REPUBLIC OF KENYA

Ministry of Environment, Climate Change and Forestry

CLIMATE CHANGE DIRECTORATE

KENYA'S ADAPTATION COMMUNICATION TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

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Correct citation:

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

Cover Design and Layout: Boniface Gor, *@digimattsol, www.digimatt.co.ke*

Photo Credits: Climate Change Directorate, Ministry of Environment, Climate Change and Forestry; Envisioning Resilience

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FOREWORD

Climate change remains one of the most pressing challenges of our time, with impacts that transcend borders, ecosystems, and livelihoods. In Kenya, the reality of climate change is deeply felt, from the arid and semi-arid lands (ASALs) to our urban centers and coastal regions. As a nation that relies heavily on its natural resources and agricultural economy, we face heightened vulnerability to the disruptions brought about by shifting weather patterns, prolonged droughts, devastating floods and rising sea levels.

Kenya initially communicated her adaptation priorities and needs via the Nationally Determined Contribution (Updated NDC) of 2020. The development of this stand-alone Adaptation Communication (AdCom) underscores the importance Kenya places on adaptation to climate change and represents the government unwavering commitment to addressing these challenges head-on. Prepared in line with Article 7 of the Paris Agreement and national climate change policies and strategies, this document serves both as a reflection of our progress with implementation of adaptation priorities captured in the, NDC, National Adaptation Plan (NAP) 2015-2030 and National Climate Change Action Plan (NCCAP) and a roadmap for the future. It highlights our efforts to build resilience, promote sustainable development, and empower communities to adapt to the changing climate.

The AdCom underscores Kenya's determination to mainstream climate adaptation into national and sub-national policies, plans, and actions. It reflects Kenya's vision for a climate-resilient future, aligning with global frameworks while addressing the unique circumstances and vulnerabilities faced by our people. From integrating traditional knowledge to leveraging innovative climate technologies, the strategies outlined in this document emphasize inclusivity, sustainability, and forward-thinking solutions.

As Kenya charts a path toward achieving its adaptation goals, this AdCom invites continued partnership, investment, and innovation. Together, we can ensure that the country and indeed the region not only survives the challenges of climate change but thrives in the face of them.

Hon. Aden Bare Duale, EGH

Cabinet Secretary

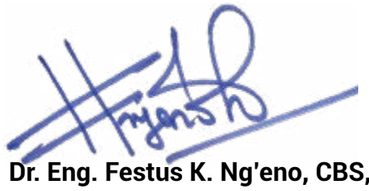
Ministry Of Environment, Climate Change and Forestry.

ACKNOWLEDGMENTS

Kenya is pleased to submit her first stand-alone Adaptation Communication (AdCom) to the United Nations Framework Convention on Climate Change (UNFCCC). This AdCom has been prepared in accordance with Article 7, paragraphs 10, 11, and 12 of the Paris Agreement and in line with Kenya's climate change strategies and plans. It updates the first AdCom that was submitted as part of Kenya's 2020 Nationally Determined Contribution (NDC).

Preparation of this stand-alone Adaptation Communication (AdCom) benefited from the input of many stakeholders at national and county levels. The Ministry of Environment, Climate Change and Forestry expresses its gratitude to the experts from the national ministries, departments and agencies, County Governments, civil society organisations, and the private sector that submitted information that informed this AdCom. Their shared commitment has been instrumental in shaping a document that is not only a testament to Kenya's leadership in climate adaptation but also a call to action for greater collective effort.

The Adaptation Communication was developed with financial and technical support from the National Adaptation Plan (NAP) Global Network, with generous funding from the United Kingdom's Foreign, Commonwealth, and Development Office. This reflects the ongoing commitment and support of the NAP Global Network to the Ministry in advancing the implementation of the NAP in the country.



Dr. Eng. Festus K. Ng'eno, CBS, MIEK

Principal Secretary

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PREFACE

Kenya is committed to implementing the Global Goal on Adaptation, which focuses on enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change. As a signatory to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement adopted in 2015, Kenya acknowledges that climate change is both a global and local challenge. This understanding underscores the importance of communicating its priority adaptation needs within the broader context of evolving socio-economic development and growth prospects.

The preparation of this Adaptation Communication (AdCom) is aligned with Article 7, paragraphs 10, 11, and 12 of the Paris Agreement, as well as Kenya's National Adaptation Plan (NAP) for 2015-2030, which envisions "enhanced climate resilience toward Vision 2030." The AdCom aims to increase the visibility of adaptation efforts by outlining Kenya's existing policy framework for climate resilience, communicating adaptation needs, and reflecting on progress at national, sub-national, and international levels. It builds upon previous work, such as the 2020 Updated Nationally Determined Contribution (NDC), and draws from recent reporting on adaptation actions.

The development of this report is informed by Decision 9/CMA.1, which provides further guidance on adaptation communication including inter alia as a component of nationally determined contributions, as stated in Article 7, paragraphs 10 and 11 of the Paris Agreement. The report outlines Kenya's national context, including climate hazards, vulnerabilities, impacts, adaptation priorities, and the implementation of adaptation actions. It also addresses gender mainstreaming and identifies support needs for continued adaptation efforts.

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Director, Climate Change

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The Ministry of Environment, Climate Change and Forestry expresses its gratitude to the experts from the national ministries, departments and agencies, County Governments, civil society organisations, and the private sector that submitted information that informed this Adaptation Communication. In addition, thanks are extended to Mr. Victor Orindi for supporting the development of this report, to Deborah Murphy, International Institute for Sustainable Development (IISD), for review and input, and to Mr. Lerenten Lelekoitien, Climate Change Directorate, for leading the work.

The Adaptation Communication was prepared with financial and technical assistance from the National Adaptation Plan (NAP) Global Network Secretariat, IISD via the generous financial support of the United Kingdom's Foreign, Commonwealth, and Development Office.

NAP Global Network

This project is undertaken with the financial support of:
Ce projet a été réalisé avec l'appui financier de :

In partnership with Canada

UKaid from the British people

Federal Ministry for Economic Cooperation and Development

An Roinn Gnóthaí Eachtracha Department of Foreign Affairs

Secretariat hosted by:
Secrétariat hébergé par :

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ABBREVIATIONS & ACRONYMS

AdCom	Adaptation Communication
ASAL	Arid and semi-arid land
BETA	Bottom-Up Economic Transformation Agenda
CBIN-K	Climate Business Information Network - Kenya
CCAP	County Climate Change Action Plan
CCCF	County Climate Change Fund
CCD	Climate Change Directorate
CCU	Climate Change Unit
CIDP	County Integrated Development Plan
CIS	Climate Information Services
CSA	Climate Smart Agriculture
CSO	Civil Society Organisation
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EDE	Ending Drought Emergencies
FAO	Food and Agriculture Organization of the United Nations
FLLoCA	Financing Locally-Led Climate Action
GCF	Green Climate Fund
GDP	Gross domestic product
GoK	Government of Kenya
IAS	Invasive alien species
IBLI	Index-based Livestock Insurance
IGAD	Intergovernmental Authority on Development
IMF	International Monetary Fund
KCEP-CRAL	Kenya Cereal Enhancement Programme - Climate Resilient Agricultural Livelihood Window
KCSAP	Kenya Climate Smart Agriculture Project
KEPSA	Kenya Private Sector Alliance
KIWASH	Kenya Integrated Water, Sanitation, and Hygiene Project
KMD	Kenya Meteorological Department
KWS	Kenya Wildlife Service
MoALF&C	Ministry of Agriculture, Livestock, Fisheries and Co-operatives
MTP	Medium Term Plan
NAP	National Adaptation Plan
NARIGP	National Agricultural and Rural Inclusive Growth Project
NCCAP	National Climate Change Action Plan
NCCC	National Climate Change Council
NCCRS	National Climate Change Response Strategy
NDC	Nationally Determined Contribution
NDVI	Normalised Different Vegetation Index
NDMA	National Drought Management Authority
NEMA	National Environmental Management Authority
NGO	Non-governmental organisation
SDG	Sustainable Development Goal
TWENDE	Towards Ending Drought Emergencies: Ecosystem based Adaptation in Kenya's Arid and Semi-arid Rangelands
UNFCCC	United Nations Framework Convention on Climate Change

EXECUTIVE SUMMARY

Kenya is pleased to submit her first stand-alone Adaptation Communication (AdCom) to the United Nations Framework Convention on Climate Change (UNFCCC). This AdCom has been prepared in accordance with Article 7, paragraphs 10, 11, and 12 of the Paris Agreement and in line with Kenya's climate change strategies and plans. It updates the first AdCom that was submitted as part of Kenya's 2020 Nationally Determined Contribution (NDC).

The AdCom provides a synthesis of Kenya's national circumstances in terms of its environmental and socio-economic profile; and reviews the enabling environment for adaptation action including policies and legislation. This is followed by a summary of climate hazards, vulnerabilities, and impacts; and emphasises that notable impacts in Kenya are related to drought, floods, and sea level rise. The AdCom highlights Kenya's national adaptation priorities as captured in the National Adaptation Plan 2015-2030 (NAP) and in the adaptation section of the updated NDC, which both have the objective of enhancing resilience building among the vulnerable communities. The AdCom provides a summary of the progress made on the implementation of adaptation actions along seven priority areas in the National Climate Change Action Plan 2023-2027 (NCCAP): disaster risk management; food and nutrition security; water, fisheries and the blue economy; forests, wildlife and tourism; health, sanitation and human settlements, manufacturing; and energy and transport. This progress is captured in greater detail in NCCAP implementation progress reports, the NAP review of progress for the agriculture sector, and the Ending Drought Emergency (EDE) medium-term review, among others. These reviews of progress on implementation highlight good adaptation practices and set out how issues of gender, youth, children, and the marginalized are being mainstreamed.

The AdCom concludes with highlights of implementation and support needs in relation to finance, technology development and transfer, and capacity building. It is noted that sustained and adequate financing is needed for scaling up successful adaptation actions and practices for transformative change in Kenya. Financial support of approximately USD 44 billion is needed to implement the priority adaptation actions up to the year 2030. Support is also required to enable the country to implement NAP-related processes including reporting at national and international levels. The country is also keen to explore options and incentives for greater private sector involvement in financing adaptation actions, and welcomes support in the design and implementation of innovative financial instruments for adaptation. Kenya also welcomes support to enhance the development of and access to relevant adaptation technology and practices. Specifically, support is required for awareness creation, technology development, and adapting relevant technologies to local contexts. Support is also needed to ensure that the right capacity exists within national and county governments institutions that are concerned with the coordination of adaptation actions, as well as in the private sector and civil society organisations that continue to support the implementation of adaptation actions and help to ensure that issues of gender are properly mainstreamed.

INTRODUCTION

Kenya is committed to taking action to implement the Global Goal on Adaptation of enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change. As a signatory to both the United Nations Framework Convention on Climate Change (UNFCCC) and its Paris Agreement that was adopted in 2015, Kenya recognises that addressing the causes and impacts of climate change is a global as well as a local challenge; hence the need to communicate her priority adaptation issues within the context of a dynamic and paradigm shift in socio-economic development and growth prospects. Preparation of this Adaptation Communication (AdCom) was guided by Article 7, paragraphs 10, 11, and 12 of the Paris Agreement as well as Kenya's National Adaptation Plan 2015-2030 (NAP) whose vision is "enhanced climate resilience towards vision 2030."[1]

The AdCom aims to enhance the visibility and profile of adaptation by outlining Kenya's existing policy context for adaptation and climate resilience, to communicate Kenya's adaptation needs, and to reflect on Kenya's adaptation progress at sub-national, national, and international levels. It builds on earlier efforts to communicate progress on adaptation under the Paris Agreement via Kenya's Updated Nationally Determined Contribution (NDC) in 2020 and draws on recent progress reporting on adaptation action.[2]

Kenya submitted her first Adaptation Communication to the UNFCCC in December 2020, opting to use the 2020 NDC as the "vehicle document". The NDC section, "Adaptation and Loss & Damage" was the AdCom component and set out Kenya's adaptation goal, identified implementation gaps, estimated costs to 2030, and prioritised adaptation programs in 21 sectors.[3] Adaptation action in Kenya is guided by the NAP 2015-2030 and the National Climate Change Action Plan (NCCAP) 2023-2027, which are aligned with the government's development agenda as set out in the Bottom-Up Economic Transformation Agenda (BETA).[4]

Due to the high priority Kenya puts on adaptation, this first stand-alone AdCom is a strategic document that aims to:

- Enhance the visibility and profile of adaptation in Kenya
- Strengthen adaptation action and support
- Provide input to the Global Stocktake and the Global Goal on Adaptation
- Enhance learning and understanding of adaptation needs and actions

Chapter 1 presents Kenya's national circumstances, and chapter 2 covers climate hazards, vulnerabilities, and impacts. Chapter 3 outlines national adaptation priorities, and chapter 4 discusses traditional indigenous and local knowledge. Chapter 5 describes the implementation of adaptation actions, and is followed by a discussion of gender mainstreaming in climate adaptation in Chapter 6. Chapter 7 summarises adaptation support and implementation needs.

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NATIONAL CIRCUMSTANCES, INSTITUTIONAL ARRANGEMENTS, AND LEGAL FRAMEWORKS

1.1 NATIONAL CIRCUMSTANCES

1.1.1 GEOGRAPHIC PROFILE

Kenya is located in the East African region between latitude 5° north and 5° south and is bisected by the equator, and between longitudes 34° and 42° east. It borders South Sudan, Ethiopia, and Somalia to the north; Uganda to the west; Tanzania to the south; and the Indian Ocean to the east. The total land area is 569,137 square kilometres.[5] Mount Kenya is the highest point in Kenya at 5,199 metres above sea level and the lowest point is at sea level on the Indian Ocean.[6] The country is situated within the Greater Horn of Africa which is a generally dry region characterised by frequent droughts that are punctuated by heavy rainfall events that often result in flash floods.

1.1.2 DEMOGRAPHIC PROFILE

The 2019 Kenya Population and Housing Census determined that the country's population was 47,564,296 persons, with 23,548,100 males and 24,014,700 females. The urban population was about 28 percent. The census determined that Kenya had a population density of 82 persons per km2. In 2019, Kenya youths under the age of 35 years made up 75 percent of the population and were comprised of children (0-14 years) - 18,541,982 (39.0 percent), adolescents (10-19 years) - 11,631,929 (24.5 percent), and youths (18-34 years) - 13,777,600 (29.0 percent). The elderly population (65+ years) was 1,870,493 persons (3.9 percent). The working age population (15-64 years) was 27,151,134 (57.1 percent) persons in 2019.[7]

1.1.3 WEATHER AND CLIMATE

Kenya is made up of seven agro-ecological zones which experience varying climates and weather patterns.

i. The arid regions of the country receive annual average rainfall of between 200 and 500 mm and annual temperatures range from 23°C to 34°C.

ii. The semi-arid areas experience an average annual rainfall of 600 to 1,000 mm and are slightly cooler in temperature. Both arid and semi-arid areas experience erratic rainfall patterns.

iii. The coastal climatic zone, a band approximately 16 kilometres wide, is humid all year round with an average annual temperature range of 22°C to 30°C and an average rainfall of between 1,000 and 1,250 mm.

iv. The most temperate zones are the central and western highlands and parts of the central Rift Valley with annual rainfall levels averaging between 950 and 3,000 mm and average annual temperatures ranging between 14°C to 28°C.[8]

Kenya Meteorological Department (KMD) data indicates that Kenya's temperatures vary, with the highlands experiencing considerably cooler temperatures than the coastal and lowland regions. The months of June to August are characterised by cooler temperatures while the highest temperatures are typically experienced during the month of March. Kenya's annual rainfall follows a bimodal seasonal pattern, commonly referred to as the "long rains" season occurring in March, April, and May, and the "short rains" season, occurring in October, November, and December. Another season takes place from June to August over the coastal region and the Highlands west of the Rift Valley.[9]

Average annual precipitation in Kenya is typically 680 mm, ranging from less than 250 mm in parts of the northern arid and semi-arid land (ASAL) areas to about 2,000 mm in the high rainfall zone in the western region, that includes the country's productive agricultural land.[10]

1.1.4 ECONOMIC PROFILE

Kenya is a lower-middle-income economy and among the fastest-growing economies in Africa. Kenya's gross domestic product (GDP) was USD 115.08 billion and GDP per capita was USD 2,190 in October 2023.[11] The World Bank reported that Kenya's GDP increased by 4.8 percent in 2022 and 5.4 percent in 2023. The country's economy expanded at a lower rate in 2022 than 2021 due to the impacts of drought conditions, the Ukraine-Russian conflict, and the lingering effects of COVID-19. The improved economic performance in 2023 was partly a result of recovery in the agriculture sector which had faced severe drought since 2021. The poverty rate ($2.15 international poverty rate) declined from 35.8 percent in 2022 to 35.1 percent in 2023. Kenya has a favourable medium-term economic outlook with projected GDP growth of 5.2 percent for 2024-2026, although the economy is susceptible to climate-related risks.[12]

The agricultural sector is the backbone of the economy, accounting for approximately 20 percent of Kenya's GDP.[13] The agriculture sector employs more than 40 percent of the total population and more than 70 percent of the rural population.[14] It largely remains rainfed making it vulnerable to the changing climate. The service and industry sectors are also major economic drivers, particularly tourism and manufacturing. There is rapid urbanisation with projections showing that over 50 percent of the population will live in urban areas by 2030.[15] Kenya is a member of the East African Community regional economic bloc and the Common Market for Eastern and Southern Africa trade blocs.

1.2 INSTITUTIONAL ARRANGEMENTS

Coordination of climate change adaptation activities is currently the responsibility of the Climate Change Directorate (CCD), State Department of Environment and Climate Change, in the Ministry of Environment, Climate Change and Forestry. CCD is the National Focal Point for the UNFCCC. Due to the priority the government places on climate change issues, the Ministry and the State Department were re-designated in October 2022 to include climate change.

CCD works with climate change coordination units in different ministries, departments, and agencies to mainstream climate change in the various sectors of the economy; and with county governments to ensure that climate change is mainstreamed at the sub-national level. The CCD works under the guidance of various climate change policies and legislative frameworks including the Climate Change (Amendment) Act, 2023.[16]

The Climate Change Act provides the primary framework for governing climate change across Kenya and sets out institutional structures and responsibilities that guide coordination and implementation of Kenya's responses to climate change (see figure 1). It establishes a National Climate Change Council (NCCC) chaired by the President that provides overarching national climate change coordination and policy guidance. In addition to the executive, the council has representatives from key government ministries, the private sector, civil society organisations (CSOs), the marginalised, academia, and the chair of the Council of Governors, so as to ensure a whole of society approach to addressing climate change issues. Furthermore, it designates CCD as secretariat to the Council and the lead agency of the government on national climate change plans and actions, including adaptation plans.

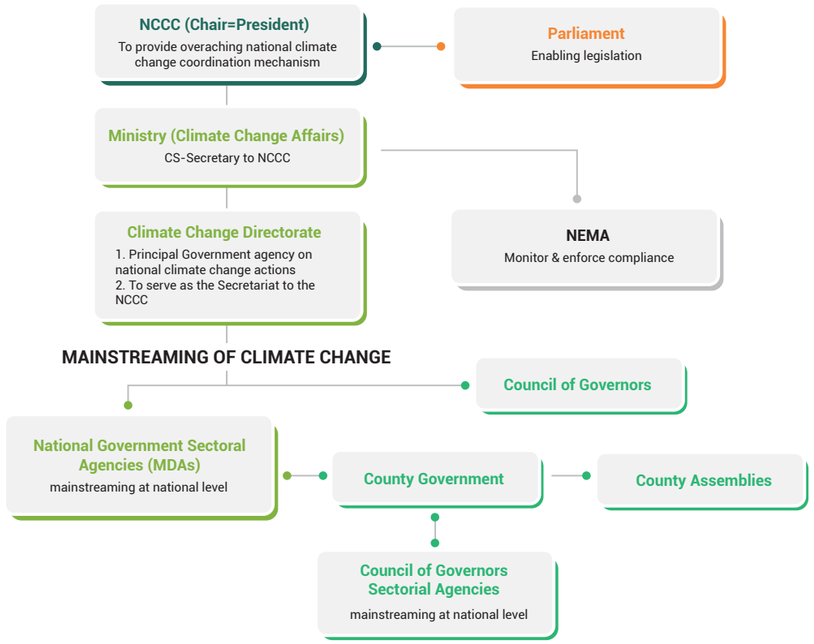

Figure 1: Climate change coordination structure

Source: Government of Keya. (2016). Kenya National Adaptation Plan 2015-2030. Page 10.

Among other things, CCD is in the process of establishing the National Climate Change Registry with the aim of helping government and non-government actors to better understand specific climate change initiatives and actions, and their resulting adaptation and/or mitigation impacts in Kenya and to assist CCD in fulfilling domestic and international reporting requirements on climate change.[17] The National Environment Management Authority (NEMA) is tasked with enforcement of the act and is expected to integrate climate risk and vulnerability assessments into all forms of assessments including Environmental Impact Assessments and Strategic Environmental Assessments and to liaise with relevant lead agencies for their technical advice. An Adaptation Technical Working Group brings together experts and practitioners from the government and non-state entities, private sector, research institutes, academia, and media, among others, to support the CCD in framing and strengthening inputs from stakeholders.

At the sub-national level, the 47 county governments are responsible for operationalising climate change planning and budgeting within their jurisdictions. All counties have designated a County Executive Committee member responsible for climate change and created a Climate Change Unit (CCU) to coordinate climate change action. Many counties also have county and ward climate change planning committees supporting planning and implementation of climate adaptation actions. The Ward Climate Change Planning Committees help communities to work in a participatory manner to analyse their resilience to present and future climate risks and use the findings to prioritise investments that the County Climate Change Funds (CCCFs) can support. The committees draw their membership from county government departments, national government institutional offices in the counties (e.g. KMD, NEMA); non-governmental organisations (NGOs), community-based organisations, the private sector, and local communities. Inclusion of diverse actors supports compliance with the Constitution of Kenya 2010, Climate Change Act, 2016, and other subsidiary legislation that provides for public participation in such matters.

The private sector continues to engage and complement government efforts on climate change. Through the NAP Readiness Support Project that was funded by the Green Climate Fund (GCF) and implemented through the Food and Agriculture Organization (FAO), the Kenya Private Sector Alliance (KEPSA) created the Climate Business Information Network-Kenya (CBIN-K) and the Private Sector Strategy on Climate Change Solutions in Kenya (2022-2030).[18] The CBIN-K provides a platform for private sector engagement in climate change activities in Kenya with a focus on adaptation matters. With a strategy in place, it is expected that the private sector will take greater action to address adaptation and build resilience within their businesses as well as tapping into the potential financial resources from private sector. The Climate Smart Agriculture (CSA) Multistakeholder Platform established in 2020 has been critical in facilitating coordination of CSA actors through the provision of opportunities for learning, exchange of ideas, and monitoring of progress.[19]

1.3 LEGAL AND POLICY FRAMEWORKS, STRATEGIES, AND PLANS

Kenya has a strong history of climate change governance beginning with the enactment of the new constitution and development of the National Climate Change Response Strategy (NCCRS) in 2010. The policy and legal framework for adaptation includes three National Climate Change Action Plans (2013-2017, 2018-2022, 2023-2027), NAP (2015-2030), and Climate Change (Amendment)Act, 2023. Kenya submitted her first Nationally Determined Contribution (NDC) in 2016 and an updated version in 2020. The NDC responds to both domestic needs and international obligations under the UNFCCC and Paris Agreement and includes a section on adaptation priorities that are aligned with the NAP and NCCAPs. As stated in the NCCAPs, NAP, and NDC, adaptation is the priority for Kenya. Table 1 below presents a summary of the key legal and policy documents related to climate adaptation.

Table 1: Key national policies, legislations, strategies, and plans related to climate change adaptation

Document	Brief Description
The Constitution of Kenya, 2010	The mother law in Kenya. Article 42 establishes Kenyans' right to a clean and healthy environment including the right to have the environment protected for the benefit of present and future generations. A healthy environment calls for the sustainable use of ecosystems and consequently continued access to ecosystem goods and the services they provide which are critical for adaptation.
National Climate Change Response Strategy, 2010	The NCCRS formally recognised the need for coordinated efforts in addressing climate change issues in Kenya. It recommended the development of a climate change policy and legislation on which adaptation activities were to be anchored. Consequently, a stand-alone climate change act and related governance structures and plans (e.g., NCCAP and NAP) were developed and supported coordinated adaptation action. Some of the priority adaptation actions highlighted in the climate change response strategy included: promoting orphan crops; agricultural produce post-harvest processing, storage, and value addition; breeding of animals from various agro-ecological zones that adapt well to climatic variances; providing special livestock insurance; establishing a national climate awareness campaign; and incorporating climate change in the school curriculum within Information and awareness building.
National Policy for the Sustainable Development of Northern Kenya and other Arid Lands, 2012	Over 80 percent of Kenya is comprised of arid and semi-arid lands (ASALs) that are characterised by high dependence on pastoralism, mobility, and high levels of poverty. Popularly known as the ASAL policy, it was adopted to facilitate and fast-track sustainable development in ASALs by increasing investments in the region and ensuring that the use of resources is fully reconciled with the reality of people's lives. It aimed at strengthening the resilience of ASAL communities to drought and other climate- related impacts through development and climate proofing of infrastructure, sustainable use of natural resources, livelihood diversification, and improved linkages to markets, among others.
National Climate Change Action Plans, 2013-2017 **and** 2018-2022 and 2023-2027	A five-year iterative tool for mainstreaming climate actions across all sectors of the economy and the two levels of government. Mechanisms for mainstreaming climate change in priority sectors include the policies and strategies, coordination structures, planning cycles (guidelines and templates), investments, and financing. It is used for implementing both the NDC and NAP and most of the actions are adaptation. The NCCAP was updated in 2023. Updating and/or revision of the NCCAP is an inclusive process involving both levels of governments, private sector, research and academia, communities, CSOs, media, and other actors in climate adaptation.
National Adaptation Plan 2015-2030	Aims at consolidating the country's vision on adaptation by supporting macro-level adaptation actions that are aligned with the economic sectors and addressing county-level vulnerabilities to enhance long-term resilience and adaptive capacity. It is implemented through the five-year NCCAPs. The NAP highlights climate vulnerabilities and priority areas for building climate resilience. It presents adaptation actions that cover the time frame 2015-2030 and builds on the foundation laid by the NCCRS and the NCCAP 2013-2017. Furthermore, it is the basis for the adaptation component of Kenya's NDC.

Document	Brief Description
Second National Communication to the UNFCCC, 2015	The chapter on assessment of vulnerability and adaptation sets out climate scenarios and assesses impacts and vulnerabilities in key sectors. It proposes priority adaptation actions that are aligned with what is captured in the NAP and NCCAP 2013-2017 and 2018-2022.
Environmental Management and Coordination (Amendment) Act, 2015	Emphasises maximum participation by stakeholders in the development and implementation of policies, plans, and processes for the management of the environment and provides for the relevant institutional framework for the coordination of environmental management including the NCCAPs. The Act provides for environmental protection through environmental impact assessment; environmental audit and monitoring; and environmental restoration orders, conservation orders, and easements.
Climate Change (Amendment)Act, 2023	The Climate Change Act enacted in 2016 is the first comprehensive legal framework for climate change governance in Kenya with the objective of enhancing climate resilient development through among others promoting the uptake of technologies that support low carbon and climate resilient development; facilitating capacity development for public participation in climate change responses through awareness creation, consultation, representation and access to information; and providing incentives and obligations for private sector contributions towards climate resilient development. Additionally, the Act provides for and supports mainstreaming of climate adaptation actions into development planning, decision-making, and implementation. It sets out principles for climate change planning and implementation of measures, and recognises the complementary role of national and county governments. The latter is critical considering the local nature of adaptation. The 2023 amendment provided for the introduction and regulation of carbon markets in Kenya.
The National Drought Management Authority Act, 2016	Creates the National Drought Management Authority (NDMA) as a permanent institution with a specific mandate of managing drought in a more pro-active and sustainable manner. It recognises drought as the most important climate-related hazard for Kenya and the need to sustainably invest in building resilience to drought in a coordinated manner. The Act also establishes the National Drought Emergency Fund to finance timely responses to drought and to support capacity strengthening in drought management.
National Urban Development Policy, 2016; and Urban Areas and Cities Act, 2011, Amendment, 2019	The urban development policy and legislation provide a framework for the establishment and governance of urban areas (i.e., cities, municipalities, towns, and market centres). The policy and legislation guide planning and development in urban areas, and the implementation of key actions in these areas, which contributes to the balance between urbanisation and sustainable development. These bodies play a key role in integrating climate resilience considerations and adaptation actions in urban centres.
Climate Risk Management Framework, 2017	The framework bridges climate change adaptation, disaster risk management, and sustainable development at national and county levels. The framework ensures that the three distinct entities are pursued as mutually supportive rather than stand-alone goals and that an integrated approach to climate risk management becomes a key component of policy and strategy for resilience building. The adaptation actions under this framework include analysing exposure and vulnerability to disasters, and capacity to respond; mobilising financial resources for climate risk management; designing and implementing pilot projects for climate risk management at county and national levels; enhancing research and dissemination of information about climate risk management; and building capacity at national and county levels for integrated climate risk management.
Kenya Climate-Smart Agriculture Strategy, 2017-2026	Aims to improve productivity and build the resilience of agricultural systems while minimising greenhouse gas emissions. Recognises the high vulnerability of the agriculture sector and identifies priority interventions for building resilience of the sector through the implementation of Climate Smart Agriculture (CSA) practices in the crop, livestock, and fisheries sectors in support of food and nutrition security and poverty reduction.
Kenya Climate-Smart Agriculture Implementation Framework Programme, 2018-2027	Provides guidelines for the implementation of the CSA strategy at national and county levels in support of food security and economic development. The national government is largely expected to lead on policy development and support capacity building, while county governments lead on implementation since agriculture is a devolved function.

Document	Brief Description
National Climate Change Framework Policy, 2018	Formulated to ensure the integration of climate change considerations into planning, budgeting, implementation, and decision-making at the national and county levels, and across all sectors. The goal is to promote climate resilient development through pursuing several objectives including providing an effective and efficient institutional framework for mainstreaming climate change; reducing vulnerability and catalyzing the transition to climate-resilient development; incentivising private sector involvement; and providing a framework for resource mobilisation in support of adaptation.
National Climate Finance Policy, 2018	Establishes the legal, institutional, and reporting frameworks to access and manage climate finance, consistent with the institutional structures and framework set out in the Climate Change Act, 2016. Interventions with respect to this policy include establishing a national Climate Change Fund, identifying climate financing sources, and creating a national system for tracking climate finance. Its operationalisation is meant to address the issue of inadequate finance for adaptation interventions.
National Biodiversity Strategy and Action Plan, 2019-2030	Guides strategies aimed at addressing declining biodiversity and related challenges. It aims to reduce the loss of biodiversity, promote the value of biodiversity, and improve community livelihoods. Highlighted adaptation interventions include conservation of agricultural biodiversity through increased support to local communities in the production and sustainable utilisation of indigenous and/or traditional species for food and other uses; strengthening institutional and community capacity and linkages; promotion of gender equity in biodiversity management; and supporting and promoting the utilisation of indigenous knowledge, innovations, and practices among others.
Nationally Determined Contribution, 2020	The vehicle document for Kenya's first AdCom, the updated NDC communicated the country's adaptation priorities and needs to the international community. The NDC prioritises adaptation and sets out adaptation actions and approaches that are aligned with Kenya's NAP and NCCAP. The adaptation goal is a climate resilient society that is to be achieved through mainstreaming climate adaptation in Medium Term Plans (MTPs) and Country Integrated Development Plans (CIDPs).
Guidance on Climate-related Risk Management, 2021	This guidance, issued by the Central Bank of Kenya, aims to guide institutions licensed under the Banking Act on climate-related risk management. The guidance sets out basic requirements for financial institutions in regard to the identification, management, and reporting of climate-related risks, including physical risks that result from the impacts of climate- and weather-related events.

The NAP 2015-2030 aims to enhance climate resilience and sets out aspirational actions to be undertaken up to 2030. The vision of the NAP is 'enhanced climate resilience towards Vision 2030' – Kenya's development blueprint which aims at transforming Kenya into a newly industrialising, middle-income country providing a high quality of life to the citizenry by 2030. The NAP is implemented through five-year NCCAPs (2103-2017, 2018-2022, and 2023-2027), with the five-year cycle providing opportunity for review and update. The process to prepare the third NCCAP involved reviewing achievements made under the previous plans, challenges experienced during implementation, and actions needed to address those challenges. In addition, NCCAP 2023-2027 was informed by new findings and research (e.g., from climate risk and vulnerability assessments, project evaluations, and assessments of progress), and learning from implementation of adaptation actions at sector, national, and sub-national levels.

The CCD has tracked progress on adaptation action and identified learning through the collection of information from stakeholders on the implementation of NCCAP 2018-2022, two annual NCCAP implementation progress reports (2018/2019 and 2019/2020 fiscal years); and a 2021 assessment of progress of the implementation of the NAP in the agriculture sector.[20] The National Drought Management Authority (NDMA) carried out reviews of the Ending Drought Emergencies (EDE) programme that provided valuable information about progress on disaster risk management.

1.4 SUB-NATIONAL LEVEL POLICIES AND STRATEGIES

The Climate Change Act, 2016 requires county governments to integrate climate change actions into their plans and policies. In furtherance of this agenda, county governments have used the five- year County Integrated Development Plan (CIDP) process to mainstream climate change actions in development planning. Over 45 counties have prepared climate change-specific policies and legislation. Additionally, some have developed strategies and regulations to operationalise the legislation. The County Climate Change Fund (CCCF) mechanism that aims to enhance access and channel climate finance to the community level was established in 45 of the 47 counties in 2023, up from 5 in 2018.

As indicated in section 1.1.5, many counties have climate change governance structures down to the ward level which is the lowest planning unit. With the support of the climate change planning committees, local communities through participatory processes identify and prioritise interventions to be financed using their CCCF, most of which are focused on adaptation.

The integration of climate information into planning and implementation has been supported through county-specific Climate Information Services (CIS) plans prepared by KMD in collaboration with partners. Many counties have CIS plans that are based on local needs and are contributing to improved access and use of climate information at institutional and household levels. The NDMA also supports the 23 ASAL counties with Drought Early Warnings that are issued monthly for drought preparedness and early action.

Through urban policy and legislation, Kenya has 5 cities and over 70 municipalities with governance structures that support the implementation of local actions including the mainstreaming of climate-resilient development pathways in the provision of necessary urban infrastructure and services.

BOX 1

County Climate Change Fund mechanism: Delivering climate finance at the local level to support adaptation

The Kenya County Climate Change Fund (CCCF) is a pioneering mechanism to facilitate the flow of climate finance to county governments and simultaneously empower local communities, by strengthening public participation in the management and use of those funds, to build their resilience to climate change. The mechanism was initially piloted as the Climate Adaptation Fund in Isiolo (2011-2012) and subsequently scaled out to four additional counties of Garissa, Kitui, Makueni, and Wajir from 2013.

Some of the achievements from the CCCF pilot include:

- Five counties enacted CCCF legislation committing themselves to use a minimum of 1-2 percent of their development budgets to support the implementation of community-prioritised adaptation and resilience investments.
- Inclusive climate change governance structures were established in the form of county and ward climate change planning structures that were anchored in the CCCF legislation. These structures promote better coordination and participation of vulnerable communities in planning and implementation of adaptation actions.
- Implementation of over 100 community-prioritised public goods investments across the five counties, reaching more than 600,000 direct beneficiaries.
- The mechanism won the Global Centre on Adaptation inaugural award under the locally-led adaptation financial governance innovation category.

Following the successful piloting, the mechanism is being scaled up nationally through the Financing Locally-Led Climate Action (FLLoCA) programme (2021-2026). Priority adaptation and resilience investments will be identified across 45 counties through participatory processes, and financed through climate resilience investment grants for a period of three years beginning in July 2023.

The FLLoCA programme is led by the National Treasury and Planning, with financial support from county government development budgets, a concessional loan from the World Bank, and grants from development partners.

Source: ADA Consortium. (2019). Inventories.

Arnold, M., & Soikan, N. (2021). Kenya moves to locally led climate action. World Bank Blog.

Crick, F., Hesse, C., Orindi, V., Bonaya, M., & Kiiru, J. (2019). Delivering climate finance at the local level to support adaptation: Experience of County Climate Change Funds in Kenya. NDMA and ADA Consortium.

Global Centre on Adaptation. (2022). Community-led initiatives for climate change adaptation recognized at COP27.

02

CLIMATE CHANGE HAZARDS, VULNERABILITIES, AND IMPACTS

This section presents a summary of key climate hazards, vulnerabilities, and risks and impacts in the different sectors of the economy. Detailed information on the same can be found in Chapter 2 of the NCCAP 2023-2027, Chapter 3 of the NAP, Chapter 3 on Assessment of Vulnerability and Adaptation in the Second National Communication (2015), and the Adaptation and Loss & Damage section of the updated NDC (2020). The analysis looks beyond the primary level of risks to consider the cascading nature of climate risks, which was highlighted during the AdCom inception workshop held in early 2023.

A critical mass of knowledge and lessons on climate risks and vulnerabilities is being accumulated through several initiatives. These include the Kenya County Climate Risk Profiles prepared for 45 counties by the by Ministry of Agriculture, Livestock, Fisheries and Co-operatives (MALF&C) with support of the International Center for Tropical Agriculture and the CGIAR Research Programme on Climate Change, Agriculture and Food Security[21]; the Climate Risk Profile Kenya prepared by the World Bank in 2021[22]; assessment of climate change impacts on health by the Kenya Red Cross, 2021[23]; Kenya Climate Smart Agriculture Programme (KCSAP) and the evaluation and monitoring process of the CSA Multistakeholder Platform[24]; and assessments at different levels undertaken by academia and research institutions. Additionally, counties also carried out Participatory Climate Risk Assessments under the Financing Locally-Led Climate Action (FLLoCA) program under the National Treasury & Economic Planning (see chapter 7 for details). The NDMA coordinates the Kenya Food Security Steering Group, a multi-agency team that carries out biannual assessments of the impacts of short and long rains on food and nutrition security with a view of informing drought response and resilience building activities across 23 ASAL counties.[25] Under the Kenya Urban Support Programme supported by the World Bank, Kenya is developing urban resilience strategies for the five major cities of Nairobi, Mombasa, Kisumu, Nakuru, and Eldoret.

2.1 CLIMATE HAZARDS

The NCCAPs and NAP explain that Kenya is exposed to climate hazards or the actual biophysical events that are driven by climate change. As temperatures have risen, Kenya has experienced acute climate hazards such as droughts, floods, landslides, and wildfires, which are expected to increase in frequency and severity. Slow onset climate hazards, such as drought, changes in precipitation, and sea level rise have intensified.[26] Climatic hazards in Kenya include increasing temperatures, changing rainfall patterns, and sea level rise along the coast as summarised below.

I TEMPERATURE INCREASE

Kenya's mean annual temperature has increased by 1.0°C since 1960, at an average rate of 0.21°C per decade and is projected to continue rising by 1.7°C by the 2050s.[27] KMD observed that several weather stations in 2022 recorded maximum temperature values exceeding long-term averages, and minimum temperatures that were higher than long-term averages.[28] Increased heat and extreme heat conditions will result in significant implications for human and animal health, agriculture, and ecosystems.

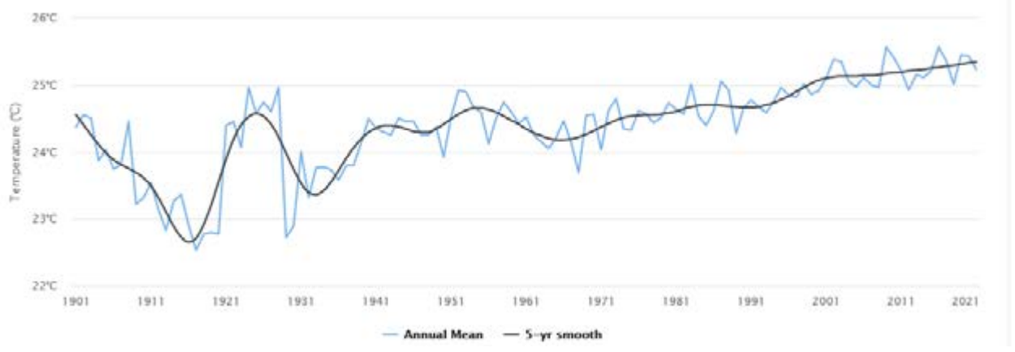

Figure 2: Observed average annual mean temperature of Kenya for 1901-2021

Source: World Bank Group Climate Change Knowledge Portal. (2022). *Kenya: Current Climate - Climatology.* https://climateknowledgeportal.worldbank.org/country/kenya/climate-data-historical

Rising temperatures may have a significant impact on water availability and general human well-being and likely will worsen drought conditions. Kenya experienced intense droughts in 1983/1984, 1991/1992, 1995/1996, 1998/2000, 2004/2005, and 2008/2011.[29] The country has experienced below average rainfall in areas and drought in ASAL areas since 2014. In early 2023, Kenya (and other countries in the Horn of Africa) were experiencing the longest and most severe drought on record, the result of a culmination of five consecutive failed rainy seasons in most parts of Kenya.[30] However, good performance of both short and long rains in 2023 after five failed seasons supported recovery from drought in ASALs.[31]

Mount Kenya's glaciers have shrunk to 17 percent of their original size and are expected to disappear in the next 30 years due to the increasing temperatures.[32] This will reduce river flows and lead to downstream environmental effects, including impacts on ecosystems, water resources, and socioeconomic activities.

II. CHANGING PRECIPITATION PATTERNS

Precipitation trends in Kenya are projected to remain highly variable and uncertain, with significant geographical diversity in rainfall trends. Average rainfall is expected to increase by mid-century, particularly during the 'short rains', which occur between October and December.[33] Increased aridity and drought have been observed, with extreme rainfall events occurring with greater frequency and intensity.

Extreme events from 2018 to 2024 in Kenya included flash floods, floods, landslides, and rising lake levels.[34] A climate change vulnerability assessment in the Upper Ewaso Nyiro basin (an ASAL ecosystem) showed that there has been high climate variability over 30 years especially within the long rains in March, April, and May.[35]

III. SEA LEVEL RISE AND TEMPERATURE INCREASE

Kenya is experiencing sea level rise, and the rate of sea level rise along East Africa's coast is projected to be greater than the global average.[36] Sea level rise along the Western Indian Ocean is estimated to be 3.6mm/year compared to the global average of 3.4mm/year.[37] Sea levels are expected to continue to rise along Kenya's coast (Figure 3 illustrates the expected increase under Representative Concentration Pathway (RCP) 4.5, which is the Intergovernmental Panel on Climate Change's moderate scenario in which greenhouse gas emissions peak around 2040 and then decline). Increasing sea surface temperatures, marine heatwaves, and ocean acidification alongside rising sea levels and stronger storm surges impact marine life, lead to coastal erosion, and increase the risk of flooding in the five coastal counties (Kwale, Mombasa, Kilifi, Tana River, and Lamu).

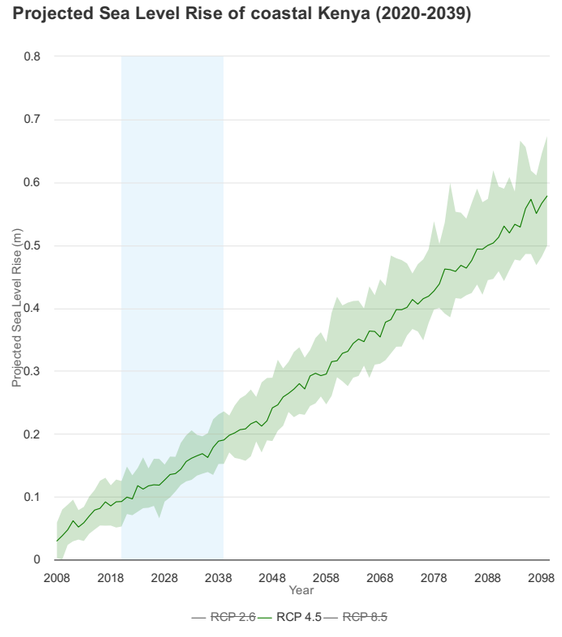

Figure 3: Projected sea level rise of coastal Kenya 2008-2098 (RCP 4.5)

Source: Climate Change Knowledge Portal (2021). *Kenya Impacts* – Sea Level Rise. World Bank Group. https://climateknowledgeportal.worldbank.org/country/kenya/impacts-sea-level-rise

Table 2 below summarises the major climate hazards and key sources of vulnerability in Kenya.

Table 2: Summary of climate hazards and climate change vulnerability in Kenya

Climate Hazards	Climate Change Vulnerability
Acute Increased frequency and severity of: • Heat stress • Extreme weather events • Floods • Landslides • Wildfires **Chronic / Slow onset** • Drought • Sea level rise and stronger storm surges • Ocean acidification	**Key sources of vulnerability** • Poverty, with 18% of the population considered extremely poor in 2022 (living on less than USD 1.90 per day); high levels of multi-dimensional poverty in the ASALs • Significant disparities between rural and urban areas, poverty rates in rural areas were 6.5 times higher than urban areas in 2022 • Population growth, with 75% of the population under the age of 35 in 2019 • Gender inequality • High reliance of the national economy and local livelihoods on natural resources • High dependence on rainfed agriculture and insufficient irrigation systems; 98% of agriculture production is rainfed • Water scarcity and mismanagement of water resources • Environmental degradation, including loss of forest cover • Pastoral mobility • Insecure land tenure and land fragmentation • Migration to urban areas • Poor urban and land-use planning; rapid and haphazard urbanisation • Large number of informal settlements due to rural–urban migration • Limited access to quality healthcare, particularly in rural areas • Inadequate access to improved technologies • Inadequate finance to address climate change priorities
	Particularly vulnerable regions • Arid and Semi-Arid Lands (ASALs) • Low-lying coastal regions
	Particularly vulnerable groups • Pastoralist communities, hunters and gatherers, and fisher communities • Women • Children/Youth • Persons with disabilities • Elderly • People with small landholdings and/or livelihoods dependent on natural resources • People living in informal settlements

Source: Government of Kenya (2023). National Climate Change Action Plan 2023-2027.

2.2 CLIMATE VULNERABILITY

Kenya is recognised as highly vulnerable to climate change impacts and has been ranked 149 out of 181 countries in the 2020 Notre Dame Global Adaptation Initiative (ND-GAIN) Index (see Figure 4).[38]

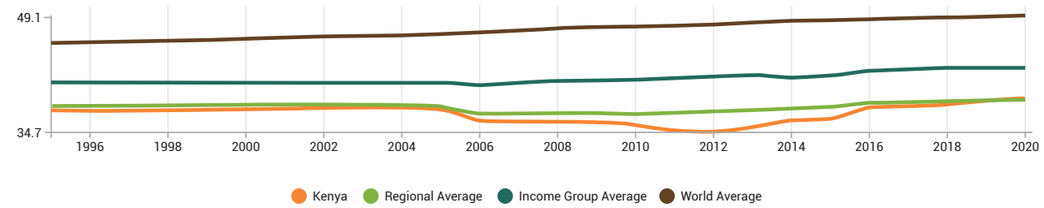

Figure 4: ND-GAIN Index for Kenya

Source: USAID Data Services. (n.d.). *International Data and Economic Analysis: ND-GAIN Overall Country Index.* https://idea.usaid.gov/cd/kenya/environment-and-global-climate-change

As summarised in table 2 above, the high levels of climate vulnerability in Kenya can be attributed to a low-lying coastline; heavy dependence on rainfed agriculture; water scarcity; insecure land tenure; and environmental degradation and related conflicts over natural resources like water and pasture during the very dry seasons.[39] In addition, communities and systems in the ASALs – which constitute up to 89 percent of the land area and 38 percent of the country's total population[40] – are highly vulnerable to climate change because of high levels of poverty and recurring droughts. Kenya's rapidly increasing population and subsequent migration to urban areas increases vulnerability to climate change. Over 51 percent of the urban population in Kenya in 2020 was considered poor and lived in informal settlements that were poorly planned and without basic infrastructure and services.[41] These informal settlements are most at risk and vulnerable to the adverse effects of climate change as they largely occupy low lying riverine areas and floodplains.

The expected changes in rainfall, coupled with increased aridity and more severe droughts, are anticipated to increase existing vulnerabilities in the agriculture, forests, and urban area sectors, as well as in livestock and dry land natural resource management. Kenya's most vulnerable areas to climate change are the ASALs where both crop and livestock production are expected to suffer

increasingly from droughts and flash flooding. Flooding hotspots include the low-lying coastal areas of the Tana delta, Kano plains, and Budalangi in western Kenya. Flash flooding is also increasingly common in urban areas partly due to poor planning and environmental management especially in the informal human settlements.

The most vulnerable groups include pastoralist communities, hunters and gatherers, and fisher communities that are affected by climate change because of environmental degradation and growing competition for land and water.[42] During the month of March 2023, for example, high rates of livestock mortality were noted in number of counties. The most affected counties with above-normal livestock mortality rates (5 percent) were ASALs and included Marsabit, Kajiado, Isiolo, Samburu, Turkana, Wajir, and Mandera.[43]

The vulnerability level of households in pastoral rangelands is largely determined by the gender and education level of the household head.[44] For example, women-headed households are highly vulnerable to climate change due to lack of ownership and control over productive assets. The role of women as primary caregivers and providers of food and fuel makes them more vulnerable when flooding and droughts occur. In general, the impacts of climate change on women are particularly acute in the agriculture and water sectors where they play significant roles.[45] For example, women comprise 75 percent of the agricultural labour force in Kenya.[46] Across many communities, women are responsible for fetching water for household use. During drought, they spend many hours and trek long distances to obtain water for domestic use; while during floods, they spend a significant amount of time searching for firewood. In some instances, hunger causes them to resort to negative coping mechanisms.[47]

Children and youth under 35 years of age, who constitute over 75% of the Kenyan population, are particularly vulnerable to climate change hazards such as droughts, floods, and heat stress. Compared to adults, children are less likely to withstand and survive climate-related shocks; are susceptible to associated nutrition deficits; and are more likely to be affected by climate-sensitive diseases. Those with disability or facing displacement often experience additional challenges during extreme weather events. The 2023 short rains assessment report found high malnutrition levels among children aged 6 to 59 months across ASALs due to the cumulative effects of previous five failed rain seasons, poor child feeding habits, and high disease burden.[48]

2.3 CLIMATE CHANGE RISKS AND IMPACTS

Climate change is causing an increase in average global temperatures, creating significant environmental and economic disruption. Increasing temperatures, changing precipitation patterns, and rising sea levels are impacting Kenyans, and both human and livestock health are increasingly at risk. Floods inundate large areas of arable land causing loss of human lives, death of livestock, and destruction of crops and infrastructure.

The impacts of climate change and climate-related disasters are felt at the household level through food insecurity, damage to property, increased prices of food and fuel, and declining access to water and other environmental services. At the national level, repeating cycles of floods and droughts in Kenya have had large socio-economic impacts and high economic costs as scarce government resources are re-allocated to address climate emergencies.[49] Socio-economic losses associated with climate change in Kenya over the past decade were estimated to amount to between 3 percent and 5 percent per year.[50] Projections for the 2021-2050 period prepared for Kenya's Long-term Low Emission Development Strategy estimate losses rising to between 6.5 percent and 8.5 percent of GDP annually, which translates to about USD 11 billion. Adaptation actions have the potential to reduce this loss by about one third over the same period highlighting the need to implement priority actions.[51] Below are highlights of risks and impacts organised by NCCAP III priority areas.

DISASTER RISK MANAGEMENT

Many parts of the country experience severe drought that is followed by heavy rainfall and flooding that has led to deaths, displacement of populations, property destruction, and disruption of agriculture and livelihoods. The Centre for Research on the Epidemiology of Disasters ranked Kenya among the top five African countries affected by droughts and floods between 2002 and 2021.[52]

In Kenya, rainy seasons are becoming progressively wetter, with sudden and/or late onsets bringing **floods** and inundation. Major floods periodically afflict the Winam Gulf of Lake Victoria, the Lower Tana basin, and the coastal regions. Floods impact an average of 75,000 Kenyans annually, with increasingly significant numbers being in the informal urban settlements. The estimated costs of floods are about 5.5 percent of GDP every seven years.[53] The NCCAP progress reports indicated that floods in early 2018 claimed over 183 lives, displaced more than 225,000 people including over 145,000 children, and closed over 700 schools. Forty out of 47 counties were affected. The floods also submerged an estimated 21,700 acres of farmland, destroying crops within the same counties that had been affected by drought, and killed more than 19,000 livestock. The heavy rainfall of the October-November-December 2019 rainfall season resulted in widespread flooding that led to the displacement of many families, especially near the Kenyan border with Ethiopia. In 2020, floods adversely impacted more than 800,000 Kenyans in 29 counties; including about 300 people that died and 100,000 people that were displaced. Heavy rains in the Arabian Peninsula in 2019/2020 created conditions that favoured a desert locust outbreak – the first witnessed in Kenya in decades. The outbreak affected 26 counties and caused significant losses totalling 609,999 ha (30,213 ha of cropland and 579,786 ha of pastureland) in the 16 most affected counties.[54]

The 2023 March-April-May long rains brought flash floods that resulted in 36 deaths; 7,568 livestock deaths; destruction of 6,070 hectares of farmland; and an increase in cholera cases from 4,831 in February to 11,694 by the end of June 2023. The 2023 October-November-December rains, which were enhanced due to the El Niño phenomena, led to 175 human fatalities; displacement of 109,581 households (545,595 persons); 5,146 livestock deaths; flooding of 34,223 hectares of cropland; and destruction of infrastructure such as roads, bridges, health facilities, and settlements.[55] Heavy rains in the long rain season of March, April, and May 2024 affected 43 counties, with flooding causing over 250 deaths and displacing over 41,000 households. The heavy rains resulted in damaged roads, schools, and health facilities; destruction of over 45,000 acres of crops; and over 10,000 livestock deaths.[56]

However, after a long period of drought, the good rains and by extension flooding supported the recovery of ASALs through the regeneration of forage and water resources, recovery of livestock including body conditions and productivity, and increased crop production.

Droughts in Kenya cause declines in water levels affecting agricultural activities, livestock keeping, and in the worst cases causing loss of lives.[57] Droughts impact an average of 6.5 million Kenyans annually (13 percent of the population); this is projected to rise to 34 percent of the population in the future.[58] Droughts account for losses equal to 8 percent of GDP every five years.[59]

Droughts contributed to conflicts, deteriorating health conditions, and forced displacement in large parts of the ASALs.[60] Conflicts often arose from increased competition over dwindling natural resources like water and pasture; and may be between communities or take the form of human-wildlife conflicts. In extreme cases, conflicts during severe drought can lead to displacement of households. The recent drought – contributed to by five consecutive poor or failed rainy seasons from 2020 to 2022 – hindered household access to water, food, and income. An estimated 2.5 million livestock died in 2022 as a result of drought causing economic losses of more than USD 1.5 billion.[61] During the 2023 January to March dry season, people trekked up to 30 kilometres to access water because 90 percent of semi-permanent open water sources had dried up in the ASALs.

FOOD AND NUTRITION SECURITY

Kenya is experiencing food insecurity due to climate change. A decline in overall crop yields has been experienced in most of the country due to insufficient availability of water, excessive moisture conditions, pests, diseases, and weeds. The impacts of climate change on food security are summarised below:

- 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 with at least 3.4 million people being severely food insecure. School attendance dropped in the counties that were impacted by the drought and an estimated 482,882 children, mainly from 23 ASAL counties, required treatment for acute malnutrition.[62]
- In 2019, the food security situation deteriorated in parts of Kenya due to the cumulative impact of the below-average short rains in 2018 followed by the poor 2019 long rains season.[63] The number of people in Kenya affected by food insecurity increased from 0.7 million in late 2018 to 3.1 million in late 2019.[64]
- The food security situation was negatively impacted by the locust invasion of 2019 that spilled over into 2020. Heavy rains in 2019 and 2020 created conditions conducive to the severe desert locust outbreaks in 2020 and 2021, which were the worst in decades and caused substantial crop losses and a worsening food security situation in Kenya and the region. The locust infestation affected the food supply of about 2.5 million people and livelihoods of some 3.5 million people. For example, the harvest per acre for maize reduced from 50 bags to 25 bags in a year.[65]
- The drought beginning in 2014 extended into early 2023, when an estimated 5.1 million Kenyans (27 percent of the ASAL population) were facing high levels of acute food insecurity and in need of humanitarian assistance because of drought.[65]

Climate shocks significantly impact annual growth rates of the agriculture sector. Climate change is negatively impacting crop yields in Kenya, with yield reductions of up to 45 percent expected for maize, rice, and soybean crops by 2100, and yield losses of up to 40 percent for tea and coffee because of reductions in suitable areas for cultivation caused by temperature increases.[67]

Drought has negatively impacted the pastoralists over years and has led to the loss of 70 percent of livestock in the ASALs.[68] Recurring droughts have forced an estimated 30 percent of livestock owners out of pastoralism over the past 20 years.[69]From 2007 to 2017, losses in livestock populations due to drought-related causes amounted to about USD 1.08 billion.[70]

WATER, FISHERIES AND THE BLUE ECONOMY

Kenya is a water scarce country with per capita water availability of about 452 m^3.[71] Water demand is projected to increase across all catchment areas and the availability of water is expected to get tighter in all areas.[72] Approximately 40 percent of the population did not have water coverage in 2020-21- which was a particular problem in rural areas where 86 percent of households fetched water from springs, wells, boreholes, and streams [73]

The decline in access to quality water in the country is exacerbated by climate change and its associated droughts. Climate change impacts on water resources have affected nearly all sectors including agriculture through unpredictable rainfall patterns, human health through water-borne diseases associated with flooding, as well as trade through the destruction of road and telecommunication infrastructure. Current climate change impacts on water availability are compounded by deforestation, unsustainable agricultural practices, low storage capacity (such as dams), as well as an increase in water demand from population growth and an expanding economy.[75] In early 2018, for example, many urban areas faced acute water shortages following a prolonged dry spell and the drying up of many rivers. Kenya shares over half the rivers, lakes, and aquifers with neighbouring countries, and their management may need cross-border coordination.

Kenya's fisheries sector, coastal ecosystems, estuaries, beaches, coral reefs, and marine biodiversity are at risk from sea level rise and increased ocean temperature and acidity. Sea level rise is a risk to the five coastal counties and their populations. An estimated 267,000 Kenyans will be at risk of coastal flooding by 2030 due to sea level rise. Research shows that an increase of 30 centimetres would likely submerge an area of 4-6 km^2 in Mombasa and 17 percent of coastal areas.[76]

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. The economic cost of impacts of climate change on fisheries and aquaculture is estimated to reach 3 percent of GDP per annum by 2030, and possibly 5 percent by 2050.[77]

FORESTRY, WILDLIFE AND TOURISM

Forests provide a number of environmental goods and services including catchment and biodiversity conservation functions, wildlife habitat, food, and medicinal and wood products that support the livelihoods of many communities. Kenya had a forest cover of 8.83 percent of total land area in 2021consisting of natural forests, plantation forests, open woodlands, and mangroves along the coast.[78] The forest sector is estimated to contribute 3.6 percent of GDP; and the five forests found in the main water towers regulate 75 percent of renewable water supplies. About two-thirds of the energy generated in Kenya comes from biomass. [79]

Climate change, together with unsustainable forest management practices, negatively affects ecosystems and the related environmental goods and services that they provide. The impacts include forest degradation, damage and transformation of forest areas, and changes in species composition among others. Wildfires are particularly common during dry seasons and destroy large forests areas whenever they occur.

Kenya Wildlife Services (KWS) reported that in some years, more animals die from drought than poaching in Kenya.[80] The severe drought that was alleviated with the onset of rains in March 2023 saw significant numbers of wildlife species dying from lack of water and pasture and increased human-wildlife conflicts. KWS reported that the Amboseli ecosystem lost over 6,000 individual wildlife from 20 species in the most recent drought, the highest numbers recorded in that area.[81] Drought in 2021 and 2022 caused drought-related mortalities of several large mammal species in eight conservation areas (see figure 6 below).

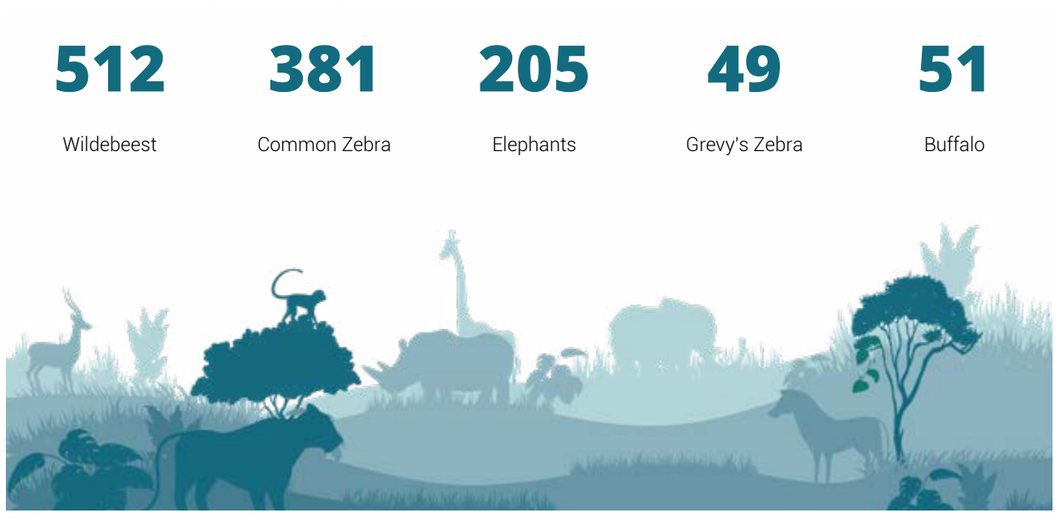

Figure 5: Drought-related mortalities of select large mammals in eight conservation areas, 2021-2022

Source: Mwiu, S., Ngene S.,, Omondi, P., Ndeereh, D., Lala, F., Muteti, D., Khyale, C., Bundotich, G., Omengo, F., & Maina, P. (2022). *The Impacts of the Current Drought on Wildlife. Nairobi*: Wildlife Research and Training Institute. Page iii.

Climate change facilitates the spread and establishment of many Invasive Alien Species (IAS) and creates new opportunities for them to become invasive. IAS have a devastating impact on the native species and research led by the Centre for Agriculture and Bioscience International (CABI) prioritised a list of 120 potential IAS (including 70 arthropods, 9 nematodes, 15 bacteria, 19 fungi/chromist, 1 viroid, and 6 viruses) that could pose a threat to agriculture and biodiversity in Kenya.[82]

The main plant invasive species include Mathenge (Prosopis juliflora) and Water hyacinth (Eichhornia crassipes). Mathange is the most notable invasive woody species in Kenya. It was introduced in the Baringo region to control widespread land degradation but has since spread to large parts of the ASALs leading to loss of pasture and wreaking havoc on grazing lands. Other negative impacts include reduced biodiversity, loss of agricultural land, and injury to livestock. Furthermore, it threatens the sustainability of the indigenous species and the proper functioning of ecosystem services. IAS rank among the most significant drivers of species extinction and ecosystem degradation resulting in significant impacts on socio-economic development. Even more concerning is the growing list of endangered species in Kenya, whose habitats are destroyed by the invasive species.[83]

HEALTH, SANITATION AND HUMAN SETTLEMENTS

More severe and frequent flooding are likely to displace communities and increase the risks of water-borne diseases, such as cholera, dysentery, and typhoid that already affect large numbers of Kenyans. The outbreak of water- and vector-borne diseases during periods of flooding is an established public health concern in Kenya.

Higher temperatures are projected to increase heat-related deaths especially among the elderly and contribute to extending the risk of malaria to new areas. Approximately 13 to 20 million Kenyans are at risk of malaria, and vulnerable populations especially pregnant women, children, the elderly and those with pre-existing health conditions are particularly at risk.[84] The percentage of the population at risk is increasing because malaria transmitting mosquitoes have moved to higher elevations by about 6.5 metres per year, facilitated by climate change.[85] Other health-related risks include an increase in acute respiratory infections for ASAL areas, emergence and re-emergence of Rift Valley fever and leishmaniasis, and malnutrition.[86] Climate change has been identified as a factor contributing to the increased burden of zoonotic diseases in Kenya, such as Brucellosis, Anthrax and Rift Valley fever.[87]

The increasing frequency and intensity of weather-related disasters in Kenya aggravates conflicts, mostly over natural resources, and contributes to security threats. Resource-based conflicts in the ASALs often get worse with drought. Intercommunity conflicts are common especially in the arid counties and intensify during drought as communities fight over scarce water and pasture resources.[88] Resource-based conflicts have resulted in the loss of human lives, livestock, forced migration, and displacements.

MANUFACTURING

The manufacturing sector, specifically the agro-processing industry, is also affected by the changing climate, particularly declining water and raw material availability. For instance, the 2011 and 2017 droughts affected tea production across the country and resulted in diminished turnover in processed tea. Drought accounted for tea yield losses of 14-20 percent in Kenya and plant mortality of 6-19 percent, which means that tea producers may lose up to 30 percent of their cash earnings due to climate variability.[89] Droughts lower water levels in the hydroelectric dams resulting in power outages that negatively affect manufacturing including small enterprises that are key in providing an asset base for vulnerable community members.

ENERGY AND TRANSPORT

Climate change, including temperature increase and higher frequency and intensity of extreme weather events, damages energy and transport infrastructure. These climate hazards increase the risk of delays, disruptions, damage, and failure across land-based, air, and marine transportation systems and impact the design, construction, location, and operation of electricity generation and transmission infrastructure.

A vulnerability assessment of hydroelectric energy resources impacted by climate change in the Seven Forks project found that the catchment temperature is rising by 0.02°C annually while the rains are declining by 3.9 mm annually. The Masinga reservoir inflow is dropping by 0.74 cubic metres of water per second annually, and thus the average power output operates below capacity by up to 16-Gigawatt hours annually.[90]

The transport sector is vulnerable to climate change impacts, particularly flooding. The Kenya Highways Authority participated in a vulnerability assessment of the Horn of Africa Gateway project, a large road infrastructure project, that found projected increased rainfall is expected to increase the risk of flooding, erosion, washouts, and siltation, and to aggravate connectivity problems.[91]

03

NATIONAL ADAPTATION PRIORITIES

As indicated in the climate change documents - including the NAP, NDC, and NCCAPs - Kenya prioritises adaptation due to the high levels of vulnerability across the key sectors that contribute the highest proportion to the country's GDP, such as agriculture, tourism, industry, and manufacturing.[92]

The priority adaptation actions are summarised in the NAP and NDC for the period up to 2030, and these priorities are implemented through the NCCAP process. The five-year NCCAP cycle provides room for review and update on a regular basis.

3.1 KEY PRIORITIES FOR ADAPTATION

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

Table 3: Priority adaptation programmes in Kenya's 2020 Updated NDC

Planning Sector	Adaptation Programme
Disaster Risk Reduction	P1: Drought risk management including drought early warning, preparedness, and response for enhanced drought resilience.
	P2: Flood risk management incorporating nature-based solutions.
Agriculture (crops, livestock and fisheries)	P3: Mainstream CSA towards increased productivity through value chain approach to support the transformation of agriculture (crops, livestock and fisheries) into an innovative, commercially oriented, competitive and modern sector.
	P4: Build resilience of the agriculture (crops, livestock and fisheries) systems through sustainable management of land, soil, water and other natural resources as well as insurance and other safety nets.
	P5: Strengthen communication systems on CSA extension and agro-weather issues.
Environment	P6: Rehabilitation and conservation of degraded forests.
	P7: Establish at least 2,000 ha to promote nature based (non-wood forest products) enterprises across the country.
	P8: Establish 150,000 ha commercial private forests plantations.
	P9: Plant 350,000 agro-forestry trees in farmlands established.
	P10: Greening of 14,000 ha of infrastructure (roads, railway lines, dams).
	P11: Enhance/strengthen governance of community structures in participatory resource management in coastal ecosystem
	P12: Conduct blue carbon readiness assessment for full integration of blue carbon/ocean climate actions into NDCs.
	P13: Develop marine spatial planning and outline sustainable management approaches.
	P14: Promote and expand opportunities for nature-based enterprises including seaweed farming and mangrove ecotourism.
	P15: Integrate the use of nature-based solutions, including the implementation of national mangrove management plan, into national and county development plans.
	P16: Strengthen early warning and tailor-made climate information services through institutional strengthening of KMD and other information user institutions.
	P17: Roll-out Early Action Protocols for forecast-based financing.
Infrastructure (energy)	P18: Develop and adopt guidelines on how to climate proof energy infrastructure using vulnerability risk assessment.
	P19: Enhance climate proofing of energy infrastructure along the renewable energy supply chain.
	P20: Increase the number of companies participating in energy efficient water-use initiatives by 40% from the baseline.
Infrastructure (roads)	P21: Upscale the construction of roads to systematically harvest water and reduce flooding.
	P22: Enhance institutional capacities on climate proofing vulnerable road infrastructure through vulnerability assessments.
	P23: Promote the use of appropriate designs and buildings materials to enhance resilience of at least 4,500 km of roads to climate risk.
Water and Sanitation	P24: Conduct and implement recommendations on climate and risk assessment on water, sanitation and irrigation infrastructure.
	P25: Build resilience infrastructure for the protection of dams, dykes and river lines.
	P26: Promote water harvesting and storage at county and household levels.
	P27: Mainstream climate change into water catchment management plans.
Health	P28: Conduct a vulnerability and risk assessment of different climate risks on human health.
	P29: Develop a public awareness and social mobilisation strategy on climate change and health impacts.
	P30: Develop health programmes, protocols and guidance to manage new climate change related diseases and risks.
	P31: Reduce the incidence of malaria, other vector-borne diseases and other health conditions.
Population, Urbanisation and Housing	P32: Introduce nature-based solutions in flood control especially around informal settlements and selected urban areas.
	P33: Strengthen the enforcement of green building codes by national and county governments.
	P34: Conduct climate risk and vulnerability assessment of building/housing infrastructure especially, to flooding and sea level rise.
Tourism	P35: Develop and adopt guidelines of how to integrate adaptation across the tourism sector.
	P36: Conduct a climate risk and vulnerability assessment of the tourism sector.
	P37: Develop climate resilient action plans for the sector.
Gender, Youth and Other Vulnerable Groups	P38: Develop social safety net structures for women, youth and other vulnerable groups within the CCCFs.
	P39: Strengthen access of women, youth and other vulnerable groups to enterprise funds, climate finance and credit lines.
	P40: Promote gender responsive technologies and innovation in the private sector through financing capacity building and start-up services.
	P41: Consolidate successful technologies and develop a transfer strategy to women, youth and other vulnerable populations.
Private Sector	P42: Mobilise financial resources from capital markets and other financial instruments for green investments and implementation of the Green Business Agenda.
	P43: Eco-label industrial products to promote green procurement especially by public procurement agencies.
	P44: Climate-proof waste management infrastructure for waste management facilities in Special Economic Zones (effluent treatment plants).
	P45: Increase the number of companies participating in efficient water-use initiatives.
Devolution	P46: Develop and adopt county adaptation guidelines for integration in CIDPs.
	P47: Build the capacities of County CCUs on adaptation.
	P48: Conduct vulnerability and risk assessment in counties.
	P49: Develop county adaptation plans for the counties with CCCFs.
Adaptation M&E System	P50: Refine and operationalise the adaptation monitoring and evaluation system at national and county levels.

Source: Government of Kenya. (2020). *Updated Nationally Determined Contribution.* Pages 15-16.

Key areas identified in the updated NDC as critical to bridging the adaptation implementation gap include:

- Strengthening adaptive capacity and climate resilience across all sectors of the economy at national and county levels.
- Financing locally-led climate change actions for enhanced resilience of local communities.
- Developing and applying comprehensive climate risk management tools.
- Enhancing access to and use of climate information in planning and decision making across sectors and counties.
- Promoting uptake and use of relevant adaptation technologies especially targeting women, youth, and vulnerable groups that make use of scientific and indigenous knowledge.
- Heightening investment in the blue economy.
- Strengthening of coordinating institutions such as CCD and CCUs at both national and county levels as well as non-state actors working on climate change.[93]

The priority actions identified in support of the above are geared at generating social, economic, and environmental benefits; and avoiding loss and damage in productive sectors. The priority actions were clustered into eight strategic areas in the NCCAP 2023-2027 to align with the government's BETA agenda and facilitate implementation. The eight strategic areas are disaster risk management; food and nutrition security; water, fisheries and the blue economy; forests, wildlife and tourism; health, sanitation and human settlements; manufacturing; energy and transport; and children and youth (see Table 4). In addition, the NCCAP 2023-2027 includes enabling actions to enhance delivery of adaptation actions in the areas of policies and regulatory frameworks; finance; technology; and capacity building.

Table 4: NCCAP 2023-2027 climate change priorities and objectives

Disaster Risk Management	Reduce risks to communities and infrastructure resulting from climate-related disasters and enhance institutional preparedness and response.
Food and Nutrition Security	Increase food and nutrition security by enhancing productivity and resilience of the agricultural systems, in as low carbon a manner as possible.
Water, Fisheries and the Blue Economy	Enhance the resilience of the Blue Economy and water sector by ensuring access to and efficient use of water for agriculture, manufacturing, domestic, wildlife, and other uses.
Forestry, Wildlife and Tourism	Strengthen the ability of forest, tree, and wildlife resources to respond to the impacts of climate change, provide climate mitigation solutions, and improve resilience of social systems across various landscapes.
Health, Sanitation and Human Settlements	Mainstream climate change adaptation into the health sector; and increase the resilience of human settlements, including improved solid waste management in urban areas.
Manufacturing	Improve energy and resource efficiency in the manufacturing sector.
Energy and Transport	Ensure an electricity supply mix based mainly on renewable energy, an electricity system that is resilient to climate change and promotes energy efficiency, and encourage the transition to clean cooking. Establish efficient, sustainable, world-class transport systems and logistics systems that withstand the projected impacts of climate change.
Children and Youth	Children and youth rights are safeguarded from the impacts of climate change including through active and continuous involvement in climate action and related policy and decision making.

Source: Government of Kenya. (2023). National Climate Change Action Plan (NCCAP) 2023-2027. Nairobi: Ministry of Environment, Climate Change and Forestry.

The priority actions have been mainstreamed in the Fourth Medium Term Plan (MTP) and CIDPs to ensure they are implemented at both sectoral and county levels.

3.2 SYNERGIES WITH OTHER GLOBAL FRAMEWORKS

Kenya is a party to many multilateral environmental agreements whose implementation has synergies with the actions to achieve the goals of the UNFCCC and its Paris Agreement. These agreements include the UN Agenda 2030 for Sustainable Development and the Sustainable Development Goals (SDGs); the other two Rio conventions (UN Convention on Biological Diversity and UN Convention to Combat Desertification and Land Degradation); the Sendai Framework on Disaster Risk Reduction; the Montreal Protocol on ozone-depleting substances; the Ramsar Convention on Wetlands; and the Global Compact for Safe, Orderly and Regular Migration; among others.

The country has made significant strides in domesticating the multilateral environmental agreements and continues to implement resulting policies and strategies on the same. Examples of such efforts include the development of the climate change policy and regulatory framework, in addition to the National Policy for Disaster Management 2017; Climate Risk Management Framework 2016; and National Biodiversity Strategy and Action Plan 2019-2030, among others.

The government is actively contributing to the achievement of the UN SDGs. An SDG Coordination Directorate was created under the State Department of Economic Planning, National Treasury and Economic Planning, to provide leadership in mainstreaming the SDGs in planning, policies, and budgeting at national and county levels. It also coordinates tracking and reporting on SDGs. This has ensured that the five-year MTPs and CIDPs mainstream the SDGs, climate change adaptation, and disaster risk management.[94] The Fourth MTP (2023-2027) recognises the challenge of climate change and prioritises investments aimed at building resilience against these challenges, including climate smart agriculture and construction of water pans, small dams, and water harvesting structures in the ASALs.[95]

The Climate Risk Management Framework was developed in 2016 to foster stronger coordination among government institutions working on climate change adaptation, disaster risk management, and sustainable development at both national and sub-national levels. The framework focusses on hydrometeorological disasters considering their frequency and wide-ranging impacts on society and the economy. Implementation of this framework is expected to enhance synergy, efficiency, and impact in resilience building across institutions and the two levels of government as well as regionally within the Greater Horn of Africa and internationally.[96]

The Government of Kenya has taken significant steps to align efforts under the Paris Agreement, Sendai Framework for Disaster Risk Reduction, and 2030 Agenda for Sustainable Development. Being a highly vulnerable country with a significant proportion of the population living below the poverty line and directly dependent on the natural resources, the adaptation actions in the NCCAP 2023-2027 have been framed in such a way that they address the multiple objectives of building resilience, reducing poverty, and supporting environmental sustainability. The NCCAP 2023-2027 is aligned with the SDGs and disaster risk reduction agendas through a shared vision for climate-resilient development. Climate change is recognized as a threat to national sustainable development in Kenya, and disaster risk management is a top priority in climate change programming.[97]

04

TRADITIONAL, INDIGENOUS, AND LOCAL KNOWLEDGE

The Government of Kenya recognises the value of traditional, indigenous, and local knowledge in supporting adaptation to climate change across all sectors of the economy. This can be seen from the many progressive policies and legislations on traditional and indigenous knowledge (e.g., the National Biodiversity Strategy and Action Plan 2019-2030, and The Protection of Traditional Knowledge and Cultural Expression Act, 2016).

The Climate Change (Amendment) Act, 2023 provides for a representative of the indigenous people as one of the members of the National Climate Change Council. The Council is concerned with providing strategic policy guidance, advice on climate change action, as well as approval of the NCCAPs. The NCCAP 2023-2027 consultation process engaged with representatives from indigenous peoples and local communities; and various actions highlight the importance of incorporating traditional knowledge.

Various institutions have been active in climate change processes and represent the views and interests of indigenous communities in policy making, for example, during preparation and implementation of climate change plans and strategies, the majority of which are on adaptation. These organisations include:

- Centre for Traditional Medicine and Drug Research.
- Coastal Biodiversity Conservation Unit.
- Indigenous Information Network.
- Indigenous Livelihoods Enhancement Partners.
- Kenya Resource Centre for Indigenous Knowledge.
- Natural Products Industry Initiative Programme under Vision 2030.
- Seed Savers Network.

The Kenya Resource Centre for Indigenous Knowledge was established in 1992 to document indigenous food plants and focusses on documenting, preserving, and disseminating indigenous knowledge as part of Kenya's natural and cultural heritage. Key achievements include the promotion of traditional foods and safeguarding traditional food ways in Kenya. It was selected in 2021 to be included in the UNESCO register of best practices in safeguarding intangible cultural heritage.[98] The Kenya Agricultural and Livestock Research Organization and the National Museums of Kenya through the Kenya Resource Centre for Indigenous Knowledge and other actors have been working to document, preserve and promote indigenous germplasm in-situ and ex-situ as part of efforts to promote food and nutrition security. The indigenous food plants are generally better adapted to local environmental conditions, which can be important for a plant's ability to adapt to climate change and will increasingly play a critical role in food and nutrition security.

The Coastal Biodiversity Conservation Unit of the National Museums of Kenya promotes sustainable livelihoods through the Kipepeo butterfly breeding project and honey production for export in the Arabuko Sokoke Forest in the coastal region that provides income for forest neighbouring communities hence reducing pressure on the forest.[99] The Seed Savers Network is concerned with training farmers on agroecology and promoting a seeds saving culture, regenerative farming practices, and food sovereignty ideals.

The Natural Products Industry Initiative under Vision 2030 aims at building a vibrant natural products industry by exploiting the interface between indigenous knowledge and modern science, technology, and innovations. It has since developed a policy, new innovations of natural products, and mainstreamed technologies into formal education curriculum.

Other areas where indigenous and local knowledge contribute to adaptation learning and programming include weather forecasting as in the case of Nganyi community in Western Kenya and among pastoralist groups such as the Borana of Northern Kenya.[100] The Nganyi are largely crop farmers while the Borana are pastoralists inhabiting dryland areas characterised by high levels of climate variability. Based on the appreciation of indigenous and local knowledge and practices in addressing climate-related challenges, both the Nganyi and local institutions among the Borana have been working with the KMD to prepare harmonised weather forecasts that are then disseminated to local communities through a variety of channels including community radio stations (e.g., Anyole FM – a radio station built with support of KMD - in the case of Nganyi) and public meetings. Traditional institutions such as the Dedha among the Borana have been used as intermediaries for disseminating climate information to users.[101]

Traditional, indigenous, and local knowledge and practices are expected to increasingly feature and inform the design and implementation of adaptation programmes in Kenya, which is of particular importance in promoting locally-led adaptation across the 47 counties, such as the FLLoCA program. Preparation of the third NCCAP 2023-2027 benefited from stronger engagement of indigenous people with the process including a representative on the steering committee and the incorporation of lessons learnt from some of the on-going initiatives on indigenous knowledge.

05

IMPLEMENTATION OF ADAPTATION ACTION AND PLANS

The national and county governments and non-state actors including NGOs, CSOs, the private sector, research organisations, institutions of higher learning, and media, have undertaken several initiatives to respond to climate change impacts. Additionally, a wide range of private sector actors have been mobilised to produce adaptation resources through partnerships, including to support adaptation among groups, regions, and other sectors.[102] Detailed information on the status of implementation of adaptation actions is captured in the NCCAP implementation progress reports for financial years 2018/19 and 2019/20[103] ; the review of progress of implementation of the NAP in the agriculture sector[104] and the EDE medium-term review report among others. Below are a few examples of adaptation actions being implemented under the various NCCAP priority areas.

5.1 DISASTER RISK MANAGEMENT

The adaptation actions in the disaster risk management (DRM) strategic area promote a proactive approach to addressing climate-related disasters through flood and drought early warning systems, improved social protection programmes, implementation of flood management plans, and community-level capacity building to raise awareness and education on disaster management and flood hazards.[105]

From 2018 to 2022, work was undertaken to issue cash transfers in areas impacted by drought through the Hunger Safety Net Programme and the National Safety Net Programme. Drought and flood early warning systems, climate information services, dam safety systems, and flood control systems were installed or improved to help communities cope with and manage climate risks. Highlights are included below.

The Government of Kenya, with the support of development and humanitarian partners, prepared the Disaster Risk Management Policy in 2017. The policy establishes DRM institutions that address prevention, preparedness, relief, and rehabilitation. DRM issues are coordinated through existing institutions like the National Disaster Operations Centre, NDMA, National Disaster Operations Unit, and National Safety Net Programme. Moreover, the policy provides for a County Disaster Risk Management Committee in each county and recognises that DRM is a shared function between the national and county governments.[106]

The Ending Drought Emergencies (EDE) Phase I (2013-2022) was a government-led initiative aimed at facilitating a holistic approach to building resilience to drought risks through optimisation of synergies and a layering of interventions. It focussed on the 23 most drought prone counties with a view of ensuring better targeting, alignment, and coordination of investments by both levels of government and development partners. Despite an increasing frequency and intensity of drought, resilience investments during EDE I reduced the worst forms of suffering due to drought, as a lesser loss of livelihoods was experienced in 2021/2023 compared to 2016/17 despite the former drought being more severe. As a result, a process is underway to prepare an EDE phase II 2023-2032 to ensure that gains made with drought management during phase I are secured going forward.[107]

BOX 2

The Ending Drought Emergencies Initiative in Kenya

The Ending Drought Emergency (EDE) initiative 2013-2022 was developed on the understanding that the impacts of drought and the worst forms of suffering could be minimised or eliminated with sustained investment in holistic drought risk management strategies. The EDE initiative covered 23 ASAL counties of Kenya which accounted for over 80% of the land area, 35% of the population, 70% of the livestock, and 90% of the wildlife.

Drought has become more frequent and intense with the latest drought running from 2021 to early 2023. While this drought is more severe than the 2016/2017 drought and one of the worst since 1984, the current loss of livelihoods and level of suffering due to the drought is significantly lower. Significant and sustained investments made in communities over the last 10 years by government and development partners has increased the resilience of people, communities, and agricultural and livestock systems – meaning they are better able to cope with the impacts of climate change.

Source: NDMA, 2023. Report on Experts consultation meeting for the development of EDE strategy Phase II. Nairobi

5.2 FOOD AND NUTRITION SECURITY

Agriculture is a priority for Kenya because of the sector's importance to food security, rural livelihoods, and poverty alleviation. An increased incidence of drought and unreliable rainfall affect agriculture and contribute to food insecurity and poor nutrition in Kenya. The Kenya Climate Smart Agriculture Strategy (2017-2026) and Kenya CSA Implementation Framework (2018-2027) were developed with the objectives of increasing productivity, building resilience, and enhancing co-benefits along the diverse agricultural value chains. The strategy builds on the NCCAPs and the NAP and was largely driven by the important role of agriculture within the Kenyan economy and the high levels of vulnerability in the sector. A number of adaptation initiatives or programmes across the crops, livestock, and fisheries sectors are implemented as part of the strategy. Examples include the Kenya Climate Smart Agriculture Project (KCSAP); Kenya Cereals Enhancement Programme–Climate Resilient Agricultural Livelihoods Window (KCEP-CRAL), Towards Ending Drought Emergencies: Ecosystem based Adaptation in Kenya's Arid and Semi-arid Rangelands (TWENDE), and National Agricultural Rural Inclusive Growth Project (NARIGP) among other projects and programmes targeting resilience building in the sector.

KCSAP was a Government of Kenya project supported by the government and through a World Bank concessional loan. KCSAP was implemented over a five-year period (2017-2023). The main actions included improving crop productivity through implementation of CSA interventions, increasing crop productivity through improved irrigation, improving productivity in the livestock and fisheries sectors through implementation of CSA interventions, and diversification of livelihoods to adjust to a changing climate. Key achievements included farmers and livestock keepers accessing climate-oriented insurance (see case study 1), significant reductions in pre- and post-harvest losses, and re-seeding of rangelands.[108]

CASE STUDY 1 THE ROLE OF INDEX-BASED LIVESTOCK INSURANCE IN DROUGHT RISK MANAGEMENT AND RESILIENCE BUILDING IN KENYA

Background

More than 75 percent of livestock losses among pastoralists in Kenya is attributed to drought. Between 2008 and 2011, the Kenyan economy suffered USD12.1 billion in damages due to drought, with livestock losses accounting for over 70 percent of the economic losses. The 2016-2017 drought recorded 2.7 million people in need of humanitarian assistance, and the current drought has already adversely affected the food security status of more than five million households in the country. Index-based Livestock Insurance (IBLI) was first developed in 2018 to help cushion pastoralists from the impacts of drought.

IBLI includes standard premiums and pay-outs that are determined within defined geographic insurance units. It was first sold in Marsabit County in 2010 and has been scaling up since. IBLI contracts rely on Normalised Different Vegetation Index (NDVI) satellite imagery, a proxy for available biomass, to make payments to those policyholders living in regions that are affected by poor forage availability compared to the average conditions. Compensation is provided early in the season to minimise livestock losses by supporting drought coping strategies. IBLI coverage has been shown to increase investments in livestock health services, improve household income, and reduce distress sales of livestock during drought when prices are low. While IBLI is a commercial product sold by local insurance companies, in 2015 the State Department of Livestock with support from the World Bank began purchasing IBLI policies on behalf of targeted vulnerable pastoral households in northern Kenya under the Kenya Livestock Insurance Program. At the same time, pastoral households in Kenya continue to purchase the IBLI product on the commercial market.

Key activities

The first key aspect of IBLI is product design and improvement. Product design usually involves the creation of the unit areas of insurance through a clustering exercise. This exercise combines remote sensing techniques with participatory stakeholder discussions with community members. Using the NDVI, forage availability is monitored within each unit area of insurance.

The second main activity involves capacity building to ensure effective delivery of the IBLI product at the last mile. Capacity building is done both on the demand side and the supply side. Training manuals are developed and disseminated to pastoralists to increase their knowledge and understanding about the IBLI product including its benefits, how forage availability is monitored remotely, the mechanisms through which pay-outs are triggered, and where to buy. This helps to establish informed and effective demand. Wide scale knowledge and IBLI diffusion is achieved through working with village insurance promoters who live in and are trusted by the communities. In addition, insurance companies have agents in all the unit areas of insurance. Leveraging these structures helps to ensure availability and access to IBLI at the last mile. Finally, pay-outs are made directly by the insurance companies using digital innovations via M-Pesa (a mobile phone-based money transfer service), which has ensured successful diffusion and scaling of IBLI.

There are ongoing efforts, as the third set of activities, to bundle IBLI with other services. These include financial (credit and savings) services, veterinary services, fodder production, and climate information services. Bundling of IBLI with other services is important to enhance the value proposition and ensure a sustainable business case to value chain actors.

Benefits

- Programs implemented by governments, NGOs, private sector, and humanitarian organisations are increasingly integrating IBLI for long-term adaptation resilience building. Beyond protecting livestock, IBLI plays an important role in protecting livelihoods.
- During drought, households with IBLI coverage have been found to obtain higher incomes and milk production (Matsuda, et al., 2019); are 27–36 percent less likely to skip meals and 22–36 percent less likely to practice distress selling (Janzen & Carter, 2018).
- IBLI coverage increases investments in livestock as a productive asset. Evidence shows a doubling of veterinary expenditures and 46 percent increase in livestock sales in non-drought years (Jensen & Barret, 2017). In addition, IBLI reduces the risk inherent in keeping livestock in a vulnerable system and enhances financial deepening in pastoral areas.
- There are also positive impacts on other indicators of well-being. For example, IBLI has been associated with improvements in child nutrition as well as better access to credit by women IBLI policy holders (Gesare, et al., 2016).

Lessons learned

Subsides, pay-outs, and environmental conditions during and immediately before the current sales period are correlated with insurance purchases. The firm selling the insurance product is an important factor in determining whether any insurance is sold. Each firm has its own distribution strategies. Distribution strategies ensuring that insurance company agents actually visit the pastoral communities in their catchment area are likely to increase access to IBLI by pastoralists.

IBLI is a promising drought risk management tool and continues to support and protect pastoral livelihoods under frequent, intense, and prolonged drought. Enhancing resilience through IBLI will require research and capacity building efforts in the areas of product development and delivery. The private sector has a crucial role to play in reaching pastoralists at the last mile. At the same time, financial constraints and limited knowledge about the product limits widescale adoption. Efforts are needed to address financial constraints by introducing "smart" subsidies and linking pastoralists to financial protection schemes such as savings and credit. Efforts to address knowledge/information constraints should focus on building the capacity of the private sector to invest in agency model, leverage digital innovations for information provision, and introduce innovative extension approaches that combine social learning from the VIPs and digital innovations.

Providing a clear business case for the private sector will crowd-in the insurance and re-insurance companies. One way to increase the value proposition is bundling insurance with other services and products that respond to the needs of pastoralists.

Scaling

Since its introduction in Marsabit county in 2010, IBLI has scaled to eight ASAL counties under the Kenya Livestock Insurance Program. Further scaling is evident from the new World Bank-financed regional project, De-Risking, Inclusion, and Value Enhancement of Pastoral Economies in the Horn of Africa. The project aims to increase pastoralists' access to IBLI in all the ASAL counties. Scaling efforts are also ongoing under the Intergovernmental Authority on Development (IGAD) whose Strategy for Sustainable and Resilient Livestock Development in view of Climate Change in the IGAD Region (2022- 2037) clearly emphasises the contribution of IBLI as a climate risk management innovation.

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Source: State Department of Livestock and International Livestock Research Institute.

KCEP-CRAL was initiated in 2015 to reduce rural poverty and food insecurity among smallholders in Kenya's ASALs through the graduation of smallholder farmers to commercially oriented, climate-resilient agricultural practices. This was achieved through improvements in productivity, post-production management practices, and market linkages for targeted value chains. In addition, county governments and communities were empowered to sustainably and consensually manage their natural resources and build resilience to climate change. It was implemented in three regions covering 13 counties between the years 2015-2022 at a total budget of USD 123 million. The key activities included supporting cereal and legume crop combinations (such as maize and beans; sorghum/maize/millet and green grams or cowpeas or pigeon peas), capacity building in agronomy, post-harvest management, natural resource management, and investments in community assets to increase productivity and enhance resilience to climate change.[109]

The TWENDE project aims to increase the resilience of the livestock and other land-use sectors in restored rangeland ecosystems, build adaptive capacity of communities and local institutions by increasing access to climate data and information, and enhance the ability of communities to access markets and financial services. The five-year project (2020-2025) is supported by a Green Climate Fund (GCF) grant of USD 23 million.[110]

The Enhancing Capacity for Planning and Effective Implementation of Climate Adaptation in Kenya was a NAP readiness project funded by the GCF and implemented between 2018 and 2022. The project aimed to enhance the technical and institutional capacities for adaptation planning and implementation in key ministries, departments, and agencies; strengthen the knowledge base for adaptation; improve the evidence base for climate change adaptation in the agriculture sector; and ensure the private sector is actively engaged and

investing in the adaptation process. Key achievements included:

- Developing a capacity building programme integrating climate change adaptation into planning and budgeting and gender responsive approaches for the agriculture sector. Over 700 national and county government staff were trained using the curriculum.
- Supporting 5 counties and over 20 community groups to implement the KCSA Framework programme.
- Sensitising 43 counties on Kenya's NAP and training 70 journalists to effectively report on climate change issues.
- Developing an impact assessment framework for adaptation interventions in the agricultural sector and capacity development of national and county officials on the use of the framework.
- Supporting the private sector to establish the CBIN-K and capacity development of the CBIN-K on climate change action and the GCF's private sector facility.[111]

NARIGP was a Government of Kenya project that was implemented through the MALF&C, State Department for Crop Development, for a period of five years from 2017. It aimed at increasing agricultural productivity and profitability in targeted rural communities in 21 counties. The key activities included strengthening community-level institutions' ability to identify and implement investments that improve their agricultural productivity, food security, and nutritional status; building producer organisations' capacity to support member common interest groups and vulnerable and marginalised groups to develop select priority value chains in targeted rural communities; and strengthening the capacity of county governments to support community-led development initiatives. Success stories included support to women's groups to invest in chicken farming, especially local breeds that are in high demand; construction of banana ripening chambers that contribute to increased income due to uniform ripening of bananas and minimal wastage; and support to communities in dryland areas to improve the design and management of water harvesting infrastructure such as earth dams.[112]

Climate change has influenced the kinds of food eaten and consumption patterns. New eating practices encourage the consumption of insects as food and feed. For instance, the GREEiNSECT and INSEFOODS projects provide a chance to increase resilience through the promotion of insects as a sufficient supply of nutrient-dense food (see Box 3).

BOX 3

INSEFOODS Project

The African Centre of Excellence in the Sustainable Use of Insects as Food and Feed (INSEFOODS) was established at the Jaramogi Oginga Odinga University of Science and Technology in Bondo in 2017. The INSEFOODS Project supports research and training that aims "to achieve long-term food and nutritional security by using insects as a cost-effective, reliable, and sustainable source of protein and other nutrients for food and feeds." Kenya passed a Regulation on Edible Insects an alternative protein in 2021.

Source: INSEFOODS. (2023). *Africa Center of Excellence in Sustainable Use of Insects as Food and Feeds.*

The CGIAR Research Programme on Climate Change, Agriculture and Food Security implemented the Open Source Seed Systems Project in Western Kenya that supported building climate resilience. The project aimed at increasing farmers' access to a wider range of agricultural biodiversity which would arm them with options to better manage climate risks and biotic stresses such as pests and diseases. One seed bank was established in Nyando with the aim of ensuring a source of resilient genetic resources for future generations. The seed banks are used to conserve local communities' genetic resources and stock other varieties received through exchange. They are also venues for capacity building, farmer-to-farmer exchanges, and seed fairs.[113]

5.3 WATER, FISHERIES AND THE BLUE ECONOMY

According to the National Water Policy (2021), Kenya is a water scarce country with per capita water availability of 452 m^3 against a global standard of 1,000 m^3. Climate change continues to exacerbate the decline in access to good quality water for domestic and productive uses. Unreliable rains due to climate change have affected the water supply negatively impacting food production, electricity generation from the hydroelectric dams, and sanitation.

The Ministry of Water, Sanitation and Irrigation through its sector institutions is implementing various water harvesting projects in the country with a view of increasing storage and making the country water secure. Actions taken by the national and county governments to enhance the climate resilience of the water and blue economy priority area included increasing water availability through improved catchment management plans; constructions of dams; and improved water harvesting and storage infrastructure. The resilience of coastal communities was enhanced through tree growing and the establishment of nurseries for mangrove rehabilitation.

Kenya first established the Water Sector Trust Fund (Water Fund) under the Water *Act*, 2002 with the mandate to provide financial assistance towards water and sanitation projects to underserved and low-income rural and urban areas. The Water Act of 2016 mandates the Water Fund to provide conditional and unconditional grants to counties and to assist in financing the development of and management of water services in marginalised and underserved areas.

The Kenya Integrated Water, Sanitation, and Hygiene Project (KIWASH, 2015-2020) supported by the United States Agency for International Development (USAID) was designed to accelerate and sustain improvements in water and sanitation access. KIWASH enabled nearly 900,000 Kenyans across nine counties to gain access to improved water security, sanitation, and hygiene services and assisted households in gaining access to irrigation and nutrition services. Additionally, KIWASH contributed to the quality of community water sources through catchment conservation and environmental awareness. The project supported sector institutions and 24 Water Resource Users Association to understand and plan for climate change risks and to date, has protected 68 springs and planted over 200,000 indigenous trees.[114]

The World Food Programme in Kenya supports the government in implementing the Asset Creation Programme. Water harvesting is one of the adaptation projects implemented under the programme in ASALs that enhance water availability for crops and pasture production. Approximately 129 institutions and 196,262 households developed and strengthened water harvesting structures namely water pans, dam liners, and gutters for agricultural use, and thus increased crop productivity and profitability. From this initiative, the annual ASAL's water harvesting and storage capacity has improved by 1,130,000 m^3 from 3,074 to 3,283 water tanks, 38 water pans, 6 sub-surface dams, 73 boreholes, and 11 shallow wells in 11 ASAL counties. The programme has constructed rainwater harvesting structures in 1,000 sites across 14 ASAL counties.

The Kenya Water Towers Agency, which is concerned with conservation, rehabilitation, and sustainable management of water towers, has initiated a number of adaptation initiatives. These are mostly aimed at providing alternative sources of income and livelihoods to communities neighbouring the water towers. Examples of such initiatives include the establishment of Community-Based Tree and Bamboo Nurseries to help raise tree and bamboo seedlings to support in the rehabilitation of degraded areas in the water towers, bee keeping initiatives to provide alternative community livelihoods to water tower-dependent communities, and establishment of Environmental Model Schools to instil environmental consciousness among school-going children through promoting environmental awareness. All these are meant to ensure that the water towers are protected and that neighbouring communities and the country continue to have uninterrupted use of the environmental goods and services.

BOX 4

Upper Tana Catchment Natural Resource Management Project 2012-2022

The goal of this project was to contribute to the reduction of rural poverty in the Upper Tana River catchment that covers six counties. The project aimed to increase sustainable food production and incomes for 205,000 poor rural households in the project area; and to sustainably manage natural resources for the provision of environmental services.

Significant progress was made in terms of investing in water harvesting structures, protecting sources such springs, digging shallow wells, and upgrading irrigation schemes, which contributed to increased water access and quality for communities. Travel distance to collect water was reduced by over one kilometre allowing women to invest their time in other productive activities. A total of 2,982 ha of degraded natural forests was rehabilitated and support was provided to improve rural livelihoods through additional income generating activities.

Source: International Fund for Agricultural Development. (2022). Natural Resource Management Project.

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5.4 FORESTRY, WILDLIFE AND TOURISM

Climate change is likely to affect the growth and development of tree species, resulting in reduced biodiversity and capacity to deliver important ecosystem goods and services. Climate change is also expected to shift wildlife species distribution, reduce population size, and lead to the extinction of some species. Priority actions aim to increase forest cover for improved ecosystem goods and services and biodiversity which are critical for ecosystem-based adaptation.

Forest cover was 8.83 percent of the country's total area in 2022, an increase from 5.9 percent of total land area in 2018. Actions that contributed to this increase included enhanced tree planting especially during public holidays and public functions, restoration of degraded forests, preparation and implementation of woodland management plans, preparation of ecosystem-based management plans for several national parks and reserves, increase in the acreage of wildlife habitat conserved, and establishment of commercial forest plantations. Private sector entities were key players in supporting the government in its afforestation and forest restoration projects, which have adaptation and mitigation benefits.

The country is targeting a tree cover of 30 percent of total land area by 2032, which will support the restoration of degraded environments and sustainable livelihoods. Towards this end, the President launched a 15-billion tree campaign in 2022 which also marked the unveiling of the Green Army. This initiative of the President will engage the youth in tree growing and environmental conservation. The Kenyan government is targeting to have planted and grown 15 billion trees by 2032.[115]

The Kenya Forestry Research Institute and the Japan International Cooperation Agency implemented an adaptation project between 2012-2017 that aimed to establish a production system of seedlings of indigenous tree species that would be drought-tolerant and suited to the drylands of Kenya. The project coverage was approximately 52.4 ha. The purpose of this project was to develop drought-tolerant native species, Melia volkensii and Acacia tortilis in particular, to contribute to the promotion of productive forestation for various uses. The project activities assisted with the establishment of two clonal seed orchards of Melia volkensii in Kitui and Kibwezi. Seed production from these two orchards produced 4,900 kg of fruit in 2016.[116]

The World Agroforestry Centre established the Kenya Rangelands Ecosystem Services Productivity Programme to improve the livelihoods of communities and their landscapes by enhancing the productivity of ecosystem services provided by rangelands for food, feed, and human and wildlife security in Laikipia, Samburu, Isiolo, and Baringo. The key activities included: characterisation and inventory of existing types of perennials, their uses as well as existing tree nurseries; establishing community tree nurseries to enable the production of multipurpose tree seedlings for planting by individuals, farmers, and local communities; promoting tree-based investments (such as aloe plants, honey, animal hides, dairy, and fruit trees like mangoes) and enterprises in agroforestry for pasture/feed and food security; use of findings from rangelands health in mapping to identify suitable interventions and engage beneficiaries in implementing agroforestry for climate mitigation and adaptation; design and installation of rain and floodwater harvesting systems for growing trees and improving pasture on croplands and rangelands, and mobilisation of local stakeholders to rehabilitate degraded dryland forests. The key achievements included maps showing the terrain, land use, soils, tree cover, and climate. The base maps will be used to produce thematic maps showing rainwater-harvesting potential, erosion hotspots, and context-based rainwater-harvesting options. The information generated will guide the design and installation of rain and floodwater harvesting systems for growing trees and improving pasture on rangelands and cropland; and inform a baseline study to establish land-use systems, patterns, and change across the four counties[117].

Kenya's tourism industry is largely based on her diverse and attractive wildlife. But the wildlife is faced with numerous challenges including climate-related impacts such as drought that has killed a significant number of animals; increased incidences of wildfires; human wildlife conflict due to encroachment in conservation areas and wildlife migratory corridors; and invasive species, among others. These need to be addressed in a holistic manner. A National Wildlife Climate Change Adaptation Strategy 2022-2032 has been developed to guide adaptation efforts within the sector and to ensure that the country's wildlife is sustainably managed in the face of climate change and continues to support the tourism sector which employs a significant number of people and is a leading foreign exchange earner for the country.[118] Promotion of nature-based enterprises as well as carrying out vulnerability assessments and developing climate resilient action plans for the tourism sector were flagged as priority needs by stakeholders consulted during the preparation of the AdCom.

5.5 HEALTH, SANITATION AND HUMAN SETTLEMENTS

Climate change is expected to exacerbate the occurrence and intensity of climate-sensitive diseases and may increase their spread in some areas. Climate actions in the health sector have been prioritised in the NCCAP 2023-2027, which proposes an integrated approach to climate actions that address sustainable human settlements and health and sanitation services. Actions taken so far include scaling up efforts to control malaria and other vector-borne diseases which resulted in a reduction in the incidence of malaria despite an extension of suitable areas for mosquitoes;[119] two urban centres screened their existing dumpsites for vulnerability to climate change and developed adaptation plans; storm water drainage was constructed in the urban areas of in several counties; and green building codes and standards were developed.

To better understand adaptation actions that can improve the climate resilience of the health sector, the Kenya Red Cross Society has conducted a national assessment of climate change impacts, vulnerability, and adaptation for the sector.[120] Furthermore, the country has climate information included in its Integrated Disease Surveillance and Response system.

In regard to urbanisation and human settlements, Kenya has prioritised implementation of the Building Climate Resilience for the Urban Poor initiative with a view to building resilience and enhancing adaptive capacity of the urban poor population at the city / municipality / town levels. This flagship project is being implemented in many urban areas across the region and focusses on delineating and profiling vulnerable urban areas; preparing climate-resilient plans; improving human settlements and climate proofing of infrastructure; developing green urban economy and livelihood strategies; and strengthening NDC urban dimensions.

5.6 MANUFACTURING

The manufacturing and trade sector are addressing adaptation through a variety of short-, medium-, and long-term strategies. These include the CBIN-K that is helping to build the private sector's capacity to invest in adaptation and assisting companies in identifying opportunities for climate-resilient products. Companies are beginning to climate-proof assets and to develop business cases for adaptation investments. Moreover, water and resource efficiency, sustainable production, and waste management are prioritised as climate adaptation programs in the manufacturing sector. A green manufacturing sector creates new product lines from waste recovery and reuse, and promotes improved resource efficiency, better water use, and increased energy efficiency.

The Ethical Tea Partnership, through the Kenya Tea Development Agency, supported 650,000 tea farmers to adopt CSA approaches. Over 40,000 farmers were trained at Farmer Field Schools on climate change impacts and agricultural practices to mitigate its effects. Farmers were supported to plant over half a million drought- and frost-resistant tea clones, which are more resilient to unpredictable weather patterns. Between 2016 and 2018, farmers planted over 1 million trees and a further 2,500,000 seedlings were being raised in tree nurseries. In addition, 27,000 energy-efficient cook stoves were installed in farmers' homes, which reduced their fuelwood consumption. [121]

As documented in the NCCAP second implementation progress report, Kenya Breweries developed a low-cost beer made from sorghum. This has created new market opportunities for the brewer and supported over 47,000 farmers from marginal areas to transition from subsistence to sustainable commercial farming.[122]

5.7 ENERGY AND TRANSPORT

The energy and transport sectors have been particularly vulnerable to the impacts of climate change, notably drought and flooding. This often lead to losses and damages that have informed the climate proofing of energy and transport infrastructure. The focus of adaptation actions in the energy sector included optimising existing hydropower plants, improving water management, and conservation and rehabilitation of catchment areas feeding the dams. For example, KenGen has worked to increase the climate resilience of its hydropower operations by improving the efficiency of existing power plants (i.e. Kiambere turbines upgrade, additional turbine unit in Kindaruma, and redevelopment of the Tana hydropower plant) and plans to increase the storage capacity of the Masinga dam, redevelop the Gogo hydropower plant, and introduce pumped storage hydropower into the electricity grid as an energy storage system.[123] Moreover, the Kenyan government has been supporting the roll-out of off-grid renewable energy technologies to ensure energy is climate smart and used productively.

In the transport sector, the focus is on the establishment of efficient, sustainable, world-class transport systems and logistics services that withstand the projected impacts of climate change.[124] The transport sector recognises climate change as a risk and at the subsector level (specifically in the Kenya Urban Roads Authority and the Kenya National Highways Authority, see Box 5) climate change is incorporated during planning and implementation of new projects.

BOX 5

Climate Proofing Transport Infrastructure

Climate change focal points across the transport agencies have received training and capacity building on climate change. These focal points are leading efforts to mainstream climate information into the design and construction of roads in Kenya. The Kenya National Highways Authority carried out a climate vulnerability assessment for the Horn of Africa Gateway Development Project which is one of the biggest road projects in Kenya at 740 km in length. Results from the assessment informed the design of the drainage structures and related interventions. Such studies are also contributing to government efforts to climate proof road infrastructure across the country for better flood control, less damage, and extended lifespans.

Source: Government of Kenya (2020). Transport Sector Climate Change Annual Report 2019-2020: Performance and Implementation of Climate Change Actions. Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works.

06

GENDER MAINSTREAMING IN CLIMATE ADAPTATION

In recognition of the fact that climate change affects the genders differently, various efforts have strived to ensure that the unique needs of men and women, youth, and the elderly are taken into account in the planning and implementation of adaptation actions at all levels. Gender features prominently in Vision 2030 by aiming to mainstream gender equity in all aspects of development, and to increase the participation of women in all socio-economic and political processes. It also aims at addressing gaps in access to and control of resources, economic opportunities, and power sharing. Gender-related actions are incorporated in the Fourth MTP 2023-2027 and CIDPs.

Adaptation strategies and plans developed by the government also highlight the importance of gender. The National Climate Change Response Strategy (2010) aims to take a "participatory approach that involves different water users including men and women's groups in water resource management." The NAP 2015-2030 states that "the Government is committed to achieving gender equity in all aspects of society and enable the vulnerable to have equitable opportunities to participate in socio-economic activities", and included "Gender, vulnerable groups and youth" as a priority sector that identified actions for the short, medium, and long term.[125] The NCCAP 2023-2027 considers gender across all the priority areas. In addition to including youth focussed consultations during its preparation, the third NCCAP includes a new priority area on children and youth in order to create an enabling environment for their participation in implementing the plan going forward. This is in recognition of the fact that youth under the age 35 constitute 75 percent of the country's population and face unique climate-related challenges that need to be addressed comprehensively in order to ensure inter-generational equity.

Gender is also recognised in the Climate Change Act. Paragraph 3(2)(e) states that the Act "shall be applied in all sectors of the economy by the national and county governments to mainstream intergenerational and gender equity in all aspects of climate change responses." One of its guiding principles is to "ensure equity and social inclusion in allocation of effort, costs and benefits to cater for special needs, vulnerabilities, capabilities, disparities and responsibilities."

All government ministries (including MALF&C, energy, and water) have gender units seconded by the Ministry for Gender, Culture, the Arts and Heritage that coordinates gender ministerial committees who are responsible for managing gender actions and ensuring mainstreaming of gender into its activities. This, for example, explains why gender dimensions feature very strongly in the 2017-2026 CSA strategy. Many county governments also have gender or social departments tasked with ensuring that government processes are inclusive by particularly paying attention to how the needs of women, youth, elderly, people living with disability, and minority groups are addressed.

The National Gender and Equality Commission ensures the government is in compliance with all international treaties and conventions that Kenya has ratified relating to equality and non-discrimination. A gender mainstreaming strategy for environment and natural resources was developed "to provide effective leadership and coordination of gender mainstreaming and women's empowerment with regard to the environment and natural resources through policy formulation and revision, research, capacity-building, partnerships and tracking of results."[126] Moreover, significant emphasis has been placed on empowering vulnerable groups through policy, legal, and institutional reforms, child protection programmes, youth programmes, gender mainstreaming, and up scaling of financing under its Vision 2030 strategy.

The NAP includes a priority adaptation intervention for the gender, youth and other vulnerable groups sector of expanding the social safety net. Previous policy documents committed to expanding social welfare and economic opportunities for vulnerable groups through expanded welfare systems and community participation in decision-making, and participation in the green economy. Prior policy interventions suggest a holistic approach to inclusion of vulnerable groups in the wider green economy through the promotion of economic opportunity, education, and access to finance.

07

SUPPORT AND IMPLEMENTATION NEEDS

As can be seen from earlier sections of the AdCom, Kenya has made significant strides in implementing adaptation actions in the priority areas identified in the NCCAPs. This includes establishing the enabling environment for climate change actions, such as the enactment of relevant policies and legislations; development of strategies and action plans; and creating relevant institutions and coordination mechanisms to advance the climate adaptation agenda. Additional effort will be channeled towards implementing specific interventions under the new NCCAP priority on children and youth. However, despite good progress being made on the implementation of adaptation actions, some challenges still exist that slow down the pace and scale of implementation. A main challenge is the need for increased support, including finance, technology, and capacity building, as discussed below.

7.1 FINANCIAL NEEDS

The climate hazards experienced in Kenya – such as droughts, floods, landslides, and sea level rise – are projected to get worse with the changing climate, meaning that Kenya requires sustained investment in adaptation and resilience building going forward. Adequate and sustained finance is needed to allow for successful and best practices to be taken to scale. It is worth noting that Kenya has a generally positive investment climate that has attracted climate finance and the country has made progress to access international climate finance for adaptation. However, financing for adaptation remains inadequate and unpredictable due to a number of challenges including complex and demanding climate finance access requirements and procedures; mitigation-centric international climate finance flows; and substituting Official Development Assistance (ODA) for adaptation finance, among others.

In order to address barriers to adaptation finance access, Kenya is already implementing readiness actions towards enhancing mobilisation of predictable financial resources, such as through the FLLoCA program (see box 5). These include an enabling policy and legislative environment, development of the Green Fiscal Incentives Policy Framework,[127] and enhanced engagement with the GCF and Adaptation Fund. As per the updated NDC of 2020, the total cost of implementing the adaptation actions up to the year 2030 is estimated at USD 44 billion.[128] Out of this, Kenya's expects to mobilise approximately 13 percent from domestic sources while the balance requires international support. Climate finance provided in form of loans will be treated as domestic contributions.

In addition to the financial needs required for the implementation of priority adaptation actions, financial support is required for Kenya's NAP process. This includes updating the NCCAP and NAP, undertaking climate risk and vulnerability assessments, coordinating adaptation action including stakeholder engagement, reporting on adaptation action to the national and international levels, maintaining the climate adaptation registry, mobilising and tracking finance for adaptation, maintaining the national climate change knowledge information centre, and maintaining the adaptation monitoring, evaluation, and learning system. The NCCAP 2023-2027 noted that the CCD requires approximately KES 500 million (about USD 3.8 million) annually to carry out its duties and functions to ensure effective coordination and delivery of NCCAP 2023-2027.

Due to the significant resources needed, Kenya is keen to explore options and incentives to encourage greater private sector involvement in financing adaptation actions. Kenya welcomes support in this area, including the design and implementation of innovative financial instruments for adaptation.

BOX 6

Financing Locally–Led Climate Action (FLLoCA) Program

The FLLoCA Program aims to "strengthen local resilience to the impacts of climate change, natural hazards, and other shocks/stressors by building country's capacity to plan, implement, and monitor resilience investments in partnership with communities" (World Bank, 2021, p. 6). It emphasizes the governance, social inclusion, and citizen participation aspects of climate and disaster risk management as a way of addressing underlying causes of vulnerability and supporting resilience investments identified by counties in partnership with communities. The Program began implementation in February 2022 and is expected to run for 5 years to 2027.

Scope of the Program

The program is national in scale, linking local level action to national-level coordination and planning, and designed to build the capacities and systems for understanding, planning, and administering climate resilience investments while at the same time funding the investments themselves. The Program supports the financing, governance, national and local coordination, and capacity building aspects of the national program and has four components, listed below.

i. County readiness for supporting locally-led climate action: covers activities to put in place the mechanisms, policies, regulations, and capacities at the county level for participatory climate risk planning, implementation, and monitoring.

ii. Locally-led climate action grants: supports local actions and adaptation activities in the counties as prioritized by communities and counties.

iii. Building cross-government teams to support local climate action and capacity for coordination and reporting: supports strengthening of linkages between the CCD, the Council of Governors, NDMA, KMD, Kenya School of Government, and other actors who play key roles in coordinating, monitoring, and reporting on climate change and disaster risk management activities in the country.

iv. Effective climate finance management and program coordination: supports program coordination and Implementation to carry out all fiduciary aspects of the implementation of the program, including financial management, procurement, environmental and social safeguards, monitoring and evaluation, sector coordination of investment targeting and policy harmonization, and donor coordination.

County Level Grants

The FLLoCA Program supports the counties through two distinct grants: The County Climate Institutional Support Grant and the County Climate Resilience Investment Grant. The specific objective of the institutional support grant is to kick-start County Governments to be ready for participation in the FLLoCA program, by putting in place institutional arrangements, like the appointment of a County Executive Committee member in charge of climate change; the establishment of a Climate Change Unit; the adoption of necessary county legislation to enable the establishment of a CCCF, in order to be able to visualize county budgets and expenditure for climate action; and prepare County Climate Action Plans (CCAPs) in a participatory bottom-up manner. The grant is annual flat rate of USD 100,000 per year for three years subject to county governments meeting minimum access conditions.

The main purpose of the County Climate Resilience Investment Grant is to encourage and financially facilitate County Governments to implement the CCAPs, whilst at the same time to incentivize them to increase county contributions into the CCCF and mainstreaming climate action into the regular operations of the county departments. The resilience investment grants flow for a period of three years starting the second year of implementation. A total amount of USD 136.25 million has been set aside for the resilience investment grant for the period of three years, or an average annual amount of USD 1.25 million per qualifying county government.

Funding

The Program is being implemented by the National Treasury and Economic Planning in collaboration with County Governments and other line ministries, with financial support from the World Bank, and the governments of Denmark, Germany, the Netherlands and Sweden. The Program funding is USD 244.40 million over five years.

Achievements

- Forty-five county governments enacted climate change legislations and met in 2024 received Kes 7.387 billion in County Climate Investment Grants.
- Forty-five counties have allocated a minimum of 1.5% of their development budgets that in addition to resilience investment grants will finance priority climate interventions identified by communities.
- The program successfully piloted the Participatory Climate Risk Assessment in Vihiga County and rolled out the exercise in the other 46 counties from March 2023.

The county budgetary allocations are important because of their predictability and the need for sustained investments in resilience building.

Source: World Bank. (2021). *Project Information Document: Financing Locally-led Climate Action Program.*

For more information, see: https://blogs.worldbank.org/nasikiliza/kenya-moves-locally-led-climate-action

https://www.facebook.com/ClimateFinanceKE/

7.2 TECHNOLOGY DEVELOPMENT AND TRANSFER NEEDS

Kenya carried out technology needs assessments in 2005 and 2015. The findings identified environmentally sustainable technologies such as solar dryers, drought tolerant crops, water harvesting, and efficient irrigation technologies.[129] Kenya is well-placed to build on its success with M-Pesa and other mobile money applications to improve farmers' access to credit for procuring adaptation technologies, to improve access to CIS, and to improve access to training. Kenya welcomes support to explore expanding this learning on mobile applications to other sectors and products.

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

7.3 CAPACITY BUILDING NEEDS

Several institutions and learning platforms have been established at the national and subnational levels to effectively coordinate implementation of the climate change agenda in Kenya (see section 1.1.3 on institutional arrangements). Support is needed for continued capacity building for the individuals from national and county governments, CSOs, and the private sector that are engaged on adaptation planning and especially implementation of actions on the ground.

Areas for capacity development include:

- Building capacities of climate change sector coordinating units at national and county levels on climate risk and vulnerability assessments, adaptation planning, and reporting.
- Building local capacity to implement adaptation actions and programmes, to reduce reliance on international organisations and consultants and enable local entities (government and non-government) to access climate finance and lead the implementation of adaptation projects and programmes.
- Establishing or strengthening monitoring, evaluation, and learning systems to support the tracking of progress on adaptation action at national and county levels, to improve understanding of the impacts of adaptation actions, and to improve the sharing and communication of learning on adaptation.
- Strengthening the capacity of relevant institutions to map, collect, and collate gender disaggregated information to inform the design and implementation of adaptation actions.
- Facilitating the uptake of improved adaptation technologies and ensuring that technologies are gender responsive.

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