developed CCCF regulations.



4.1.2 Technology and Innovation

The climate change actions on technology and innovation are important enablers of success for the adaptation and mitigation actions described in Chapter 3. The overall objective is to support the various sectors in Kenya to promote appropriate technologies, to deliver such adaptation and mitigation actions as water harvesting, Climate Information Services (CIS), and clean cooking technologies.

The enabling actions on technology and innovation are presented in Table 9. They include, building the capacity of KIRDI to deliver on its role as the National Designated Entity (NDE) for the Climate Technology Centre and Network (CTCN) under the *UNFCCC.* Other research institutions, including KALRO, Kenya Forestry Research Institute (KEFRI), and Kenya Marine and Fisheries Research Institute (KMFRI) will also be supported to promote climate innovation.

The enabling actions on technology and innovation promote the role of the private sector to develop and disseminate adaptation and mitigation technologies, to deliver the associated priority climate change actions. Development and deployment of locally-relevant technologies for climate change action will be supported through the provision of incubation and capacity building services, and financing of Kenyan entrepreneurs. Promotion of sustainable production and consumption will help the private sector achieve resource efficiency, and move toward industrial symbiosis, while the identification of appropriate and effective policy and fiscal tools will be another priority action.

Technology diffusion and uptake will be facilitated through such policy and fiscal incentives as the introduction in the 2018/2019 budget statement of 100% duty remission for inputs and raw materials for assembly of clean energy cooking stoves imported by local manufacturers.[137] Another priority will be to assist KMD to improve the provision of CIS, including immediate and short-term climate forecasts and advisories. Climate information is important for farmers to manage risk, for planning standards and regulations, and for assessing climate change risks in environmental assessments. Climate information is also a critical element of early warning systems to help communities, especially vulnerable groups, cope with such extreme climate events as droughts and floods.

Table 9: *Priority enabling actions: Technology and Innovation.*

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
T1	■ Improve the capacity of KIRDI to coordinate the activities and services that it delivers as the NDE for the CTCN, the operational arm of the UNFCCC Technology Mechanism, including the promotion, upscaling	■ KIRDI ■ KALRO ■ KEFRI ■ CCD ■ The academia ■ Research institutions ■ The private sector	**By 30th December 2020** Request CTCN for technical assistance on gender-responsive climate technologies is approved for KES 25 million.

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
	and dissemination of endogenous technologies that meet the needs of women and marginalised groups. **NB.** Endogenous technologies are based on locally available knowledge and cultures, and ensure that external resources fit the local conditions.	■ KIRDI ■ KALRO ■ KEFRI ■ CCD ■ The academia ■ Research institutions ■ The private sector	**By 30th June 2023** Information on five endogenous climate technologies disseminated to stakeholders.
T2	■ Provide Climate Information Services (CIS), including information to help farmers manage risk, inform early warning systems, and inform decision making for organisations, businesses and households.	■ KMD ■ CCD ■ CoG ■ County Governments ■ The private sector	**By 30th December 2020** 24 County Climate Information Service Plans developed. **By 30th June 2023** At least 100 clients (organisations, businesses and households) access CIS provided by KMD.
T3	■ Establish a Sustainable Consumption and Production Networking facility for Micro, Small and Medium Enterprises (MSME), with an emphasis on women and youth.	■ CCD ■ The private sector ■ The youth organisations ■ Women ■ groups	**By 30th December 2020** 50 MSMEs, half of which are led by the youth, and women, trained in sustainable consumption in production. **By 2022** Trained MSMEs reduce resource (energy and water) use by 10%.

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
T4	■ Promote gender-responsive climate technologies and innovations in the private sector through the provision of financing, capacity building, and start-up/ scale-up of services. ■ Encourage youth innovation through outreach programmes with schools, universities, and organisations of the youth.	■ CCD ■ The private sector	**By 30th December 2020** 10 clients, half of who are women and youth, supported to commercialise their clean technology businesses. **By 30th June 2023** Clean technology businesses reach 1,000 customers.
T5	■ Identify policy and fiscal incentives to promote the uptake of climate-friendly technology (such as tax incentives, reduced-energy tariffs, low-interest loans, and public-private partnerships). *Action continues from NCCAP 2013-2017: Finance 7.*	■ The National Treasury and Planning ■ CCD ■ CoG ■ Other State Departments and Agencies ■ The private sector	**By 30th December 2020** Options identified and analysed, including the development of baseline information and expected climate results. **By 30th June 2023** Two policies and fiscal incentives launched.

4.1.3 Capacity Development and Knowledge Management

Climate change-related knowledge management refers to the organisation and sharing of climate change knowledge, while climate change-related capacity development is defined by the *UNFCCC* as "enhancing the capacity and ability of countries to take effective climate change action."[138] The priority actions on capacity development, presented in Table 10, emphasise the establishment of engendered coordination structures effective implementation of the *Climate Change* Act and the *National Climate Change Policy, 2018,* and for the effective delivery of Kenya's NDC. The actions will also build the capacity of climate change units in state departments and Counties, and assist NEMA to incorporate climate change in environmental assessments, and to develop its enforcement role.

Table 10: *Priority enabling actions: Capacity development and knowledge management.*

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
C1	■ Operate 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; and ■ Use Knowledge Harvesting techniques to capture and share information, including on climate change-based traditional knowledge, especially from women and the elderly. *Action continues from NCCAP 2013-2017: Knowledge Management and Capacity Development 1, 2, and 5.*	■ CCD	**By 30th December 2020** Business plan for NCCRC developed. **By 30th June 2023** NCCRC refitted to enable access for persons with disabilities.
C2	■ Establish Community Education, Business and Information Centres in select Counties, building on the model established in Samburu County, to improve access to information and reduce climate vulnerability. The Centres will be managed by engendered local management committees, and will provide focused services for women, the youth, minority, and other marginalised groups.	■ CoG ■ County Governments ■ CCD	**By 30th December 2020** Samburu Community, Education, Business and Information Centre established. **By 30th June 2023** Two additional Community, Education, Business and Information Centres established.

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
C3	■ Strengthen the capacity of National Government institutions to implement the *Climate Change Act*, including: • Training of staff of climate change units on reporting and climate finance; • Support to NCCC; • Training on the climate change-gender nexus; • Supporting CCD in its coordination. *Action continues from NCCAP 2013-2017: Knowledge Management and Capacity Development 3 and 4, and Enabling Policy and Legal Framework 5.*	■ The National Treasury and Planning ■ State Departments ■ CCD	**By 30th December 2020** Climate change is mainstreamed in MTP sector plans. **By 30th June 2023** All state departments provide annual reports with gender-disaggregated information.
C4	■ Build the capacity of County Governments, including: • Strengthening of Climate Change Coordination Units (CCCUs); • Setting up functional CCCFs, and gazettement of engendered County Environment Committees and other supportive structures; • Coordination of climate change programmes across Counties; • Mobilisation and tracking of climate finance using gender-disaggregated data, including CCCF allocations; and • Monitoring and reporting on the impact of climate change programmes.	■ CoG ■ County Governments ■ The National Treasury and Planning ■ CCD	**By 30th December 2020** Five County Governments reporting on a pilot basis. **By 30th June 2023** All County Governments providing annual reports on climate change with gender-disaggregated information.

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
C5	■ Strengthen the capacity to NEMA to implement the *Climate Change Act*, including integrating climate change in impact assessments and, GHG emissions control, regulation, and enforcement.	■ NEMA ■ CCD	**By 30th December 2020** Climate change integrated in impact assessment guidelines. **By 30th June 2023** Role of NEMA in compliance and enforcement defined and its capacity built.
C6	■ Build the capacity of stakeholder, including: • Vulnerable groups, such as women, the youth, marginalised and minority communities, and persons with disabilities, to participate in, attract funding for, and report on climate change actions. • The private sector and civil society to implement and report on climate actions.	■ CCD ■ County Governments	**By 30th December 2020** Ten awareness sessions held. **By 30th June 2023** Twenty (20) awareness sessions held.
C7	■ Develop a national gender and inter-generational responsive awareness plan and build capacity for effective gender integration in NCCAP 2018-2022, and in the implementation of NDC; ■ Incorporate a knowledge harvesting approach to develop the strategy for capturing knowledge and insights from the local level; and ■ Engage women and the youth in the development of the gender and intergenerational responsive awareness plan.	■ CCD ■ National Gender and Equality Commission (NGEC)	**By 30th December 2020** National gender and inter-generational plan delivered to the National Climate Change Council. **By 2022** Gender integration guidelines and training toolkits developed. Twenty institutions sensitised on integration of gender into NDC planning and implementation.

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
C8	■ Develop and operationalise a public awareness and engagement strategy that highlights outreach to politicians and media. ■ Engage vulnerable groups, including women, older members of society, children, youth, persons with disabilities, and members of minority and marginalised communities, in the development of the strategy.	■ CCD	**By 30th December 2020** Public awareness and engagement strategy delivered to the National Climate Change Council. **By 30th June 2023** Strategy operationalised at the National and County levels.
C9	■ Develop a national vulnerability assessment to identify and prioritise adaptation actions. The assessment to include the identification and compilation of existing vulnerability assessments at the National and County levels.	■ CCD	**By 30th December 2020** National vulnerability assessment completed. **By 30th June 2023** National vulnerability assessment informs updating of *NCCAP.*
C10	■ Integrate climate change in the education system, emphasising integration in existing curriculum for lower secondary grades 7, 8 and 9. *Action continues from NCCAP 2013-2017 – Knowledge Management and Capacity Development 6.*	■ Ministry of Education ■ Kenya Institute of Curriculum Development ■ CCD	**By 30th December 2020** Draft climate change curriculum developed and piloted for lower secondary grades. **By 30th June 2023** Climate change curriculum introduced for lower secondary grades.

4.1.4 Climate Finance and Resource Mobilisation

The priority actions on climate finance and resource mobilisation, set out in Table 11, implement the *National Climate Finance Policy, 2018.* The actions emphasise the design and launch of the Climate Change Fund, development of a climate finance and resource mobilisation strategy, piloting of the issuance of Green Bonds, improving access modalities and efficiency of climate finance, and ensuring that climate finance is available for actions in key sectors, including for the Big Four Agenda. The actions help GoK to effectively mobilise, manage, and track climate finance.

A priority action will be to operationalise the Climate Change Fund to be overseen by the National Climate Change Council, which will allocate funding for priority mitigation and adaptation initiatives. The action includes the establishment of regulations, and management and oversight functions. Work will be undertaken to link the National Climate Change Fund (NCCF) with CCCFs. In 2018, such CCCFs were established in Garissa, Kitui, Makueni and Wajir Counties, and were in the planning and design stages in many other Counties.

Building the capacity of the National Treasury and Planning as the National Designated Authority (NDA) to the Green Climate Fund (GCF) will be a priority action. Capacity is needed to track and report on sources, applications, and impacts of climate finance. Climate finance includes all finance that targets low carbon climate resilient development, and consists of domestic budget allocations, public grants and loans from bilateral and multilateral agencies, and private sector investments. Important sources of international climate finance for Kenya include the Green Climate Fund (GCF) and the Global Environment Facility (GEF), which are the entities entrusted with the operation of the Financial Mechanism of the *UNFCCC*. Other mechanisms of interest under the *UNFCCC* include the Special Climate Change Fund (SCCF), the Adaptation Fund (AF), and the REDD+ mechanism.

Tracking of, and reporting on climate finance will include alignment of climate finance as tracked by the National Treasury and Planning, and adaptation and mitigation results as tracked by CCD. This tracking will improve analysis, including the identification of actions that provide value for money, and determining how much climate finance reaches those most in need, including women, the youth, and marginalised and minority communities and, the climate impact of that finance.

The National Treasury and Planning will develop a climate finance resource mobilisation strategy that will be cascaded to the Counties, recognising that many adaptation actions will take place at the county level, with climate finance reporting taking place at the National level. The capacity of the private sector to access climate finance will be enhanced, recognising the sector's critical role of investing in the implementation of the priority climate actions in Chapter 3, including the development of bankable projects, and accessing funding through Green Bonds. The National Treasury and Planning will work with financial institutions to increase their understanding of climate finance, develop a climate risk index, and develop climate-related funding schemes in high-risk areas.

Kenya needs to be well positioned to act on emerging carbon market opportunities and to benefit from results-based payment

mechanisms. This action will support engaging in the development of new market mechanisms under the *UNFCCC*, clarification on the treatment of emission reductions in Kenya that are created through climate finance and investment, improving Kenya's capacity to engage in carbon asset activities, strengthening the viability of domestic carbon asset production, and increasing access to international carbon markets.

Table 11: *Priority enabling actions: Climate finance and resource mobilisation.*

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
F1	■ Operationalise NCCF, including establishing the management and oversight of the Fund; annual budgeting and reporting; development of policies, guidelines and procedures; and capitalising the Fund through GCF, DPs, and other contributions. Action continued from *NCCAP 2013-2017 – Finance 1.*	■ The National Treasury and Planning ■ Office of the Attorney General and Department of Justice ■ CCD	**By 30th December 2020** NCCF is operationalised, secretariat and management board in place, as set out in the Climate Fund regulations. **By 30th June 2023** Climate finance being disbursed through identified funding windows; and NCCF is linked with CCCFs.
F2	■ Enhance the capacity of the NDA to mobilise and manage climate finance, including the management of, access to, and tracking of international climate finance; and development of funding proposals. ■ Build the capacity of national institutions to gain accreditation for international finance mechanisms, and to develop bankable proposals.	■ County Governments ■ The National Treasury and Planning ■ State Departments ■ NEMA	**By 30th December 2020** Climate resource mobilisation strategy developed. **By 30th June 2023** Climate resource mobilisation strategy cascaded to the Counties (five Counties have developed strategies).

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
	■ Develop a climate finance resource mobilisation strategy that includes domestic allocations, international climate finance, access to carbon credits and markets, allocations from the private sector, and Public-Private Partnerships for climate-friendly investments). *Action continued from NCCAP 2013-2017 – Finance 1.*		
F3	■ Report on domestic and international climate finance flows through an improved tracking system (including building capacity of government to track climate finance), and supported through improved coordination with development partners. *Action continued from NCCAP 2013-2017 – Finance 2 and 3.*	■ County Governments ■ The National Treasury and Planning ■ State Departments ■ CCD	**By 30th December 2020** A climate finance tracking system established at the National level. **By 30th June 2023** Climate finance tracking system reporting on domestic and international climate finance flows.
F4	■ Build the capacity of the private sector and civil society to develop bankable projects and build the in-house capacity of financial institutions to assess climate risk and develop climate-related schemes.	■ The National Treasury and Planning ■ CCD ■ The private sector	**By 2022** Three financial institutions have developed climate-related lending schemes.

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
F5	■ Pilot the issuance of Green Bonds. Through these bonds the funds will be earmarked for green projects, many of which will have climate change benefits.	■ The National Treasury and Planning	**By 30th December 2020** Pilot the issuance of two green bonds. **By 30th June 2023** Assessment of the green bonds' impact on climate change.
F6	■ Participate in the design and implementation of market-based mechanisms. ■ Promote investor confidence and participation in market-based and results-based mechanisms. ■ Enhance Kenya's capacity to engage in carbon asset activities. ■ Strengthen the viability of domestic carbon asset production; and ■ Increase access to international carbon markets. *Action continued from NCCAP 2013-2017 – Finance 4 and 6.*	■ CoG ■ The National Treasury and Planning ■ CCD ■ NEMA ■ KenGen ■ GDC ■ KFS ■ The private sector	**By 30th December 2020** Submission to the UNFCCC on market-based mechanisms. **By 30th June 2023** Unit established to promote projects responsible for generation of carbon credits.
F7	■ Update the Climate Public Expenditure and Budget Review (CPEBR).	■ County Governments ■ The National Treasury and Planning ■ State Departments ■ CCD	**By 30th December 2020** Updated CPEBR complete. **By 30th June 2023** Implementation of recommendations of CPEBR.

4.1.5 Transparency: Measurement, Reporting and Verification Plus (MRV+)

The Paris Agreement under the UNFCCC sets out an enhanced transparency framework for climate change action and support. Kenya is expected to provide information on mitigation, adaptation, and the support received, including:

- National GHG inventory to enable tracking of progress on implementing and achieving of the mitigation component of Kenya's NDC;
- Information related to climate change impacts, vulnerabilities, and adaptation; and
- Information on financial, technology development and transfer, capacity building needs, and the support received from developed countries.

Kenya's transparency framework is based on the Measurement, Reporting, and Verification plus (MRV+) system defined in *NCCAP 2013-2017* as "an integrated framework for measuring, monitoring, evaluating, verifying and reporting results of mitigation actions, adaptation actions and the synergies between them."[139]

The MRV+ system includes MRV of emissions and removals of GHGs by mitigation actions, and is an enabling action as presented in Table 12. Kenya reports to the *UNFCCC* through National Communications and Biennial Update Reports, which include GHG inventories in the agriculture; energy, which includes energy use in the transport sector; land use, land-use change and forestry (LULUCF); industrial processes; and waste sectors.

Adaptation actions under *NCCAP 2018-2022* will be tracked through a monitoring and evaluation (M&E) system based on indicators. Currently, there are no agreed adaptation indicators at the international level. Kenya made progress under NCCAP 2013-2017 and NAP to identify relevant and appropriate indicators to track progress on adaptation and resilience-building.

The MRV+ system generates information for national and international reporting requirements. Reporting to the National Climate Change Council needs to demonstrate that climate change action and spending on climate change leads to real results. For mitigation, this means demonstrating that GHG emissions are lower than the projected baseline, and that Kenya is delivering on its NDC.



For adaptation, this means demonstrating that people are better able to cope with climate change. Examples are that production be maintained or increased in the agricultural sector as the climate changes, and that capital investments in infrastructure are not damaged by such extreme climate events as flooding, sea level rise and storm surges, and maintain their value over time.

Kenya's MRV+ system will be developed in a phased approach over the 2018-2022 period. Initial actions will seek to improve the measurement of adaptation outcomes, including the identification of indicators to measure climate-related impacts, and the collection of baseline data. The mitigation actions include establishment of an appropriate process to collect, collate, and analyse GHG emissions, and improvements to, and embedding of the System of Land-based Emissions Estimation in Kenya (SLEEK) process. Actions to 2020 will take place under established projects, including the US$ 2.2 million project to help Kenya meet the transparency requirements of the *Paris Agreement,* supported by the Capacity Building for Transparency Initiative (CBIT) of the GEF, and support for the third GHG inventory from the UN Environment Programme and the Low Emission Climate Resilient Development (LECRD) project managed by UNDP and funded by the United States Agency for International Development.

Table 12: *Priority enabling actions: MRV+.*

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
M1	■ Establish the M&E component of the MRV+ system to report on adaptation actions and benefits, including the identification and measurement of such adaptation indicators as collected baseline data, gender-disaggregated data, and gender indicators. *Action continued from NCCAP 2012-2017: NPBM 1,2,3,4, 6, 7, 8.*	■ CCD ■ Kenya National Bureau of Statistics (KNBS) ■ County Governments ■ State Departments ■ NGEC	**By 30th December 2020** Climate registry for adaptation actions established, with information publically available. **By 30th June 2023** The adaptation M&E system fully functional, setting out institutional structures and role of stakeholders in reporting.

	Enabling Actions	Coordinating Institution and Relevant Partners	Expected Results (Process Indicator)
M2	■ Establish a functional system to develop Kenya's GHG inventory, and an MRV system for tracking mitigation for NDC reporting. ■ Strengthen capacity for carbon management and verification. *Action continued from NCCAP 2013-2017: NPBM 5.*	■ CCD ■ NEMA ■ SLEEK ■ KNBS ■ State Departments	**By 30th December 2020** Third National Communication submitted to the UNFCCC, including the third National GHG Inventory. **By 30th June 2023** CCD has established systems to collate, track, analyse, and report on GHG data, including a climate registry for mitigation actions.
M3	■ Establish a system to track and report on land-based emissions; and ■ Develop a monitoring and reporting system for transparent accounting of emissions and removals in the forestry and land-use sectors. *Action continued from NCCAP 2013 – 2017: Mitigation 8.*	■ CCD ■ KFS ■ SLEEK	**By 30th December 2020** Six working groups under SLEEK established to provide data and information to the national GHG inventory and MRV systems. **By 30th June 2023** Reporting on land-based emissions fully integrated in GHG inventory.
M3	■ Establish a Climate Business Platform to support reporting requirements of private entities.	■ CCD ■ The private sector	**By 30th December 2020** Framework for large emitter reporting established. **By 30th June 2023** Private sector large emitters reporting to CCD on a voluntary basis.

4.2 Delivery and Coordination Mechanisms

4.2.1 Institutional Roles and Responsibilities

The *Climate Change Act* sets out institutional structures and responsibilities to guide the oversight and management of NCCAPs (see figure 11). Responsibilities of the main institutions engaged in the oversight, implementation, and monitoring of *NCCAP 2018-2022* are illustrated in Figure 11, and described in this Section.

The National Climate Change Council, chaired by His Excellency the President of the Republic of Kenya, is responsible for such overall coordination and advisory functions as guiding the implementation of NCCAPs, including this *NCCAP 2018-2022*. The Council ensures, among others, the mainstreaming of climate change functions by the National and County Governments and, approves and oversees the implementation of NCCAPs. Members of NCCC are set out in Section 7 of the Climate Change Act. They are:

- Cabinet Secretary (CS) responsible for environment and climate change affairs;
- CS responsible for the National Treasury and Planning;
- CS responsible for economic planning;
- CS responsible for energy;
- Chairperson of the CoG;
- A representative of the private sector;
- A representative of civil society;
- A representative of the marginalised community; and
- A representative of the academia.

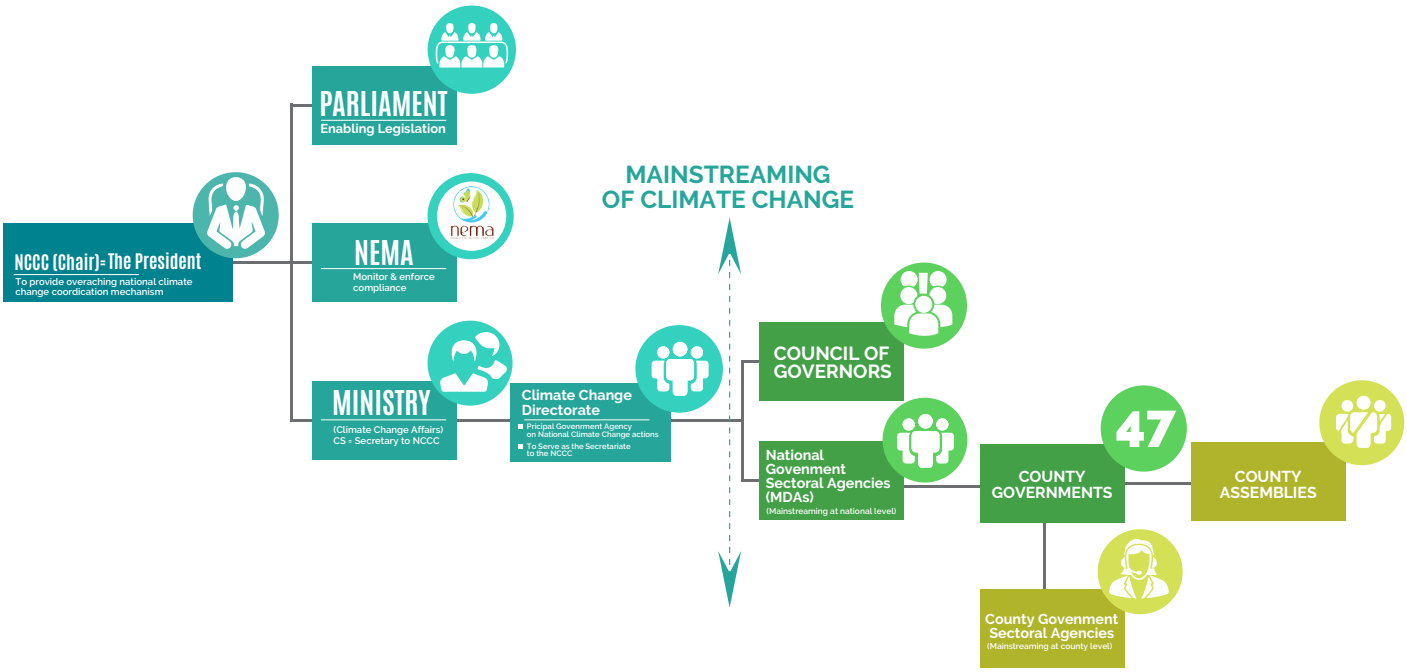


Figure 11: *Institutions established in the Climate Change Act, 2016.*

To ensure gender equity on the Council, groups recommending nominations of representatives for the private sector, civil society, marginalised communities, and the academia are requested to take into account gender equity, in the context of the broader membership of the Council.

The CS responsible for climate change affairs is the Secretary to the Council, formulates and periodically reviews climate change policy, strategy, and NCCAPs, and submits them to the Council for approval. He or she provides, through CCD, technical assistance on climate change actions and responses to County Governments, based on mutual agreements and needs identified by County Governments. The CS reports biennially to Parliament on the status of implementation of international and national climate change obligations.

The Climate Change Directorate (CCD) coordinates the implementation of NCCAPs, including this NCCAP 2018-2022. This responsibility includes the coordination of climate change actions and related measurement, monitoring, and reporting. CCD is the Secretariat for the Council, and coordinates the technical implementation of climate change functions. CCD's responsibilities include providing analytical support and technical assistance on climate change, and coordinates the implementation of, and reporting on, NCCAPs.

As regards the implementation of climate change actions and *NCCAP 2018-2022,* the Climate Change Act sets out roles and responsibilities for government entities as follows:

- **The National Treasury and Planning** is responsible for developing a strategy and making regulations that set out procedures and powers to identify sources of climate finance, and monitoring its use and, working with the CS responsible for climate change affairs to develop incentives to promote climate change initiatives (Section 25(9) and Section 26). The National Climate Change Fund (NCCF) is vested in the National Treasury and Planning (Section 25(2));
- **County Governments** are responsible for integrating and mainstreaming climate change into CIDPs, designating a CEC member to coordinate climate change affairs, and reporting on the implementation of climate change on an annual basis. County Governments are also expected to establish Climate Change Units, led by the CEC member responsible for climate change. The units oversee the implementation of climate change actions stipulated in CIDPs (Section 19), in this case, the 2018-2022 CIDPs;
- **State departments** and national public entities are to establish Climate Change Units (CCUs) responsible for integrating NCCAPs into strategies and implementation plans, and report to the Council on an annual basis on performance and implementation. All state departments and public entities are required to report on the priority actions in NCCAP 2018-2022, even if they did not implement climate change actions (Section 15(5));
- **The National Environment Management Authority (NEMA)** is responsible, on behalf of the Council, for monitoring and enforcing compliance of climate change interventions (Section 17); and for integrating climate risk and vulnerability assessment into all forms of assessment (Section 20); and
- **The Kenya Institute of Curriculum Development (KICD)** is to integrate climate change into the national education curricula at all levels, and to advise tertiary institutions on the integration of climate change into their curricula (Section 21).

Mainstreaming and reinforcing Climate Change Disaster Risk Reduction (CCDRR) into strategies and actions of public and private entities, as set out in section 3(2)(d) of the Climate Change Act, requires the participation of the following government entities:

- **The National Drought Management Authority (NDMA)** coordinates actions on drought management and disaster risk reduction in 23 ASAL counties. It plays a critical role in mainstreaming and reinforcing climate change disaster risk reduction into strategies and actions of public and private entities, including reporting annually to the Council on the status and progress of climate change actions in Counties;
- **The National Drought Operation Centre (NDOC)** is the focal point for disaster management and response in Kenya, including drought, floods, and landslides. NDOC is critical in the mainstreaming and reinforcing of climate change disaster risk reduction into strategies and actions of public and private entities; and
- **The National Disaster Risk Management Authority (NDRMA)** proposed in the National Disaster Risk Management Bill, 2018, is expected to lead the coordination of disaster risk management activities.

Various stakeholders have roles in implementing *NCCAP 2018-2022* and addressing climate change. They include:

- **Public:** The public play a role in the planning, implementation, and monitoring of climate change interventions, with emphasis on enhancing adaptive capacity and improving ability to withstand climate shocks;
- **Private sector:** Action on climate change and implementation of *NCCAP 2018-2022* and the *Climate Change Act* could be supported by the private sector in two ways: 1) Adaptation, which ensures that businesses adjust as well as possible to any consequences of climate change by managing risk and exploiting opportunities; and 2) Mitigation, which relates to the reducing of GHG emissions from business operations to minimise future impacts of climate change. According to section 16 of the *Climate Change Act,* the Council may impose climate change obligations on private entities regarding likely reporting requirements that would be introduced in a phased manner and developed in consultation with the private sector;
- **Public Benefit Organisations:** These include non-governmental organisations, civil society organisations and faith-based organisations, amongst others. They have been involved in climate change activities in Kenya, and the *UNFCCC* acknowledges the role of civil society in Paragraph 1(i) Article 4 in the areas of education, training, and public awareness related to climate change. In Kenya, 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.
- **Vulnerable groups within society,** including women, older members of society, persons with disabilities, children, the youth, and members of minority or marginalised communities are engaged through an inclusive approach to climate change action. Due to inequities and disparities, these groups are disproportionately affected by impacts of climate change. Climate change actions will be delivered in a way that accounts for the unique needs of the following groups:
  - **Women:** Gender equality is a critical component of *NCCAP 2018-2022,* and women will be engaged through planning, implementation, and monitoring of climate change interventions. Women will also be involved in reviews of the implementation of *NCCAP 2018-2022,* and

in the development and implementation of gender and intergenerational plans. The National Climate Change Council will include representation of women.

- **Youth:** Engagement of the youth, who constitute the majority of the population in many Counties in Kenya, will be encouraged through schools, post-secondary institutions, and youth-focused organisations. Youths are agents of change, and have influence on the broader community through their parents, relatives, and families. They will be engaged through climate change actions, and in the development and implementation of the gender and intergenerational plan.
- **Pastoralists, hunter gatherers, and fisher communities:** These groups are a critical constituency. Article 56 of the *Constitution of Kenya*, read together with Article 260, recognises these groups as marginalised communities for whom efforts must be put in place to ensure their participation and representation in governance and other spheres of life. The livelihoods of these communities are at risk because of climate change, hence adaptation actions should engage them in implementation and monitoring.

- **The Academia and research institutions:** Researchers help to provide evidence and science for knowledge-based decision making by the National and County Governments, the private sector, development partners, and civil society. They conduct research on different aspects of climate change, including ways of improving the understanding of climate change attribution in Kenya, and developing appropriate technologies for reducing GHG emissions and adapting to climate change.
- **Media:** Media provides vital information at times of emergency, from warning of imminent floods, to explaining how to deal with disease outbreaks. Media also helps to disseminate information about climate change. Accurate, timely, and relevant information is a critical component of resilience and appropriate climate change action.



Photo: *Solomon Ngari*

4.2.2 Coordination of NCCAP 2018-2022

(a) The Role of the Ministry of Environment and Forestry through CCD

CCD is responsible for overall coordination of the implementation of *NCCAP 2018-2022*, including coordination and reporting on implementation of actions by partners. Section 9(8) of the *Climate Change Act* provides guidance on the role of CCD in climate change action. CCD will:

- **Provide analytical support on climate change** for County Governments, various ministries, and agencies.
- **Provide technical assistance** based on the needs identified by County Governments.
- **Establish and maintain a national registry** for both mitigation and adaptation actions.
- **Serve as the national knowledge and information management centre** for collating, verifying, refining, and disseminating knowledge and information on climate change.
- **Coordinate adherence to the country's international obligations,** including reporting on Kenya's NDCs, representing Kenya in international negotiations, and developing national communications, biennial update reports, and Kenya's GHG inventory.
- **Coordinate implementation of the gender and intergenerational plan** at the levels of the National and County Governments.
- **Coordinate actions related to climate finance.**

Additionally, CCD is to work in collaboration with other agencies at the National and County Government levels to:

- Identify **low carbon development strategies,** and coordinate related MRV;
- Develop strategies and coordinate actions for **building resilience to climate change** and enhancing adaptive capacity; and
- Optimise Kenya's opportunities to **mobilise climate finance.**

CCD is delivering on these roles, including the establishment of a pilot registry, launching the NCCRC, and providing analytical support; but much work remains, which will be undertaken with the support of the enabling actions set out in Section 2.1. CCD will establish an inter-governmental platform to improve its climate change coordination function. This engendered platform will include key players in the climate change response, including County Governments, sector ministries, the private sector, civil society, the academia, and representatives of vulnerable groups, including women, the youth, and minority and marginalised communities. The members of this platform will assist CCD to access required information, mainstream climate change in plans and policies, guide the actions of the Climate Change Units in County Governments and state departments, monitor progress on the implementation of the *Climate Change Act, 2016,* and report to the National Climate Change Council. The platform will also play a role in the M&E of *NCCAP 2018-2022,* as described in sub-section 4.2.3.

Three coordination committees; adaptation, mitigation, and means of support, will report to the inter-governmental platform for climate change coordination. These technical committees will provide advisory support for effective coordination of the respective issues, support monitoring of climate change actions, advise on gaps in implementation of *NCCAP 2018-2022,* identify climate finance opportunities, and propose solutions to enhance the delivery of *NCCAP 2018-2022.* The committees will submit regular progress reports to the inter-governmental platform, and to CCD.

(b) The Role of County Governments

County Governments will support CCD in its coordination role by:

- Nominating a CEC Member to be in charge of coordinating the implementation of climate change actions. The Council of Governers will work closely with CCD to ensure that County Climate Change Units are established, strengthened, and functional, leading to effective implementation of *NCCAP 2018-2022.*
- Mainstreaming climate change actions in their respective CIDPs, and implementing and reporting on these actions over the 2018-2022 period.
- Generating best practices, including the development of County legislation that supports climate change action. These best practices, together with those documented by the National Government, will be shared in Kenya and through global platforms.
- Reporting annually, at the end of every financial year, to respective County Assemblies on the progress achieved in the implementation of climate change actions. A copy of the report will be sent to CCD, which is responsible for compiling reports and submitting a summary report to the CS in charge of climate change affairs, and to NCCC.

4.2.3 Monitoring and Evaluation (M&E) of NCCAP 2018-2022

CCD is responsible for M&E of *NCCAP 2018-2022.* Implementation of *NCCAP 2018-2022* will be reviewed every two years, as required by Section 13(7) of the Climate Change Act. The review will utilise reports from County Governments and state departments, and inputs from relevant stakeholders. Important stakeholders in the review process include, the private sector, the academia, women, the youth, and minority and marginalised groups, including pastoralists, hunter gatherers, and fisher communities.

The M&E of *NCCAP 208-2022* will focus on demonstrating that investments in adaptation and mitigation actions are leading to real climate results and development benefits that are linked to the Big Four Agenda. The M&E systems will track the implementation and results of *NCCAP 2018-2022*, and climate finance raised to deliver the Plan. This will provide the evidence base for planning and implementation of future actions, support seeking, and domestic and international reporting.

The M&E system to report on the implementation *NCCAP 2018-2022* will be linked to the MRV+ system and SDG reporting. Establishment of the M&E system will include development of reporting frameworks for County Governments and state departments, and processes to compile, analyse, and report on the actions and results. The key to success is a workable M&E system that is appropriate for the devolved system of governance, and for the available resources. The system will:

- **Ensure that all state departments** report on their progress and achievement of *NCCAP 2018-2022* actions.
- **Ensure efficient reporting processes for County Governments** and draw, where possible, on such established reporting procedures as the National Integrated Monitoring and Evaluation System (NIMES), and the County Integrated Evaluation System (CIES).
- **Report on climate finance that supports the delivery of NCCAP 2018-2022.**
- **Identify a limited number of national indicators that have baseline data** and are tracked by the National Treasury and Planning to measure climate-related impacts at the National level. This will help to align the tracking and measurement of climate change co-benefits with the Government's Big Four Agenda and SDGs.
- **Use gender disaggregated data, where possible,** and prioritise collection of this data if it is not available; and
- **Track and measure GHG emissions on a sector basis at the National level.** Measuring GHG emissions on an action or County basis is costly and resource-intensive, and unlikely to generate robust information that is aligned with the National GHG inventory approach. Sector-based tracking and measurement of GHG emissions will be embraced.

3.2.4 Financial Requirements

NCCAP 2018-2022 requires the National and County Governments, the private sector, civil society, faith-based organisations, other non-state actors, individual citizens, and development partners to contribute in its implementation between 2018-2022 broken down as follows; KES 1,784,309 million; KES 289,093 million in the 2018/2019 fiscal year, KES 408,424 million in the 2019/2020 fiscal year, KES 486,013 million in the 2020/2021 fiscal year, KES 352,044 million in the 2021/2022 fiscal year, and KES 248,335 million in the 2022/2023 fiscal year.

In addition to the above, KES 11 billion will be required for the implementation of the enabling actions. This brings the total approximated cost to KES 1.8 Trillion.

This funding will enable CCD to participate in international discussions and negotiations on climate change; build the capacity of national government ministries and departments, County Governments, and other stakeholders; develop regulations and guidelines; mobilise and track climate finance to deliver on *NCCAP 2018-2022;* and monitor and report on climate change actions.

Implementation Matrix

Strategic Objectives	Priority Actions	Expected Outputs/Outcomes	Key Performance Indicators	Responsible Institutions	Targeted Groups	Time-frame	Source of Funds	Indicative Budget (KES million)					
								Total	18/19	19/20	20/21	21/22	22/23
Disaster (Drought and Flood) Risk Management **Reduce risks to communities and infrastructure resulting from climate-related disasters such as droughts and floods** National-level indicators: ■ No. of deaths, missing persons and directly affected persons attributed to disasters per 100,000 people. ■ Proportion of County Governments adopting and implementing local disaster risk reduction strategies in line with national strategies ■ Number of households receiving food aid and cash transfers	Increase the number of households and entities benefiting from devolved adaptive services, including HSNP and CCCFs	The climate-resilience of the vulnerable members of society enhanced by: - a. Increased No. of regular beneficiaries from 100,000 to 150,000; and scalability beneficiaries from 90,000 in 2018 to 130,000 b. Increased No. of households receiving benefits from CCCFs increased from 300,000 households in 2018 to 800,000 households c. No. of beneficiaries increases under the National Safety Net Programme increased from 4,017,759 in 2017 to 4,280,000 due to programme expansion	*Adaptation* ✓ Number of beneficiaries of social protection mechanisms (food and cash transfers) ✓ Number of households benefiting from HSNP ✓ Amount of funding allocated to climate change actions through CCCFs in counties that have climate fund regulations	Ministry of Labour and Social Protection and secretariat; CoG and CGs; National Social Protection Council and Secretariat; County and Sub-County Social Protection Committees; National Social Protection Council and Secretariat; Ministry of Devolution and ASAL Areas; Ministry of Interior and Coordination of National Government (MoICNG); NDMA; NTP; Ministry of Public Service, Youth and Gender Affairs; MALFI; MoH;	Persons with disabilities; Pastoral communities in ASALs; Marginalised communities; the elderly; Women and children.	2018-2022	GOK / DPs	80,089	14,160	14,794	16,285	16,650	18,200
	Improve the ability of people to cope with drought	better able to cope with drought because of: a. Improved Climate Information Services (CIS), with number. of recipients of CIS increased from 1,000,000 to 2,000,000 b. Improved and increased No. of early warning systems c. NDEF operationalised	*Adaptation* ✓ Number of recipients of CIS ✓ Number of early warning systems ✓ National Drought Emergency Fund (NDEF) disbursed	County Governments; WRMA; Kenya Meteorological Department (KMD); CCD; NGOs/CBOs; Water Services Trust Fund (WSTF); MoE; Media for Education and Development (Media), Intergovernmental Authority on Development Climate Prediction and Applications Center (ICPAC);	Farmers; Pastoral and agro-pastoral communities in ASALs; Marginalised communities; Women and children in drought prone areas	2018-2022	GOK / DPs	10,310	2,054	2,058	2,062	2,066	2,070
	Improve the ability of people to cope with floods	better able to cope with floods and damage to infrastructure reduced via: a. Establishment of early warning systems b. Existing integrated flood management plans implemented c. Establishment of Dam Safety Control System d. Improved capacity of at least 50 WRUAs	*Adaptation* ✓ Number of early warning systems ✓ Dam safety needs assessment, safety manual and codes of practice published ✓ No. of WRUAs participating in training sessions	County Governments; WRMA; MWS; MOH; MoICNG, NDMA; KMD; CCD; NTP; NGOs/CBOs; KMD; WSTF; MALFI; KenGen; CoG; Media for Education and Development (Media), ICPAC;	Communities living in flood prone areas, like Lower Tana and Lake Victoria basin regions, and towns that experience flash floods	2018-2022	GOK / DPs	1,000	500	125	125	125	125

Strategic Objectives	Priority Actions	Expected Outputs/Outcomes	Key Performance Indicators	Responsible Institutions	Targeted Groups	Time-frame	Source of Funds	Indicative Budget (KES million)					
								Total	18/19	19/20	20/21	21/22	22/23
	Improve coordination and delivery of disaster management response	rdination of disaster management is centralised and improved by: - a. Enactment of Disaster Risk Management Bill b. Operationalisation of the National Disaster Risk Management Authority c. Operationalisation of DRMF	*Adaptation* ✓National Disaster Risk Management Authority established ✓DRMF established ✓Amount of funding allocated through DRMF	County Governments; NDMA; Disaster Operation Centre (DOC); MoICNG; KMD; Disaster Management Council, Disaster Management Committees; NTP; MoH; MALFI; CBOs/ NGOs; Hospitals	Communities living in flood prone areas, like Lower Tana and Lake Victoria basin regions, and towns that experience flash floods	2018-2022	GOK/ DPs	3,250	650	650	650	650	650
	Sub-total: Disaster Risk Management							94,649	17,364	17,627	19,122	19,491	21,045
Food and Nutrition Security **Increase food and nutrition security through enhanced productivity and resilience of the agricultural systems in as low-carbon manner as possible.** National-level Indicators: ■ GDP growth of agricultural sector ■ Livestock deaths from drought / number of livestock slaughtered attributable to drought ■ Agricultural land under irrigation(acreage) ■ GHG emissions in the Agriculture and LULUCF sectors	Improve crop productivity through the roll out of the Climate Smart Agriculture interventions	Crop productivity and farmer resilience increased through: a. No. of climate-oriented insurance coverage increased from 280,000 to 3,500,000 farmer beneficiaries b. No. of farmers accessing appropriate agriculture input subsidies increased from 239,000 to 311,300 c. No. of institutions and households harvesting water for agricultural purposes increased from current to 500,000 d. Pre-and post-harvest losses reduced from 40% to 15% e. Adoption of Sustainable Land Management techniques for agricultural production, including: - Reclamation of 60,000 ha of degraded land - GHG emissions reductions of 1.66 Mt CO_2e by 2022 through agroforestry on 200,000 ha of farmland - Reduction in GHG emissions of 0.55 Mt CO_2e by 2022 by increasing SLM practices, incl. conservation tillage, on 250,000 acres	*Adaptation* ✓Number of farmers with crop insurance ✓Number of farmers accessing agriculture input subsidies ✓Number of institutions harvesting water ✓Percentage of pre- and post-harvest losses *Mitigation* ✓GHG emissions from LULUCF sector	County Governments; MALFI; KALRO; Kenya Forest Service (KFS); CBOs/ NGOs; DPs; Private sector investors; Kenya Marine and Fisheries Research Institute (KMFRI); Horticulture Crops Development Authority; Information Communication Technology (ICT) providers, KEFRI; KEPHIS; INSURANCE COMPANIES; INTERNATIONAL RESEARCH INSTITUTES (ICRISAT, ICRAF, INTERNATIONAL POTATO RESEARCH CENTRE, IITA, IRRI, CIAT, KEPSA, ICIPE etc.); KMD; DRSRS; RCMRD	Farmers and pastoralists; Cooperatives, and private producers	2018-2022	GOK / DPs	17,920	2,913	3,955	4,526	3,213	3,313
	Improve crop productivity by increasing the acreage under irrigation	a. Crop production efficiency from irrigated fields increased from 50% to 90% b. Increased area under irrigation from 202,000 ha to 486,000 ha	*Adaptation* ✓Acreage under irrigation	County Governments; MALFI; KMFRI; KALRO; Private sector investors; CBOs / NGOs	Farmers and pastoralists; Community-based organizations	2018-2022	GOK / DPs	219,420	26,413	42,355	47,826	51,413	51,413
	Increase productivity in the livestock sector through implementation of CSA actions	Improved resilience of pastoralists and livestock farmers through: a. Re-seeding of 10,000 ha of rangeland in 23 ASAL counties b. Annual ASALs water harvesting and storage increased by 25% c. Control disease outbreaks	*Adaptation* ✓Hectares of rangeland re-seeded ✓MCM of water storage in ASALs ✓Numbers of farmers accessing livestock insurance	County Governments; MALFI; KMFRI; KALRO; ICT; Private sector investors; KMFRI; KALRO CBOs / NGOs;	Pastoral communities; Small-scale and underprivileged farmers	2018-2022	GOK / DPs	25,246	6,018	5,660	5,731	3,918	3,919

Strategic Objectives	Priority Actions	Expected Outputs/Outcomes	Key Performance Indicators	Responsible Institutions	Targeted Groups	Time-frame	Source of Funds	Indicative Budget (KES million)					
								Total	18/19	19/20	20/21	21/22	22/23
		and piloted		Kenya Fish Advisory council									
	Diversify livelihoods to adjust to a changing climate	Improved resilience of households through livelihoods diversification	*Adaptation* ✓Number of households supported to diversify livelihoods	County Governments; MALFI; CBOs / NGOs; KMFRI; Private sector investors; CoG	Fisher communities and fish farmers	2018-2022	GOK / DPs	9,659	1,469	2,407	2,873	1,457	1,453
	Sub-total: Food and Nutrition Security							**282,243**	**38,352**	**56,858**	**63,908**	**61,514**	**61,611**
Water and the Blue Economy Enhance resilience of the Blue Economy and water sector by ensuring adequate access to and efficient use of water for agriculture, manufacturing, domestic, wildlife and other uses National-level SDG Indicators: ▪ Water storage per capita ▪ Water coverage ▪ Per capita water availability ▪ Cover age of protected areas in relation to marine area	Increase annual per capita water availability from 647m³ to 1000 m³ via development of water infrastructure	Increased water availability through: a. 12 multipurpose dams constructed b. 5 ground water surveys completed c. 56 Sub-catchment management plans developed	*Adaptation* ✓Per capita water availability ✓Number of dams ✓Number of sub-catchment management plans	County Governments; MWS; Kenya Waters Towers Agency (KWTA); RMA; WSRB; Private sector investors, MWS; KRA; National Treasury and Planning	Household consumers; Industrial consumers; The marginalized	2018-2022	GOK / DPs	43,116	8,163	9,210	9,249	9,015	7,479
	Increase climate-proofed water harvesting and water storage infrastructure from 700 to 2,000	Water storage and flood control improved through the establishment of 1,300 climate-proofed water harvesting, flood control and water storage infrastructure.	Adaptation ✓Number of climate-proofed water harvesting, flood control and water storage infrastructure	County Governments; National Water Conservation and Pipeline Corporation (NWCPC); NCA; Private sector investors; NHC; NEMA	Farmers and pastoralists; Household consumers; Industrial consumers; Irrigation schemes	2018-2022	GOK / DPs	325,626	83,349	89,443	76,149	50,250	26,435
	Promote water efficiency (monitor, reduce, re-use, recycle and modelling	Household water access enhanced via development of: - a. 300,000 farm ponds b. Water pans c. Tool kits on commercial lending to the water sector	*Adaptation* ✓Number of farm ponds ✓Number of households with access to water pans and ponds ✓Tool kit on commercial lending to water sector	County Governments; MWS; CBOs / NGOs; WRUA; NHC; NWCPC; Private sector investors	Households, and Corporate buildings / businesses	2018-2022	GOK / DPs	10,140	2,020	2,020	2,100	2,000	2,000
	Improve access to good quality water	Increased percentage of people (from 58% to 65%) accessing good quality water through regular inspection of water quality and large-scale installation of water meters	*Adaptation* ✓Percentage of people with access to good quality water	County Governments; MWS; NWCPC; WRUA; CoG; Regional Water Management Boards	Household and industrial Consumers; Irrigation Schemes; Residents of ASALs	2018-2022	GOK / DPs	29,474	2,727	5,080	5,057	3,971	3,638
	Improve climate resilience of coastal communities	a. Improved coastal fisheries by Increasing deep/offshore fishing fleet from 9 to 68 b. Restored and rehabilitated mangrove forests c. Constructed seawalls to prevent erosion d. At least 15% of coastal and marine areas conserved	*Adaptation* ✓Number of deep/offshore fishing vessels ✓Hectares of mangroves restored/ rehabilitated ✓Percentage of coastal and marine areas conserved	County Governments; MALFI; KFS KWS; Kenya Marine & Fisheries Research Institute (KMFRI)	Fisher communities and fish farmers; Coastal residents; CBOs; Conservation NGOs	2018-2022	GOK / DPs	30,988	4,396	6,422	7,394	6,833	5,943
		Sub-total: Water and the Blue Economy						430,344	100,655	112,174	99,948	72,070	45,495

Strategic Objectives	Priority Actions	Expected Outputs/Outcomes	Key Performance Indicators	Responsible Institutions	Targeted Groups	Time-frame	Source of Funds	Indicative Budget (KES million)					
								Total	18/19	19/20	20/21	21/22	22/23
Forestry, Wildlife and Tourism **Increase forest cover to 10% of total land area; rehabilitate degraded lands, including rangelands; increase resilience of the wildlife and tourism sector** National-level SDG Indicators ▪ Forest cover as a % of total land area	Afforest and reforest degraded and deforested areas in Counties	a. Increase in the area of land afforested or reforested by 100,000 hectares to improve resilience of ecosystems and reduce GHG emissions by 2.0 Mt CO_2e by 2022 b. Improved forest management by ensuring CGs are prepared for management of community forests	*Adaptation* ✓Hectares of land afforested or reforested ✓Number of TIPs signed *Mitigation* ✓GHG emissions from LULUCF sector	County Governments; KFS; KEFRI; Community Forest Associations Youth Organizations; Kenya Plant Health Inspectorate Service (KEPHIS); Ministry of Lands	Non-industrial forest owners; Marginalised communities, including hunters and gatherers, farmers; Pastoral communities; Rangelands Conservation NGOs	2018-2022	GOK / DPs	41,511	7,311	7,996	8,534	8,720	8,950
	Implement initiatives to reduce deforestation and forest degradation	Deforestation and forest degradation reduced via protection of an additional 100 million ha of land, leading to increased resilience, and increases in forest carbon stocks leading GHG emissions reductions of 2.0 Mt CO_2e by 2022	*Adaptation* ✓Number of hectares of protected forest land *Mitigation* ✓GHG emissions from LULUCF sector	KFS; KEFRI; CGs; Community Forest Associations Youth organizations; Academia	Youths; Schools; Tertiary Institutes; Private Conservancies; Conservation NGOs	2018-2022	GOK / DPs	10,037	1,850	2,250	2,116	1,910	1,660
▪ Area of land used for private forestry ▪ Proportion of land that is degraded over total land area ▪ Hectares of land conserved for wildlife habitats ▪ Death of big wildlife animals such as elephant and rhinos as a result of drought	Restore degraded landscapes (ASALs and rangelands).	Up to 200,000 ha of forests restored on degraded landscapes (ASALs, rangelands) to a build climate resilience and reduce GHG emissions by 5.4 Mt CO_2e by 2022	*Adaptation* ✓Number of hectares of restored degraded landscapes *Mitigation* ✓GHG emissions from LULUCF sector	County Governments; KFS; KEFRI; Ministry of Petroleum and Mining	Pastoralists; Farmers; Rangelands and wetlands inhabitants	2018-2022	GOK / DPs	10,037	1,850	2,250	2,117	1,910	1,660
	Promote sustainable timber production on privately-owned land	More sustainable production of timber by increasing the area under private-sector commercial and industrial plantations from 71,000 ha to at least 121,000 ha, leading to reduction in GHG emissions of 1.0 Mt CO_2e by 2022	*Adaptation* ✓Number of hectares of private-sector based plantations *Mitigation* ✓GHG emissions from LULUCF sector	County Governments; KFS; NEMA; KEFRI; Private sector investors	Private land owners; Timber manufacturing industry	2018-2022	GOK / DPs	30	6	6	6	6	6
	Conserve land area for wildlife	The resilience of wildlife increased by: - a. Conserving at least 20% of terrestrial and inland water b. Conserving 30,000 ha of wildlife habitats c. Reducing HWCs by 50% d. Securing 20% of dispersal areas and migratory pathways	*Adaptation* ✓Percentage of terrestrial and inland water areas conserved ✓Number of hectares of wildlife conservation areas ✓Number of secured incidents of human-wildlife conflicts ✓Percentage of dispersal areas and migratory pathways	County Governments; KWS; Wildlife Conservations Society (WCS); Wildlife Conservations NGOs; Kenya Wildlife Service Training Institute (KWSTI)	National and private reserves; Households; Farmers; Pastoralists and fisher communities experiencing human-wildlife conflicts; Private conservancies	2018-2022	GOK / DPs	1,875	375	375	375	375	375
▪		**Sub-total: Forestry, Wildlife and Tourism**						63,490	11,392	12,877	13,248	12,922	12,651

Strategic Objectives	Priority Actions	Expected Outputs/Outcomes	Key Performance Indicators	Responsible Institutions	Targeted Groups	Time-frame	Source of Funds	Indicative Budget (KES million)					
								Total	18/19	19/20	20/21	21/22	22/23
Health, Sanitation and human settlements National-level SDG Indicators • Malaria incidence per 1,000 population • Percentage of urban solid waste regulatory collected and well managed • Proportion of urban population living in slums, informal settlements or inadequate housing	Reduce Incidence of malaria and other vector-borne disease	Reduction in the incidence of malaria and other vector-borne diseases that are expected to increase because of climate change through: - a. Scaled-up community health interventions b. Improved uptake and utilisation of malaria treatment services	*Adaptation* ✓Malaria incidence per 1,000 population	County Governments; MoH; Kenya National Bureau of Statistics (KNBS); MOTIHUD; Development Partners	Marginalised communities; Underprivileged women and children	2018-2022	GOK / DPs	9,900	1,200	1,200	1,200	3,200	3,100
	Promote recycling to divert collected waste away from disposal sites.	a. Solid waste management improved through the implementation of a circular economy solid waste management in Nairobi that leads to GHG emissions reductions of 0.1 Mt CO_2e by 2022 b. Feasibility of installing methane capacity and power generation at landfill sites explored	*Mitigation* ✓Percentage of waste diverted from disposal sites towards recycling practices in Nairobi ✓GHG emissions from waste sector ✓Feasibility study complete for methane capture and power generation at landfill sites	County Governments; NEMA; Waste Management Authority; MoH	Persons living near dumpsites; Manufacturers; Waste management companies; Private sector investors,	2018-2022	GOK / DPs	20,500	3,100	5,100	5,100	4,100	3,100
	Climate proof landfill sites	Protection of human health by climate proofing at least two landfill/waste disposal sites	*Adaptation* ✓Number. of landfill/waste disposal sites screened for climate impacts	County Governments; NEMA; Waste Management Authority; Private waste collectors	Waste management companies	2018-2022	GOK / DPs	25	5	5	5	5	5
	Control flooding in human settlement	Improved health and safety in human settlements through the construction of flood ways.	*Adaptation* ✓Number. of flood ways constructed in urban centres	County Governments; MWS; WRA; MOTIHUD	Residents of flood-prone areas	2018-2022	GOK / DPs	20,000	4,000	4,000	4,000	4,000	4,0000
	Promote green buildings	Buildings are better able to withstand the impacts of climate change through an improved policy and regulatory framework.	*Adaptation* ✓Number of green building codes developed and approved	County Governments; MOTIHUD; NCA; NEMA; NHC; ERC	Landlords; Tenants; Industries; Private sector investors	2018-2022	GOK / DPs	1,085	115	320	225	225	200
		Sub-total: Health, sanitation and human settlements						51,510	8,420	10,625	10, 530	11,530	10, 405
Manufacturing **Promote energy and resource efficiency in manufacturing sector** National-level SDG Indicators	Increase energy efficiency	Energy efficiency increased in manufacturing processes leading to GHG emission reductions, through participation of 1,000 companies in energy audits and improved standards Minimum Energy Performance Standards (MEPS) developed for an additional five appliances	*Mitigation* ✓GHG emissions from energy sector ✓Number of companies participating in energy efficiency initiatives ✓Number of energy efficiency standards	County Governments; MOE; KEBS; KAM; KIRDI	Industries; Manufacturers	2018-2022	GOK / DPs	250	50	50	50	50	50

Strategic Objectives	Priority Actions	Expected Outputs/Outcomes	Key Performance Indicators	Responsible Institutions	Targeted Groups	Time-frame	Source of Funds	Indicative Budget (KES million)					
								Total	18/19	19/20	20/21	21/22	22/23
▪ GHG emission reductions through adoption of energy efficiency and energy conservation practices ▪ Number of industrial parks adopting waste diversion practices	Improve water use and resource efficiency	Water use and resource efficiency improved in manufacturing processes through participation of 200 companies in water efficiency audits	*Adaptation* ✓Number of companies participating in water efficiency initiatives	County Governments; Ministry of Industry, Trade and Cooperatives (MITC); KAM; WRMA; WRUA	Industries; Manufacturers	2018-2022	GOK / DPs	50	10	10	10	10	10
	Optimise manufacturing and production processes	GHG emission reductions of 0.45 $MtCO_2e$ by 2022through improved industrial processes, including the promotion of a sustainable charcoal production system with efficient kiln technologies to increase yields to 32-40%	*Mitigation* ✓GHG emissions from industrial sector	County Governments; MOE; MITC; KEBS; KIRDI; KAM; KEPSA	Charcoal manufacturers; Briquette manufacturers; Cement manufacturers	2018-2022	GOK / DPs	50	10	20	10	10	0
	Promote industrial symbiosis in industrial zones	Improved industrial practices through the scale up of industrial symbiosis in five Counties through waste diversion and energy and transport efficiency	*Adaptation* ✓Number of industrial parks adopting industrial symbiosis practices *Mitigation* ✓GHG emissions from waste, energy and transport sectors	County Governments; MITC; KIRDI; NEMA; KEPSA	Manufactures; Waste companies; Transport companies	2018-2022	GOK / GCF	4,500	900	900	900	900	900
		Sub-total: Manufacturing						**4,850**	**970**	**980**	**970**	**970**	**960**
Energy and Transport **Climate-proof energy and transport infrastructure; encourage renewable energy development; increase uptake of clean cooking solutions; and develop sustainable transport systems** National-level Indicators: - ▪ Percentage of renewable energy share in the total electricity generation mix ▪ Percentage of households using biomass for energy ▪ Percentage of households using LPG ▪ Percentage of freight moved by rail	Increase renewable energy for electricity generation	GHG emission reductions of 9.20 $MtCO_2e$ by 2022 through the development of 2,405 MW of renewable energy for electricity generation, with an emphasis on geothermal, and including hydro, solar, wind and biomass	*Mitigation* ✓GHG emissions from the energy sector	Ministry of Energy (MOE); Geothermal Development Corporation (GDC); Energy Regulatory Commission (ERC); KenGen; PPPs; Kenya electricity Transmission Company (KETRACO)	Industries; Household consumer; Corporate consumers	2018-2022	GOK / DPs		88,630	164,199	245,561	145,155	70,322

Strategic Objectives	Priority Actions	Expected Outputs/Outcomes	Key Performance Indicators	Responsible Institutions	Targeted Groups	Time-frame	Source of Funds	Indicative Budget (KES million)					
								Total	18/19	19/20	20/21	21/22	22/23
	Increase captive renewable energy	Captive renewable energy generation plants developed, where electricity is used by the developers	*Mitigation* ✓GHG emissions from the energy sector	MMOE; KenGen; GDC; PPPs; NETFUND; KETRACO	Industries; Private Consumers; Renewable energy providers and manufacturers	2018-2022	GOK / DPs						
								Included in amounts for Action 29					
	Improve energy efficiency and conservation	▪ Losses in transmission and distribution reduced from 18% to 14% ▪ 3.3 million Compact Fluorescent Light (CFL) distributed to households through CFL initiative. ▪ Energy efficiency and conservation projects delivered that focus on efficient lighting, energy efficiency in buildings and minimum energy performance standards	*Mitigation* ✓Losses in transmission and distribution ✓Number of CFLs delivered to households ✓Number of energy performance standards developed	MOE; ERC; KETRACO; KIRDI; KAM	Households; Corporate businesses; Electricity consumers	2018-2022	GOK / DPs	1,250	250	250	250	250	250
	Climate proof energy infrastructure	ience of the energy is increased by: a. Concrete poles replacing wooden poles. b. Existing hydropower plants optimised, and water management and conservation improved. c. Conservation and rehabilitation of 1000 ha of water catchment areas feeding the hydro-power reservoirs	*Adaptation* ✓Percentage of poles that are concrete ✓Number of hydro plants optimised ✓Hectares of water catchment areas conserved and rehabilitated	MOE; KETRACO; Kenya Roads Board; Water Resource Management Authority; KFS; KWTA	Electricity consumers; Large power producers; Hydro-power plants	2018-2022	GOK / DPs	640	120	130	130	130	130
	Promote the transition to clean cooking with alternative clean fuels in urban areas; and clean biomass (charcoal and wood) cookstoves and alternatives in rural areas	GHG emission reductions of 7.1 $MtCO_2e$ by 2022 through the development and distribution of 4 million improved biomass stoves and 1 million LPG stoves	*Mitigation* ✓GHG emissions from the energy sector ✓Number of households using LPG ✓Number of households with improved biomass cookstoves	MOE; ERC; NOC; CGs; NEMA; CBOs / NGOs; KFS	Rural residents who are firewood and charcoal consumers; Urban households who are charcoal consumers; Institutions (schools, prisons) using fuelwood	2018-2022	GOK / DPs	9,325	2,628	3,004	3,091	417	185
		Sub-total: Energy						725,092	91,628	167,583	249,032	145,952	70,887
	Develop an affordable, safe and efficient public transport, including a Bus Rapid Transit System in Nairobi	Public transport systems are improved, resulting in GHG emission reductions of 0.44 $MtCO_2e$ by 2022 and providing co-benefits of safety, reduced air pollutants and reduced commuting time, through: - a. Construction of 70 km of the BRT for Nairobi b. Construction of 150 km non-motorised transport facilities to complement BRT c. Extension of SGR from Nairobi to Naivasha	*Mitigation* ✓GHG emissions from the transport sectors	MOTIHUD; NAMATA; KRC; NTSA; KENHA; KURA; Motorists Association of Kenya (MAK)	Commuters in traffic-challenged towns; Public transport providers; Cyclists; Pedestrians	2018-2022	GOK / DPs	82,350	17,050	20,200	17,950	14,450	12,700

Strategic Objectives	Priority Actions	Expected Outputs/Outcomes	Key Performance Indicators	Responsible Institutions	Targeted Groups	Time-frame	Source of Funds	Indicative Budget (KES million)					
								Total	18/19	19/20	20/21	21/22	22/23
	Reduce fuel consumption and fuel overhead costs, including electrification of the SGR	Fuel consumption is reduced, resulting in GHG emission reductions of 1.48 $MtCO_2e$ by 2022 including through the: a. Electrification of the SGR b. Shifting freight from road to rail c. Improving heavy-duty truck efficiency	*Mitigation* ✓GHG emissions from the transport sectors	MOTIHUD; KRC; National Transport Authority (NTA); ERC; Transport License Board; NTSA; KPC; NTP	Logistics and freight companies; Motorists	2018-2022	GOK / DPs	960	192	192	192	192	192
	Encourage low-carbon technologies in the aviation and maritime sectors	The maritime and aviation sector transition to low-carbon pathway via: - a. Installation of shore power infrastructure for four berths to provide power to ships while at berth instead of using their engines b. Purchase of 6 new aircraft (B787) which have fuel efficient engines c. Implementation of Service Charter on Sustainable Aviation Fuels (certification and use of biodiesel production for captive use at the airports) by 2020 d. Installation of 0.5 MW of solar power plant at Moi International Airport by 2018	*Mitigation* ✓GHG emissions from the transport sectors ✓Number of berths with shore power ✓Number of fuel efficient aircraft purchased	MOTIHUD; KCAA; KPA; Kenya Maritime Authority; Kenya Ferry Authority; Kenya Airport Authority; Transport License Board; IMO; Kenya Power; Kenya Airways; KEBS	Shipping companies; Airline and air cargo companies	2018-2022	GOK / DPs	2,170	434	434	434	434	434
	Climate-proof transport infrastructure	Transport infrastructure better able to withstand extreme weather events through: a. Climate proof 4,500 km of roads b. Assessing the feasibility of constructing roads that systematically harvest water and mitigate floods undertaken	*Adaptation* ✓Number of kilometres of roads that are climate proofed ✓Feasibility study of road construction to harvest water and mitigate floods	Kenya Urban Roads Authority (KURA); MOTIHUD; KeRRA; KeNHA; CGs	Pedestrians; Motorists; Farmers	2018-2022	GOK / DPs	141,300	20,000	26,500	29,800	32,000	33,000
Sub-total: Transport								**226,780**	**37,676**	**47,326**	**48,376**	**47,076**	**46,326**
Sub-total: Energy and Transport								**951,872**	**129,304**	**214,408**	**297,408**	**193,038**	**117,213**
Total for NCCAP 2018-2022								**1,784,309**	**289,093**	**408,424**	**486,013**	**352,044**	**248,335**



Enabling Actions

Enabling Actions	Expected output by 30th June 2023	Indicators	Responsible agency	Time-frame	Source of Funds	Estimated Budget (KES millions)	Climate Finance Allocation and Source (KES millions)	Climate Finance Gap (KES millions)
Policy and Regulatory Framework								
P1. Develop regulations for Climate Change Act	Subsidiary legislation enacted	Number of regulations	Ministry of Environment and Forests (MEF) National Treasury & Planning Office of Attorney General	2018-2022	GoK/ Climate Finance	500	USAID 60 UNDP NDC 10	420
P2. Support County Governments to develop legislation and regulations	Climate legislation developed in 15 Counties	Number of Counties with climate legislation	Climate Change Directors (CCD) National Treasury & Planning Council of Governors (CoG) County Governments	2018-2022	GoK/ Climate Finance	180	0	180
					Sub-total	680	70	610
Capacity Development and Knowledge Management								
C1. Operationalise the National Climate Change Resource Centre	Business plan developed and operationalised	Number of people using National Climate Change Resource Centre	CCD	2018-2022	GoK/ Climate Finance	300	0	300
C2. Establish Community Education, Business and Information Centres in two Counties	Two Centres established	Number of centres established	CCD	2018-2022	GoK/ Climate Finance	100	0	100
C3. Strengthen the capacity of CCD and climate change units in State Departments	NCCC established, CCUs established in state departments, CCD	Number of trainings Number of people trained (M/F) Number of CCUs established	CCD National Treasury & Planning State Departments	2018-2022	GoK/ Climate Finance	2,300	GCF-FAO 300 GNI Plus 950	

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