REPUBLIC OF KENYA

National Climate Change Action Plan 2013 -2017

VISION 2030
a competitive and prosperous Kenya

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Preface

H.E. Hon. Mwai Kibaki, C.G.H, MP, President and Commander-in Chief of the Defence Forces of the Republic of Kenya

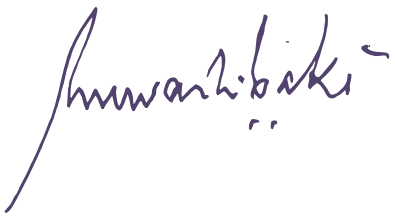
In recognition of the serious threats posed by climate change my Government has taken and continues to take bold measures to secure the country's development against the risks and impacts of climate change. The Constitution of Kenya provides for maintenance of at least ten per cent tree cover of the land area. The Kenya Vision 2030 targets the planting of at least seven billion trees to address food, water and energy security. During the last ten (10) years, Kenya has been able to restore 6% of forest cover. There are clear indications we will be able to attain the 10% tree cover in the next three years.

In 2010, the Government launched the National Climate Change Response Strategy which enhanced understanding of the global climate change regime and the impacts of climate change in Kenya. The Strategy was Kenya's first climate change agenda guide as it provided a basis for strengthening and focusing nationwide action towards climate change adaptation and mitigation.

The development of this National Climate Change Action Plan marks another landmark stride by the Government towards addressing climate change vulnerability. The Action Plan takes adaptation and mitigation efforts to the next stage of implementation and equips the country to take decisive action in responding to the challenges we face. It encourages people-centred development, ensuring that climate change actions support Kenya's achievement of development goals. It also supports efforts towards the continued attainment of Vision 2030. This Action Plan guides the transition of the country towards a low carbon climate resilient development pathway.

The Government has already established a National Climate Change Secretariat and other institutional arrangements that will provide for the implementation of the actions identified. Through the implementation of this Action Plan, Kenya will be in a much better position to develop in the face of climate change and the uncertainty it presents for the attainment of sustainable development goals.

It is my believe that this Action Plan will lead to collective action and innovation across all stakeholder groups for a prosperous and more climate resilient Kenya.



Mwai Kibaki
President

Foreword

The Rt. Hon. Raila Amolo Odinga, EGH, MP, Prime Minister

Kenya and indeed the horn of Africa region at large has in the last few years come face to face with the unprecedented challenge of climate change impacts and the corresponding socio-economic losses to our communities. Our high dependence on climate sensitive natural resources for our livelihoods and economic sustenance will inherently increase our vulnerability to this phenomenon.

Climate Change is not only a threat to the achievement of sustainable development and poverty reduction but has the potential to reverse the modest gains that we have achieved towards attaining the Millennium Development Goals (MDGs). Responding to climate change will require the sustained participation of all stakeholders, including government and the private sector.

I firmly believe that we are up to the task. Addressing climate change is now a top priority of the government. The Ministry of Environment and Mineral Resources in partnership with stakeholders prepared and launched the National Climate Change Response Strategy (NCCRS) in 2010 so as to ensure a climate resilient Kenya that will stay on track towards attainment of Kenya's Vision 2030 and the MDGs. I am pleased to say that the Strategy can now be operationalized through this comprehensive National Climate Change Action Plan.

It will now take a similar level of commitment to realize the vision that brought about this plan. It will be critical to generate and maintain the political will to not only act together but to generate the enabling legislation, relevant regulations as well as to address barriers to investment in this action plan.

Finally, it must be clear that private sector will play a significant role in tackling climate change and supporting green economic growth. With this Action Plan we hope to work together to enhance our understanding of the risks and opportunities and find innovative and effective ways to address the climate change challenge in a manner that will result in a climate resilient and a secured future for Kenya.

The RT.Hon. Raila Amolo Odinga, EGH, MP
PRIME MINISTER

Acknowledgements

The Hon. Minister for Environment and Mineral Resources

The National Climate Change Action Plan 2013-2017 is Kenya's first Action Plan on climate change. It has been developed with the aim of implementing the National Climate Change Response Strategy (NCCRS) that was launched in 2010.

A wide range of individuals and institutions have participated in the development of this National Climate Change Action Plan and I would like to recognise their efforts. The development of the Action Plan was guided by the technical input of a cross-sectoral Climate Change Taskforce. This comprised of representatives from relevant government agencies, civil society, the academia and the private sector.

The Ministry of Environment and Mineral Resources, is grateful to the Permanent Secretary, Ali D. Mohamed CBS for chairing the Climate Change Taskforce. The staff of the National Climate Change Secretariat who, with support from subcomponent 9, diligently coordinated other government representatives and stakeholders in the development of the Action Plan, are also appreciated.

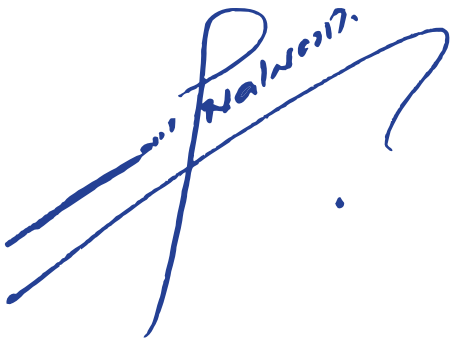
Several Thematic Working Groups provided oversight to the subcomponents of the Action Plan. These included:

- Subcomponent 1: Long-term National Low Carbon Climate Resilient Development Pathway
- Subcomponent 2: Enabling Policy and Regulatory Framework
- Subcomponent 3: Adaptation Analysis and Prioritisation
- Subcomponent 4: Mitigation and nationally appropriate mitigation action
- Subcomponent 6: National Performance and Benefit Measurement
- Subcomponent 7: Knowledge Management and Capacity Development
- Subcomponent 8: Finance

Many individuals participated in a large number of consultations including at the county level. This reflects the dedication invested by the people of Kenya in the process of making our country more climate-resilient and means the Action Plan responds to the most pressing climate change issues affecting our country.

Reaching this significant milestone in Kenya's response to climate change would not have been possible without the generous support provided by UK aid through the Department for International Development (DFID) of the UK Government. Other financial support was received from the Danish International Development Agency (DANIDA), the Japanese International Cooperation Agency (JICA) and the Climate and Development Knowledge Network (CDKN). Finally, the consortia of national and international experts who provided management support and technical input are acknowledged.

The Government is committed to the implementation of the Action Plan and invites all partners and stakeholders to join in delivering the prioritised actions for the benefit of our country. I look forward to seeing the fruits of all of our efforts in a more climate resilient and low carbon Kenya.



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Nation Media Group /Tom Otieno

Contents

Abbreviations

AAP	Africa Adaptation Programme
ASALs	Arid and Semi-Arid Lands
ATAR	Adaptation Technical Analysis Report
BaU	business as usual
BRT	Bus Rapid Transit
BUR	Biennial Update Report
CBA	Community-based Adaptation
CCD	Climate Change Directorate
CCRDR	Climate Change Relevant Repository
CCU	Climate Change Unit
CDKN	Climate and Development Knowledge Network
CDM	Clean Development Mechanism
CGE	Computable General Equilibrium
CO_2e	Carbon dioxide equivalent
COF	Climate Outlook Forum
COMECs	County Monitoring and Evaluation Committees (proposed in NIMES)
DfID	UK Department for International Development
DoE	Directorate of Environment
DNA	Designated National Authority
DSROA	Data Supply and Reporting Obligation Agreement
EAC	East African Community
EF	Emissions Factor
EMCA	Environmental Management and Coordination Act
FU	Focal Unit
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoK	Government of Kenya
IA	Inventory Agency (for estimating GHG Emissions)
ICPAC	Climate Prediction and Applications Centre

ICRAF	World Agroforestry Centre
IDLO	International Development Law Organization
IE	Included Elsewhere
IGAD	Intergovernmental Authority on Development
IIED	International Institute for Environment & Development
IISD	International Institute for Sustainable Development
IPCC	Intergovernmental Panel on Climate Change
KAM	Kenya Association of Manufacturers
NCCAP	Kenya Climate Change Action Plan
KCCWG	Kenya Climate Change Working Group
KCF	Kenya Climate Fund
KEIN	Kenya Environment Information Network
KEPSA	Kenya Private Sector Alliance
KMD	Kenya Meteorological Department
KSh	Kenyan Shillings
LEDS	Low Emissions Development Scenarios
LPAR	Legal Preparedness Assessment Report
LPG	Liquefied Petroleum Gas
LRT	Light Rail Transit
M&E	Monitoring and Evaluation
MDA	Ministries, Departments and Agencies
MDG	Millennium Development Goal
MEA	Multilateral Environmental Agreement
MEMR	Ministry of Environment and Mineral Resources
MMECs	Ministerial M&E Committees (proposed by NIMES)
MPND	Ministry of State for Planning, National Development and Vision 2030
MRV	Monitoring, Reporting and Verification
MRV+	Monitoring, Reporting and Verification (covering adaptation, mitigation and synergies between them)
Mt	Million tonnes
MTP	Medium Term Plan

$MtCO_2e$	Million tonnes of carbon dioxide equivalent
NA	Not applicable
NAMA	Nationally Appropriate Mitigation Action
NAP	National Adaptation Plan
NAPA	National Adaptation Programmes of Action
NC	National Communication
NCCAP	National Climate Change Action Plan
NCCC	National Climate Change Council
NCCRS	National Climate Change Response Strategy
NCCS	National Climate Change Secretariat
NE	Not Estimated
NEC	National Environment Council
NEMA	National Environment Management Authority
NEP	National Environment Policy
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organisation
NIE	National Implementing Entity
NIMES	National Integrated M&E System
NMESC	National Monitoring & evaluation Steering Committee (proposed by NIMES)
NPBMF	National Performance & Benefit Measurement Framework
NRMP	Natural Resource Management Project
NSA	Non-State Actor
PAMs	Policies and Measures
QA	Quality Assurance
QC	Quality Control
REDD+	Reducing Emissions from Deforestation and forest Degradation plus the role of conservation, sustainable management of forests and enhancement of forest carbon stocks
RBM	Results-Based Management
SC	Subcomponent of National Climate Change Action Plan
SME	Small and Medium Enterprise

SC1	Subcomponent 1 – Low Carbon Climate Resilient Pathway
SC2	Subcomponent 2 – Enabling Policy and Regulatory frameworks
SC3	Subcomponent 3 – Adaptation
SC4	Subcomponent 4 – Mitigation/NAMAs
SC5	Subcomponent 5 – Technology
SC6	Subcomponent 6 – National Performance & Benefit Measurement Framework
SC7	Subcomponent 7 – Knowledge Management & Capacity Development
SC8	Subcomponent 8 – Climate Finance
SNE	Single National Entity (for reporting GHG emissions to the UNFCCC)
SSA	Sub-Saharan Africa
SSEA	Strategic Social and Environmental Assessment
T21	Threshold 21 dynamic model
TACCC	Transparency, Accuracy, Completeness, Comparability, Consistency
TAG	Technical Analysis Group
TAGA	Technical Analysis Group on Adaptation
TAGD	Technical Analysis Group on the adaptation/mitigation outcomes of Development actions
TAGM	Technical Analysis Group on Mitigation
TAGGHGI	Technical Analysis Group on the GHG Inventory
TAMD	Tracking Adaptation and Measuring Development
TF	Task Force
TR	Technical Report
TWG	Thematic Working Group
UNFCCC	United Nations Framework Convention on Climate Change

Definition of Terms

Adaptation refers to an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects that moderate, harm or exploit beneficial opportunities[1].

Climate Change: The United Nations Framework Convention on Climate Change (UNFCCC), defines climate change as a "*change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods*"[2]. Climate Change is what we experience when the climatic conditions permanently shift either upwards or downwards of the average. Shifts in the start or end of the rainfall season, the length of the season, the number of rainy days, the number, length and intensity of dry spells, or changes in the total seasonal rainfall, among others, can also signify climate change. Climate change is hence not always a shift in the mean climatic conditions, but can also exhibit itself as a change in the intensity and frequency of extreme climate events, such as drought, floods, storms, and strong winds, among others. Climate change is closely related


Panos/Crispin Hughes

to global warming, the latter being the general increase in the earth's near-surface air and ocean temperatures due to rising greenhouse gas (GHG) emissions attributed to industrialisation, fossil fuel consumption, land use conversion, deforestation and other human influences since the mid-twentieth century.

Climate variability refers to time scales ranging from months to decades, falling between the extremes of daily weather and the long-term trends associated with climate change[3]. Climate variability thus refers to fluctuations of the climate about the 'mean average conditions', with some periods experiencing 'normal' climatic conditions, others experiencing below 'normal' conditions and still others experiencing above 'normal' conditions. Climate variability is, therefore, indicative of the natural breathing rhythm of the climate and it is what we experience on an hour-to-hour, day-to-day, month-to-month, season-to-season, year-to-year basis, with one hour being more or less cloudy than the other, one day being either wetter or drier than the other, one season being either cooler or warmer than the other, and perhaps one year being either more or less rainy than the other.

REDD+ is the acronym for 'reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forest and enhancement of forest carbon stocks in developing countries'.

Resilience refers to the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning and its capacity for self-organisation and to adapt to stress and change[4].

Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity[5].

Panos/Karen Robinson

1. Setting the Scene for Climate Change in Kenya

1.1 Introduction

Climate change is the most serious global challenge of our time. The 2010 National Climate Change Response Strategy (NCCRS) recognised the importance of climate change impacts for Kenya's development. This National Climate Change Action Plan developed in 2012 is the logical next step to enable Kenya to reduce vulnerability to climate change and to improve our country's ability to take advantage of the opportunities that climate change offers. The Action plan is the result of a year-long, participatory process involving the public sector, the private sector, academia and civil society, under the leadership of the Ministry of Environment and Mineral Resources guided by a multi-stakeholder, multidisciplinary taskforce.

Kenya Vision 2030 – the long-term development blueprint for the country – aims to transform Kenya into "a newly industrialising, middle-income country providing a high quality of life to all its citizens in a clean and secure environment."[6] A low carbon climate resilient development pathway, as set out in this *National Climate Change Action* Plan (NCCAP), can help meet Vision 2030's goals through actions that address both sustainable development and climate change. This pathway can also help the Government achieve the Millennium Development Goals (MDGs) and other internationally agreed development goals without compromising the environment and the natural resource base.

Achieving long-term sustainable economic growth up to and beyond Vision 2030 in the face of climate change is a primary concern. Kenya is already extremely susceptible to climate-related events and such events pose a serious threat to the socio-economic development of the country. Droughts and floods in particular have devastating consequences on the environment, society and the wider economy. According to the science of climate change, these impacts are likely to continue to affect the country in the future. Since Kenya's contribution to global emissions of greenhouse gases is negligible, it is not responsible for causing this problem.

However, Kenya's growing population and economy coupled with urbanization have the potential to increase future GHG emissions. In addition, the environmental and social conditions resulting from the country's growth together with increased competition over resources, may intensify the country's vulnerability to climate risks. Transitioning to a low

carbon climate resilient development pathway will reduce the country's vulnerability to climate risks and improve Kenya's ability to prosper under a changing climate while contributing towards the global efforts to reduce greenhouse gases (GHG) emissions.

The Government of Kenya (GoK) is taking climate change and its impact on development seriously. Between 2005 and 2015, the GoK has committed approximately KSh37 billion (USD 438 million equivalent) while development partners have committed KSh 194 billion (USD 2.29 billion equivalent) to programmes that they classified as having a 'significant' or 'principal' climate change component (See Section 7.2). Climate change is considered a cross-cutting issue that has to be mainstreamed in all the sectors of the economy through the planning process. The Medium-Term Plan (2013-17), has provided an opportunity to incorporate climate change programmes into the national development plans, and build on both the National Climate Change Response Strategy and its Action Plan.

1.2 Evidence of Climate Change

Climate change can be detected through changes in the average patterns of climate parameters like rainfall, temperature, wind and pressure, among others. The Intergovernmental Panel on Climate Change (IPCC) has also recommended indicators that can be used to detect climate change. Some of these indicators include the "number of nights with temperature below/above certain threshold values", cold and warm spells indicators, the daily temperature range, extremely wet days, and the number of heavy precipitation days; among others[12]. Several approaches can be used for the analysis of climate change, including statistical and graphical techniques. Modelling is one technique used to simulate climatic variables to generate projections of climatic conditions in the future. These projections are based on certain assumptions and have high uncertainties, but are needed to inform responses and address current and future climate-related impacts.

Recognising that the risks posed by climate change are legitimate but highly unpredictable, the Government of Kenya published its National Climate Change Response Strategy (NCCRS) in 2010 to investigate vulnerability in the country and potential future responses. The NCCRS concluded that "the evidence of climate change in Kenya is unmistakeable": in many areas, rainfall has become irregular and unpredictable; extreme and harsh weather is now the norm; and some regions experience frequent droughts during the long rainy season while others experience severe floods during the short rains. The NCCRS presents a series of observed climatic trends in Kenya, including a general warming over land locations except for the coastal zone that shows cooling trends, as summarised in Table 1.1.[13] This is in line with previous studies that showed a general warming over land stations with some cooling

over coastal locations and near large water bodies.[14] A reduction in cold extremes has also been observed over the Arid and Semi-Arid Lands (ASAL) regions.[15] There are, however indications that some of the observed trends may be related to urbanisation, implying that urbanisation effects need to be 'removed' for climate change to be delineated with a higher degree of certainty.[16]

Table 1.1: Observed temperature change 1960 – 2006

Region	Minimum (night) Temperature		Maximum (day) Temperature	
	Trend	Magnitude/˚C	Trend	Magnitude/°C
Western	Increase	2.9 – 0.8	Increase	2.1 – 0.5
Northern & N Eastern	Increase	1.8 – 0.7	Increase	1.3 – 0.1
Central	Increase	2.0 – 0.8	Increase	0.7 – 0.1
South Eastern	Increase	1.0 – 0.7	Increase	0.6 – 0.2
Coast	Decrease	1.0 – 0.3	Increase	2.0 – 0.2

Source: NCCRS, 2010

Rainfall trends show mixed signals with some locations indicating trends towards wetter conditions in recent years, but the majority of locations are not showing any significant trends. The annual rainfall shows either neutral or slightly decreasing trends due to a general decline in the long rains season that extends from March to May. The short rains season between October and December, on the other hand, shows a positive trend in some locations. This positive trend is thought to be due to the season extending into January and February in recent years, possibly as a result of more frequent El Niño events, occasionally coupled with relatively warmer sea surface temperatures over the western Indian Ocean (along the coast of East Africa) and relatively cooler than average sea surface temperatures (SSTs) to the east of the Indian Ocean. This SST pattern is conducive to enhanced rainfall over the country.[17]

1.3 Climate Change and Socio-Economic Development

Kenya has a land area of 580,728km^2, out of which approximately 85% is classified as arid and semi-arid land (ASAL). According to the 2009 census[8], the country had a total population of 39 million people, with 67.7% of the population living in rural areas and 32.3% in urban centres. The ASAL areas support almost 30% of the total national population and 70 % of the livestock production.

Kenya has in recent years had its share of climate-related impacts: prolonged droughts; frost in some of the productive agricultural areas; hailstorms; extreme flooding; receding lake levels; drying of rivers and other wetlands; among others leading to large economic losses and adversely impacting food security. Many of these extreme climate events have led to displacement of communities and migration of pastoralists into and out of the country resulting in conflicts over natural resources. Slow-onset events associated with climate change also lead to competition over scarce resources resulting in human-wildlife conflicts. Other climate change impacts include widespread disease epidemics, sea-level rise, and depletion of glaciers on Mount Kenya.

There is scientific evidence that the frequency of droughts, floods, and other extreme climate events has increased in recent years. The recent (2010-2011) Horn of Africa drought crisis demonstrated how vulnerable Kenya is to climate change but also presented an opportunity for the country to develop appropriate response strategies and activities required to making communities safer and resilient[18]

The adverse impacts are compounded by local environmental degradation, primarily caused by habitat loss and conversions, pollution, deforestation and overgrazing. Forest cover, for example, has reduced from 12 per cent in the 1960s to 6 per cent today[21]. Impacts of climate change are discussed further in chapter 5.

The country's economy is highly dependent on climate sensitive sectors including agriculture, tourism, and energy[19].Climate change potentially poses one of the greatest challenges for Kenya to realise its vision to become a prosperous country. The World Bank affirms that "poverty and vulnerability to climate change remain the most critical development challenges facing Kenya"[7].

Agriculture is the backbone of the Kenyan economy directly contributing 24% of the GDP valued at KSh342 billion in 2009 and another 27% indirectly, valued at KSsh.385 billion. The sector accounts for 65% of informal employment in rural areas. Kenya faces major food security challenges due to the over dependence on rain-fed agriculture for food production. The number of Kenyans requiring food assistance rose from 650,000 in 2007 to almost 3.8 million in 2009/2010. Pastoral and marginal agricultural areas are particularly vulnerable to the impacts of climate change. Extended periods of drought erode livelihood opportunities and community resilience in these areas; leading to undesirable coping strategies that damage the environment and impair household nutritional status, further undermining long-term food security.

Similarly, the tourism sector plays an important role in the national economy contributing about 27% of the foreign exchange earnings and 12% to the GDP. Kenya's tourism industry is largely nature-based and the wildlife populations are highly susceptible to climate variability and change.

The energy sector too has largely depended on hydro-power which contributes about 50% of the total national energy production. This sector has been most impacted by droughts and unreliable rainfall.

The poor infrastructure in the country also increases the risks and vulnerabilities to climate change. A higher percentage of Kenya's roads are earth roads. Floods cut off links and destroy the limited infrastructure.

The combination of these factors increases Kenya's vulnerability to climate change. In addition, the growth projections in the Vision 2030 coupled with population increase and urbanization are expected to lead to a rise in the emission levels.

The continued annual burden of the extreme climatic events could cost the economy as much as US$500 million a year, which is equivalent to approximately 2.6 percent of the country's GDP with implications for long-term growth[10]. For example, the 1998-2000 drought led to an economic loss of about US$ 2.8 billion resulting from the loss of crops and livestock, forest fires, damage to fisheries, reduced hydropower generation and industrial activity.

Panos/Dieter Telemans

The 1997/98 floods, on the other hand, are estimated to have affected about 1 million people, costing the economy US$0.8-1.2 billion in terms of damage to infrastructure (roads, buildings and communication systems), public health effects and loss of crops. Other losses amounting to US$9 million arose from flooding, property destruction, soil erosion, mudslides and landslides, surface and groundwater pollution and sedimentation of dams and water reservoirs.[11]

Therefore, to address the impacts of climate change on the country's socio-economic growth, proper planning and implementation of actions are necessary. Such measures should include appropriate adaptation to enhance the country's capacity to cope with the impacts of climate change and build resilience, as well as development choices that minimize carbon emissions.

1.4 The Way Forward on Climate Change in Kenya

The National Climate Change Response Strategy (2010) was the first national policy document to fully acknowledge the reality of climate change. The NCCRS has been guiding policy decisions since its launch in 2010.The Strategy provided evidence of climate impacts on different economic sectors and proposed adaptation and mitigation strategies.

This comprehensive National Climate Change Action Plan (NCCAP) takes forward the implementation of the NCCRS. The NCCAP has been developed, through an extensive consultative process, and has received support from a wide range of stakeholders and development partners. The summary findings of the NCCAP include a low carbon, climate resilient development pathway; recommendations for an enabling policy and regulatory framework; adaptation analysis and priority actions; mitigation options; considerations for technology requirements; a national performance and benefit measurement (NPBM) system; recommendations for knowledge management and capacity development; and a climate change financial mechanism. The detailed recommendations are further elaborated in the document.

The NCCAP is expected to inform national development and policy decisions in all sectors of the economy. A wide range of actors including Government agencies, private sector and civil society organizations will contribute to the implementation of the NCCAP. As climate change planning is a cross-cutting and dynamic process, it is anticipated that the recommended actions will be tracked continuously and that the NCCAP will be revised and updated on a five yearly cycle in line with the national planning and budgetary processes.

Nation/Stephen Mudiari

2. Climate Change Action Planning in Kenya

2.1 Global and Regional Context

Climate change is a global challenge that requires a global response. The international political response to climate change began with the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992. The convention sets out the framework for actions aimed at stablising the atmospheric concentration of GHG at a level that would prevent dangerous anthropogenic interference with the climate system. The Conference of Parties, which manages the Convention and meets annually, adopted the Kyoto Protocol in 1997 (and entered into force in 2005) that commits industrialized countries and countries in transition to market economies to reduce their overall emissions of GHGs. Similarly, the convention requires all countries to take up climate actions taking into account their common but differentiated responsibilities and respective capabilities.

Decisions adopted at the sixteenth conference of parties (COP16); Cancun Agreements, recognise that "*addressing climate change by all countries, requires a paradigm shift towards building a low-carbon society that offers substantial opportunities and ensures continued high growth and sustainable development, based on innovative technologies and more sustainable production and consumption and lifestyles, while ensuring a just transition of the workforce that creates decent work and quality jobs"*[*]. *(Conrad please insert a footnote and the reference for the footnote should be "*UNFCCC (2011) Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to 10 December 2010. Decision 1/CP.16 The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention")

In accordance with the same decisions, developing countries are required to undertake Nationally Appropriate Mitigation Actions(NAMAs) in the context of sustainable development, supported and enabled by technology, financing and capacity building. The voluntary implementation of NAMAs is aimed at achieving a deviation in emissions relative to 'business as usual' emissions by 2020. There is also a requirement of robust measurement, reporting and verification(MRV) system and submission of biennial reports and national communications (every four years) by all countries. Additionally, countries are expected to prepare and implement National Adaptation Plans (NAPs).

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* UNFCCC (2011) Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to 10 December 2010. Decision 1/CP.16 The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention

At the regional level, the African Union adopted an African Climate Change Strategy in 2011, whereas, in the East Africa Community, Climate Change Policy, Strategy and Master Plan (2011) have been developed and adopted. These policy documents provide priority actions in the region, which shape national climate change policies and strategies in member countries.

The Kenya Climate Change Action Plan has been informed by the global and regional commitments and obligations.

2.2 Relevant National Policies and Legislation

Current Government of Kenya policies, plans, strategies and initiatives that provide a supportive framework for implementing climate change responses include:

The Constitution of Kenya (2010) which provides ground for the formulation of adaptation and mitigation legislation, policies and strategies by guaranteeing the right to a clean and healthy environment under the Bill of Rights.

Vision 2030, the national development blue print encapsulates flagship programmes and projects with aspects of adaptation and mitigation. This include:

Integrated National Transport Policy (2010)[26] provides for transport solutions that have relevance to climate change mitigation.

The National Policy for the Sustainable Development of Northern Kenya and other Arid Lands focuses on climate resilience requiring Government to find solutions to address climate challenges and to come up with measures to manage drought and strengthen livelihoods. The policy also focuses on an enabling environment for accelerated investments in "foundations" to reduce poverty and build resilience and growth. The establishment of the National Drought Management Authority (NDMA), the National Disaster Contingency Fund and the Council for Pastoralists education are provided for in the policy.

The National Disaster Management Policy, 2012 institutionalizes disaster management and mainstreams disaster risk reduction in the country's development initiatives. The policy aims to increase and sustain resilience of vulnerable communities to hazards.

Environmental Management and Coordination Act (EMCA, 1999): The Act is the principle instrument of Government for the management of the environment. and provides for the relevant institutional framework for the coordination of environment management including

the establishment of the National Environment Management Authority (NEMA) which is the Designated National Authority (DNA) for Clean Development Mechanism (CDM) and the National Implementing Entity(NIE) for the Adaptation Fund[25] .

Water Act, 2002: The EMCA 1999 and the Water Act of 2002 provide the overall governance of the Water Sector. The regulations and strategies following on from this Act, recognize the climate change implications on health, sanitation and water.

The Energy Policy and Act: Kenya's energy policy of 2004 encourages implementation of indigenous renewable energy sources to enhance the country's electricity supply capacity. The policy is implemented through the Energy Act of 2006, which provides for mitigation of climate change, through energy efficiency and promotion of renewable energy. In addition, the Feed in Tariffs (FiTs) policy of 2008 (revised 2012) promotes generation of electricity from renewable sources. It applies to geothermal, wind, small hydro, solar and biomass

The Agricultural Sector Development Strategy 2010-2020 is the overall national policy document for the agricultural sector. The strategy promotes sustainable food production and agroforestry. There are also broad implications for the forestry sector that are detailed in one of the six sub-sectors of the agriculture sector.[27]

The Kenya Forestry Master Plan 1995-2020 provides for an overarching framework for forestry development in the country for the 25 year period up to 2020 and was the blue print for reforms in the sector, including the Forest Act of 2005 and Forest Policy of 2007. It recognizes the environmental role of forests including water values, biodiversity values, climate change values through carbon sequestration and other environmental services.

The Second National Environment Action Plan (NEAP, 2009-2013) provides for a broad framework for the coordination of environmental activities by the private sector and Government to guide the course of development activities, with a view to integrating environment and development for better management of resources.

Threshold 21 (T21) Kenya is a dynamic simulation tool designed to support comprehensive, integrated long-term national development planning. The T21-Kenya model has been developed to integrate the analysis of the risks and impacts of climate change across the major sectors of the economy, society and environment, in order to inform coherent national development policies that encourage sustainable development, poverty eradication, and increased well-being of vulnerable groups, especially women and children, within the context of Vision 2030.

2.3 Key Institutions in Climate Change Planning and Actions

In Kenya, the lead institutions that have responsibilities on climate related policies, plans and strategies are set out in the table below. These institutions include Government ministries, departments and parastatal agencies.

Table 2.1: Lead Government institutions for climate change

Ministry/ agency	Description
Ministry of Environment and Mineral Resources (MEMR)	The mandate of the Ministry is to monitor, protect, conserve and manage the environment and natural resources through sustainable exploitation for socio-economic development aimed at eradication of poverty, improving living standards and ensuring that a clean environment is sustained now and in the future. The Ministry is also responsible for the coordination of climate change response in the country. The National Climate Change Secretariat (NCCS) is a department of the Ministry and spearheads the development and implementation of climate change policies, strategies and action plans. These include the National Climate Change Action Plan (2013-2017) which implements the National Climate Change Response Strategy (2010). The Ministry is the national focal point for the United Nations Framework Convention on Climate Change (UNFCCC). In addition to the NCCS, the Ministry comprises of the following departments and institutions, which also play a role in the national climate change response: • Directorate of Environment (DoE) • Kenya Meteorological Department (KMD) • Mines and Geology Department • Department of Resource Surveys and Remote Sensing (DRSRS) • National Environment Management Authority (NEMA)

Ministry/ agency	Description
Ministry of Planning and National Development	This is the primary ministry with responsibility for national development planning and associated monitoring and evaluation in Kenya. It is leading the process to mainstream climate change into the national plans including the 5 year mid-term plans under Vision2030. Ministry of Planning works with the Ministry of Environment to analyse the risks and impacts of climate change to national development using the Threshold 21 Model.
Ministry of Finance	The Ministry is charged with the responsibility of formulating financial and economic policies as well as the management of revenues, expenditures and borrowing by the Government. In relation to climate change, the Ministry of Finance is responsible for the allocation of funds from the exchequer.
Ministry of Energy	The Ministry of Energy is mandated to facilitate provision of clean, sustainable, affordable and secure energy for national development while protecting the environment. The Ministry has a department of renewable energy and other associated relevant institutions which include: Geothermal Development Company (GDC), Kenya Electricity Generation Company (KENGEN), Kenya Power and the Kenya Electricity Transmission Company Limited (KETRACO).
Ministry of Agriculture	The Ministry of Agriculture is mandated to promote and facilitate production of food and agricultural raw materials for food security and incomes; advance agro-based industries, and agricultural exports; and enhance sustainable use of land resources as the basis for agricultural enterprises. Due to the sensitivity of agriculture to climate change, the Ministry has established a climate change unit that coordinates climate related issues across the agriculture sector. The Ministry is also implementing various climate change programmes and projects.

Ministry/ agency	Description
Ministry of State for Development of Northern Kenya and Other Arid Lands (MSDNKOAL)	The MSDNKOAL provides policy direction and leadership in planning, implementation and coordination of development of Northern Kenya and other Arid lands which account for 80% of the country and are highly vulnerable to climate change.
Ministry of Water and Irrigation	The Ministry of Water and Irrigation facilitates sustainable management and development of water resources for national development. Its mandate includes the reclamation of degraded lands for sustainable development.
National Economic and Social Council (NESC)	Set up under the Office of the President in September 2004 in response to the Economic Recovery Strategy for Wealth and Employment Creation, NESC is Kenya's top advisory body to the Government on policies required to accelerate social and economic development of the country.
Climate Change Unit at the Office of the Prime Minister(OPM)	The Climate Change Unit, which provides technical support for the OPM, also participates in the preparation and implementation of national climate change policies, strategies and action plans.
National Environment Council (NEC)	Established by EMCA, and chaired by MEMR, the NEC is responsible for policy formulation under EMCA, contains various provisions that impact climate change mitigation, adaptation and finance. NEC sets national goals and objectives and determines policies and priorities for the protection of the environment, which ostensibly include climate change responses. Despite its strategic position to offer leadership on adaptation in particular, NEC has so far played a minimal role.

Ministry/ agency	Description
National Council for Science & Technology (NCST)	The NCST is an advisory institution on matters of Science, Technology, Innovation and Research in Kenya for national social economic development.
National Drought Management Authority (NDMA)	Established by Legal Notice in late 2011, the core mandate of the NMDA is to exercise general supervision and coordination over all matters relating to drought management in Kenya, and to be the principal instrument of Government in ensuring the delivery of all the policies and strategies that relate to drought management and climate change adaptation.
Climate Change Units/Desk Offices	Climate Change Units and Desk Offices have been established in most Government of Kenya institutions including: Kenya Agricultural Research Institute (KARI), Kenya Forest Service (KFS), Kenya Wildlife Service(KWS), Kenya Forestry Research Institute (KEFRI).
County Governments	The Kenya Constitution 2010 establishes 47 constitutionally autonomous county governments that have defined spheres of power and functions. *The County Governments Act, 2012* states that a county government shall plan within a framework that integrates economic, physical, social, environmental and spatial planning, and protect and develop natural resources in a manner that aligns national and county government policies. Environment and climate change is a function of the national and county government and requires concurrent jurisdiction across both levels.

2.4 On-going Responses to Climate Change

The Government and other stakeholders are implementing many interventions that have direct and/or indirect relevance to climate change adaptation and mitigation. The interventions cover a wide range of sectors including: agriculture, water, energy and infrastructure. Examples include:

- Agriculture: promoting irrigated agriculture, promoting conservation agriculture, value addition to agricultural products, developing weather indexed crop insurance schemes, support for community-based adaptation including provision of climate information to farmers, enhanced financial and technical support to drought resistant crops.
- Livestock and Pastoralism: Breeding animals tolerant to local climatic conditions, weather indexed livestock insurance, establishment of fodder banks, documenting indigenous knowledge, provision of water for livestock and humans, early warning systems for droughts and floods, and vaccination campaigns.
- Water Resources: Enforcement and/or enactment of laws for efficient water resource management, increasing capture and retention of rainwater, water quality monitoring, de-silting rivers and dams, protecting and conserving water catchment areas, investing in decentralized municipal water recycling facilities, campaigns on water harvesting, developing hydrometric network to monitor river flows and flood warning.
- Forestry: Intensified afforestation, promoting agroforestry-based alternative livelihood systems, promoting alternative energy sources, community forest management, REDD+ initiatives and reduced mono-species plantation stands.
- Energy: promoting the use of alternative energy including geothermal, wind, solar and mini hydro power generation; and the promotion of improved cook stoves.

Panos/Sven Torfinn

Panos/Dieter Telemans

3. Preparation of Kenya's Climate Change Action Plan

3.1 Planning Climate Change Responses in the Kenya Context

Kenya has enjoyed significant economic growth over the last decade. As Kenya strives to achieve middle income status, national development is challenged by the environmental consequences of economic growth, largely elsewhere on the planet.

Development in Kenya is best served by harnessing a comprehensive response to climate change – one that involves building resilience through adaptation measures, one that invests in and achieves due rewards from reducing deforestation and forest degradation, and one that pursues the benefits of low emissions development. For this reason the Government of Kenya has integrated planning for adaptation and low carbon development in developing the National Climate Change Action Plan (NCCAP) 2013 - 2017.

The NCCAP seeks to contribute to the achievement of Vision 2030 and, therefore, uses a process from action prioritisation to implementation that is driven by assessments of the climate change effects on development. This process is referred to in the annex to UNFCCC Decision 5 CP17 as "comprehensive, iterative assessments of development needs and climate vulnerabilities". Crucial to the implementation of climate change responses at the national level is identification and assessment of institutional arrangements, programmes, policies and capacities for overall coordination and leadership leading to strengthening as required.

Implementation of the NCCAP as part of the national development policy system requires internalising low carbon and resilience pathways – including the institutions, systems, tools and instruments that form the foundations of a low carbon climate resilient system/society. This will be done through a series of steps using a process of review and adjustment. To achieve mainstreaming at the national and devolved county planning arena, obstacles to mainstreaming climate change into the national development planning system will be identified as will the levers for promoting mainstreaming.

The cycle of the iterative actions envisaged for the design and implementation of the NCCAP is set out in Figure 3.1. The Figure shows the inter-relationship between evaluation, prioritisation, planning and implementation. Too often evaluation is relegated to the last activity of such a cycle and therefore the previous steps of prioritisation, planning and implementation are done irrespective of how the effectiveness of these steps will be assessed. Leaving the establishment of an evaluative framework to the end of the first iteration, as so often happens, means that plans for a journey are made without knowing where the destination really is and how those travelling will know when they arrive. Bringing the design of an evaluative framework up front so that it is central in the initiation of the planning and implementation cycle leads to better outcomes and more reliable impacts. This is the sense behind having SC6 – National Performance and Benefit Measurement – fully integrated into and concurrent with the development of the other sub-components of the NCCAP.

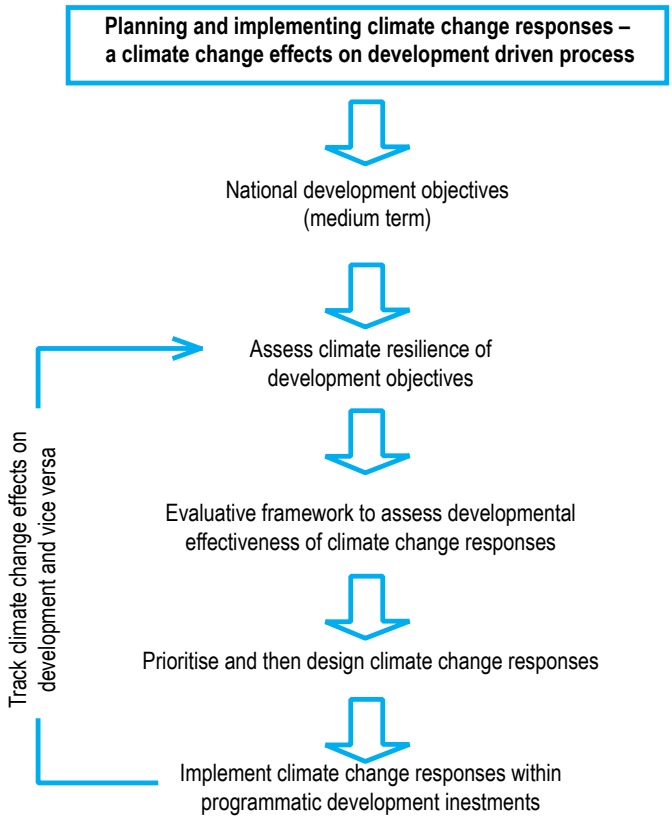


Figure 3.1 Planning and implementing climate change responses

3.2 National Coordination of Climate Change Action Planning

The preparation of Kenya's national climate change action plan (NCCAP) was an elaborate consultative process that involved representatives from across the Government, civil society and the private sector. The process was led by the Ministry of Environment & Mineral Resources through an inter-ministerial, cross-sectoral Task Force that provided guidance to the NCCAP process. The Taskforce was chaired by the Permanent Secretary of MEMR.

Seven Thematic Working Groups (TWGs) each chaired by a member of the taskforce brought together a wide range of expertise from different fields to provide support and quality assurance on the content of the specific elements of the NCCAP. Each of the TWGs worked on one of the sub-components of the Action Plan.

3.3 The Action Plan Sub-components

The Action Plan was prepared through work on eight distinct but integrated subcomponents. A ninth subcomponent provided overall coordination to the process. These sub-components and the relationships between them are illustrated in Figure 3.2.

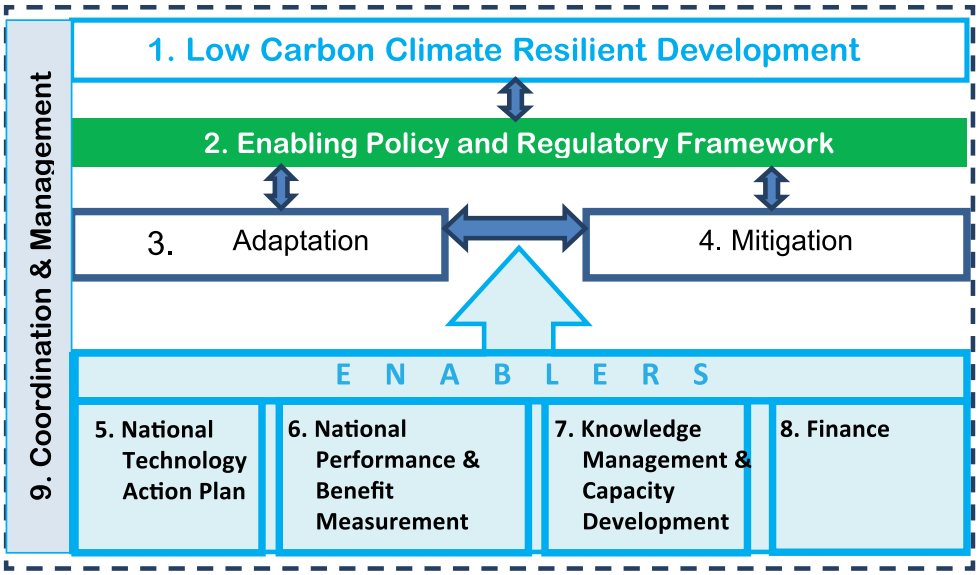


Figure 3.2 Kenya climate change action plan subcomponents

The eight subcomponents were as follows:

Subcomponent 1: *Long-term National Low Carbon Climate Resilient Development Pathway* facilitated reflection and mainstreaming of climate change aspects in the country's long-term development planning and budgeting. It identified key elements of the country's low-carbon and climate resilient growth and worked with the MPND to integrate climate change into the 2013-2017 Medium Term Plan.

Subcomponent 2: *Enabling Policy and Regulatory Framework* reviewed international, regional and national policy and legislative instruments related to climate change to form the basis for developing a policy and legislative framework to promote coherence, coordination and cooperative governance of climate change issues for Kenya.

Subcomponent 3: *Adaptation Analysis and Prioritisation* undertook a comprehensive review of all relevant literature to identify and prioritise immediate, medium- and long-term adaptation actions. The proposed actions informed the 2013-2017 Medium Term Plan and National Adaptation Plan.

Subcomponent 4: *Mitigation actions* examined potential low-carbon development opportunities in the six mitigation sectors set out in Article 4.1 of the UNFCCC: energy; transport; industry; agriculture; forestry; and waste management. The analysis provided the basis for identifying potential internationally and domestically supported NAMAs that would enhance sustainable development. Identifying priority REDD+ activities was also addressed.

Subcomponent 5: *The Technology* chapter has drawn attention to the barriers affecting the uptake of technologies related to adaptation and mitigations. A national technology needs assessment has been undertaken separately to this action plan.

Subcomponent 6: *National Performance and Benefit Measurement* developed a national performance and benefit measurement framework for measuring, monitoring, evaluating, verifying and reporting results of mitigation actions, adaptation actions and the synergies between them.

Subcomponent 7: *Knowledge Management and Capacity Development* designed a knowledge management system to address the sharing of climate change-related knowledge and proposed capacity building measures to address the institutional and technical capacity needs of the various actors.

Subcomponent 8: *Finance* developed an innovative financial mechanism that includes a climate fund, investment strategy/framework and carbon trading platform to position the country to access finances from various sources.

Panos/Frederic Courbet

Panos/Steve Forrest

4. Low Carbon Climate Resilient Development

4.1 The Benefits of Low Carbon Climate Resilient Development in Kenya

As Kenya realises its development aspirations, there will be gains and risks. A growing population and economy with urbanization will mean increases in greenhouse gas (GHG) emissions. Resulting environmental and social conditions, including increased competition over resources, could intensify vulnerability to climate risks. Transitioning to a low carbon climate resilient development pathway can address future risks, thereby improving Kenya's ability to prosper under a changing climate while reducing the emissions intensity of a growing economy.

Kenya's Vision 2030 sets out a development path aimed at creating a prosperous country with a high quality of life.[38] Kenya's Climate Change Action Plan will support efforts towards the attainment of Vision 2030 and encourage people-centred sustainable development – ensuring that climate change actions help the country move towards long-term development goals. An integrated low carbon climate resilient pathway emphasises:

- **Sustainable Development** – Achieving sustainable development should be at the forefront of all climate actions; climate change and development are intricately linked.

- **Adaptation** – Reducing vulnerability to avoid or cushion the impacts of climate change, and enable people to respond to climate risks by moving toward a climate-resilient society.

- **Mitigation** – Taking actions, where possible, to encourage GHG emissions that are lower than business-as-usual practice; and to reduce the human causes of emissions by moving toward a resource efficient economy that is as low carbon as possible.

For Kenya, the conundrum of choosing between action on climate change and action on development is a false one; the two are interlinked and will become increasingly so over the coming decades. Building climate resilience, or increasing the ability to adapt to climate change, in as low carbon a way as possible will help Kenya achieve sustainable development and Vision 2030 goals. This will in addition contribute to the implementation of the Kenya Constitution 2010 that guarantees every Kenyan the right to a clean and healthy

environment under the Bill of Rights. Some of the actions in the Action Plan contribute to development, climate resilience and transitioning to a low carbon economy' while other actions focus on development and climate resilience. In Kenya, low carbon actions should be considered as priority actions only if they also have climate resilience or significant sustainable development benefits.

A low carbon climate resilient development pathway should be tailored to the country's unique circumstances. Kenya has little historical or current responsibility for global climate change, and emissions are low relative to global emissions. Kenya's low carbon climate resilient development pathway recognises that national emissions will increase with population and economic growth. However, the pathway can help ensure that Kenya remains a low emitter as the country develops and takes steps to reduce vulnerability to climate change.

Low carbon climate resilient development can bring benefits including:

- **Enhancing sustainable development** – The best low carbon climate resilient opportunities deliver multiple benefits, helping to address pressures related to increasing population growth, economic growth, urbanisation and resource use. Low carbon resilient development enhances the integration of the social, economic and environmental pillars of sustainable development. Box 4.1 discusses green jobs, a potential benefit of transitioning to a low carbon climate resilient development pathway.

Box4. 1 Green Jobs – A potential benefit of low carbon climate resilient development

The transition to a low carbon climate resilient development pathway can include a shift to green jobs - where the economy, companies and workplaces promote decent work that:

- Reduces consumption of energy and raw materials;
- Limits GHG emissions:
- Minimises waste and pollution; and
- Protects and restores ecosystems

Source: International Labour Organization. 2012. *Green Jobs*.

- **Improving lives of the poor and vulnerable** – The human impacts of climate change are often experienced most acutely by the poor, who are often women and children. The urban poor living in slums that are flood-prone and the rural poor who rely on ground water for water supply and rainfall for food production are particularly vulnerable. Efforts to improve climate resilience can further Kenya's people-centred development strategy.

- **Building adaptive capacity** – Kenya's vulnerability to climate change is influenced by the adaptive capacity of its people and institutions, or their ability to take advantage of opportunities or to cope with the consequences of potential damages.[39]Improving development outcomes such as income, literacy, social networks and access to information and services is critical to building our country's adaptive capacity.

- **Reducing disaster risks** –The use of climate risk information in economic activities (such as farming), public infrastructure investment and government planning decisions can enhance decision-making capacity, and reduce and prevent climate-related disasters and climate risks. More than 70 percent of natural disasters in Kenya are related to extreme climate events.[40]

- **Contributing towards the implementation of the Constitution of Kenya 2010** – A clean and healthy environment (Articles 42, 69 and 70) is a fundamental right under the Bill of Rights. This right cannot be fully provided for unless action is taken to address environmental pollution, which can be supported through a low carbon climate resilient development pathway.

- **Attracting international climate finance, technology and capacity building** – The evidence base provided through this Action Plan can help development partners ensure that their investments align with Government of Kenya climate change priorities and that these investments are nested within Vision 2030 and Kenya's national planning process. Potential sources of international support include bilateral and multilateral funders, the Green Climate Fund, the Adaptation Fund, carbon markets, and the emerging Nationally Appropriate Mitigation Actions (NAMAs) and REDD+ mechanisms.

- **Leveraging investment** – A coherent action plan can encourage investment in low carbon climate resilient technologies and industries, such as water resource management, renewable energy, and agroforestry. Policy and institutional reforms supported through climate finance can stimulate investment in targeted actions that support a low carbon climate resilient pathway.

- **Demonstrating global leadership** – The implementation of low carbon climate resilient development demonstrates Kenya's leadership in the global fight against climate change. The leading-edge work to mainstream the Climate Change Action Plan across national and county government departments through the national planning process is an example for other countries.

A low carbon climate resilient development pathway is a promising option for Kenya. Meeting development goals requires modernisation while increasing ability to manage climate risk. The drivers of our economy are primarily natural resource-based and climate-sensitive, and new investments in infrastructure must consider expected changes in temperature and precipitation. Kenya can advance economic growth in ways that reduce climate risk or are less carbon-intensive while seizing opportunities for innovation, such as leapfrogging to the best-available technology. Making the right investments now can prevent technology lock-in and a more costly transition in the future. This development pathway can help to improve competitiveness through a focus on the sustainable use of resources, improved productivity, and decreased vulnerability to variations in climate.

Challenges will have to be addressed in implementing low carbon climate resilient interventions; but many of these can be addressed through a systematic focus to identify and remove barriers. These efforts can be supported through international climate mechanisms and other international support. Finance, technology and capacity building support can help fill information and capacity gaps and overcome financial, regulatory and policy barriers.

4.2 The Need for Low Carbon Climate Resilient Development

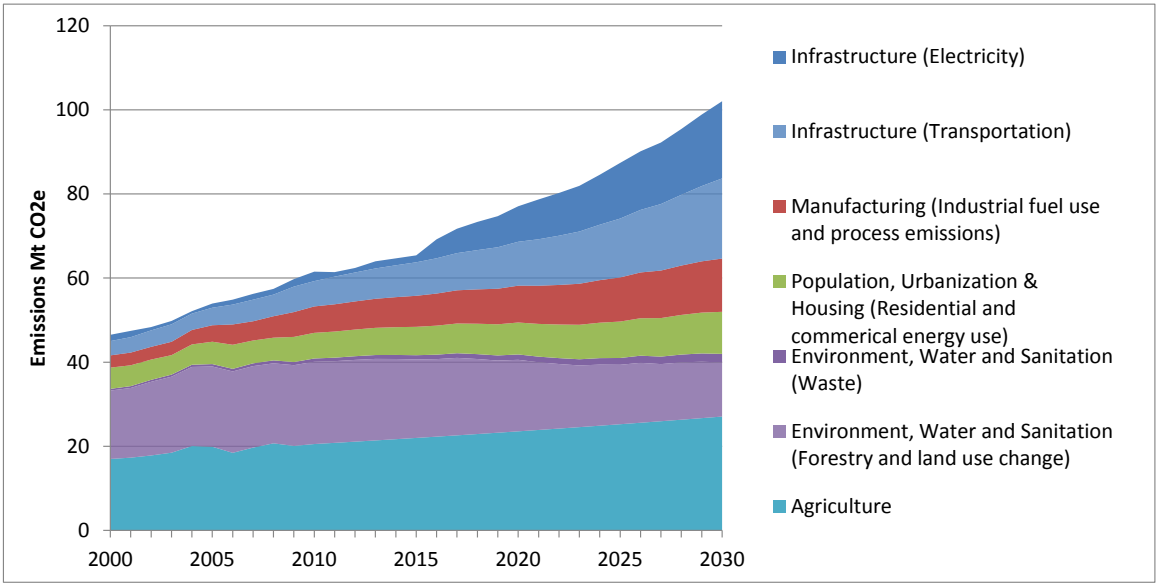
Transitioning to a low carbon climate resilient development pathway is important for our country. Climate change poses a real threat to development prospects and livelihoods, and can undermine investments made to meet Vision 2030 goals. Chapter 1 explains that average temperatures are rising, rainfall patterns are changing and the incidence and intensity of extreme weather events such as droughts and floods is increasing. Droughts and floods have devastating consequences on the economy, environment and society, causing food insecurity, malnutrition, damage to infrastructure and loss of life. Some studies have estimated the cost of droughts and flooding to Kenya at about 2.6 percent of GDP per year.[41]

The adaptation analysis explains that exact processes that affect Kenya's climate are not fully understood and predicting future climate trends remains difficult. Research suggests that temperatures will continue to increase, and the frequency of hot days and nights will rise, with cold days and nights becoming rare. Precipitation is expected to increase in many areas, with the largest growth in rainfall occurring in the highland districts and the coastal region. The Northeast is expected to become significantly drier.

Our population is vulnerable to climate risks due to the high dependency on natural resources for food, fuel and shelter. IISD's report on climate risk and vulnerability in Kenya indicates that water availability is especially critical as we live in one of the most water scarce countries in Africa.[42] Access to this basic resource is likely to become more difficult due to population growth, economic expansion, unsustainable management of water and forest resources, and changes in rainfall patterns. At the same time water is the core input for most economic activities: irrigated and rain-fed agriculture, hydroelectric power that constitutes over half the installed capacity of electric power, sanitation and provision of drinking water.

Climate change will affect all sectors of the economy. Agriculture, which accounts for about 20 percent of the GDP[43], is very sensitive to climate change, meaning that agricultural systems will need to adapt to ensure provision of adequate food for a growing population and to improve production of export crops. Trade and industry rely on infrastructure and services, such as water, energy and transport, and are vulnerable to disruptions caused by droughts and heavy rains. Tourism, an important source of foreign exchange earnings, depends on a wide range of environmental resources, such as the abundance and diversity of wildlife, which will be impacted by climate change.

The low carbon analysis detailed in Chapter 6 determined that Kenya's GHG emissions are expected to rise, consistent with a growing population and expanding economy, with emissions increasing from 59 million tonnes of carbon dioxide equivalent ($MtCO_2e$) in 2010 to 102 $MtCO_2e$ in 2030 (see Figure 4.1). The livestock, agriculture and forestry sectors are the largest emitters in Kenya, accounting for approximately 67 per cent of emissions in 2010 and 40 per cent in 2030. The largest absolute growth in emissions is expected in energy and transport, with energy emissions increasing from 10 $MtCO_2e$ in 2010 to 33 $MtCO_2e$ in 2030 and transport emissions increasing by about three times in the same period. The low carbon analysis detailed in Chapter 6 indicates a maximum reduction potential of about 15 per cent below the 2010 reference base by 2015; and that this reduction potential could grow to almost 70 per cent in 2030.



Source: GoK NCCAP Mitigation Analysis 2012

Figure 4.1: Business As Usual GHG Emissions by MTP2 Planning Sectors between 2000 and 2030

4.3 Priority Actions for Transitioning to a Low Carbon Climate Resilient Development Pathway

The National Climate Change Action Plan identifies a series of actions that begin to transform our country's climate change ambitions into reality. These include investing in actions that deliver development, mitigation and adaptation benefits; and enabling actions to improve the conditions for success.

4.3.1 Investing in actions that deliver sustainable development, climate resilient and low carbon benefits

Success in achieving low carbon climate resilient development will require a series of discrete priority actions and related investments across government, society and industry. These priority investments will generally alter current practices or technology choices and ideally result in a range of benefits that improve livelihoods and environmental quality

while contributing to economic performance. Priority areas for action demonstrate an integrated approach to climate change – that is, developing sustainably in a low carbon manner while building climate resilience.

People-centred development is a priority and underlies Vision 2030, and low carbon climate resilient actions will need to support the government's development priorities, including those related to economic growth, food security, forest cover, ending drought, water management and improved energy access, including in the Arid and Semi-Arid Lands (ASALs). Priority low carbon climate resilient actions, discussed below by select Government of Kenya planning sectors and elaborated in the Adaptation and Mitigation chapters (Chapters 5 and 6), have considerable sustainable development benefits both at the household level such as improved livelihoods and increased food production and at the national level including improved energy security, economic growth). Increasing climate resilience and achieving the mitigation potential in each of these sectors will require a range of enabling actions, such as institutional strengthening, capacity building, improved information systems, and mainstreaming climate change across policies and programmes. These enabling actions are discussed in Section 4.3.2.

The six priority low carbon actions identified and described in detail in Chapter 6 (restoration of degraded forests, reforestation, agroforestry, geothermal, improved and liquid propane gas (LPG) cook stoves, bus rapid transit with light rail corridors) represent about three-quarters of the mitigation potential identified in the low carbon assessment. The full deployment of these actions would almost halve GHG emissions by 2030 compared to the baseline scenario. Investment costs would vary, but significant GHG emissions reductions can be obtained at marginal costs of less than USD15 per tonne of carbon.

a) Agriculture

The agriculture sector, including livestock, is very sensitive to climate change, meaning that agricultural systems will need to adapt to ensure provision of adequate food for a growing population while increasing export crop production to generate foreign exchange. At the same time, the sector is a large and growing GHG emitter, responsible for about 30 per cent of Kenya's emissions in 2010, with about 90 per cent of these emissions generated by the livestock sector. However actions to respond to these increasing emissions will be considered and prioritised based on the country's unique social, cultural, environmental and economic factors.

The agriculture sector offers great potential for synergies among the objectives of food security, poverty reduction, adaptation and mitigation. Many climate-smart agricultural

MEMR NCCS/HTSPE

practices that reduce climate vulnerability also reduce emissions and improve agricultural production potential. Agroforestry, for example, has the potential to abate 4.2 $MtCO_2e$ by 2030, while offering climate resilience benefits of improved soil quality, improved water retention in the soil, reduced erosion, and perennials that are better able to withstand climatic changes.

Agroforestry also contributes to the government's goal of 10 per cent tree cover on farms in addition to benefits of enhanced food security and improved livelihoods of farmers. In regard to livestock, priority low carbon climate resilient actions will be considerate of local cultural practices and include improved management of grazing systems, livestock diversification, and breeding of animals to improve their ability to adapt to climate change and produce lower emissions. Adaptation actions to improve the resilience of livestock are particularly important for the ASALs.

Other important low carbon priorities that have significant adaptation benefits are conservation tillage and limiting the use of fire in cropland and rangeland management, which have the potential to abate 1.1 and 1.2 $MtCO_2e$ by 2030, respectively. Priority adaptation actions to increase climate resilience include the promotion of drought tolerant crops, water harvesting, integrated soil fertility management, insurance schemes, price stabilization schemes for livestock, strategic food reserves, providing farmers and pastoralists with climate change-related information, and mainstreaming climate change into agricultural extension services.

b) Environment, Water and Sanitation

A low carbon climate resilient pathway in the environment, water and sanitation sector can have important sustainable development benefits and contribute to a clean and healthy environment, which is a fundamental right under Kenya's constitution.

Increasing tree cover to 10 per cent of total land area is a goal stated in Kenya's constitution. Actions to increase forest cover have important climate resilience and low carbon benefits. Forests help to prevent flooding and landslides, and reduce erosion and sediment discharge into rivers. Forests also contribute to water availability by slowing the loss of rainwater from the ecosystem, demonstrating the importance of reforesting and rehabilitating the main water towers and water catchment areas. Moreover, forest conservation can contribute to livelihood improvements and has biodiversity benefits. An important low carbon climate resilient action is the restoration of forests on degraded (dry) lands, which has a mitigation potential of over 30 $MtCO_2e$ a year in 2030. Other important low carbon climate resilient actions are reforestation and reducing deforestation and forest degradation, with mitigation potentials of 6.1 and 1.6 $MtCO_2e$, respectively.

Important adaptation actions to improve climate resilience in the environment sector include improving coastal zone management to rehabilitate and conserve vital coastal ecosystems through the implementation of the Integrated Coastal Zone Management Plan, the National Disaster Risk Management Response Plan and National Environment Action Plan.

Water resource management is important for addressing drought, and forests in water catchments are critical for sustaining water availability, which is needed for generation of hydropower, drinking water and water for irrigation. Water resource management is linked to Kenya's expected economic and social transformation, and is directly linked to food security, health and GDP growth – especially in the ASALs.

Priority adaptation actions to improve water management include increased domestic water supply and improved sewage systems, enhanced irrigation and drainage to increase agricultural and livestock production, effective trans-boundary water resources management, and flood mitigation schemes. These actions reduce the impact of droughts and floods on crop yields and livelihoods, and more irrigation-based agriculture reduces the reliance of crop production on rainfall.

Waste management has important low carbon climate resilient impacts. Improved waste management systems are being planned for several cities, and with proper design can contribute to mitigation. Methane produced in landfills can be captured and used for

electricity generation, with an abatement potential of 1.1 $MtCO_2e$ for methane capture and 0.5 $MtCO_2e$ from electricity generation from landfill gas.

Mining and mineral resources hold promise for significant growth in Kenya, which has implications for a low carbon climate resilient pathway. Mining and minerals currently contribute less than one per cent to GDP, but this is expected to increase with the exploitation of newly found reserves of oil, coal, natural gas and other minerals. Kenya has options to develop these resources taking low carbon considerations into account, including encouraging the use of clean coal technologies with international support; making use of the natural gas, which is a by-product of oil production, instead of flaring it; and allocating a percentage of royalties to a climate change fund to support reforestation and other low-carbon actions.

c) Tourism

Coastal rainforests, marine ecosystems, wildlife and Mt. Kenya's glaciers make our country one of the top tourist destinations in the world. Tourism is a highly climate-sensitive industry because climate change affects a wide range of the environmental resources that are critical attractions for tourists, such as wildlife and biodiversity. Climate change also has an important influence on environmental conditions and incidents that can deter tourists, such as very high temperatures, infectious disease, wildfires, increased wildlife mortality, and insects and waterborne pests.

A low carbon climate resilient pathway can help to ensure long-term sustainable growth of the tourism industry. Priority adaptation actions include completion of the National Wildlife Adaptation Strategy, and undertaking research to determine the vulnerabilities of wildlife populations and habitats. GHG emissions in the tourism sector are low relative to Kenya's overall national emissions, but many low carbon actions can be applied – such as solar water heating, the use of energy efficient lighting and appliances, and more efficient passenger vehicles. A concerted programme could help to create a niche market by branding Kenya as a low carbon footprint destination. This could include replication of sustainable tourism initiatives, and guidelines on resource efficiency and greening the sector.

d) Infrastructure (Energy and Transport)

Physical infrastructure, particularly for energy and transport, is an important and necessary enabler of socio-economic development. An improved, expanded, effective and reliable

MEMR NCCS/HTSPE

national infrastructure – to lower the cost of doing business and increase competitiveness – is crucial for development. A low carbon climate resilient pathway means that:

1) GHG emissions are as low as possible in the sector – recognising that emissions will rise as Kenya develops; and

2) Infrastructure is "climate proofed" – that is, designed, constructed and operated in a way that accounts for anticipated risks and opportunities that result from climate change, ensuring that infrastructure investments are not compromised in the future.

For the ASALs, this means a road network that can stand up to a changing climate, the establishment of strategic multipurpose dams and expanding renewable energy capabilities (wind, solar and biogas), both decentralised and connected to the national grid.

In regard to *transport infrastructure*, port facilities, roads, railways and bridges will need to account for rising sea levels and the increased occurrence of extreme weather events and flooding. Kenya is expected to have high growth in the transport sector and a challenge will be to develop the required infrastructure in a low carbon and climate resilient manner. A priority low carbon action is an extensive mass transit system for Greater Nairobi in the form of bus rapid transit corridors complemented by light rail transit, which could abate about 2.8 $MtCo_2e$ in 2030. Construction of a mass transit system can also be a starting point for non-motorised

transport infrastructure, such as bicycle lanes and sidewalks, which can be developed in parallel with the transit system. Other low carbon transport options include a shift of freight from road to rail, improved passenger and freight vehicle efficiency, and bioethanol blending and biodiesel use – with a combined mitigation potential of 4.1 $MtCO_2e$ a year in 2030.

The aviation sector is a growing source of GHG emissions, and Kenyan airlines that fly into countries of the European Union will be expected to offset the emissions associated with this international travel. Research is needed to determine the best way for Kenyan airlines to meet or reduce these costs. Low carbon actions can be taken to make refurbished airports as energy efficient as possible; and climate resilience can be improved through up-to-date weather observations systems, which also improves airline safety.

Infrastructure for *electricity generation* is a priority to support Kenya's development ambitions. Improved electricity production helps to ensure a stable and secure supply of power – which is critical for economic growth and job creation. Increased generation of renewable energy also has the benefit of improved energy security by reducing reliance on fossil fuel imports. A climate resilient pathway includes electricity generating systems and a national grid that can withstand the extreme weather events expected as a result of climate change.

A low carbon climate resilient pathway prioritises renewable energy systems, which increase reliability of the electricity supply by reducing reliance on hydropower, which is vulnerable to climate change-induced variations in rainfall patterns. Development of Kenya's geothermal energy potential will arguably be the powerhouse for renewable energy development. This low carbon option has the largest abatement potential in the electricity generation sector at approximately 14 $MtCO_2e$ a year by 2030. Other low carbon options include the expansion of wind and hydropower-based electricity generation with an abatement potential of 2.5 $MtCO_2e$ by 2030.

Off-grid electricity generation systems are important for communities where it is not economically viable or physically feasible to connect them to the national grid. These systems, which are likely to use wind turbines, solar panels or small hydro systems, can help to provide electricity to the 70 per cent of Kenyans who have no access to power.[44]

Climate resilient actions in the infrastructure sector include improved use of weather and climate information in infrastructure development, and research to identify designs and materials that enhance the resilience of infrastructure. Regulations and codes should be revised to account for climate change impacts, and climate risk screening should be undertaken for flagship projects in the infrastructure sector.

e) Manufacturing

Kenya has one of the largest manufacturing sectors in sub-Saharan Africa, and expansion of the sector forms a significant part of the country's development strategy. Climate change causes real problems for the manufacturing sector. For example, increased frequency of droughts creates water scarcity that disrupts industrial processes and compromises hydroelectric power generation resulting in additional operating costs for running generators or paying more for electricity due to increased use of thermal-based sources. Many cement manufacturers in Kenya plan to turn to coal as a reliable and cheap fuel source, which will lead to increased GHG emissions.

Greenhouse gas emissions from the manufacturing sector are still relatively low compared to other sectors, with emissions coming from electricity and fuel use in industry as well as from industrial processes (mainly from cement and charcoal production). Improvements in the energy efficiency of industrial processes will enhance competitiveness and potentially create cost reductions. The use of state-of-the-art technology and equipment for manufacturing processes can reduce emissions – both by reducing use of electricity and reducing emissions in the industrial process. For example, process emissions from cement manufacturing can be reduced by replacing clinker in the cement mix with alternative materials – a low carbon option implemented by some Kenyan cement companies. The most significant low carbon opportunity in regard to process emissions is the introduction of more efficient kilns for charcoal production, with an abatement potential of 1.6 $MtCO_2e$ a year by 2030.

A low carbon pathway also includes actions to improve energy efficiency in the manufacturing sector, which can abate 1.3 $MtCO_2e$ a year in 2030. Another important low carbon option is industrial-scale cogeneration using biogas produced from agricultural residues, which is used to generate electricity and heat. The co-generation action has a mitigation potential of 1.6 $MtCO_2e$ a year in 2030. Governments can also help to stimulate markets for climate-friendly products by prioritising purchases from manufacturers of green products.

A low carbon climate resilient pathway includes active planning of industrial development, taking into account energy and water use and scarcity. Climate resilient actions include the generation of data to improve awareness of climate impacts and decision-making in the sector. Support for the growth of insurance markets can help manufacturers have access to a range of insurance products.

f) Population, Urbanisation and Housing

Kenya is expected to become a predominately urban country by 2033 mainly due to rural-urban migration.[45] Climate change is likely to make rural livelihood strategies and living conditions increasingly challenging, which will exaggerate the rural-to-urban migration trend. Climate drivers, and particularly extreme events, such as flash flooding and severe and persistent droughts, are responsible for global and regional migration and internally displaced persons. Building capacity to manage climate risks in urban centres will increase in importance, particularly since cities such as Nairobi and Mombasa are predicted to play a vital role in Kenya's future economic development.

Priority adaptation actions to promote a climate resilient pathway in the population, urbanisation and housing sector include expanded flood management in high-risk areas, including in slums, which need upgrading to increase the resilience of the poor. Also important is the upgrading of building codes to include climate resilience and green building concepts. Climate risk assessments should be undertaken for essential public buildings and emergency services, and priority actions implemented in a timely manner. Research is needed to assess migration as an adjustment or coping mechanism for climate variability, and to identify alternatives to allow people to remain in their communities. This is closely linked to the drought and climate change actions discussed below.

A low carbon pathway includes distributed clean energy solutions for households and institutions (such as solar lanterns, improved cookstoves and LPG cookstoves, and energy efficient lighting and appliances), which can have huge social and economic benefits. Improved cookstoves can better the lives of individuals, particularly women and children, in rural and urban areas – by reducing time to collect fuelwood, reducing indoor air pollution, and potentially introducing cost savings to households. Access to modern energy solutions enables income-generating activities, health services, access to communication and improved education outcomes – all of which are of particular benefit to women and children. The mitigation potential of stepping up distributed clean energy technologies is over 10 $MtCO_2e$ per year in 2030. Some of the options, such as solar lamps, have very attractive payback times and can introduce cost savings to consumers.

g) Health

The burden of climate-sensitive disease is high in Kenya and future climate change is expected to "exacerbate the occurrence and intensity of future disease outbreaks and may increase the spread of diseases in some areas".[46] Climate change is expected to put human health at risk by exacerbating the magnitude and occurrence of heat stress, asthma,

vector-borne diseases (such as malaria, dengue, schistosomiasis and tick-borne diseases), and food-borne diseases (such as diarrheal diseases). Climate change is also expected to increase exposure to Rift Valley Fever, malnutrition and water-borne diseases.[47] Geographic exposure to malaria, which is one of the most physically and economically debilitating diseases in Kenya, is predicted to expand into new areas due to increasing temperatures and changing distribution of precipitation.

Priority adaptation actions to increase climate resilience include improved disease surveillance, including strengthening existing early warning, monitoring and evaluation systems for malaria epidemics. Improved community-level health care and dissemination of information on changing health risks can enhance the response to climate-related diseases. Importantly, increased access to water and sanitation can improve disease vector control. A low carbon action is the use of water filters that provide access to clean water while reducing demand for firewood used to boil water and therefore slowing deforestation.

h) Disaster Preparedness[48]

The Government of Kenya has recognised the growing threat of climate-related risk to the achievement of its development goals; and, in response, has improved its capacity to prevent, manage and recover from disasters and to adapt to the impacts of climate change. Kenya has made large technological advances in predicting drought and generating credible early warning information. Yet the challenge of effective response has become more urgent as climate change increases drought vulnerability. The magnitude and severity of drought has increased in the recent past; this is particularly true in the ASALs that make up more than 89 per cent of Kenya's total land mass.

Actions to improve climate resilience in the disaster preparedness programme include modernisation of meteorological systems, and an early and appropriate response to emerging drought that includes a well-maintained early warning system. These systems should be backed by a reliable and effective social safety net programme carried out by empowered youth and women. Trained county-level disaster management officers can also help to ensure a timely and effective response. Actions should also address current and anticipated levels of water scarcity, including implementing the Water Sector Investment Plan for 2008 to 2030 and Water Catchment Management Initiative. Climate-proofed infrastructure development in the ASALs, investment in sustainable livelihoods that are adaptive to climate change (such as crop farming with drought resistant seeds, dryland forestry and community-based livestock systems), and education programmes are priority elements of a climate resilient pathway.


Nation/Billy Mutai

4.3.2 Improving the enabling conditions for success

A supportive enabling environment includes appropriate institutions, national legal instruments including codes and standards, a supportive investment environment, appropriate technology development, and access to information to help make informed choices. Kenya is developing a solid policy, regulatory and institutional foundation to address climate change (see Chapter 8); but more can be done to overcome barriers that inhibit the transition to a low carbon and resilient development pathway. These barriers include gaps in policy and legislation, weak institutional capacity, poor management of natural resources, limited private sector involvement, lack of capital and financing, and inadequate access to adaptation and mitigation technology. The Action Plan recommends actions to improve the enabling environment in five areas – finance, regulatory and policy framework, knowledge management and capacity development, technology and measuring results – which are summarized in Table 4.1 and elaborated in the respective chapters of the Action Plan.

Table 4.1: Enabling actions to support the transition to a low carbon climate resilient development pathway

Action plan chapter	Recommended enabling actions	Importance in the transition to a low carbon climate resilient future
Financing Implementation of the Action Plan (Chapter 8)	- Undertake targeted interventions to help overcome weakness in the investment climate: one-stop shop for permits and licenses; standardised Power Purchase Agreements for renewable energy; improvements to the Feed-in Tariff regime; the development of a national energy efficiency policy and greater co-ordination of technical assistance programmes - Establish the Kenya National Climate Fund as the primary vehicle for receiving and disbursing international climate finance - Establish a carbon trading platform to market Kenya's carbon market activity	- Finance is essential, requiring a mix of international and domestic climate finance that leverages public and private sources. - Improves investment climate - Strengthens Kenya's position as a credible and attractive destination for international public climate finance flows - Improves absorptive capacity - Stimulates involvement of private sector - Improves access to carbon finance - Improves promotion and marketing of Kenya's carbon market activities
Regulatory and Policy Framework (Chapter 9)	- Enact an overarching standalone climate change law - Amend sectoral laws to facilitate priority actions - Establish a high-level National Climate Change Council to provide oversight and coordination - Establish a Climate Change Secretariat as the main technical mechanism to deliver on the Action Plan	- Provides legitimacy - Sets goals - Encourages transparency and openness - Regulates conduct and establishes sanctions to ensure compliance - Promotes coherent, crosscutting action - Promotes investment
Knowledge Management and Capacity Development (Chapter 10)	- Establish a national framework for capacity development - Establish a climate change information and knowledge management network to collect, generate and analyse climate change knowledge products - Disseminate climate change knowledge products to potential beneficiaries, especially women and other vulnerable groups, through improved public awareness and communication - Develop collaborative partnerships to engage government and civil society - Integrate climate change in the education system and in all other professional practices.	- Improves capacity to face new challenges posed by climate change - Improves knowledge of what works for people, at the national and local level, including indigenous knowledge as recognised in the Constitution Article 11 (2) (b) - Provides access to and sharing of climate change knowledge - Facilitates capturing of best practices from outside Kenya's borders to support cross-country learning - Guides strategy, planning and implementation through improved links between science and evidence-based policy and planning

Action plan chapter	Recommended enabling actions	Importance in the transition to a low carbon climate resilient future
Technology (Chapter 11)	- Identify priority technologies using the updated Technology Needs Assessment - Establish and support climate change technology promotion centres - Upgrade codes and regulations to promote low carbon climate resilient technology choices - Promote research and development to ensure appropriate technologies use and development - Explore South-South technology cooperation	- Facilitates the introduction of leading-edge technology and leapfrogging to the best technologies - Develops indigenous technology in line with Article 35 of the Constitution and technology assessment - Improves technology cooperation - Improves the innovation and knowledge base in Kenya
Performance Management and Benefit Management Framework (Chapter 12)	- Measure benefits and results, including increasing resilience to climate change and emission reductions, using the MRV+ system - Identify key synergies between adaptation and mitigation outcomes - Report on links between low carbon climate resilient actions and national priorities and sectoral objectives - Track Kenya's voluntary contributions to address adaptation and mitigation - Track international support and the results generated	- Ensures effectiveness and accountability of climate change actions - Attracts funding, through proper accounting and cost effective use of resources - Reinforces synergies between adaptation and mitigation outcomes - Facilitates reporting to the UNFCCC on progress to adapt to climate change, reduce GHG emissions and achieve the Convention's climate goals

4.4 Moving Forward

Significant investments are required and a series of barriers need addressing before the low carbon climate resilient opportunities can be realised. Moving forward on the low carbon climate resilient development pathway set out in this Action Plan will require overcoming regulatory, institutional and market barriers that currently prevent large-scale implementation. A large challenge is financing the higher upfront costs of low carbon climate resilient investments. The investment costs to 2030 for implementation of the six priority low carbon options identified in Chapter 6 are estimated to be KSh1,371 to 1,773 billion (USD16.2 to 20.84 billion) to 2030. Even with lower life-cycle costs, as is the case with many energy efficiency technologies, higher upfront costs can inhibit investment. Greater involvement of the private sector is needed in financing these low carbon climate resilient investments. Especially important are the investments in low carbon technologies required to improve energy and transport infrastructure and to develop recently discovered oil and coal deposits in as low carbon a manner as possible; and the incremental investments required to ensure that all infrastructure developed is climate-resilient.

Bilateral and multilateral funding, as well as international climate finance mechanisms – such as the Green Climate Fund, Adaptation Fund and emerging NAMAs and REDD+ mechanisms, are essential if Kenya is to implement such an ambitious National Climate Change Action Plan. The evidence base provided through this Plan can help international partners ensure their investments align with Government of Kenya climate change priorities as agreed under Vision 2030. International support can also help Kenya create the enabling environment to attract private sector investment to make the transition to a low carbon climate resilient development pathway.

Panos/Sven Torfinn

5. Adaptation

5.1 Introduction

Although Kenya has little historical or current responsibility for global climate change, and emissions are insignificant relative to the global emissions, the country is highly vulnerable to its impacts. Therefore adaptation to climate change is the main priority of the country.

The climate risk-based adaptation analysis conducted during the preparation of the National Climate Change Action Plan (NCCAP) built on the findings of the National Climate Change Response Strategy (NCCRS), with the aim to:

- Provide evidence of the key climate risks to Kenya;
- Assess climate change impacts on the sectors;
- Document climate adaptation activities that are underway, planned and recommended;
- Develop a set of potential and priority adaptation actions to address projected climate impacts per sector that will feed into Kenya's National Adaptation Plan (NAP);
- Support the integration of climate change adaptation into relevant new and existing sector policies, development, budgetary and planning processes and strategies, and across different levels.

The output from the adaptation analysis is summarised in the Adaptation Technical Analysis Report (ATAR) and detailed in a series of reports compiled in the Adaptation Annex to this NCCAP. This chapter introduces a summary of the findings from the ATAR and elaborates further on the climate resilience analysis introduced in Chapter 4. Escalating climate change effects outlined in these various reports mean that adaptation to climate change in Kenya is recognised as a journey – and not a destination. National plans should be developed continuously, progressively and iteratively, and implementation should be based on "nationally identified priorities" (see UNFCCC Decision 5 CP 17).

A comprehensive National Adaptation Plan (NAP) for Kenya to accompany this NCCAP will be finalized during 2013. Evidence and recommendations of the ATAR are being drawn on to set adaptation priorities and to frame an adaptation strategy that responds to Kenya's development needs and climate vulnerability by proposing initiatives to build adaptive capacity and resilience through social sectors. A framework is being developed

for the governance of climate adaptation decision-making and implementation from local to national levels. The NAP will address how to integrate climate change adaptation into relevant new and existing policies, programmes and activities and how adaptation is planned through the annual and medium-term planning processes and strategies, within all relevant sectors and at different levels.

5.2 Vulnerability to Climate Change

Kenya is susceptible to climate-related effects and extreme weather events pose serious threats to the socio-economic development of the country. Climate change poses threats to the attainment of Vision 2030 objectives. Droughts and floods in particular are having devastating consequences on the environment, society and the wider economy.[49]

The associated spill-over to the macro-economy has been significant. The overall impact of the 2008-2011 drought in Kenya is estimated at KSh968.6 billion (USD 12.1 billion), and was predicted to have caused a slowing down in the growth of the country's economy by an average of 2.8 per cent per year during that period. Similarly, the 1998-2000 drought is estimated to have resulted in a 16 per cent reduction in the GDP in each of the 1998-99 and 1999-2000 financial years.[50] Lost industrial production alone due to inadequate power supply during this period amounted to a loss of approximately KSh 110 billion (USD 1.4 billion).

Floods have also caused equally devastating consequences in recent years, including loss of lives and livelihoods, personal property damage and damage to infrastructure, with ramifications for the economy. For example, the 1997-98 El Niño floods are estimated to have caused damage at least equivalent to 11 per cent of GDP, including KSh62 billion (USD 777 million) in damage to transport infrastructure and KSh3.6 billion (USD 45 million) to water supply infrastructure.

While floods are generally associated with higher damages on public infrastructure assets, the burden of droughts falls more heavily on people, communities and the private sector. In particular, the livestock and agriculture sectors were the most affected by the 2008 and 2011 drought events, with respective drops in productivity of 72 per cent and 13 per cent.[51] Along with these direct impacts, climate-related events affect the overall performance of the economy in the long run. Other macro-economic trends which have been evident during droughts and which appear to be exacerbated by climate related effects include:

- Reduced foreign exchange earnings (Kenyan business and international competitiveness);

- Altered balance of payments (e.g. reduced exports, increased imports);
- Current account deficit (e.g. reduced government revenues or increased expenses);and
- Price inflation (e.g. increased food or energy prices). (See sectoral risk analysis in TR1 for more details.

Risks and vulnerabilities were identified according to the methodology presented in Box 5.1

Box 5.1: How the impacts and risks were identified

The impacts and risks identified in the Climate Change Action Plan assessment are based on desk-based review, utilising peer-reviewed and grey literature, together with Kenya's National Communication to the UNFCCC, stakeholder and county consultations, Technology Needs Assessment reports and other relevant national planning documents. By incorporating an assessment of their future likelihood and consequence (the two key elements of risk), the assessment prioritised and ranked impacts with reference to the themes of the Medium Term Plan. The strength of this methodology is that it puts climate effects at the centre of the analysis and derives priorities to address the most important risks – often assessed in terms of expected economic losses where there is adequate information.

Recent UNFCCC decisions have recommended national adaptation planning be based on assessments of development needs and climate vulnerability. This approach recognises that adaptation actions need to address socio-economic development deficits as well as climate effects. The strength of this approach is that a fuller integration with national development planning and implementation is possible than through the climate risks-based approaches. In the NAP the climate risk-based approach of the ATAR and a development needs and climate vulnerability will be combined to draw the strengths from each.

The climate change impacts and risks to Kenya's economy have been analysed in detail for each sector in the Adaptation Technical Analysis Reports. Impacts for particular sectors are summarised as follows:

- **Agriculture, livestock and fisheries**: This sector is key for Kenya in terms of employment, food security, livelihoods and economic development. Climate change has the potential

to significantly affect agriculture-based livelihoods by challenging the sustainability of current arable, pastoral and fishing practices. However, in some generally temperature-stressed highland settings, climate change has the potential to create more favourable agro-climatic conditions.[52] The climate change effects likely to directly and indirectly impact agricultural productivity include:

- Higher temperatures are likely to directly reduce yields of desirable crops in the long-term. For example, parts of south west Kenya have been highlighted as potentially experiencing a significant reduction in the number of reliable crop growing days by the 2050s.[53]

- Changes in precipitation patterns are likely to directly increase short-term crop failures and long-term production declines for rain-fed agriculture. The high inter-annual unpredictability in precipitation is already having negative consequences on rural livelihoods.

- A number of indirect impacts, such as increased rates of runoff and soil erosion, and increased crop losses from wildlife migrations, insects, diseases and weeds, could significantly magnify production losses.

- Declines in agricultural production will be detrimental for the food security and human health of small-scale subsistence farmers and their local communities.

- Approximately 60 per cent of the country's livestock is found in the ASALs, which constitute about 80 per cent of the country's land mass and which are home of 30 per cent of the country's population.[54] Pastoralism is the dominant form of livestock-keeping in the ASALs and given the recourse to mobility to manage climate variability, pastoralism is inherently adaptive. However, the increased frequencies of extreme weather events multiply the impact of factors that constrain pastoralists' livelihoods.

- **Manufacturing, retail and trade sectors:** Climate change has the potential to impact manufacturing, retail and trade sectors across a range of economic scales, from individual businesses operating in manufacturing, wholesale and retail through to the national economy and international trade. Impacts to critical supporting infrastructure, such as energy, water, communications and transport, have the potential to reverberate into the private sector, with consequences for business continuity, revenue, workforce and associated supply chains. The agricultural sector accounts for about 26 per cent of Kenya's GDP and 75 per cent of jobs. Climate-induced changes in productivity and

crop diversity, such as tea, coffee and vegetables, have implications for exports and what will need to be imported. For example, recent crop failure in maize resulted in the government importing 2.6 million bags between 2008 and 2009, worth KSh6.7 billion.[55]

- **Financial services sector:** Climate change is a potential "external shock" to the financial services sector, through, for example, exposure to indirect risks to investment portfolios, and retail customers defaulting on loans, and to insurance through increased risks leading to high claim ratios and lower uptake of insurance cover.

- **Tourism sector:** Tourism is a major foreign exchange earner contributing 10 per cent to Kenya's GDP.[56] Climate change may exacerbate the effects of changes in water availability, biodiversity loss and reduced landscape aesthetics, natural hazard frequencies, coastal erosion and inundation, and the incidence of vector-borne diseases on the tourism industry to varying degrees.

- **Natural resource and environment sector:** Kenya's natural resources, in particular its rich flora and fauna, are among the country's most valuable natural assets. Climate change will affect the availability of key environmental and water resources, while exacerbating existing sanitation problems. Increases in sea surface temperature, sea level rise and coastal erosion, are likely to put additional pressure on coastal ecosystems, including islands, estuaries, beaches, coral reefs and marine biodiversity. Sea level rise in combination with extreme weather events is likely to intensify flooding as the majority of the coastland is low-lying and result in saline intrusion of aquifers. Anticipated impacts of climate change on biodiversity include shifting of ecosystem boundaries, change in natural habitats and sharp increases in extinction rates for some species.[57] The distribution of forests in Kenya is largely determined by precipitation, therefore in areas where precipitation is projected to decrease there is the potential for significant forest die-back and biodiversity loss to occur, which will have associated detrimental consequences for rural livelihoods. Forest fires, which are influenced by climatic conditions, have in the recent past affected Kenya's major forests, including the Mount Kenya Forest in February/March 2012.

- **Water sector:** Freshwater resources are already highly influenced by inter- and intra-annual rainfall variability, including the extremes of flooding and drought and climate change may further reduce the availability of this resource through altered rainfall patterns, higher evaporation, lower lake levels, accelerated loss of glaciers and rising sea level.

- **Health sector:** Climate change is expected to put human health at risk by increasing the magnitude and occurrence of existing impacts, such as heat stress, air pollution, asthma, vector-borne diseases (such as malaria, dengue fever, schistosomiasis and tick-borne diseases), water-borne and food-borne diseases. According to the World Health Organisation, increasing temperatures and precipitation patterns arising from a changing climate in the past 30 years already claim over 150,000 lives annually.[58] Geographic exposure to malaria is predicted to expand into new areas, including the Kenyan Highlands, due to increasing temperatures and changing distribution of precipitation. Increasing annual temperature is likely to be responsible for increasing prevalence of diarrhoeal disease, particularly among children under 5 years. Extreme events and El-Niño floods are also likely to lead to increasing outbreaks of other diseases such as cholera and rift valley fever. In coastal areas, toxins from harmful algal blooms can create significant health risks for humans and wide-ranging impacts on marine ecosystems.

- **Urban and housing sectors:** Climate change is likely to make rural livelihood strategies and living conditions increasingly challenging and as a result is likely to exaggerate the rural-to urban-migration trend Kenya is currently experiencing. Specific risks and challenges for communities, especially those living in urban environments and particularly the most vulnerable, include river and flash flooding, with flood related fatalities constituting 60 per cent of disaster victims in Kenya.[59] Extreme events and particularly El Niño rains are likely to undermine the health of Kenya's inhabitants directly through increasing numbers of injuries and deaths and indirectly through water quality issues and food insecurity. Drought and associated water scarcity, in particular, have the potential to exacerbate existing inequalities. Women in Kenya have been observed to be disproportionately affected by drought because pre-existing gender discrimination exposes them to higher rates of poverty and insecurity and because of the extra socio-economic burden they have meeting the needs of households, children, vulnerable and the elderly.[60]

- **Infrastructure (for energy and transport):** A range of climate impacts have the potential to compromise infrastructure design, function and performance across a range of settings. In coastal locations, ports and transport infrastructure is particularly exposed to climate impacts, together with tourism assets and settlements. Riverine flooding and landslides have the potential to cause significant damage to physical infrastructure such as roads, bridges, water pipelines and power lines, resulting in widespread disruption. The resulting mobility challenges are multiplied by the existing poor state of many roads in rural Kenya. Droughts cause underperformance of hydroelectric power infrastructure, with power generation in periods of drought reduced by almost 40 per cent of normal years.[61]

- **Political and social arena:** Both sudden and slow onset effects of climate change have the potential to affect geo-political and social landscapes for the worse. A changing climate that is poorly adapted to can compound the causal factors of environmental degradation, natural resource scarcity, human health and social conflict. As governance and planning is the basis for national and local level climate adaptation, countries that are politically unstable and have weak governance structures are seen as being more susceptible to climate-induced conflicts. However, a 'securitization' of debates on climate change responses runs the risk of devolving humanitarian responsibilities to the security forces, ignoring key challenges and losing sight of those climate vulnerable communities that stand most in need of protection. [62]

Box 5.2: Focus on Droughts

Drought is the prime recurrent disaster in Kenya. In recent times intense droughts have occurred in 1991/92, 1995/96, 1998/2000, 2004/2005, and 2008-11.[63,64,65] Each of these events has caused severe crop losses, famine and population displacement in the country. Climate change introduces additional uncertainties into existing vulnerabilities, particularly in the ASALs.[66] Increased temperatures and rainfall variability are likely to exacerbate the conditions already experienced and may in the future have a significant impact on water availability and thereby droughts.

The prolonged drought of 2008 - 2011 serves to highlight some of the devastating and pervasive socio-economic consequences resulting from such events, as summarised below[67]:

- *Agriculture:* Crop production losses arising from reduced yields of food crops and cash crops amounted to KSh69 billion and KSh52 billion, respectively. Maize, tea and coffee had the highest losses.
- *Livestock:* The livestock sector experienced the worst impacts, losing approximately KSh699 billion, with KSh56 billion in damages due to costs from veterinary care, water, feeds and production decline and KSh643 billion in losses due to animal deaths.
- *Fisheries:* The total value of the effect of the drought on fisheries was estimated at KSh4.2 billion, comprising KSh3.6 billion in losses and KSh0.5 billion in damages.
- *Environment:* Direct impacts of the drought and indirect impacts from wildfires included environmental losses as a result of damages to plant and animal species, habitats, reduced forest productivity, lower water levels, increased livestock and wildlife mortality rates.
- The drought in Kenya had profound impacts on many communities, destroying livelihoods and increasing vulnerability. In pastoralist areas where men are traditionally responsible for livestock, reduced herd sizes forced men to migrate to urban centres for wage-employment. This had implications for women and children due to the additional burden of sustaining household food, water and human security". School attendance rates decreased, child labour increased and conflicts over resources were observed to intensify.

- The influx of civil strife and drought-driven refugees to northern Kenya is another consequence of drought which creates challenges to the ASAL economy and natural resource base. According to UNHCR, Kenya is currently (2012) hosting 650,000 refugees located in three camps. Based on a recent Kenya Forest Service (KFS) report 11.3 million tonnes of fuelwood were cut by the refugees from an area of 80-km radius over three years. The recovery of these resources will take a long time in the pastoral areas.

- Over the past few decades, the ASALs have witnessed several transformations that impacted on the livelihoods of the pastoralists. Migration of rural communities from the congested high-potential areas and the dry arid areas to cities has contributed to over-populated slums and settlements that lack basic services. The dwellers of the slums in turn continue to migrate to the semi-arid areas and pursue non-pastoral activities such as cropping in grazing lands not well suited for agriculture.

- *Energy:* Reduced output of hydropower that resulted in reduced revenue for KPLC, estimated to be about KSh2.6 billion. Likewise, the Kenyan electricity producer KenGen also reported a downward trend in their revenue in late 2010, totalling KSh1.25 billion.[68] Reduced hydropower production was accompanied by an increased share of thermal power generation at a higher cost of generation. The losses due to higher production costs are estimated to be about KSh29.8 billion contributing to total cumulative losses of approximately KSh32.4 billion.

5.3 Current Actions to Address Vulnerability -Examples from Drought Management and Agricultural Sectors

The Government of Kenya has initiated various responses to climate change challenges affecting the country's development. For example, the climate risks assessment conducted for the agriculture sector shows how the integration of climate change issues into planning and implementation is taking place (see the ATAR for more detailed reports of the response in other sectors).

Box 5.3 Drought Intervention

Policy, strategy, legal frameworks and assessment documents that reflect the Government's position on drought management and the development of arid and semi-arid lands include Kenya's Vision 2030, specifically the Northern Kenya addendum, the Draft Sessional paper on National Policy for Sustainable Development of Northern Kenya and other Arid Lands, the Draft Disaster Management policy, the Agricultural Sector Development Strategy, the Food and Nutrition Security Policy, the draft National Social Protection Policy, the policy framework for Nomadic Education in Kenya, the strategy for Ending Conflict Among Communities in Northern Kenya and other Arid Lands 2010-2012 and the National Climate Change Response Strategy 2010.

The Kenya Government has developed a series of approaches for the development of ASALs since independence in 1963. Those that have focused on building resilience of ASAL communities to drought include: i) Kenya Livestock Development Programme (KLDP), 1968–1982; ii) Emergency Drought Recovery Project, 1991–1996; iii) Arid Lands Resources Management Project (ALRMP), 1996–2010; iv) ASAL-based Livestock and Rural Livestock Support Programme (ALLPRO), 2004–2010; v) Kenya Drylands Livestock Development Programme 2010–2013; vi) Kenya Rural Development Programme (KRDP); vii) The DFID-supported Hunger Safety Net Programme; viii) Education for Nomads; and ix) Capacity Kenya.

The Nairobi Summit of the IGAD Heads of State of September 2011 called for an end to drought emergencies in the Horn of Africa. The Kenya Country Programme Framework for Ending Drought Emergencies (CP-EDE) is based on six Strategic Response Areas (SRAs)[69] aligned to the IGAD Common Architecture as follows:

1. Development of a coherent strategy for peace and conflict transformation and prevention to be integrated across all major sectors and include all actors in order to strengthen and institutionalise the peace infrastructure at all levels.
2. Support the consolidation and coordination of scattered drought-management initiatives that currently operate independently of each other under one institution (the National Drought Management Authority (NDMA), including the strengthening and support to early warning systems, risk management initiatives and fund flow from a National Drought and Disaster Contingency Fund (NDDCF).
3. Interventions to develop cost-effective, world-class climate-proofed infrastructure facilities and services in the ASALs, including construction of priority roads, physical markets and growth poles to promote value addition, mapping of established settlements in arid lands without permanent water, construction of multi-purpose dams, development of mechanisms that ensure timely maintenance of existing water sources, development and expansion of ICTs capabilities and infrastructure, development of disease control mechanisms and livestock marketing infrastructure, and development and harnessing of energy sources.
4. Increase participation rates in all sectors of education and training as a long-term measure to address human capital challenges and support livelihood diversification.
5. Focus on livelihoods improvements to enable adaptation to increased climate variability over the short term and to change over the medium term.
6. Strengthen the NDMA to ensure it is responsible for the supervision and coordination of all drought management activities and coordination of all stakeholders implementing any drought management program in Kenya.

A number of climate change adaptation interventions have been proposed in strategic plans of ministries and some are currently being implemented by government, civil society and/or the private sector. These include: seasonal forecast provision to vulnerable communities, support for community-based adaptation strategies, conservation agriculture, developing weather indexed livestock and crop insurance schemes, climate change relevant agricultural research and extension services, promoting heat tolerant and adaptive livestock breeds, establishment of fodder banks for dry season feeding, and institutionalising early warning systems.

The Agriculture Sector Development Strategy (ASDS) 2010-2020 specifically outlines the implementation of the National Climate Change Response Strategy (NCCRS), noting in part that *"Climate fluctuations have a bearing on the way the environment and natural resources are managed … and the effect has been unpredictable weather that in turn has affected agricultural activities.*[70]*"* Under the Northern Kenya and Arid Lands sub-sector the main challenge cited is the high impact of drought on local communities, which causes food insecurity and contributes to the increase of poverty in the arid areas.

Climate related issues are also raised in the MTP for the agricultural sector, recognising that climate-related destruction of the natural environment is causing concern, as increased flooding and occurrence of landslides have resulted in loss of agricultural land. In addition, human-wildlife conflict, which may or may not be attributed to climate change and drought in particular, is a major threat to agricultural productivity. It is recognised that temperature rises may also affect fish stocks, which means the fisheries sector needs to adapt. Under the fisheries sub-sector diminishing fish stocks are cited as an impediment in realising the potential of the sector.[71]

The Medium Term Expenditure Framework (MTEF) (2011) report states that emerging concerns such as the effects of climate change mean that adaptation measures will need to be mainstreamed in the sector's programmes and projects. To this end the Ministry of Agriculture has established a climate change unit to monitor and take actions against the effects of climate change, and is in the process of developing a policy on mainstreaming climate change within the sector, with climate change adaptation pilot projects being implemented in various parts of the country.

5.4 Options for Combined Adaptation Actions

The adaptation analysis undertaken for the preparation of the NCCAP and documented in the ATAR and NAP proposed a set of priority options for adaptation for each MTP theme. These are referred to in the ATAR as 'Resilience Pathways'. The prioritisation of options was based on:

- Available knowledge and information of current and projected climate impacts;
- A survey of current, planned and proposed adaptation actions; and
- Other information and recommendations gathered via stakeholder engagement processes.

The vision and objectives for each MTP theme provide the starting point for each of the adaptation actions. A desired 'adaptation outcome' has been proposed for each MTP theme which sets out the desired position that the adaptation actions should contribute to deliver at the end of the MTP period. The adaptation actions were developed by consultative prioritisation from long lists of potential actions recommended for each theme over the next 5 years. An implementation strategy for each sector was devised that combines actions and aims to help to build the adaptive capacity of the sector to climate change.

The proposed combined adaptation actions from the adaptation technical analysis report(ATAR) for the agricultural sector are presented below as an example (note livestock is presented separately in the ATAR). See ATAR Technical Report (TR) for all 24 combined adaptation actions.

Box 5.4 Adaptation actions over 5 years for the agricultural sector (ATAR)

Medium-term adaptation outcome proposed for the agriculture sector:

- Farmers and climate adaptive farming practices supported by applied research.
- Effective communication among farmers and from farmers to government on climate adaptive strategies for the agricultural sector.

Actions proposed:

- Promote up-scaling of available climate adaptive inputs, technologies and production strategies including success stories in relevant agro-climatic zones.
- Continue to develop through research climate change resilient inputs, technologies and strategies and identify adaptation success stories and support up-scaling in relevant agro-climatic zones.
- Explore alternative financial instruments for promoting adaptation, e.g. Payment for Environmental Services, carbon finance.
- Recognise and protect emergency drought reserve areas for livestock keeping.
- Develop buffer areas of crop/forage production as part of contingency planning in drought prone regions of Kenya.
- Mainstream geographically specific climate resilience strategies into agricultural extension services delivered by government and its partners (private sector, CSOs) across Kenya.

- Undertake initial and regular screening of farming community vulnerability to current climate and use to prioritise response actions in each target area. Mainstream climate resilience into agricultural sector laws (e.g. Agriculture Act), new bills being developed, (e.g. ASCU draft bills), regulations, codes of practice, other quasi-regulatory guidance, policies, etc.Building adaptive capacity:
- Mainstream climate resilience into agricultural finance and financial mechanisms for adaptation e.g. credit, grants, subsidies, import duty, support up-scaling of successful mechanisms.
- Build enabling policy environment for development of crop, livestock, fisheries, insurance; develop framework for up-scaling successful insurance initiatives.
- Build on existing market access improvement activities to ensure Kenyan small-scale farmers can deliver crops at a fair price to market in the face of a variable and changing climate.
- Strengthen demand-driven R&D to generate climate resilient information, technologies, methodologies.
- Contribute to development of climate information sharing and knowledge management systems; strengthen collaboration between MoA, KMD and others; enhance capacity for agro-meteorological information provision and ensure effective service delivery mechanisms including climate smart extension.

5.5 Recommended Priority Adaptation Actions

During the NCCAP consultation of stakeholders and as part of the adaptation priority validation process, representatives of Government agencies in key sectors and other stakeholders prioritised climate adaptation actions and associated cost estimates based on the analysis in the ATAR as shown in Table 5.1. The interventions proposed include: livelihood diversification, development of human capital, water resources conservation and development, climate proofed infrastructural development (roads & energy), afforestation & reforestation and climate resilient agricultural systems, among others. Detailed fact sheets are not presented for the adaptation actions as they are captured in the NAP. These adaptation actions together with the MTP 2013-2017 are informing the National Adaptation Plan.

Table 5.1 Priority Adap tation Actions per Sector

Sector	Actions Prioritised by Sector Agency	Billion KSh
ADAP-1 Agriculture	Coordination and mainstreaming of climate change into agricultural extension	4.5
	Establishment and maintenance of climate change related information for agriculture	9.5
	Up-scaling specific adaptation actions - Promotion and bulking of drought tolerant traditional high value crops; Water harvesting for crop production; Index-based weather insurance; Conservation agriculture; Agro-forestry; and Integrated soil fertility management.	14.5
	Promote climate-smart agriculture in Kenya	15.0
	Development and application of Performance Benefit Measurement methodologies for adaptation, mitigation and development	1.41
ADAP-2 Livestock	Grazing management systems, fodder banks and strategic reserves	12.5
	Price stabilization schemes and strategic livestock based food reserves	4.0
	Selection and breeding animals to adapt to climate change	4.5
	Livelihood diversification (camels, indigenous poultry, beekeeping, Rabbits, emerging livestock - quails, guinea fowls, ostriches etc)	2.1
	Capacity building -Inventory of indigenous knowledge, livestock insurance schemes, early warning systems, early action, stocking rates, vaccination campaigns, disease control	4.0
ADAP-3 Water	Mainstreaming of CC into all water resource management plans and actions	5.0
	Water conservation efforts including the reversal of degradation of the main water towers and rehabilitation and restoration of all water catchments	74
	Increasing urban& rural domestic water supplies urban sewage services to help combating water borne diseases and their social and economic impacts	134
	Enhance irrigation and drainage to increase agricultural production and address water requirements for livestock production	63.4
	Carry out effective trans-boundary water resources management	0.2
	Carry out water resources assessment, documentation and dissemination of necessary information to stakeholders	2.16
ADAP-4 Environment	Strengthening the capacity of national and county institutions responsible for climate change coordination; climate-related data and information collection, processing, and management; including the National Implementing Entity; among others.	25.0
	Increase tree cover to 10% per year to contribute to reduced erosion, flood risk, environmental integrity, improved livelihood sustainability and ecosystem based adaptation.	30.0
	Mainstream climate change risks and opportunities within and across major vulnerable sectors including the Coastal Zone Management Plan, the National Disaster Risk Management Response Plan and the National Environment Action Plan in line	15.0
	Improve and strengthen climate change information management systems and enhance awareness creation of climate risk management and opportunities.	45.0

Sector	Actions Prioritised by Sector Agency	Billion KSh
ADAP-5 Infrastructure	Climate-proofing of roads in the ASALs	107
Adap-6 Sustainable livelihoods	Supporting sustainable livelihoods in drought prone ASAL	59
ADAP-7 Energy Infrastructure	Solar (hybrid systems, installation of solar in more institutions in ASAL areas, promotion of solar street lighting) to provide power for schools and other public institutions	2.2
	Increase small hydropower generation plants to provide electricity to large numbers of local community members and businesses in the rural setting enabling job creation	0.4
	Promotion of energy efficiency programmes to reduce demand for generation to save the environment	0.3
	Rehabilitation of water catchment areas (which feed the various hydro dams) -leading to regular flow in the rivers that serve the hydro dams, hence even out power generation	0.4
	Geothermal resources development - due to uncertainty in the hydrology, geothermal will become the base load.	2.0
ADAP-8 Tourism	Develop and implement action plans to build resilience of vulnerable tourism areas to climate change and variability.	0.5
	Identify and replicate sustainable tourism projects with full involvement of and distribution of equitable benefits to local communities.	0.4
	Develop and disseminate guidelines on resource efficiency for the operation of existing tourism facilities and the design standards for new ones.	0.3
	Review and update tourism sector policies, laws and regulations and other quasi-regulatory guidelines, Wgovernance and funding processes (within the context of Vision 2030 and the next MTP review) once the tourism risk assessments have been completed.	0.2
	Implement research, training and capacity building programmes in tourism to enhance the climate resilience of the tourism sector	0.1
Total over 5 years KSh billion		638

Panos/Peter Barker

6 Mitigation

6.1 Introduction

The low-carbon assessment for the six mitigation sectors, namely energy, transport, industry, agriculture, forestry and waste management, which was introduced in Chapter 4 is provided in more detail in this chapter. This assessment – which includes a bottom-up assessment of mitigation opportunities and a top-down economy-wide economic, energy and emissions model – provides the evidence base for prioritising low-carbon development opportunities and, ultimately, developing investment proposals to attract international climate finance through Nationally Appropriate Mitigation Actions (NAMAs) and Reducing Emissions from Deforestation and Forest Degradation plus the role of conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+).

Vision 2030 – Kenya's long-term development blueprint – aims to transform Kenya into a newly industrializing middle-income country by 2030. As Kenya moves to achieve its development aspirations, greenhouse gas (GHG) emissions will rise. This mitigation assessment, available in detail in the Mitigation Analysis Reports, concludes that transitioning to a low-carbon development pathway would ensure that the country's contribution to global emissions remains low and, importantly, deliver other important benefits:

- **Sustainable development** – The ideal low carbon development opportunities deliver multiple benefits, helping to address pressures related to a growing population, increasing resource use and other constraints on development. One such opportunity is the promotion of agroforestry, which increases the carbon stock on farmland, improves food security and climate resilience, and helps meet the government's goal of 10 per cent tree cover on farms.
- **International climate finance** – Nesting low carbon development within Vision 2030 and Kenya's development planning process means that development partners can ensure their climate-related investments align with Government of Kenya priorities. International climate finance for low carbon development options can potentially be obtained through bilateral and multilateral support, the Green Climate Fund, the emerging NAMA and REDD+ mechanisms or the carbon markets.
- **Demonstration of global leadership** – The implementation of a low carbon development pathway demonstrates Kenya's leadership in the global fight against climate change.

A detailed technical analysis was undertaken to identify the main elements of a low carbon development pathway, recognising that the pathway needs to emphasise sustainable development and climate resilience co-benefits. This view was supported by stakeholders and experts through an extensive consultation and validation process, which also confirmed that the low carbon analysis is:

- A first step in a longer-term effort to identify feasible low carbon development opportunities;
- Based on aggregated data from disparate sources, and as such represents new analysis previously unavailable for Kenya;
- A common base for those seeking to understand how to transition Kenya to a low carbon development pathway;
- A major catalyst that has started a conversation on how to think about low carbon development in the various sectors.

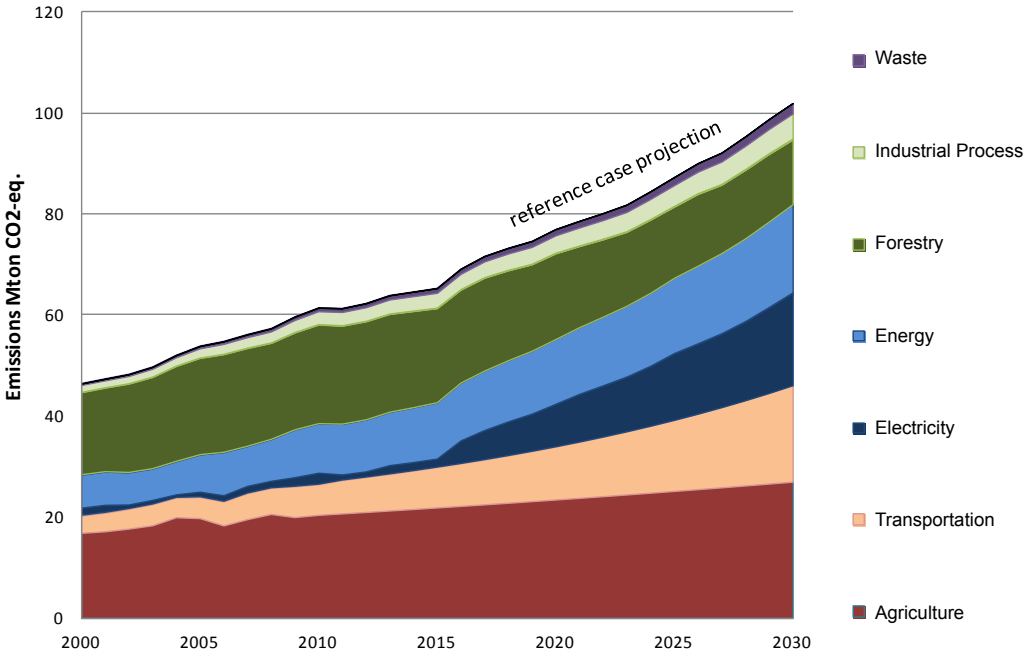
The analysis starts with the development of an inventory of historical GHG emissions and a projection of how these could change by 2030, forming the reference scenario. Low carbon development opportunities are then examined, looking at their mitigation potential, costs and sustainable development benefits. The computable general equilibrium modelling (CGE) approach informs investment choice and long-term development impacts, providing a wider view of the possible scale and scope of reductions available within the country. The analysis concludes with priority actions that can enable the transition to a low-carbon development path.

6.2 Key Findings

6.2.1 GHG emissions inventory and reference case

The last official GHG emissions inventory for Kenya was completed for the year 1994 and used in the First National Communication, in 2002. Therefore, an essential first step in the low carbon development assessment under the 2012 Action Plan analysis was to develop a comprehensive up-to-date GHG emissions inventory. Historical GHG emissions from 2000 to 2010 were calculated using the Intergovernmental Panel on Climate Change (IPCC) 2006 guidelines for GHG emissions inventories. While the inventory provides a strong starting point for building a national inventory, additional work and consultation with sectors is required before it constitutes a complete national Kenyan inventory for reporting to the UNFCCC.

Historical trends and expert assessments of sector and economic growth were used to project annual emissions up until 2030 (see Figure 6.1: Chapter 2 of the Mitigation report includes the detailed analysis). This reference case forms the baseline against which abatement potential is estimated for the six mitigation sectors.



Source: GoK NCCAP Mitigation Analysis 2012

Figure 6.1: Greenhouse gas emissions reference case: 2010 to 2030

In most cases, the projections assume historical trends in key emission drivers (population, energy demand and economic growth) will continue at constant growth rates, with no major structural changes in the economy. In the case of energy and livestock (agriculture), expert opinion and data indicated future growth would vary from historical trends, and emission forecasts were adjusted accordingly. The ambitious goals set out in Vision 2030 and other policy documents are assumed to be aspirational and unlikely to be achieved without financing, technology transfer and capacity building beyond current levels. As such, the reference case forecast does not reflect all of Vision 2030's aspirations.

In the reference case, emissions increase up until 2030 in all sectors except forestry:

- **Electricity emissions grow the most,** increasing from 2.2 million tonnes of carbon dioxide equivalent ($MtCO_2e$) in 2010 to 18.5 $MtCO_2e$ in 2030. Much of this increase is attributed to new coal and natural gas coming online to meet increasing energy demand.

- **Forestry sector emissions are likely to decline after 2020** due to the reduced clearing of forests and increases in the number and size of trees, a result of tree-planting programmes and a reduced projection in wood harvesting.

- **Agriculture and forestry sectors are the largest emitters,** accounting for approximately 72 per cent of emissions in 2010 and 65 per cent in 2030, mainly due to emissions from livestock and deforestation.

- **Emissions in other sectors grow significantly,** with transport emissions increasing by about three times between 2010 and 2030, and emissions from the waste sector and energy demand doubling in the same time period.

6.2.2 Kenya's low-carbon development opportunities

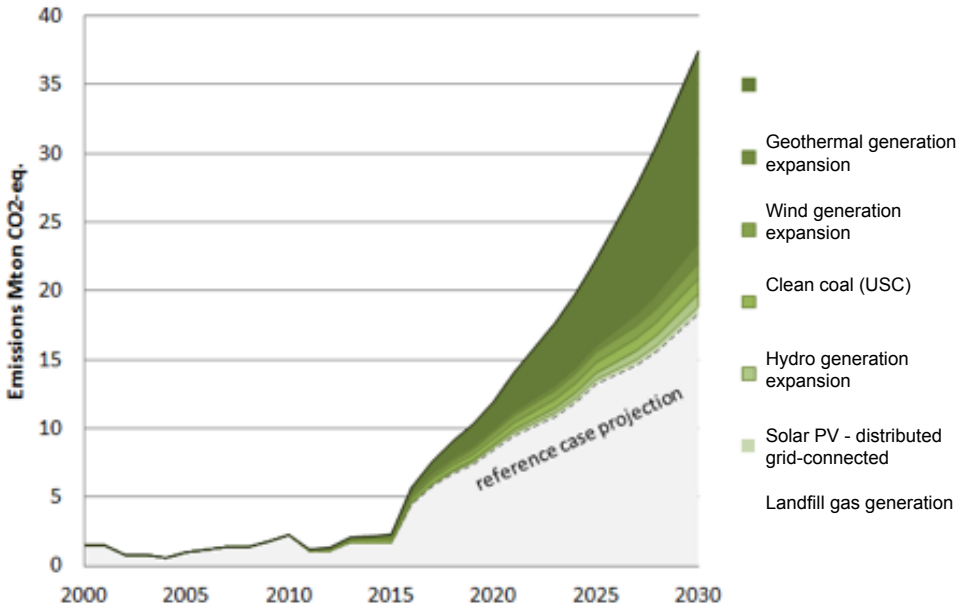
a) ***Energy***

The analysis of low-carbon development options in the energy sector considered two categories: 1) electricity supply; and 2) energy demand – including options such as energy efficiency and fuel switching.

In terms of **electricity supply**, the installed capacity in Kenya in 2011 was 1,411 megawatts. Generation was dominated by hydroelectricity, geothermal power and medium-speed diesel, which respectively accounted for 49, 29 and 21 per cent of electricity sent to the national grid. Rapidly increasing demand for electricity and fluctuating hydroelectric output have led to an increase in diesel-based generation in recent years. In addition, there has been a strong focus on expanding geothermal power, which is considered a key enabler for Kenya's economic growth. Although geothermal is the most promising renewable energy source, Kenya also has excellent bioenergy, solar, wind and hydro resources for the supply of electricity.

The analysis of six low carbon development options for electricity supply (Figure 6.2, Chapter 5 of the Mitigation report includes the detailed analysis) shows

that geothermal power has by far the largest abatement potential (14 $MtCO_2e$ per year) in 2030, with other technologies varying between 0.5 and 1.4 $MtCO_2e$. Increasing the share of renewable electricity can have benefits in terms of energy security (through decreased energy imports) and reduced costs of generation. In particular, geothermal power can provide low-cost base load generation, facilitating economic activity and development. It would also reduce the current reliance on hydropower thereby improving climate resilience.



Source: GoK NCCAP Mitigation Analysis 2012

Note: The methodological approach for the electricity sector analysis deviates from a traditional analysis of climate mitigation options. Usually mitigation options are assumed to replace a business as usual alternative or reference mix. However, for this analysis, the ambitious electricity expansion plans needed to satisfy Vision 2030 were assumed to be supply constrained in the absence of external support. International climate finance for low-carbon development opportunities provides the funding for additional capacity expansion that would not be installed in the reference case.

Figure 6.2: Low-carbon development wedges for electricity supply

Energy demand includes the final use of electricity and other sources of energy, such as biomass combustion. At present, roughly 25 per cent of the population is connected to the electricity grid. About 60 per cent of electricity is consumed by the commercial and industrial sectors, while approximately 25 per cent is used by households. Direct fuel combustion of biomass from wood sources, such as fuelwood and charcoal, is the dominant fuel source in Kenya, accounting for almost 70 per cent of primary, non-electricity, non-transport energy demand. This has placed the forests under pressure and has led to widespread scarcity of biomass. Direct fuel use in the industrial and commercial sectors is relatively low. Moreover, the energy sector may be an important transition point. The exploitation of indigenous coal resources is beginning and domestic oil resources were discovered in early 2012.

Electricity demand, particularly household demand, is expected to rise sharply with continued economic development and a growing share of the population gaining access to electricity. Even when using a conservative approach to estimate future energy demand, energy-related GHG emissions are expected to increase from 10 $MtCO_2e$ in 2010 to 25 $MtCO_2e$ in 2030.

Nine low carbon development options were analysed in the energy demand sector (Figure 6.5; Chapter 6 of the Mitigation report includes the detailed analysis). Improved cookstoves that reduce the volume of biomass required for cooking have the largest potential for GHG emission reductions, 5.6 Mt CO_2e a year in 2030. Replacing kerosene lamps with renewable lighting technologies, using liquefied petroleum gas (LPG) instead of fuelwood for cooking, and cogeneration of heat and power in agriculture were also found to have significant abatement potentials of over 1.5 $MtCO_2e$ a year in 2030. The opportunities for promoting energy efficiency are captured under energy efficiency across industry, energy efficient electrical appliances and energy efficient light bulbs.

Sustainable development benefits associated with the use of improved fuelwood or charcoal-based and LPG-based cookstoves include significant health benefits as a result of reduced indoor air pollution. Health benefits are also expected with the replacement of kerosene lamps with distributed renewable energy (such as solar) lanterns. These technologies can also bring cost savings to consumers, depending on the price of alternatives. Improved cookstoves and the use of LPG for cooking contribute to increased climate resilience as they lower fuelwood demand and reduce pressure on forests.

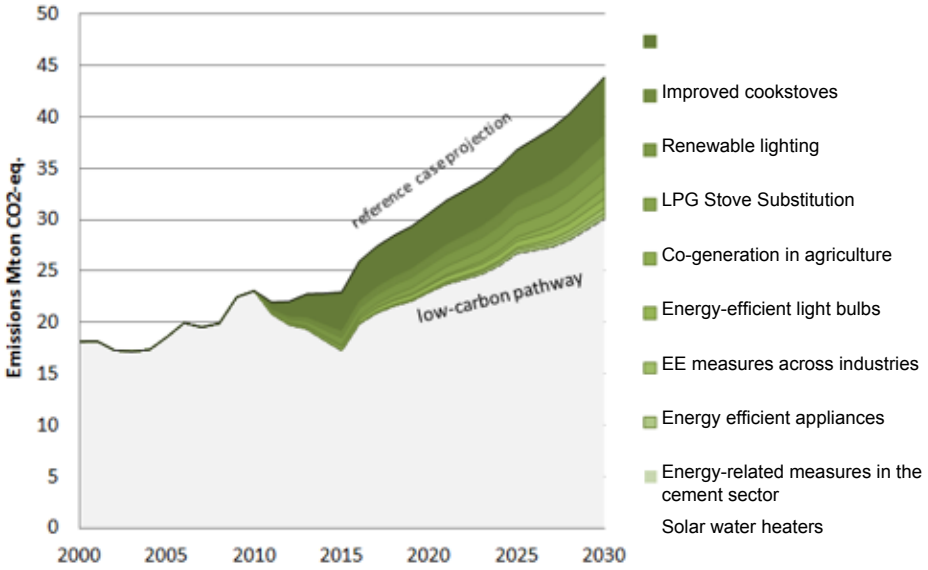
b) ***Transport***

Kenya's transport sector is dominated by road transport. The total vehicle population (excluding motorcycles) is estimated to have doubled from 600,000 vehicles in 2000 to 1,200,000 vehicles in 2010. Public transport is relatively under-developed and is dominated by minibuses (matatus). The vast majority of freight transport, including transit freight headed to other countries, is served by trucks. At the same time, increasing urbanisation and the growth of major cities have put pressure on urban transport systems and infrastructure. In Nairobi and other major cities, severe traffic congestion, especially during the extended peak hours, contributes to local air pollution and leads to significant economic losses in time and fuel. That said, the majority of individual trips in cities are still by foot because public transport services are comparatively expensive and private cars are out of the financial reach of the majority of Kenyans.

With the sector experiencing strong growth, GHG emissions from transport are projected to grow significantly from 6 $MtCO_2e$ in 2010 to almost 18 $MtCO_2e$ in 2030 (Figure 6.4; Chapter 7 of the Mitigation report includes the detailed analysis). Improved traffic conditions and access to modern transport services are required, along with increased efficiency through improved technologies, alternative (including non-motorised) modes of transport and fuel substitution.

Seven low carbon development options were analysed for the transport sector (Figure 6.4). The option with the largest mitigation potential is the development of an extensive mass transit system for greater Nairobi in the form of bus rapid transit (BRT) corridors, complemented by light rail transit (LRT) in very high thorough fare corridors. This public transport system has an abatement potential of approximately 2.8 $MtCO_2e$ a year in total. The second largest mitigation potential is the introduction of biodiesel, with a 10 per cent blend requirement having a potential of approximately 1.2 $MtCO_2e$ a year in 2030. The abatement potentials for the other low-carbon development options vary between 0.5 and 0.8 $MtCO_2e$ a year in 2030.

Introducing large-scale bus rapid transit (potentially complemented with some light rail transit) has significant associated benefits in terms of reduced traffic congestion, improved local air quality and improved road safety. These options are in line with the priorities of the Government of Kenya, which has started to secure funding for these actions. A shift of freight transport from road to rail through modernising and extending the existing rail network would facilitate regional trade, as well as improve traffic safety and road infrastructure lifetimes. While the use of biofuels would lower GHG emissions and the need for fossil fuel imports, large-scale production of biofuels could compete for land with food production if poorly planned; any move towards commercial growing of biofuel crops should be pursued in a well-regulated manner.



Source: GoK CCAP Mitigation Analysis 2012

Note: Assumes 35 per cent of unsustainable biomass

Figure 6.4: Low-carbon development wedges in the transport sector

c) *Industrial process emissions*

The industrial sector is relatively small in Kenya, both in terms of its share of GDP and contribution to total GHG emissions (in terms of process emissions). Ninety-five per cent of industrial process emissions in Kenya are created by two industries: cement manufacturing (1.7 $MtCO_2e$ in 2010) and charcoal manufacturing (0.8 $MtCO_2e$ in 2010). The figures for charcoal production assume that the feedstock used is completely carbon neutral. If 35 per cent unsustainable biomass usage is assumed, emissions from charcoal production increase to 4.3 $MtCO_2e$.

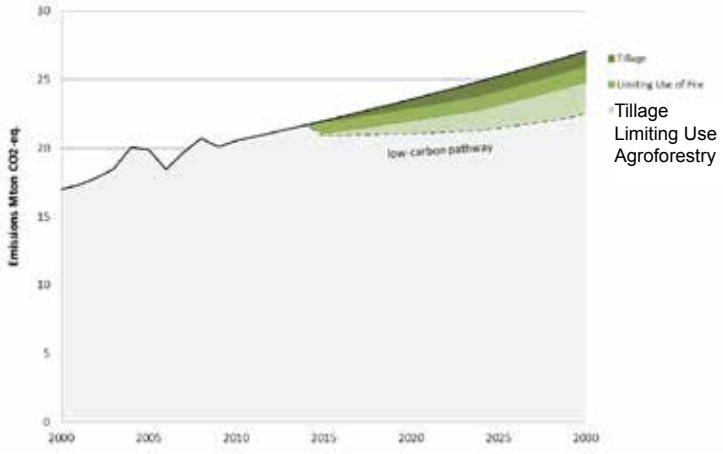
In the reference scenario, emissions from charcoal production are projected to remain relatively stable, while emissions from cement production increase to 4.4 $MtCO_2e$ in 2030. Process emissions from cement manufacturing can be reduced by replacing clinker in the cement mix with alternative materials. Although some Kenyan cement companies are implementing this approach, this was not considered in this low carbon analysis. The most

significant low carbon development opportunity is the introduction of more efficient kilns for charcoal production, with an abatement potential of 1.6 $MtCO_2e$ per year in 2030 (see Chapter 8 of the Mitigation report for the detailed analysis). Sustainable development benefits include reduced fuelwood demand leading to lower levels of deforestation.

d) Agriculture

Agriculture is the largest source of GHG emissions; it was responsible for one-third of Kenya's total emissions in 2010. Agricultural emissions are likely to increase from 20 $MtCO_2e$ in 2010 to 27 $MtCO_2e$ in 2030 (Figure 6.2; Chapter 3 of the Mitigation report includes the detailed analysis), largely driven by livestock methane emissions and land use change , which account for 90 per cent of agriculture emissions and 30 per cent of overall national emissions. The sector also plays an important role in sequestering carbon in soil and trees on farms.

Agricultural low carbon development options have the potential to abate in the order of 6 $MtCO_2e$ per year in 2030 (Figure 6.5). The most significant reduction can be achieved through agroforestry, which has an abatement potential of 4 $MtCO_2e$ per year in 2030. Other low carbon development options include conservation tillage and limiting the use of fire in range and cropland management, with abatement potentials of over 1.1 and 1.2 MtCO2e per year in 2030, respectively. These three options are elements of a climate-smart agriculture approach, and a framework to encourage investment in climate-smart agriculture will be an important action.



Source: GoK NCCAP Mitigation Analysis 2012

Figure 6.5: Low-carbon development wedges in the agriculture sector

Low carbon development actions in the agricultural sector have important sustainable development benefits, including improved retention of water and nutrients in the soil, and reduced soil erosion. These actions increase soil fertility and crop yields, improving food security and the livelihoods of farmers. Such efforts are important in arid and semi-arid lands where climate conditions are expected to become more extreme. Efforts to increase agroforestry will help meet Kenya's goal of increasing tree cover on farmland to 10 per cent as a means to preserving and maintaining the environment and combating climate change.

Important actions related to the livestock sector include manure management through biogas promotion, and rangeland pasture rehabilitation, management and conservation. In addition, actions to help farmers and pastoralists adapt to climate change, discussed in Chapter 5 of the Action Plan, should be undertaken in a manner that is as low-carbon as possible, complemented by awareness raising and education.

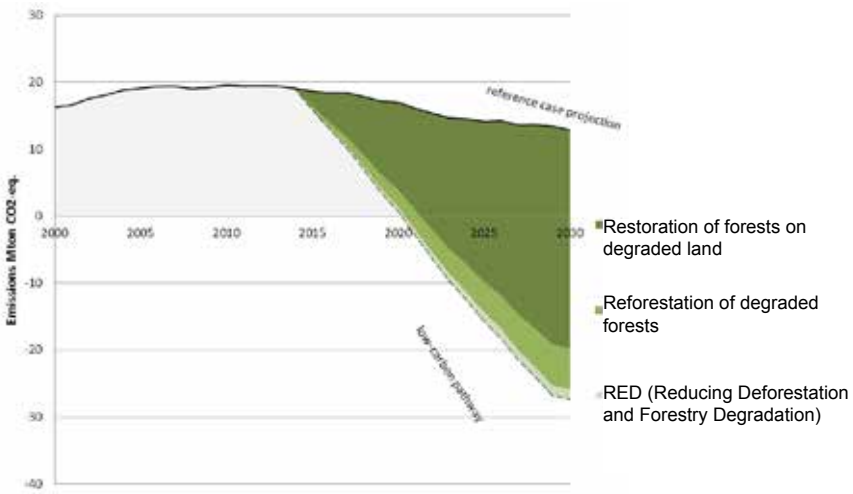
e) ***Forestry and other land use***

Forestry and other land use related emissions accounted for 19.6 $MtCO_2e$ in 2010, or about 32 per cent of national emissions. Emissions primarily originate from deforestation, where forests are cleared for fuelwood and charcoal production or to create agricultural land. The Government of Kenya is working to increase tree cover to 10 per cent of total land area – a goal stated in the 2010 constitution.

Emissions are expected to decline to 17 $MtCO_2e$ in 2020 and then to 13 $MtCO_2e$ by 2030, (Figure 6.3: Chapter 4 of the Mitigation report includes the detailed analysis). Reduced deforestation and increases in the carbon stock of trees contribute to the decline in emissions. On-going GoK REDD+ activities are taken into account in the reference case. Low carbon development actions in the forestry sector have the potential to abate an additional 40 $MtCO_2e$ per year in 2030 compared to the baseline (Figure 6.6).

The most significant abatement potential can be achieved through restoration of forests on degraded lands. Abatement potential of 32.6 $MtCO_2e$ per year by 2030 is likely through conservation and sustainable forest management interventions. Restoration of degraded forests has an abatement potential of 6.1 $MtCO_2e$ per year by 2030, and reducing deforestation and forest degradation potentially can abate 1.6 $MtCO_2e$ per year by 2030.

Kenya's forest resources provide important environmental and ecosystem services, and contribute to economic development, rural livelihoods, water availability and climate resilience (adaptation benefits). Maintenance of and increased forest cover in water catchments is critical for sustaining water availability and the generation of hydropower.



Source: GoK NCCAP Mitigation Analysis 2012

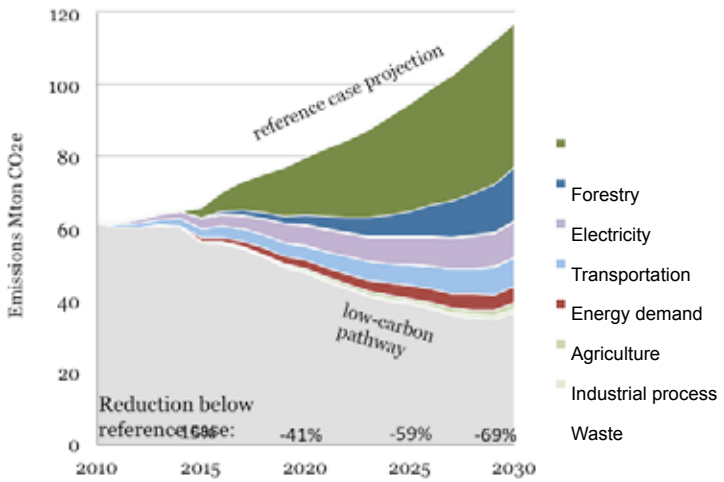
Figure 6.6: Low-carbon development wedges in the forestry sector

f) ***Waste***

Landfills and sewage treatment plants generate GHG emissions through the production of methane. Waste management and access to sewerage systems have improved, yet comprehensive coverage is still lacking. The share of the waste sector in total GHG emissions is low and is expected to remain modest. Waste-related GHG emissions are expected to increase from 0.8 $MtCO_2e$ per year in 2010 to 2 $MtCO_2e$ in 2030. Landfill gas methane capture,[85] with an abatement potential of 1.1 $MtCO_2e$ in 2030, is the main low carbon development opportunity (see Chapter 9 of the Mitigation report for the detailed analysis). (looks like it is repeated below). Methane capture can go hand in hand with proper management of solid waste, thereby improving groundwater quality, local air quality, safety by avoiding dangerous methane gas build-ups, as well as hygienic conditions. Improved management will result in small increases in employment and the methane capture can be combined with baseload electricity production, improving energy security.

g) ***Summary of bottom-up assessment of low-carbon development options***

Figure 6.7 indicates the composite mitigation abatement potential of low-carbon development opportunities in six sectors.

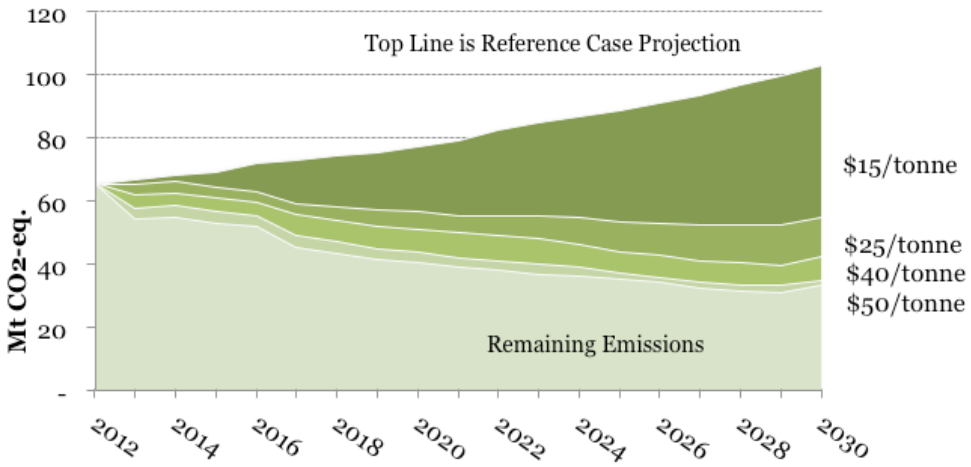


Source: GoK NCCAP Mitigation Analysis 2012

Figure 6.7: Composite abatement potential for all sectors (technical potential)

6.2.3 Economy-wide top-down assessment of low-carbon opportunities

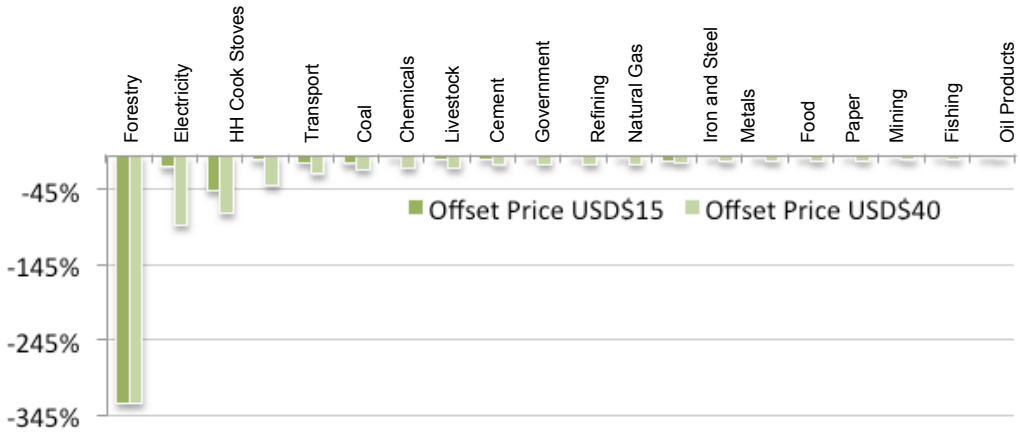
The low carbon analysis also included economy-wide economic, energy and emission modelling. A computable general equilibrium (CGE) modelling approach was used to inform climate investment choices and long-term development impacts in Kenya. The top-down CGE modelling also incorporated the bottom-up low carbon development options and emission forecasts described above. The resulting analysis provides a wider view of the possible scale and scope of reductions available. Figure 6.8 identifies the mitigation potential that is available at different carbon offsets prices ranging from between US$15 and US$50 per tonne. Costs are not the only factor affecting prospects for implementation; barriers to implementation and potential policy measures are discussed for each low-carbon development opportunity in Chapters 3 to 9 of the detailed low-carbon development analysis.



Source: GoK CCAP Mitigation Analysis 2012

Figure 6.8: Economy-wide abatement potential for all sectors (US$/tonne)

Figure 6.9 provides an overview of the emissions reduction potentials by sector at two carbon offset prices: US$15 and US$40. At these prices, a wide range of reduction opportunities are available within the Kenyan economy; but opportunities in forestry, the electricity sector and cookstoves dominate. Commercial buildings also represent an opportunity (but were not assessed in detail in the bottom-up and more technically detailed analysis). A more disaggregated view of reductions relative to the UNFCCC six sectors is provided to reveal a wider range of low carbon development opportunities.



Source: GoK NCCAP Mitigation Analysis 2012

Figure 6.9: Sector reduction potentials at US$15 and US$40 in 2030

Table 6.1 provides a summary of the impact of international climate finance that targets economy-wide offsets at US$15 per tonne based on the results of the CGE modelling. At an offset supply price of US$15 per tonne, offsets supply rises steadily throughout the simulation, primarily as a result of forestry reductions which account for over 90 per cent of all offsets supply up until 2030. The total climate investment to deliver the reductions climbs from US$12 million in 2015 (US$2,011 at a 10 per cent discount rate) to on average about US$40 million annually out to 2030. With an international demand for Kenyan offsets, the increased spending to supply offsets increases economic activity in Kenya, thereby increasing Kenyan GDP throughout the entire period.

Table 6.1: Summary of climate finance impacts: US$15 offset supply

	2015	2020	2025	2030
GHGs offsets supply (Mt)	3.0	16.5	30.1	40.8
Climate finance (millions US$ 2011 @10% discount rate)	$12.8	$43.8	$49.5	$41.7
GDP (% change from reference case)	0.18%	0.17%	0.19%	0.17%

Source: GoK NCCAP Mitigation Analysis 2012

6.3 Summary of Mitigation Actions

Based on the comprehensive bottom-up assessment, six proposed priority areas for low carbon development and proposals for their implementation are described in Table 6.2. These six priority areas cover about three-quarters of total abatement potentials found in this study. Their full deployment would almost halve GHG emissions by 2030 compared to the reference case scenario (cross-sectoral interactions not taken into account). Investment costs would vary, but significant reductions can be obtained at marginal costs of less than US$15 per tonne of carbon. Some of these options also deliver fuel savings, which may result in overall social cost savings relative to high emitting options.

Significant investments will be required and a series of barriers will need to be addressed before the low-carbon opportunities can be realised. Implementing the six priority low carbon actions would require investments of KSh1,371 – 1,773 billion (USD 16.12 – 20.84 billion) until 2030 (equivalent to a Net Present Value of KSh600 – 770 billion at a real discount rate of 10 per cent). Out of these investment costs, it is estimated that KSh839 – 1,110 billion would have to be borne by the public sector, with the remaining costs covered by private sector and household investments. A large challenge is financing the higher upfront costs of low carbon investments. Kenya sees clear potential to make effective use of bilateral and multilateral funding, as well as international climate finance mechanisms – such as the Green Climate Fund and the international support likely to be mobilised to support the emerging NAMA and REDD+ mechanisms– in moving forward on the Action Plan, in addition to systematic domestic support.

The six priority low carbon development options are summarised in Table 6.3 together with three a enabling actions, which are needed to achieve the desired potential: updating of the GHG inventory, improving emissions data and mainstreaming of low carbon development in planning processes. Additional enabling actions include: an enabling policy, regulatory and institutional framework, capacity building, adequate financing, Monitoring, Reporting and Verification (MRV) system (including an updated GHG inventory system) and technology development and transfer. Finally, the low carbon development opportunities need to be mainstreamed in the planning processes.

Table 6.2: Suggested priority low-carbon development opportunities up to 2030

Low carbon option	Government planning sector	Lead Agency	Investment costs for implementation to 2030 (KSh and USD, 2011)	Estimated split between public, private sector and household investments	NPV of investment at a 10% real discount rate (KSh and USD, 2011)	Abatement potential and sustainable development impacts
Restoration of forests on degraded lands including in rangeland	Environment, Water and Sanitation (Forestry)	Kenya Forest Service	KSh 186 – 290 billion, (USD 2.2 – 3.4 billion)	100% public	KSh 69 – 108 billion (USD 0.81 – 1.3 billion)	- Abatement potential to 2030 of 32.6 $MtCO_2e$ - Contributes to constitution's goal of 10% tree cover - Biodiversity benefits - Sustainable forest products contribute to improved livelihoods - *Conservation may remove access to forests for communities*
Geothermal	Infrastructure	Ministry of Energy, working with GDC	KSh 877 – 1,115 billion (USD 10.3 – 13.1 billion)	About 45% public / 55% private sector investment assuming current electricity market structure	KSh 399 – 507 billion (USD $4.7 – 6.0 billion)	- Abatement potential to 2030 of 14.1 $MtCO_2e$ - Energy security, economic growth - *May require relocation of communities/ villages*
Reforestation of degraded forests	Environment, Water and Sanitation (Forestry)	Kenya Forest Service	KSh 48 – 61 billion (USD0.56 – 0.71 billion)	100% public	KSh 18 – 22 billion (USD 0.21 –0.26 billion)	- Abatement potential to 2030 of 6.1 $MtCO_2e$ - Sustained water availability (generation of hydropower) - Contributes to constitution's goal of 10% tree cover - Biodiversity benefits - Sustainable forest products contribute to improved livelihoods

Low carbon option	Government planning sector	Lead Agency	Investment costs for implementation to 2030 (KSh and USD, 2011)	Estimated split between public, private sector and household investments	NPV of investment at a 10% real discount rate (KSh and USD, 2011)	Abatement potential and sustainable development impacts
Improved cookstoves and LPG cookstoves	Population, Urbanisation and Housing	Ministry of Energy	KSh 20 billion (USD 0.24 billion) Improved cookstoves: KSh 9 billion (USD 0.11 billion) LPG stoves: KSh 11 billion (USD 0.13 billion)	Improved cookstoves: about 75% consumer costs and 25% public support costs LPG stoves: about 85% consumer cost and 15% public support	KSh 10 billion (USD 0.12 billion) Improved cook-stoves: KSh 4.5 billion (USD 0.053 billion) LPG stoves: KSh 5.3 billion (USD 0.062 billion	- Abatement potential to 2030 of 5.6 + 1.7 $MtCO_2e$ - Health benefits from reduced indoor air pollution - Lower fuelwood demand and defor-estation - Potential cost savings to households
Agroforestry	Agriculture	Ministry of Agriculture	KSh 70 – 117 billion (USD0.82 – 1.37 billion)	100% public	KSh 26 – 43 billion (USD0.31 – 0.51 billion)	- Abatement potential to 2030 of 4.1 $MtCO_2e$ - Increased soil fertility and crop yields, improving livelihoods of farmers and food security - Improved climate resilience - Contributes to goal of 10% tree over on farms
Bus rapid transit (BRT) with light rail transit (LRT) corridors	Infrastructure	Ministry of Transport	KSh 170 billion (USD 2 billion) BRT: KSh 21 billion (USD0.25 billion) LRT: KSh 149 billion (USD1.75 billion	About 75-85% public investment cost for infrastructure and 15-25% private costs for vehicle stock	KSh 79 billion (USD 0.93 billion) BRT: KSh 10 billion (USD0.116 billion) LRT: KSh 69 billion (USD0.81 billion)	- Abatement potential to 2030 of 2.8 $MtCO_2e$ - Reduced traffic congestion - Improved local air quality - Improved road safety

6.4 Summary of Actions

Table 6.3 summarises the recommended mitigation actions, including enabling actions.

Table 6.3: Summary of Mitigation Actions

Number	Action	Estimated Cost KSh to 2030
MITI-1	**Restoration of Forests on Degraded Lands -**Undertake a programme of work to restore forests on 960,000 hectares up to 2030 including: *inter alia* dryland forest restoration activities; awareness raising, consultation and demonstration; capacity building; development, testing and application of compensation and benefits-sharing mechanisms; measuring, monitoring and reporting; and research.	**186-290billion**
MITI-2	**Geothermal -** Develop an additional 2,275 MW of geothermal capacity by 2030 through a support programme aimed at encouraging private sector investment. The programme could include: additional grants for the early phases of geothermal development, access to loans for latter stage development, risk mitigation instruments, capacity building programmes, and harmonization and improvement of the regulatory framework.	**877-1115 billion**
MITI-3	**Reforestation of Degraded Forests -** Undertake a programme of work to replant forests on 240,000 hectares of land that were previously forests; including, *inter alia*: tree planting activities; awareness raising, consultation and demonstration; policy development; capacity building; measuring, monitoring and reporting; and research.	**48-61 billion**
MITI-4	**Improved Cookstoves and LPG Cookstoves -** Undertake a programme to support the use of improved cookstoves and of LPG cookstoves, including increasing awareness of improved cooking practices, undertaking pilot initiatives which promote the use of LPG, increasing awareness of stove quality, increasing access to soft loans, building capacity of stove producers, and improving access to testing facilities.	**20 billion**
MITI-5	**Agroforestry -** Convert 281,000 hectares of existing arable cropland and grazing land that have medium or high agricultural potential to agroforestry by 2030 through a programme of work that includes: research to identify appropriate agroforestry practices; technological development; extension services and training of extension workers; capacity building and education for farmers; pilot projects; research to determine potential in more marginal lands; and measuring, monitoring and reporting.	**70-117 billion**

MITI-6	**Bus Rapid Transit and Light Rail Corridors -** Implement an extensive Mass Transit System for greater Nairobi, based predominantly on Bus Rapid Transit corridors complemented by a few Light Rail Transit corridors.	**170 billion**
MITI-7	**Development of GHG inventory and improvement of emissions data** Develop Kenya's GHG inventory, building on the information developed in the SC4 reference case of GHG emissions; develop Kenya specific emissions factors, especially in the agricultural sector; improve overall data; and build capacity to develop, use and monitor data and impacts.	**42 million**
MITI-8	**Measuring, reporting on and monitoring forestry emissions and sinks -** Develop a national forest inventory, forest reference scenario, and a monitoring and reporting system that allows for transparent accounting of emissions and removals in the forestry and land-use sectors.	**624 million**
MITI-9	**Mainstreaming of low-carbon development options into planning processes**- Undertake low-carbon assessments of current and new flagship projects; mainstream low-carbon screening and planning in the county planning process and sectoral development plans. Build capacity on the use of the tools to update the low-carbon scenario assessment.	**21 million**
Total KSh to 2030		KSh1,371 – 1,773 billion
Total KSh for next five years (4596 – 5815 USD equivalent)		KSh 391 – 495 billion

ACCI-MoA/GIZ

7. Financing Implementation of the Action Plan

7.1 Introduction

The realisation of the bold ambitions identified in this Action Plan will require substantial financial resources. To be successful, Kenya will need to access resources from both public and private sources and from both within Kenya and overseas.

This chapter summarises the analysis and recommended actions on financing the Action Plan. It draws on four separate reports[86]:

- Recommendations for the creation of a Kenya Climate Fund (KCF), which is intended to become the key vehicle for mobilising and allocating resources from international development partners towards climate change activities in Kenya, and which could also be used for allocating domestic public resources towards climate change actions.[87]

- Recommendations for improving the absorptive capacity of the Kenyan public sector to enable the use of domestic and international public resources for climate finance as efficiently and effectively as possible.[88]

- Recommendations for scaling-up access to international carbon markets, with a particular focus on the possible establishment of a carbon trading platform so as to increase international private sector financial flows for mitigation investment.[89]

- Analysis on ways to improve the 'investment climate for climate investment' so as to increase the flows of, in particular, private sector capital towards mitigation investment, from both Kenyan and international investors.[90]

Figure 7.1 shows the different forms of climate finance – public and private, domestic and international – and how the recommendations cover all of these sources of climate finance. Each box represents a section of the main report on climate finance and an associated set of recommendations with the chart showing the extent to which they relate to public or private, domestic or international resources. For example, the absorptive capacity section relates to domestic and international public resources, and the investment climate paper relates to domestic and international private finance. As such, the recommendations form a coherent package of actions intended to maximise the flows of climate finance into and within Kenya.

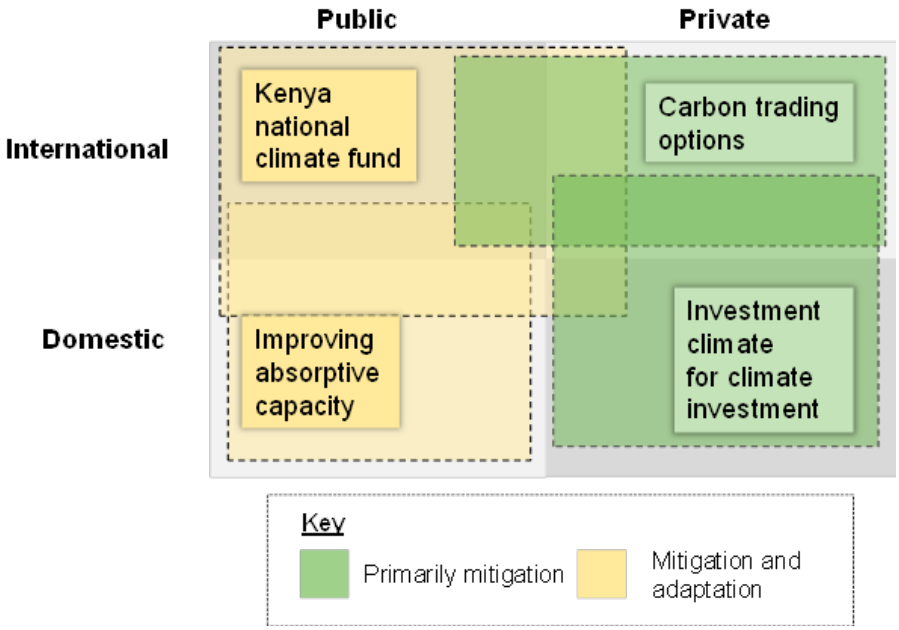


Figure 7.1 The analysis and recommended actions cover all forms of climate finance

7.2 Key Findings

7.2.1 Current climate change finance flows in Kenya

The cumulative expenditure commitments estimates on climate change by the Government of Kenya and development partners over the years 2005-2015 are summarised in Table 7.1 below. The estimates cover all projects that are classified as having a 'significant' or 'principal' climate change component, as defined by the OECD Development Assistance Committee's Rio Markers. If all projects under this definition are included, then the total, cumulative amount of climate finance committed by development partners in Kenya as of February 2012 was USD2.29 billion, whereas total Government of Kenya funds came to USD438 million. It should be noted, however, that having significant or principle climate change components are broad terms, and most development agencies and the Government of Kenya tend not to classify development finance and climate finance separately. Some of the projects included in the analysis are therefore likely to be part-climate-focused and part-development-focused,

and consequently the figures presented are in reality likely to be higher than the amount of 'pure' climate finance in Kenya[91]. Furthermore, it should be noted that the OECD itself, using the Rio Markers classification, reports total, cumulative development agency climate funding for Kenya as USD1.1 billion as of 2010. This differs from the figures reported in this Action Plan. The discrepancy could be due to the fact that the OECD database is incomplete: for many projects listed there is no financial information available, rather just a title and a sector.

Table 7.1 Cumulative expenditure per sector on climate change 2005-2015

Sector	2005-2015 Cumulative GoK	2005-2015 Cumulative Development Partner Funds USD
Agriculture	2,088,680	123,121,142
Coastal areas		97,240,000
Energy	176,515,680	921,846,999
Forestry	103,056,360	232,806,874
Water and sanitation	85,031,496	664,058,705
Cross sectoral	49,372,840	252,031,826
Drought Management	22,175,560	
Total USD	**USD438,240,616**	**USD2,291,105,546**
Total KSh	**KSh37.23 billion**	**KSh194.735 billion**

7.2.2 Kenya Climate Fund

The National Climate Change Action Plan (NCCAP), as set out in this document, identifies the key priorities for Kenya to successfully transition to a low-carbon, climate-resilient growth path whilst realising the ambitions of Vision 2030 of becoming a middle-income country. In terms of mitigation, Chapter 6 discusses the considerable emphasis on geothermal electricity generation in the energy sector and identifies a complementary role for landfill gas, solar PV and wind power. In the transport sector, the development of new or improved public transport systems (light rail and/or bus rapid transit) will be a priority. Important mitigation opportunities are also available from agricultural co-generation, improved charcoal manufacturing in the industrial sector and in advanced cookstoves and efficient electrical appliances in the household energy sector. Adaptation priorities, as discussed in Chapter 5, focus on building adaptive capacity (for example, the ability to respond to current and future climate extremes) and selected strategic decisions and actions (such as infrastructure investments and spatial planning) that lock in long-term vulnerability profiles.

This is an ambitious programme, which will require substantial investment. Raising the necessary capital is currently impeded by a number of barriers; overcoming them will also require public finance. Some of the key barriers to scaling up investment to the magnitude envisaged include policy and regulatory weaknesses, difficulties in accessing commercial finance and technical capacity shortcomings. However, the judicious use of public resources – on many occasions as a tool to stimulate greater levels of private sector investment – can play a key role in overcoming these barriers. This can be, for instance, through improving access to finance or ameliorating some of the negative social and redistributive impacts that might otherwise be experienced from, for instance, higher electricity prices. It is also broadly recognised that the characteristics of an important component of climate change activities and programmes – such as some adaptation activity and capacity building – will require public resources in the form of concessional or grant finance.

There are three main options for the delivery of the public resources. The first is to continue and scale-up the current project-oriented, development partner-led approach (status quo). The second would be to enhance direct flows of international finance to the Government of Kenya (GoK), i.e. budgetary support, to be disbursed using existing government structures and mechanisms. The final approach would be to create a dedicated national Climate Fund.

The creation of a Kenya Climate Fund (KCF) would have a number of advantages. Relative to greater budgetary support; the KCF would have more clarity of purpose and allow the development of Kenyan expertise and transparency on climate financing. Relative to maintaining or augmenting the current development partner-led approach, the KCF would offer greater opportunities for alignment with national priorities (the 'ownership' principle). There are admittedly challenges to using the Fund to channel public resources, but with careful design these can be overcome.

A well-designed Climate Fund would have a number of key features: It would focus both on mitigation and adaptation activities; it would evolve in a phased manner starting with providing grant financing before evolving to offer a wider palette of financing instruments; it would aim to catalyse private sector funding through interacting with other financial intermediaries (e.g. commercial banks); and its governance structure would allow broad and equal representation from the government, civil society and the private sector leading to improved capacity of the Government to absorb international public climate finance. In this way, the Fund would have the potential to evolve to become the main recipient of multilateral and bilateral climate finance flows mobilised by Kenya.

7.2.3 Improving absorptive capacity

The ability of the Government to absorb international public climate finance, as well as to use its own public resources expeditiously towards climate change activities could be improved. Low absorption rates arise from a range of factors, from budgeting and fund flow challenges on the part of the Treasury and line ministries, to limited alignment of government and development partner fiscal policies and procedures, capacity constraints and a limited prioritisation of climate change within the budget. These barriers can impact the speed of fund disbursement from development partners to the Treasury and implementing agencies (e.g. line ministries and NGOs), and consequently the effectiveness of climate-relevant project implementation.

The scope for improving absorptive capacity of climate change finance in Kenya provides further justification for the creation of a Climate Fund that can manage and disburse funds more quickly and efficiently.

7.2.4 Scaling-up access to international carbon markets

Future carbon market conditions are likely to be difficult, both for Kenya and in general. The combination of an unfavourable demand/supply balance globally has already led to low carbon credit prices. The prospect of the European Union excluding credits from Kenyan projects registered after 2013 from the European Union Emissions Trading Scheme (EU ETS) will further serve to make the environment challenging for carbon market project developers in the country. Kenya's future actions in relation to carbon market activity need to balance the fact that these conditions suggest government support is more urgent with the fact that they make it more difficult for that support to be effective.

A primary trading platform is more appropriate to Kenya's needs than a secondary platform. It is possible to distinguish 'primary' carbon trading platforms from 'secondary' carbon trading platforms. Primary platforms facilitate the origination of carbon credits from individual projects, and their initial purchase from project developers; secondary platforms allow trading on a larger scale, treating carbon credits as a uniform commodity (like wheat or oil) and allowing ultimate compliance purchasers and market intermediaries to purchase credits and manage their carbon price exposure. A primary trading platform would be more appropriate for Kenya's needs in the current market environment.

Within the primary platform options, a focus on enhancing the Designated National Authority (DNA) under the National Environment Management Authority and export promotion activities is recommended. There are a number of different roles and activities that

a primary carbon trading platform could perform. Three key options have been identified: a more efficient DNA; an export promotion agency model where public resources are used to increase the supply of Kenyan credits and promote their sale in overseas markets; and a brokerage model where a new body is created which looks to bring together buyers and sellers of credits and works on a commission basis. Analysis suggests that either or both of the first two are likely to be the most appropriate for Kenya.

7.2.5 Investment environment for climate investment

Relative to a number of comparator countries, Kenya is already a good place for the private sector to undertake low carbon investment. The features that support private sector investment in Kenya include its high GDP and energy demand growth, its excellent renewable energy resources and high energy efficiency potential, its fairly favourable regulatory environment and its relatively well-developed financial sector. We estimate that the private sector, both domestic and international, has already invested more than USD2.8 billion in renewable energy production in Kenya.

There are, however, a number of challenges that hold back even greater engagement by the private sector. On the policy and regulatory side, the main challenges include a project development process that is long and arduous and policy interventions and incentives that could be improved (renewable energy) or are poorly implemented (energy efficiency). There are also difficulties in accessing financing from both banks – whose risk averseness and limited understanding of low carbon opportunities means that interest rates and collateral requirements are high and loan tenors are short – and from equity funds that are scarce in the country. These challenges are compounded by a limited technical capacity among Kenyan firms, especially smaller ones, which means that they may experience difficulties in developing feasibility studies, understanding and developing financing models or managing and accounting for finances.

The Government of Kenya is currently undertaking to reform and ameliorate the policy and regulatory environment for renewable energy and energy efficiency. This comprises efforts to implement energy efficiency regulation and incentives of the Sessional Paper No.4 of 2004 and the Energy Act of 2006 that had not been put into practice; the on-going drafting of the draft Energy Bill 2012 which will reform the renewable energy feed-in tariff and power purchase agreement, amongst other regulatory reforms; and the creation of a one-stop shop for renewable energy permits and licenses.

Panos/Peter Barker

7.3 Recommended Actions

7.3.1 Kenya Climate Fund

As a matter of priority, the GoK should begin the process of creating the Kenya Climate Fund (KCF). There are a number of concrete, specific steps to be undertaken (suggested implementing agencies are in brackets):

- Design the KCF based on the detailed analysis within and accompanying the KCCAP (GoK and stakeholders);
- Establish a multi-departmental Task Force within the GoK to steer the process of establishing the KCF (GoK);
- Convene a climate finance pledging conference (Task Force);
- Create a Trust Fund (GoK);
- Communicate and consult nationwide about the KCF, its mandate, and the target date for the launch of operations (Task Force);
- Appoint the Governing Board (Task Force and stakeholders);
- Draft terms of reference for the Fund Administrator (Governing Board with temporary assistance from Task Force);
- Establish a joint financing agreement with development partners;
- Recruit a KCF Administrator (Governing Board with temporary assistance from Task Force);
- Prepare an initial budget (Fund Administrator);
- Develop and approve key policies, guidelines, procedures and templates (Board with assistance from the KCF Administrator);
- Appoint the Operations Committee (Governing Board and Fund Administrator); and approve the initial budget (Governing Board and Operations Committee).

7.3.2 Improving absorptive capacity

There are a number of actions that the government can take to improve its capacity to absorb climate finance, which will need to be taken forward concurrently with the creation of the KCF to maximise the effectiveness of the Fund and of GoK climate spending. Three of the most important are the prioritisation of climate funding within the budget, the need to harmonise funding requirements, and efforts to improve the capacity of GoK trust funds.

The Government of Kenya could take this opportunity to prioritise climate change funding in the budget by creating climate change line items in the budget. In the context of the Medium Term Plan 2013-2017, the Medium Term Expenditure Framework 2013-2017 and the 2013/14 budget, the GoK could create a specific code within the Integrated Financial Management System to allow climate change budgets to be tracked and reported. At present, the absence of such a code inhibits monitoring of climate change-related expenditures, which is important both for effective internal government processes as well as for reporting to the UNFCCC.

Working with development partners to harmonise funding with priority interventions is another action area for the Government. This could include standardising the financial requirements and fiscal calendars of the government and development partners according to the principles of Kenya's Joint Assistance Strategy. In developing the modalities for providing resources to the KCF it will be necessary to establish the processes by which development agency and government resources (as appropriate) are provided to the Fund through a joint financing agreement.

Furthermore, measures could be taken by the Government to enhance on-going efforts to improve the operational and absorptive capacity of trust funds with a focus on the KCF. With Treasury's support, strong financial management capabilities within the Fund could improve disbursement and project implementation. It would also be desirable for the Fund to provide assistance to project implementing agents in areas of proposal preparation, implementation and compliance with accounting and reporting requirements

7.3.3 Scaling-up access to international carbon markets

There are a number of actions that can improve the overall market conditions for Kenyan carbon market projects. These include accelerating negotiations with the European Union regarding a bilateral deal in relation to EU Emissions Trading Scheme eligibility for credits from Kenyan projects registered after 2012, and furthering discussions with Japan about its bilateral offset credit scheme among others.

There are also specific actions that can be undertaken with regards to designing and implementing a carbon trading platform:

- Enhance the capacity of the DNA. The additional activity that the DNA can undertake includes, for instance, undertaking studies to create new methodologies; calculating and publicising baselines and emission factors; updating its website to inform stakeholders about relevant carbon market developments and allowing for project

documents to be uploaded online; and developing expertise in sectoral crediting opportunities.

- There are a number of external development partner initiatives that Kenya should explore to fund these activities, including the African Carbon Support Programme of the African Development Bank and the Climate Initiative for Development of the World Bank.

- The Ministry of Finance could also determine, and then establish, the appropriate home for a unit that develops and promotes projects responsible for generating carbon credits, both in the compliance and voluntary markets.

7.3.4 Conducive environment for climate investment; energy sector example

There are six priority actions for improving the policy and regulatory framework for low carbon investment in Kenya:

- To establish a regular platform for continued engagement and dialogue between the Government of Kenya and both domestic and international representatives of the private sector on matters relating to Kenya's low carbon growth strategy;

- To accelerate and promote improvements to the structure of the renewable energy feed-in tariff as envisaged under the draft Energy Bill 2012;

- To accelerate and promote the establishment of a standardised Power Purchase Agreement template for renewable energy as envisaged under the draft Energy Bill 2012;

- To implement the national energy efficiency policy, strategy and regulations as laid out in Sessional Paper No.4 of 2004, the Energy Act 2006 and the draft Energy Bill 2012;

- To support existing efforts by the Ministry of Energy to enhance awareness of energy efficiency technologies through labelling of end-user consumer technologies and an awareness campaign among large-scale energy users;

- To support existing efforts to establish a 'one-stop shop' under the Energy Regulatory Commission to expedite the process of acquiring permits and licenses needed for renewable energy investments.

To promote access to finance for the private sector to undertake climate investment (for example, via the provision of early stage, patient equity or technical assistance in low-carbon investment to financial institutions), the Kenya Climate Fund should be established as a matter of priority.

7.4 Summary of Actions

(See Annex 3 for detailed actions)

Table 7.2 Priority Actions related to Climate Finance

Number	Action (figures in KSh)	Estimated Cost KSh for 5 years
FINA-1	Establish the Kenya Climate Fund (KSh38-94million/Yr)	190-470 million
FINA-2	Create climate change code in the government budget system	Negligible
FINA-3	Coordinate and harmonise Government of Kenya and development partner funding with priority interventions	60 million
FINA-4	Open/Accelerate Negotiations with various countries to overcome the lack of carbon market access for Kenya.	4-6 million
FINA-5	Enhance the capacity of the Designated National Authority	17-25 million
FINA-6	Determine the appropriate institutional home for, and then establish, a unit that develops and promotes projects responsible for generating carbon credits (20 Million/Yr)	100 million
FINA-7	Support actions to improve the regulatory and policy framework for low-carbon investment	40 million
FINA-8	Establish a regular platform for engagement and dialogue between the Government of Kenya and investors	0.5 million
FINA-9	Support the creation of a one-stop shop to expedite the process of acquiring renewable energy permits and licenses (5 Million/Yr)	25 million
	Total KSh for five years	436-727 million

Nation/Laban Walloga

8. Enabling Policy, Legislative and Institutional Framework

8.1 Introduction

Policy, legislative and regulatory frameworks for climate change response provide legitimacy, set goals, regulate conduct, provide incentives for action, promote investment and establish sanctions that can ensure compliance. For Kenya's National Climate Change Action Plan (NCCAP) to be fully and effectively implemented, a sound and enabling policy, legislative, and institutional framework must be in place. In the absence of such a framework, substantial obstacles will emerge in translating the identified priority actions into implementable initiatives with tangible climate change benefits.

While the process of developing a comprehensive climate change policy and related legislation is now well underway, as demonstrated by the existing climate change institutional architecture and debates on future legislative framework for climate change response, these efforts need to be taken forward as set out in the actions recommended in this chapter. Further, to ensure the constitutional validity of any reform, any newly established policy and legislative framework must respond to the transition to devolved government and facilitate the implementation of actions at the county level. Importantly, policy and legislative instruments are the primary tools to ensure that our climate change response is integrated into development planning processes, and are therefore vital in achieving climate resilient and low carbon development. This chapter and the associated reports detail key findings and actions necessary to ensure that an enabling policy, legislative and institutional framework to facilitate optimal NCCAP implementation is in place.

8.2 Key Findings

8.2.1 Legal Preparedness Assessment Report

As an initial starting point for analysis, a thorough and extensive assessment of Kenya's existing policies, laws and institutional framework related to climate change response was conducted culminating in the Legal Preparedness Assessment Report (LPAR) and several Legal Working Papers. The sector- wide approach, which reviewed all relevant policies,

laws and institutions, identified key areas of law and policy that if reformed could establish an enabling framework for NCCAP implementation. It could thereby provide a catalyst for effective climate change response. Covering sectors relevant to adaptation, mitigation, finance, capacity building, measurement, reporting and verification (MRV) and technology transfer, as well as broader climate change governance, this body of work formed the basis of the LPAR findings.

Significant efforts have been taken to commence Kenya's policy response to climate change, including the development of the NCCRS in 2010 and this Action Plan and the on-going process to develop a Climate Change Policy and mainstream climate change into Vision 2030 especially its MTP 2013 – 2017.This has increased recognition of climate change as a development challenge and policy priority, and has resulted in the establishment of several (albeit fragmented) climate change-related institutions and policy instruments. Other parallel efforts include the Kenya Climate Change Authority Bill 2012, a private members Bill that was presented to Parliament in 2012.

Key achievements to date include:

- Establishment of the National Climate Change Secretariat by the public service commission;
- Creation of designated offices to oversee climate change issues in several Ministries and institutions, such as Energy, Agriculture, Office of the Prime Minister, NEMA, KARI, etc;
- Constitutional recognition of the principles of sustainable development and public participation in environmental decision-making;
- Intensification of forest rehabilitation and reforestation by constitutionally mandating increased forest cover from 6 per cent to 10 per cent of the total land area;
- Strategies for efficient and accessible integrated transportation systems;
- Encouragement of renewable energy development through fiscal incentives.

These achievements provide a solid basis from which to further strengthen climate-related policies, legislation and institutions and thereby establish an enabling framework for NCCAP implementation. Importantly, these actions further provide synergies and opportunities within the emerging UNFCCC framework, particularly regarding Reducing Emissions from

Deforestation and Forest Degradation (REDD+), the development of Nationally Appropriate Mitigation Actions (NAMAs) and the securing of climate finance.

Although the Constitution, Vision 2030 and the Environmental Management and Coordination Act (EMCA 1999), provide some legal foundation, more specific policy and legislative instruments are required that effectively acknowledge the severity of potential climate change impacts and address the importance of climate change response. Vision 2030 does not adequately recognise the threats and opportunities presented by climate change and this crucial planning document will be strengthened by integrating climate change response considerations into Kenya's development planning process. The comprehensive sector-specific analysis that informed the KCCAP, demonstrate that gaps exist in the current policy, legislative and institutional framework. Responding to the need for greater coherence and amendments to the framework will address the significant gaps across sectors to enable Kenya to respond to climate change.

Core issues in the sectoral laws that need to be addressed include how the impacts of climate change affect sectoral planning, how positive mitigation can be scaled-up, or how sectoral laws affect the capacity of human and ecological systems to adapt to climate change.

Regarding the institutional arrangements, key aspects that need to be addressed include the need for clarity in roles and functions, the overlapping mandates, as well as institutional capacity and related enforcement capability of many institutions that perform climate change related functions. Importantly, the identified institutional concerns cut across almost all sectors, impact on the effectiveness of regulation, and addressing them requires substantial investment in financial and human resources. Institutional reform is therefore needed to establish a framework that coordinates and mainstreams climate change response across government, achieves policy integration and provides authoritative direction to achieve implementation of priority sectoral actions.

The LPAR identifies policy and legislative gaps, barriers and opportunities for effective climate change response, and thereby provides the analytical basis from which to assess how Kenya's existing framework and institutions can be strengthened and reformed to support NCCAP implementation. This process will also be reinforced by Kenya's obligations under the UNFCCC, for instance, on adaptation, mitigation and financing, and regional climate changes approaches such as the East African Climate Change Policy.

8.2.2 Recommended enabling policy, legislative and institutional framework

Building on the LPAR findings, broader analysis regarding the legislative and institutional reform options was undertaken, culminating in a report on the Enabling Legislative and Institutional Framework for Climate Change Response. Drawing on comparative analysis and international best practice, with particular focus on the experiences of devolved government jurisdictions in the Philippines, South Africa and the UK, the report highlights key comparative lessons for Kenya as it embarks on legislative and institutional reform.

Particular focus was placed on analysing the strengths, weaknesses, opportunities and threats regarding overarching climate change legislation and reforming the institutional framework. In this context, the study analysed the current climate change institutional structure, and based on these findings, proposed a comprehensive institutional and mainstreaming framework, with defined roles and responsibilities which would allow for the mainstreaming of climate change in Kenya. The proposed framework, illustrated via the conceptual map in Figure 8.1 captures the need to respond to climate change in the context of the devolved government.

All Government ministries, departments and agencies will have a role in mainstreaming climate change across their functions and processes. Therefore, the group of institutions featuring in the conceptual map in Fig 8.1 is not exhaustive. However the Ministry responsible for climate affairs is a fundamental leader for climate change mainstreaming to be successful. This Ministry in consultation with all relevant actors will need to develop a coherent stand-alone Climate Change Policy building on the NCCAP process that will frame and articulate Kenya's response to climate change.

Climate Change Policy

The Climate Change Policy will provide guidance on the realisation of sustainable development through implementation of critical climate resilient and low carbon development actions, as well as stipulate governance frameworks, financial structures and implementation arrangements. The policy will further provide guidance on: (i) the envisaged general legislative framework to be established through a Climate Change Law; (ii) the specific sectoral legislative amendments that will enable full implementation of NCCAP priority actions; and (iii) provide a facilitative framework for development of specific actions and responses to climate change in the years ahead.

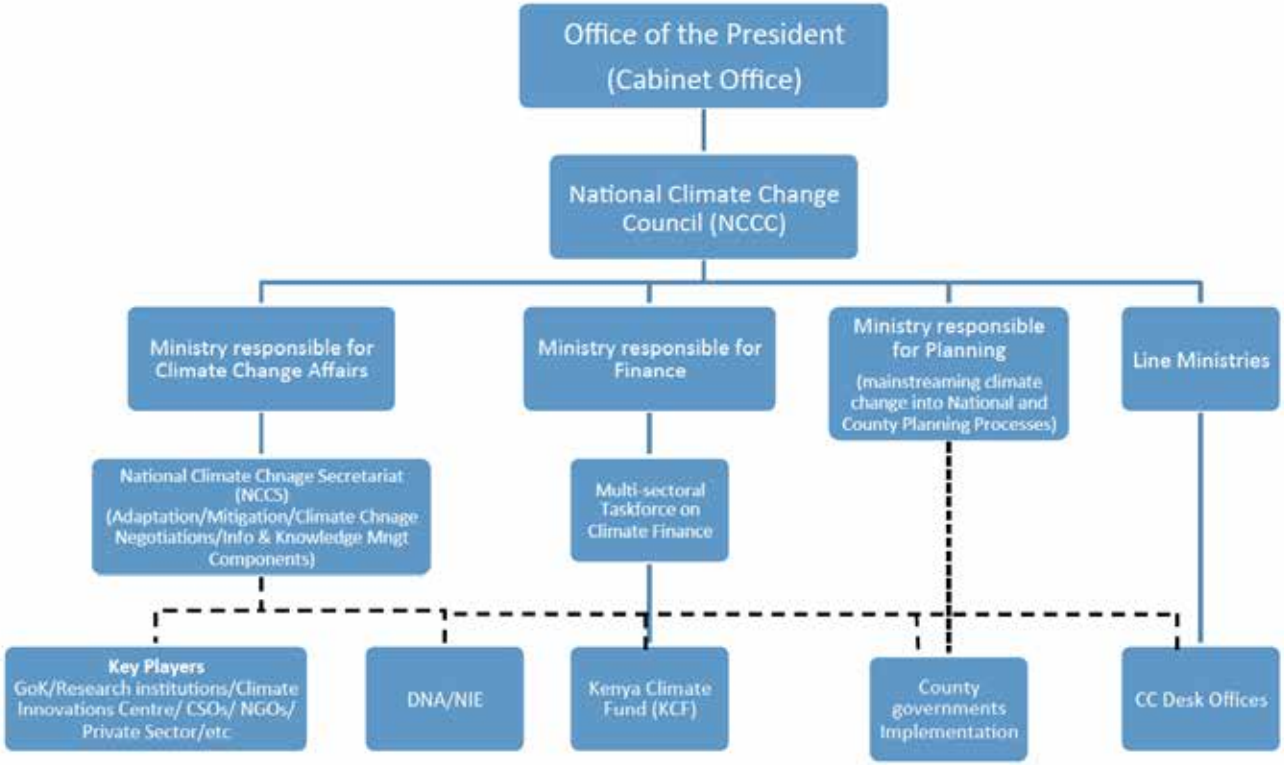


Figure 8.1: Proposed Climate Change Institutional Structure

Under current practice, any new legislation requires an accompanying policy framework and accordingly, developing a Climate Change Policy will be a necessary and a critical precursor to the legislative process to pass a new stand-alone climate change law. Following completion of the NCCAP process, the draft Climate Change Policy developed through the Action Plan Process will be subjected to extensive redrafting and stakeholder and public consultation, as well as thorough validation processes.

Climate change legislation

Another key finding from the analysis is the the need to enact a stand-alone framework climate change law to facilitate the necessary direction, coordination, policy setting and high-level political prioritisation in order to mainstream climate change across government functions. The overarching legislative framework will need to take account of all necessary institutional and financial considerations for effective climate change response.

Such a law should provide:

i. A framework for the implementation of global obligations arising from relevant international conventions, protocols and agreements;

ii. A framework to enhance the resilience of human and ecological systems to the impacts of climate change taking into consideration Article 42 of the Constitution of Kenya (2010);

iii. For the mainstreaming the principle of sustainable development in the planning and making of decisions on climate change;

iv. A contribution towards the global efforts of combating climate change and facilitate approaches that support low carbon climate resilient development.

v. A framework for the governance, coordination and financing of climate change at all levels.

The stand-alone law needs to be accompanied with, or followed by, a series of sectoral legislative and regulatory reforms that enable implementation of all NCCAP priority actions. This will be achieved through a Statute (Miscellaneous) Amendments Bill or through a number of separate legislative amendments following consultation with the various ministries and agencies to bring sectoral legislation in harmony with the framework law.

Institutional reform

The Action Plan recommends a wide range of economy wide actions to be undertaken by the government, private sector and civil society organisations. Therefore, comprehensive institutional reform is required to achieve the following objectives: high-level oversight and policy guidance, climate change mainstreaming across government; enforcement and compliance capability; county level government involvement; a stakeholder advisory forum; and, the provision of highly specialised technical and scientific analysis.

Specifically, this requires the establishment of a National Climate Change Council comprised of prominent individuals appointed by the President with strong expertise and experience in matters of climate change adaptation, mitigation and international negotiations, representing a wide cross-section of stakeholder interests from public, private, academia, research and non-state actors. A Secretariat within the Cabinet Affairs Office of the Presidency is to serve as liaison and communication focal point.

A reinforced National Climate Change Secretariat under the Ministry responsible for climate affairs would undertake technical aspects of climate change, within the constitutional mandate of the national government.

The establishment of the Kenya Climate Fund (KCF) (as described in Chapter 7) in the Ministry of Finance to facilitate the sourcing of finance from domestic budgets and international climate funding mechanisms is crucial to ensure effective implementation of the Action Plan. A multi-sectoral taskforce is recommended to coordinate climate finance-related issues.

In addition, the institutional structure recognises the role of the Designated National Authority (DNA) on the Clean Development Mechanism (CDM) and the National Implementing Entity (NIE) for the Adaptation Fund, currently located at NEMA, which requires capacity building to effectively contribute to the implementation of the Action Plan.

The Ministry in charge of planning has a crucial role of spearheading the implementation of the Climate Change Action Plans through mainstreaming climate change into the national development planning processes. Reinforced climate change desk officers in all line ministries will also be required to achieve effective mainstreaming of climate change.

To ensure the institutional structure provides for climate change response by the county governments, county governments will have climate change functions. These functions will be coordinated by the National Climate Change Secretariat, which will provide the necessary support to the counties in the development and implementation of county level climate change action plans.

8.3 Recommended Actions

Given the cross-cutting and overarching role that policy, legislative and institutional reform plays in enabling Kenya's climate change response, the following priority actions are envisaged. Jointly implemented, these actions constitute a comprehensive package that facilitates climate change mainstreaming and effective NCCAP implementation. Accordingly, the separate actions identified below are closely interlinked and are designed to reinforce the objectives of the other legislative, institutional and policy actions.

1 Develop and adopt a comprehensive Climate Change Policy to enable the country achieve the adaptation and mitigation goals.

2. Establish the enabling legislative framework to implement NCCAP actions by enacting a stand-alone, overarching, framework Climate Change Law. Amendment of key sectoral laws will be required to make them consistent with the framework climate change law and to ensure that all actions under the NCCAP have the legislative basis to be implemented and translated from concept to practice. This can be done either through s single Statute (Miscellaneous) Amendments Bill or through a raft of separate amendments of the relevant sectoral laws.

3. Establish a high-level National Climate Change Council (NCCC), in the Office of the President, with the role of primary coordination, policy direction, oversight and guidance across all levels of government. The Council should ensure mainstreaming of climate change by national government agencies and departments. The Council is expected to coordinate climate change issues through an inter-ministerial, an inter-agency committee as required by the UNFCCC.

   The NCCC may be chaired by the Secretary to the Cabinet, have a secretariat within the Cabinet Affairs Office, report annually to Parliament, comprise lead experts in climate change, representatives of the national and county governments, and involve representatives of civil society, academia and the private sector.

4. Establish a National Climate Change Secretariat as the primary national government technical agency for climate change response, located within the sectoral ministry responsible for climate affairs. Such a Secretariat may perform defined statutory functions, key among them the proposal and continuous revision of climate policy to the NCCC, oversight of climate change strategy and action plan implementation, proposal of climate change legislation, as well as the role of national compliance and enforcement. Other functions could include maintaining a greenhouse gas

inventory system; coordinating UNFCCC related activities, acting as a clearing house for climate change information; preparation and monitoring the mainstreaming and implementation of the national adaptation plan as well as nationally appropriate mitigation actions. The Secretariat may also have a decentralised structure that through county level offices could collect and collate climate change data. It is important that the Secretariat is provided with financial resources, and adequate staffing capacity that support the performance of these key functions. To ensure existing institutional capacity is built upon, the existing National Climate Change Secretariat (NCCS) under the Ministry of Environment and Mineral Resources should be strengthened to reflect the proposed functions, together with financial and technical capacity.

8.4 Summary of Actions

(See Annex 4 for detailed Actions)

Table 8.1 Priority actions related to Enabling Policy, Legal & Institutional Framework

Number	Action (figures in KSh)	Estimated Cost KSh for 5 years
EPLF-1	Consult on and adopt the draft Climate Change Policy currently being developed.	10 million
EPLF-2	Enact a stand-alone, overarching, framework Climate Change Law.	10 million
EPLF-3	Amend key sectoral laws consistent with NCCAP priority actions through a Miscellaneous Amendments Bill.	10 million
EPLF-4	Establish a high-level National Climate Change Council (150 million/yr).	750 million
EPLF-5	Strengthen and support NCCS to implement NCCAP within the sectoral Ministry responsible for climate affairs (300 million/Yr).	1500 million
Total		2280 million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9. Knowledge Management and Capacity Development

9.1 Introduction

As is evident from this Action Plan, climate change poses major challenges for Kenya and will require significant management in the decades to come. Action will have to be taken across all sectors of the economy as well as the social sectors to address climate vulnerabilities. The Government of Kenya will need to work with the private sector, civil society, communities, individuals and international partners to meet these challenges. The decisions and investments that are made at the national and local level will need to be based on the best information that is available and guided by capable and well-educated experts. This chapter is based on an analysis report which assessed how climate change knowledge is managed in Kenya and what improvements are required to ensure that Kenya achieves the required levels of climate change-related knowledge management, capacity development, education, public awareness and communication. The outcome of the analysis is a proposed Climate Change Knowledge Management System for Kenya.

9.2 Findings of the Analysis

9.2.1 Knowledge management

Even though climate change is an emerging issue, significant climate change knowledge is currently generated by Kenyan institutions and individuals. This section outlines the current status of knowledge management in Kenya, especially in relation to the generation and gathering, organisation, storage and dissemination of knowledge on climate change.

Agencies involved in climate change knowledge creation in Kenya include government, research and academic institutions, more than 300 civil society organisations (CSOs) and private sector companies. During the development of the climate change knowledge management system prototype, an exercise to scope existing institutions involved in climate change work revealed the need for a standardised method of organising knowledge and the Dublin Core Metadata standard has been presented as an example. Various institutions have developed basic data bases, libraries and websites where they store the climate change knowledge. There is limited sharing of climate change information and knowledge

across government, private sector, CSOs, academic and research institutions and individual researchers. A few organisations are, however, starting to share their knowledge but on a small scale. A good example is the Arid Lands Information Network (ALIN) which publishes *Joto Afrika*, a quarterly magazine that carries climate change research briefings by African scientists. In 2011, ALIN partnered with the Climate and Development Knowledge Network (CDKN) and CARE to develop special issues of *Joto Afrika* in the build up to COP 17. Based on these and the findings presented in the detailed report of the analysis, the establishment of an electronic system for managing climate change related knowledge has been recommended. The Proposed Knowledge Management System for Kenya will be structured according to the Conceptual Framework illustrated in Figure 9.1.

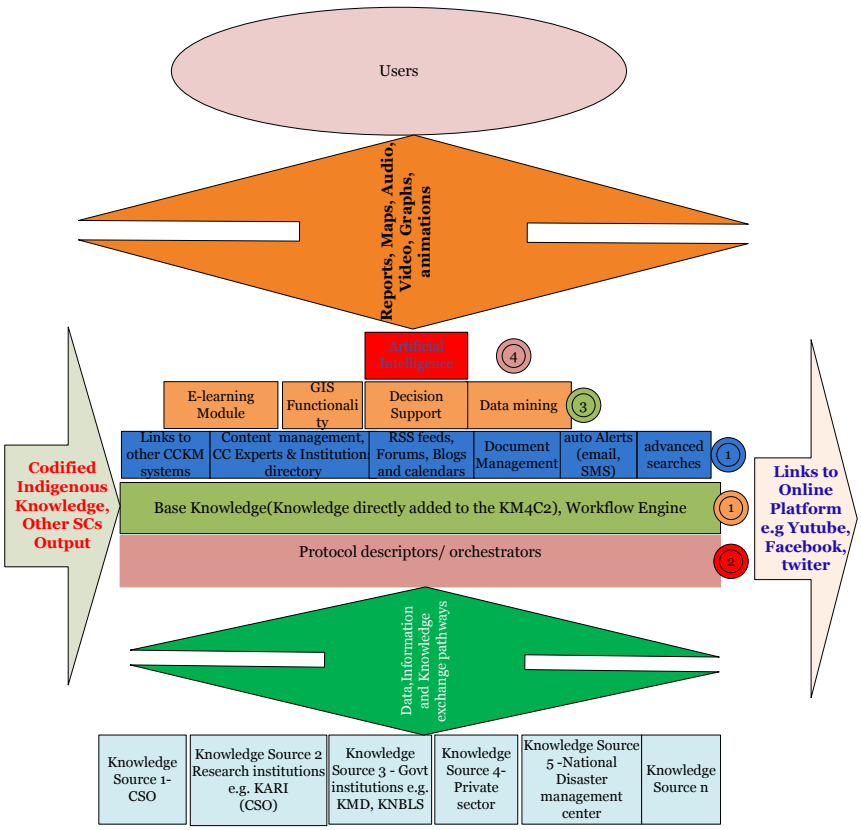

Figure 9.1: Conceptual Framework for Climate Change Knowledge Management

9.2.2 Capacity development

The myriad of risks and opportunities that come with climate change in Kenya require enhanced capacity to take advantage of the opportunities that may arise and at the same time reduce the associated risks. As with all capacity development efforts, the required capacity development for climate change resides in three different levels, namely, (i) systemic; (ii) organisational; and (iii) individual. Capacity development for climate change must focus on those individuals and institutions that are dedicated to climate change and to those that are mainstreaming climate change adaptation or low carbon development into their sectors, organisations and companies.

The focus of capacity development at the systemic level is on putting in place enabling environments that encapsulate policy, regulatory and economic frameworks, institutional arrangements and linkages, management and accountability processes, and resource availability and allocation. Chapter 8 has addressed the policy, legal and institutional factors that need to be addressed in Kenya and has provided recommendations with regard to a climate change policy, a stand-alone climate law and a miscellaneous amendments bill to remove barriers and provide incentives across the sectors. An institutional arrangement for the governance of climate change has also been proposed.

9.2.3 Public awareness and communication

A survey undertaken during the development of the NCCAP confirmed that public awareness about climate change in Kenya is very low, confirming similar findings during the development of the National Climate Change Response Strategy (NCCRS). Research on access to the various forms of media suggest that communicating climate change information to the general public in Kenya requires the use of radio, mobile phones, television, internet and print media, in that order.

Participants at stakeholder forums held during the development of the NCCAP identified the following climate change information needs:

- Extreme weather events, such as floods and droughts
- Food security – agriculture and livestock
- Climate change adaptation and mitigation strategies
- Change in rainfall patterns and rising temperatures
- Effects of climate change on the economy and health
- Early warning natural disasters, particularly droughts and floods

Stakeholders emphasised that they would benefit most from timely, accessible, dependable, usable, credible, authoritative, responsive and sustainable climate change information.

9.2.4 Integrating climate into Kenya's education system

While preparing the plan for integrating climate change into the education system, analyses of the curricula for primary, secondary and tertiary institutions prepared by the Kenya Institute of Education (KIE) confirmed that climate change has not yet been integrated into the formal education system. A survey of selected public and private universities, however, indicated that climate change is offered at the University of Nairobi and Kenyatta University. Some of the other universities, offer courses in environmental science and natural resources management, among others, into which climate change is progressively being infused.

9.3 Recommended Actions

9.3.1 Knowledge management

It is recommended that a network of the organisations carrying out climate change activities is developed and that stakeholders continue to build and strengthen partnerships with regional and global organisations engaged in climate change learning. A desirable network for sharing climate change information in Kenya is illustrated in Figure 9.2.

Additionally, it is recommended that a Climate Change Resource Centre, hosted by the NCCS in the Ministry responsible for climate change affairs becomes the one-stop online space for Kenya's climate change information and knowledge. Development of such a system will be based on a phased approach. In addition to hosting an electronic system, it is recommended that the proposed Climate Change Resource Centre will also act as a resource centre for traditional information products such as books, reports, videos, etc. A partnership should also be established between the Climate Change Resource Centre and the Kenya National Library Services (KNLS) to make climate change information and knowledge products available at the county level.

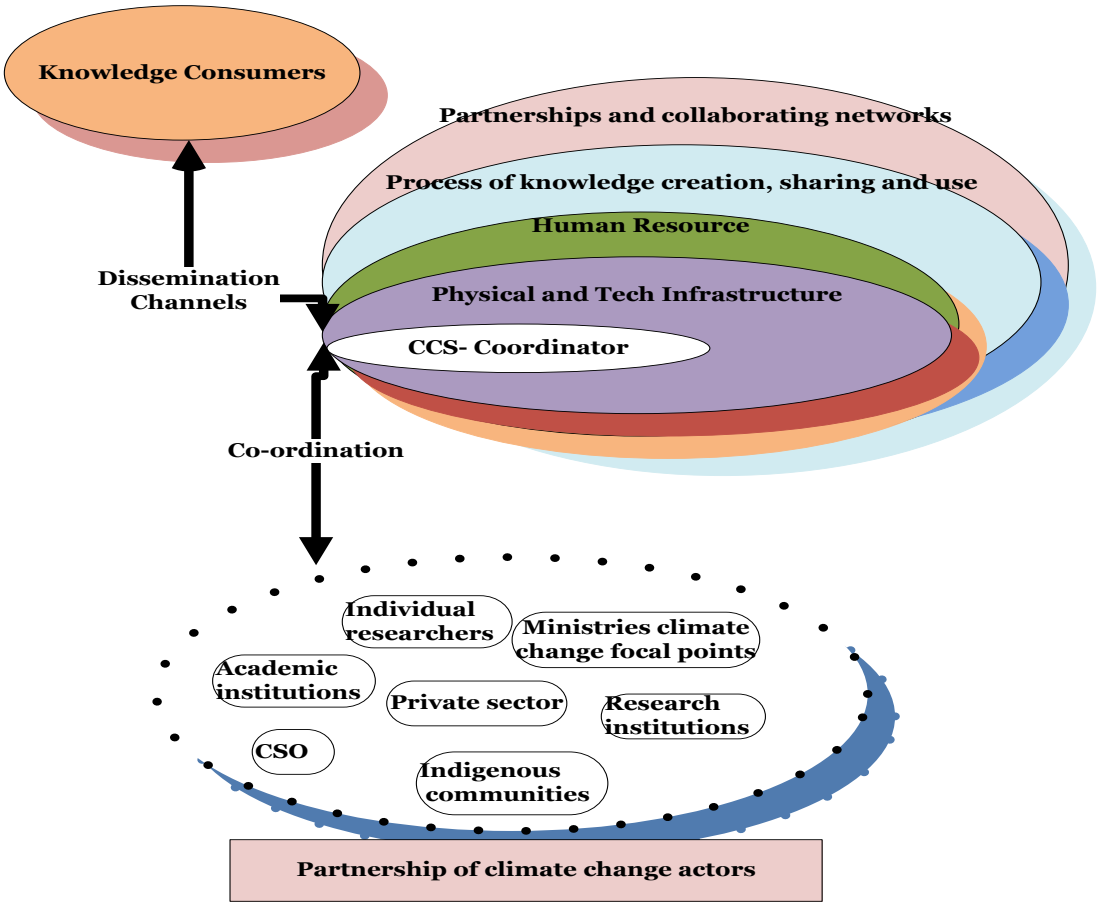

Figure 9.2: Proposed conceptual framework for climate change knowledge exchange in Kenya

9.3.2 Capacity development

Findings and recommendations from the assessment of Kenya's dedicated climate change institutions are presented in detail in the Knowledge Management and Capacity Development annex. The Ministry of Environment and Mineral Resources (MEMR) has the core mandate for coordinating climate change issues in the country with the National Climate Change Secretariat (NCCS) leading the day-to-day coordination. Other key Government actors in addressing climate change are the MEMR Departments/Directorates of Resource Survey and Remote Sensing, Meteorology andthe National Environment Management Authority

(NEMA) and climate change units in other line Ministries including Agriculture, Livestock and Health etc. The analysis found that a wide range of capacity development initiatives will be required to address their expanding mandates as they lead the implementation of the National Climate Change Action Plan. A list of climate related capacity development service providers should also be developed and maintained by the Climate Change Resource Centre.

For institutions to take forward priority adaptation and low carbon development actions, more detailed capacity analysis will be needed at the institutional level since a wide range of capacities will be required. For example, the capacity required by Ministry of Energy, KenGen and other actors to maximise Kenya's geothermal opportunities; the capacity of private enterprise and relevant local authorities and central agencies to maximise Kenya's solar potential; the capacity required to climate-proof Kenya's roads.

The focus of capacity development at the individual level is on developing performance/job related competencies and is, therefore, concerned with job descriptions; skills, knowledge, attitudes and motivation; training and career progression. And as per the capacity, at the individual level it is necessary to consider the climate change specialists who have assignments in the core climate change space and others who need to incorporate climate change into their sectors e.g. health professionals who need to consider the increased incidence of malaria in non-traditional areas; agricultural extension agents who need to integrate advice on climate change resilience into the advice that they share with farmers.

The emerging areas for targeted capacity development already identified in other chapters of this Action Plan include climate change data collection, analysis and utilisation of scenario modelling, climate change diplomacy, treaty implementation, evidence-based policy development and implementation, climate finance, including carbon trading, vulnerability and risk assessments, approaches to building adaptive capacity, sector specialisations to take advantage of low carbon development opportunities, applying monitoring and evaluation to mitigation and adaptation (MRV+) among others.

9.3.3 Public awareness and communication

Since climate change is a serious challenge requiring the active participation of all members of the society, the most up to date techniques for creating public awareness and action amongst all segments of the populace are recommended. It is thus important to implement the public awareness plan as detailed in the full analysis report on knowledge management mentioned above. Table 9.1 below summarises the techniques and channels that may be used to communicate the various climate change issues identified in the NCCAP.

Table 9.1 Techniques for communication climate change issues

	Communication technique, channel							
Desired adaptation/ mitigation practice	Radio/ Newspapers/TV	Group (chama) meetings/ social media	Barazas	Demos (how to use)	Posters and billboards	Bulk SMS	Opinion leaders (talks)	Drama, songs, skits
Energy-saving stoves	√	√	√	√	√		√	√
Drip irrigation	√		√	√			√	
Drought tolerant crops	√	√	√	√			√	
Weather patterns	√	√	√	√		√		
Geothermal power	√		√	√	√		√	√
Landslides, floods	√	√	√			√	√	
Animal disease outbreaks	√	√	√		√	√	√	
Solar lanterns	√	√	√	√	√		√	
Agroforestry	√	√	√	√	√	√	√	√
Reforestation	√	√	√	√	√	√	√	√
National Adaptation Plan (NAP)	√	√	√		√		√	
County level adaptation plans	√	√	√		√		√	
Biofuels	√	√	√	√	√	√	√	√
Rail transport	√	√	√	√	√	√	√	√
Large-scale bus transportation	√	√	√		√	√	√	√
Waste management	√	√	√	√	√	√	√	√
Kenya Climate Fund	√	√	√	√	√	√	√	√
Pan-Kenya	√	√	√	√	√	√	√	√
NCCAP	√	√	√	√	√	√	√	√
MRV+ system	√			√	√	√		
Institutions (NCCS, KMD, NEMA, NEC, DoE, etc)	√	√	√		√	√	√	√

9.3.4 Integrating climate change into Kenya's education system

Primary schools already offer courses that introduce children to nature study and agriculture and some schools have agriculture clubs that include gardens and the rearing of livestock. Adaptation to climate change can be integrated through these and other subjects. It is also recommended that the formulators of the primary school curriculum make a conscious effort to introduce climate change and its impact into all primary school subjects.

As Kenya implements a low carbon development pathway, students at secondary schools will need to be equipped with skills to support a future climate resilient economy. As has been recommended for primary schools, integration of climate change studies into secondary education should happen through the introduction of content that makes learners aware of the need to develop climate adaptation and mitigation capacities for the country. Courses touching on specific areas, such as clean energy alternatives and reduction of deforestation, should then be introduced incrementally at secondary school level.

Kenya lacks middle level technicians to support widespread adoption of technologies that will be required to support the country's aspirations towards a low carbon development pathway. For example, whereas it is desirable for Kenyans to adopt solar technology on a mass scale, supportive networks for installation and maintenance of solar power systems are not well-established nationally. Furthermore, standards for such system are non-existent. The same can be said of other technologies, such as those to harness geothermal and wind energy. There is therefore an opportunity to train technicians with these skills to support the widespread adoption of adaptation and mitigation practices needed to support the NCCAP.

At university level, climate change should be infused into the various professions. Civil engineers, for example, need to learn how to design and develop structures that can withstand climate shocks. Doctors need to be aware of the effects of climate change on human health, while architects should have the skills and training to design houses that are climate-proofed and energy efficient. Teachers ought to be equipped with knowledge about climate change in order for them to be suited to teach a curriculum that integrates climate change across all subjects taught at schools in Kenya. Whereas it is already the case that climate change as a subject is now being taught at Kenyan universities, there will be a need for institutions of higher learning to develop policies to ensure that all students educated there are familiar with climate change, its impact and strategies for adaptation and mitigation.

9.4 Summary of Actions

(See Annex 5 for detailed actions)

Table 9.2 Priority Knowledge Management & Capacity Development Actions

Number	Action	Estimated KSh for 5 years
KMCD-1	Develop and maintain a robust and up-to-date climate change know ledge management system.	100 million
KMCD-2	Develop a physical climate change resource centre	400 million
KMCD-3	Address the capacity gaps required to implement the NCCAP in the agencies coordinating and leading climate change efforts.	200 million
KMCD -4	Provide capacity development support to actors at national and county level to move forward with implementing the NCCAP (based on an annual identification of priorities).	200 million
KMCD-5	Establishment of an effective public awareness associated with the climate change resource centre.	100 million
KMCD-6	Integration of climate change into all levels of Kenya's education system.	450 million
Total		1450 million


SONITEC

10. Technology

10.1 Introduction

Technology development, transfer and diffusion are required to avoid the adverse effects of climate change and to enable Kenya to achieve low carbon climate resilient development. Applying modern technologies to better cope with climate variability is not new to our country and as technology developments have supported Kenya to cope with climate variability in the past, new technologies will continue to pave the way for low carbon climate resilient development in the future. Technology developments will improve the investment climate, stimulating sustainable flows of finance needed for long-term action.

Multiple social, economic and environmental challenges can be addressed through the development and transfer of technologies. Exploiting available renewable energy resources can reduce dependence on imported fossil fuels and hydropower (which is becoming more insecure with increasing drought) while providing a cleaner and healthier environment when technologies are low or carbon neutral. The favourable business environment created by technology adoption will be important to provide incentives to private and public financiers to invest in and support the mitigation and adaptation actions proposed in this NCCAP.

Communities must be at the forefront of technology development, not least because responses to climate change must be people-centred, but also because it is the people that will be required to adopt and utilise the technologies essential for reducing vulnerability and building capacity to respond to climate change. Non-governmental organizations (NGOs) and community-based organisations (CBOs) need to provide the strong links between the development of climate change technologies and their diffusion and the up-scaling of technologies to users at the community level.

Internationally there is a call for enhanced action on technology development and transfer to support action on mitigation and adaptation. The main issues include:

- Promotion, facilitation and financing, as appropriate, access to and the development, transfer and diffusion of environmentally sound technologies and corresponding know-how, in particular to developing countries, on favourable terms, including concessional and preferential terms, as mutually agreed.

- Creation of an enabling environment for the development, transfer and diffusion of environmentally sound technologies, especially with regard to policy and legal instruments. In Kenya there is neither specific policy nor legislation on transfer and

diffusion of technologies but there are references made in other sectoral policies and legislations such as the Environmental Management and Coordination Act (EMCA 1999); National Climate Change Response Strategy; Energy Policy (2004) and Act (2006) promoting geothermal and renewable energy technologies; Forestry Act promoting community-driven technologies; Vision 2030; and various Finance Acts that provide incentives for cleaner production and renewable energy generation technologies.

- Enhancement of foreign direct investment, international trade and international cooperation to support the transfer of environmentally sound technologies.
- Supporting developing countries to undertake Technology Needs Assessment, options to address the needs and associated capacity building.
- Strengthening international, regional and national capacities in cooperative action in research and technology assessment and issues of intellectual property rights.
- Encouraging developing countries to undertake activities on national communications, national adaptation programmes of action, nationally appropriate mitigation actions, national adaptation plans and technology road maps and action plans as it is only through this that meaningful development and transfer of technology can be realised.
- Technologies that enable adaptation and REDD+ are urgent priorities for developing countries, especially in Africa.

10.2 Overview of the Technology Needs Assessment (TNA) Process

In 2005, Kenya prepared and submitted a Technology Needs Assessment report to UNFCCC, which was a first step towards factoring the development and diffusion of environmentally sound technologies in Kenya's investment strategies. The purpose of the TNA was to identify, evaluate and prioritize technological means for achieving sustainable development, increasing resilience to climate change and avoiding dangerous anthropogenic climate change.

The prioritised technologies identified in 2005 for the agriculture and water sectors included drought tolerant sorghum, drip irrigation, conservation tillage, bio-technology, tissue

culture banana, early warning systems, hay production and soil and water conservation. Technologies for the development of renewable energy resources, such as geothermal, solar and wind power were also prioritised. The technologies developed in the energy sector have been crucial for supporting adaptation to current and future impacts of climate change, from improving the accessibility of energy for rural households and businesses, to enhancing the energy security of the country through diversification away from hydropower. The technologies prioritised in the TNA (2005) should be considered in the implementation of the adaptation and mitigation actions proposed throughout this National Climate Change Action Plan (NCCAP).

10.3 Technologies within the Actions for Mitigation and Adaptation

The recommendations on technology presented since the 2005 Technological Needs Assessment will be important for gaining momentum on implementing actions of the NCCAP. These will need to be considered in line with the wide-range of technologies identified in the NCCAP for low carbon climate resilient development. Selected technologies required to implement the NCCAP proposed actions include:

- **Energy sector technologies:** Geothermal generation; wind power generation; hydro-electricity expansion; solar PV; landfill gas generation; clean coal; improved cook stoves; LPG stove substitution; renewable lamps replacing kerosene lamps; energy-efficient light bulbs; energy-efficient appliances; emission reduction in the cement industries; solar thermal water heating; compact florescent lamp (CFL); energy efficiency improvements across industries; co-generation in agriculture; improved passenger vehicle stock efficiency; heavy-duty stock efficiency (HDV); biodiesel; bioethanol; bus rapid transit system-Nairobi; light rail transit system- Nairobi; and shift of freight from road to rail.

- **Waste sector technology:** Methane avoidance from landfills.

- **Industrial Processes technology:** Improved charcoal production.

- **Agriculture sector technologies:** Agro-forestry; conservation tillage; and limiting usage of fire in crop land.

- **Forestry sector: technologies:** Reforestation of degraded lands; restoration of forests and degraded lands; and reducing emissions from deforestation and forest degradation (REDD).

Technologies developed in Kenya or transferred from other developed or developing countries will be essential for the intended emissions reductions and sustainable development benefits to be achieved. The following sections present some technologies and enabling conditions, which may be required for selected NCCAP low carbon options and climate resilience actions.

10.3.1 Energy sector

There is no doubt that the Energy Policy, Feed-in Tariff Policy, Energy Act, Updated Least Cost Power Development Plan (ULCPDP) and Power Purchase Agreement Policy have promoted the transfer and diffusion of low carbon technologies in Kenya. The government has also zero rated the import duty on renewable energy technologies and removed VAT on equipment and components.

Technology options for the energy sector include, but are not limited to:

Solar Home Systems Technology: Solar Home Systems (SHS) involve generation of electric power from sunlight through the use of devices called solar cell modules. It is an imported technology that is being adopted in some parts of the country, especially in areas that are not served by the national electric grid. Solar home systems are yet to get wide diffusion in Kenya due to a number of barriers, both financial and non-financial, the top most being high initial investment costs. The enabling actions that are required to promote the diffusion of solar home systems include: provision of financial incentives to consumers of SHS, promotion of local production/assembly of SHS, public awareness campaigns and research and development.

Energy-efficient Bulbs: Compact fluorescent lamp (CFL) bulbs provide an energy efficient alternative to traditional light bulbs. Replacing incandescent bulbs with CFL decreases energy consumption by as much as 80 per cent. Among the enabling actions to promote energy-efficient bulbs are duty and VAT exemptions to make them affordable to low-end consumers. Compact fluorescent lamp technology is an imported one but is not widely diffused especially at the household level. Among the barriers to diffusion of CFLs is the high cost of the bulbs and lack of awareness as to the benefits they bring to the consumer and the environment in general. The government has been promoting adoption and diffusion of compact fluorescent bulbs by providing a limited number per household free

of charge in order to motivate households to switch to their use. CFLs are still relatively expensive in the country with a CFL from a good company costing about KSh400. There is a need to remove VAT on CFL (currently charged at 16 per cent)in order to accelerate their diffusion.

Geothermal Power Generation: Geothermal power generation technologies involve the tapping of steam energy to turn power generation turbines. Up-scaling of geothermal power generation can contribute to the challenge of meeting increased electricity demand and improving energy supply in Kenya. Currently directional and deeper drilling is being employed in both Olkaria and Menengai to directly access deeper geothermal energy sources. Well-head power generation technology is being employed to enable power production immediately after the geothermal source has been confirmed and assessed. Enabling actions to provide development of geothermal power development include scaling up of resource mapping and data availability of the resource in order to assist potential developers with information to support power production planning and assessment. The Ministry of Energy has produced a map of Geothermal Energy Resources in the country. The government and IPPs are actively engaged in geothermal development in the Rift Valley. According to ULCPDP reference scenario, Kenya will have about 5000 MW of installed capacity in 2030 from geothermal energy.

Wind Power Generation: Wind power generation technologies have been transferred to Kenya and are being deployed at various hill top locations. The Ministry of Energy has developed a Wind Energy Resources Atlas of Kenya which will support developers to identify suitable areas for installation of wind power turbines. The main barrier to the technology continues to be the initial capital costs.

Improved Cook Stoves: Improved cook stoves are characterised by higher fuel efficiency, which results in less fuel wood being used, cost-saving on charcoal and lower indoor air pollution. The Kenya Ceramic Jiko is among the widely used improved cook stoves. The technology is an improvement on the conventional charcoal cook stove developed by placing a ceramic lining on the top half of a metal stove which guarantees improved heat retention thus improving the stoves' efficiency. The improved cook stove has a 50 per cent efficiency improvement over traditional simple cook stoves. They are now being used in both rural and urban households but their penetration is constrained by high upfront cost and lack of standardization of the stove. Among the enabling actions to improve diffusion of the ceramic stoves are formulation of standards for the manufacturing of cook stoves and regulation of fuel wood harvesting in order to reflect the true value of the resource.

10.3.2 Waste sector

In the waste sector, potential emissions reductions have been identified in the capture of methane from municipal waste. For this, biodigester technology will be required and this involves construction of an enclosed waste container for anaerobic digestion of biodegradable solid waste. The aim of methane capture is to prevent the gas from escaping to the atmosphere where it contributes to global warming. In Kenya a lot has been done on methane capture, namely in the production of biogas, but much more could be done. Methane capture from landfills is a technology that involves prevention of emissions of methane gas and other pollutants from landfills by extracting the gaseous mixture using a series of wells and a blower/flare system. In Kenya feasibility studies have been undertaken on use of landfill gases from municipal waste dumps but there are no concrete plans for implementation. In order to get the technology operational in Kenya it is crucial that the following enabling actions be undertaken: improved rates of waste collection and disposal; creation of a regulatory framework that allows for the rights to landfill gas to be licensed for developers for capture and use; plans for future landfills to allow for landfill gas to be captured and utilised; and creation of financial incentives for households to install methane capture facilities for energy generation.

10.3.3 Industrial process sector

The most significant low carbon development opportunity in the industrial process sector is the introduction of more efficient kilns for charcoal production. Improved charcoal production technologies provide improvement on the traditional earth mound kilns which have low material recovery efficiency ranging from between 10 per cent and 22 per cent. The improved technologies use kilns that have greater efficiencies ranging from 30 per cent to 42 per cent. There are several improved charcoal production technologies, including among others, the metal kiln and drum kiln developed by the Kenya Forestry Research Institute (KEFRI), the Kuki Gallman retort kiln and the Meko portable kiln. Most of these kilns are prototypes that are yet to be widely diffused. The KEFRI portable kiln has potential for wide diffusion in that it can be easily transported to various sites depending on availability of raw material. Among the enabling actions for diffusion of improved charcoal kilns include: the provision of subsidies for efficiently produced charcoal as an incentive to producers to invest in efficient charcoal kilns; and the formulation of regulations to control illegally produced charcoal.

10.3.4 Agriculture sector

Existing and new technologies used in agriculture will require further advancement for the low carbon and climate resilient development of the sector. Major opportunities include:

Drought-tolerant crops: Varieties of drought-tolerant crops

grow well in semi-arid and arid (ASAL) areas of Kenya. The technology has been developed in the country by KARI and its diffusion is gradually picking up.

Conservation tillage technology: This is a land preparation method that ensures minimum disturbance to the soil during land preparation for planting. It involves the use of a riper or a hole to make farrows on holes in which seeds are sown thus leaving the intervening land undisturbed. The technology embraces soil erosion control, moisture conservation and conservation of soil carbon thus enhancing agricultural productivity in addition to minimising GHG emission. Conservation tillage has been adopted in some parts of Kenya but is yet to be widely diffused due to barriers, including lack of information and awareness of environmental and economic benefits of the technology as well as resistance to change among the farmers. To promote conservation tillage it is necessary to undertake extensive agricultural extension services to popularize the technology.

Drip irrigation technology: This addresses a single plant's need for water through conveyance of water through pipes and releasing it around the plant's roots. A standard drip irrigation system uses a water head of 10-15 metres while a cow-head rip one uses a head of 0.5-2 metres. Drip irrigation has been promoted in Kenya by both the government and the private sector for sometime now. It has taken off among large scale horticultural enterprises but it is yet to be widely adopted by small scale producers. High installation costs of about 400,000 Kenyan shillings for 2 acre areas of irrigation and inadequate access to credit and resistance to change are amongst the barriers. Awareness raising on the use and benefits of drip irrigation and improving accessibility of the technology to small scale farmers are needed to increase the uptake of this technology.

10.3.5 Transport sector

Motor vehicles in the country have been increasing at the rate of about 10,000 per year with overall numbers now standing at about 1,000,000 small vehicles and 120,000 heavy vehicles, according to Ministry of Transport estimates. As a result, traffic congestion on the roads, especially in urban areas, is a common daily occurrence leading to high emissions of greenhouse gases and other air pollutants and high fuel consumption. Technologies in the action plan to address these issues include, but are not limited to, the following:

- Employ more effective traffic management technologies, especially traffic control lights to reduce vehicle travel time mainly in urban areas.

- Introduce vehicle emission control technologies, such as the installation of catalytic converters in the vehicle exhaust pipes to reduce gaseous emissions.

- Enhance vehicle inspection regulations to include personal cars and also to enforce emission controls.

- Formulate a regulatory and economic framework that will lead to reduction of old inefficient vehicles from the roads.

- Transfer and deploy technologies for solar energy-driven small vehicles. Hybrid vehicles that use both solar and fossil fuel energy are good examples.

- Up-scale mass transport systems to reduce the use of personal vehicles. In this regard, bus rapid transit technologies need to be actively promoted, and should include financial incentives and modification of road infrastructure to create enabling conditions for their operations.

- Promote technologies for manufacturing light-weight non-motorised hand carts to enhance their manoeuvrability.

10.3.6 Forestry sector

In the forestry sector, low carbon development actions include the restoration of forests on degraded lands and reforestation of degraded forests. The former process involves re-establishment of tree cover on lands that once had forest cover that has over time been reduced by human activity, including excessive wood harvesting, livestock grazing, and poor management. Technologies will be required to implement the processes required to achieve these actions, including large-scale planting in the case of degraded forest plantations or through promotion of natural regeneration in the case of indigenous/natural forests.

In the case of natural forests, technologies will be applied to support the removal or reduction of barriers to natural regeneration, such as competition with weedy species, protection from animal grazing, wood harvesting and wildfires. In the case of degraded forest plantations, technologies will be applied to support species selection, production of tree seedling, site preparation, planting of seedlings and tending of saplings.

The forestry sector is an important source of income for many communities in Kenya. To ensure that the forests can continue to provide important environmental and ecosystem services, and contribute to economic development, rural livelihoods, water availability and climate-resilience benefits, technologies may be required to enhance capacity for sustainable natural resource management in the face of increasing climate uncertainty. Technology will also pave the way for forest-based income-generating activities, which can support adaptation to climate change for those engaged in livelihoods that are particularly sensitive to climate impacts.

In all cases, provisions will need to be in place so that technologies can be locally supplied, managed and maintained to the greatest extent possible.

10.3.7 Water sector

As for the forestry sector, technologies will pave the way for adaptation to climate change in the water sector. Major technologies which could be applied or scaled-up to enhance water security through the NCCAP proposed actions include:

Surface Run-off Water Harvesting Technology: Surface runoff water harvesting is the collection, accumulation, treatment or purification and storing of storm-water for its eventual reuse. It can also include other catchment areas from man-made surfaces, such as roads, park gardens and playing fields. The technology involves harnessing surface run-off from ground surfaces and directing the water into a retention earth dam for storage. The water can be used directly for livestock, irrigation or for drinking after appropriate treatment. The main barriers to diffusion and adoption of this technology, which has been limited to date in Kenya, are economic and financial, including high initial costs and inadequate access to financial resources; technical (insufficient capacity among the local community); environmental, including evaporation, and policy and legal (inappropriate land tenure). The enabling actions that are required to promote the adoption, diffusion and transfer of the technology are financial incentives, availability of affordable credit, improvement of appropriate land tenure system, especially in ASALs, and capacity building.

Roof Rainwater Harvesting Technology: Roof rainwater harvesting involves inducing, collecting, storing and conserving rain water for reuse before it reaches the aquifer. It requires the collection of rainwater in gutters through down-pipes and diversion to containers or tanks. The technology is used more in high potential agricultural areas than in urban areas and ASALs. The barriers to the use of this technology are high initial costs, lack of suitable roofs, and inadequate rainfall and settlement patterns in ASALs, among others. Actions required to enable this technology to be adopted and diffused include financial incentives, provision of affordable credit and creation awareness and information.

Solar Powered Sea Water Desalination Technology: Desalination involves removing the salt and other dissolved constituents from seawater, brackish waters, waste water or contaminated freshwater to make it drinkable. The current and future projected water stress along the coastline (which has vibrant tourism and other associated industries) will require new sources of drinking and desalination will allow Kenya to tap into the immense sea water. The large energy demands of the current desalination process will contribute to GHG emissions and could set back climate change mitigation efforts. Solar powered desalinators are therefore an appealing technology. The perceived high costs associated with acquiring the solar desalinators and also the low level of technology transfer has meant that they have not been widely adopted in Kenya. Among the enabling actions that are required to promote the transfer and diffusion of the technology are financial incentives, and information and awareness creation.

10.4 Institutions for the Development of Required Technology

There are many institutions in Kenya currently involved in research and development activities for technologies that would support low carbon climate resilient development. The initiatives implemented will continue to support the country to adapt to and mitigate the effects of climate change through the production of new technologies, modification of transferred technologies according to national circumstances and the adjustment of existing technologies to respond to changing conditions, including the changing climate. In addition to a wide-range of private sector entities, the major institutions include:

- Kenya Meteorological Department (KMD) conducts research on climate information packages, develops seasonal climate information products and disseminates the same to the public for early warning and preparedness. KMD also has a flagship project proposal for weather modification for rainfall enhancement over the drylands of the country; hail suppression over the western part of the country and snow-pack augmentation over the glaciers on Mt Kenya.

- IGAD Climate Prediction and Application Centre (ICPAC) develops seasonal climate information products for the IGAD countries in collaboration with the National Meteorological Services of the region.

- The Kenya Agricultural Research Institute (KARI) conducts research and development on the relationships between climate variability and change and agricultural crops and livestock.

- The Kenya Forestry Research Institute (KEFRI) conducts research on forestry and has recently focused on the issue of reduced emissions from deforestation and degradation (REDD).

- The Kenya Medical Research Institute (KEMRI) conducts research on climate- sensitive human diseases, such as malaria.

- The Kenya Marine and Fisheries Research Institute (KEMFRI), which focuses on marine resources, especially fisheries, is investigating the impacts of climate change on marine resources.

- The Kenya Industrial Research and Development Institute (KIRDI) undertakes research and development of environmentally-sound industrial technologies.

- The Department of Resource Surveys and Remote Sensing (DRSRS) in the Ministry of Environment and Mineral Resources conducts research and monitoring of national resources using satellite and aircraft technologies. The World Centre for Agro-forestry, also known as ICRAF, is conducting research and application of conservation agriculture with the objective of conserving soil, water and plant nutrients under variable climate conditions.

- The International Livestock Research Institute (ILRI) conducts research on the influence of climate change on livestock pests and diseases. The Institute of Climate Change and Adaptation (ICCA) has recently been established at the University of Nairobi to focus on research and training related to adaptation.

Private sector investment and support in the national climate change response must be encouraged for NCCAP actions to be long-lasting. The ability for the private sector to do business in Kenya will be supported by enhanced technologies. And these will only be developed through innovation, risk-taking and financial investment. Kenya has recently established the first Climate Innovation Centre (CIC) in the World at the Strathmore Business School. Dedicated to supporting climate change technologies and research and development entrepreneurships, its main focus will be on innovative technologies in the area of energy, agriculture and water supply that will contribute to Green Development and growth. The CIC will play an important role in developing green technologies in Kenya and will target solutions that are relevant across the East Africa Region.

10.5 Existing Initiatives Related to Technology Transfer and Research & Development

As Kenya creates the enabling environment for the development, transfer and diffusion of technologies for low carbon climate resilient development, the country can learn from past and existing initiatives.

In 2001, the Kenya Association of Manufacturers (KAM) which represents private sector manufacturers commenced implementation of a project known as Removal of Barriers to Energy Efficiency and Conservation in Small and Medium Scale Enterprises (SME). The main objective was to build the capacity of the manufacturers and other enterprises to use innovative technologies in their operations to enhance energy efficiency. At the end of the project the results showed that the participating institutions were able to increase their profits, reduce poverty and reduce emissions of greenhouse gases, with some of the industries now saving up to 30 per cent of energy consumption.

Further examples of best practice in using technologies to develop renewable energy resources have been demonstrated by KenGen. The company has acquired geothermal energy technologies that make it possible to drill deeper wells and to undertake directional drilling to produce more electricity and in a more environmentally friendly manner. KenGen has introduced an innovative well-head technology which enables electricity power generation from an individual geothermal well. The power can then be fed to the national grid. The technology is efficient and cost-effective in that it enables electric power generation immediately after the drilling of the well is completed instead of having to wait until all the other planned wells are completed in order to put up a power generation station for all of them. Furthermore a well-head can be dismounted and transferred to a different well as the need arises.

Policy tools can create the enabling environment for technology development and uptake, as demonstrated in 2001 when Kenya developed National Guidelines for the Clean Development Mechanism (CDM) under the Kyoto Protocol. The subsequent support provided to project developers in accessing technology and information means there are now ten registered CDM projects and twenty eight others in the pipeline in Kenya (NEMA, 2012).

Innovation, finance, capacity building and local ownership must be provided if the benefits of technology are to be maximised for the adaptation and mitigation actions proposed in this Action Plan. Effective information and knowledge management in support of these conditions could be provided for by the Climate Change Resource Centre mentioned in the above chapter hosted by the Ministry responsible for climate affairs. Expected to be constructed and operational in 2013, the new Resource Centre could encourage awareness raising of best practice initiatives around Kenya and internationally for the development of technologies to support mitigation and adaptation.

Specific actions have not been developed for climate related technology as it is assumed that technology considerations have been integrated into the various actions for mitigation and adaptation,

Panos/Andrew McConnell

11. National Performance and Benefit Measurement Framework

11.1 Introduction

The National Performance and Benefit Measurement Framework (NPBMF) is an integrated framework for measuring, monitoring, evaluating, verifying and reporting results of mitigation actions, adaptation actions and the synergies between them.

The work to develop the NPBMF took place in two stages: Stage 1 identified the building blocks for the framework and Stage 2 designed the framework. The outputs of these two stages are presented in five separate reports:

- NPBMF Review Report (Stage 1)
- NPBMF and MRV+ System Design, Road Map and Guidance Report (Stage 2)
- Selecting and Monitoring Adaptation Indicators Report (Stage 2)
- Tools to Measure, Report and Verify Synergistic Mitigation and Adaptation Actions (Stage 2)
- Capacity Development Plan (Stage 2)

This chapter describes the key elements of a NPBMF for the NCCAP, drawing on the evidence and recommendations described in the reports listed above.

Effective implementation of the NCCAP is highly dependent on the internal "feedback" generated through monitoring, reporting and verification (MRV) processes. Without the NPBMF, it will be impossible for the Government of Kenya (GoK) to assess the effectiveness of investment in mitigation and adaptation, or to determine whether the money is being spent wisely.

The continuance of international funding for climate change activities depends on effective MRV. Bilateral aid agencies, multilateral development banks and other providers of finance need the results of MRV systems to validate the effectiveness of funds they provide. Therefore, securing further financial support for the implementation of the NCCAP will be dependent on the successful establishment of the framework described below.

11.2 Key Findings

The key component of the proposed NPBMF is an "MRV+" system. It is referred to as MRV+ because it will deliver both MRV of greenhouse gas (GHG) emissions and mitigation activities and Monitoring and Evaluation (M&E) of the adaptation activities. The MRV+ system will assist by:

- Providing guidance on the implementation of climate change response actions (both adaptation and mitigation actions), whether in the form of policies, projects, programmes or business ventures.

- Helping fulfil Kenya's international reporting obligations: for example, by assisting in developing its GHG inventory and tracking mitigation and adaptation actions ready to report to the United Nations Framework Convention on Climate Change (UNFCCC), through National Communications (NCs) and Biennial Update Reports (BURs). The MRV+ system will formalise and institutionalise the process for producing the GHG inventory, NCs and BURs.

- Demonstrating the country's climate finance readiness and providing a strong platform for attracting international climate finance flows from multilateral and bilateral development partners.

11.2.1 MRV+ system design

The MRV+ system will carry out a process that contains three main stages, as follows:

- Measurement, monitoring (and evaluation): data and information will be gathered and fed into the system; the data and information will be quality checked and evaluated.

- Verification: the analysis will produce results that will be cross-checked and verified to ensure that they are realistic estimates of the outcomes being monitored.

- Reporting: once the results have been verified, they will then be reported in whatever format is required.

There are a number of core elements within the system that have been designed to carry out these three stages and to facilitate the MRV+ process (see Figure 11.1).

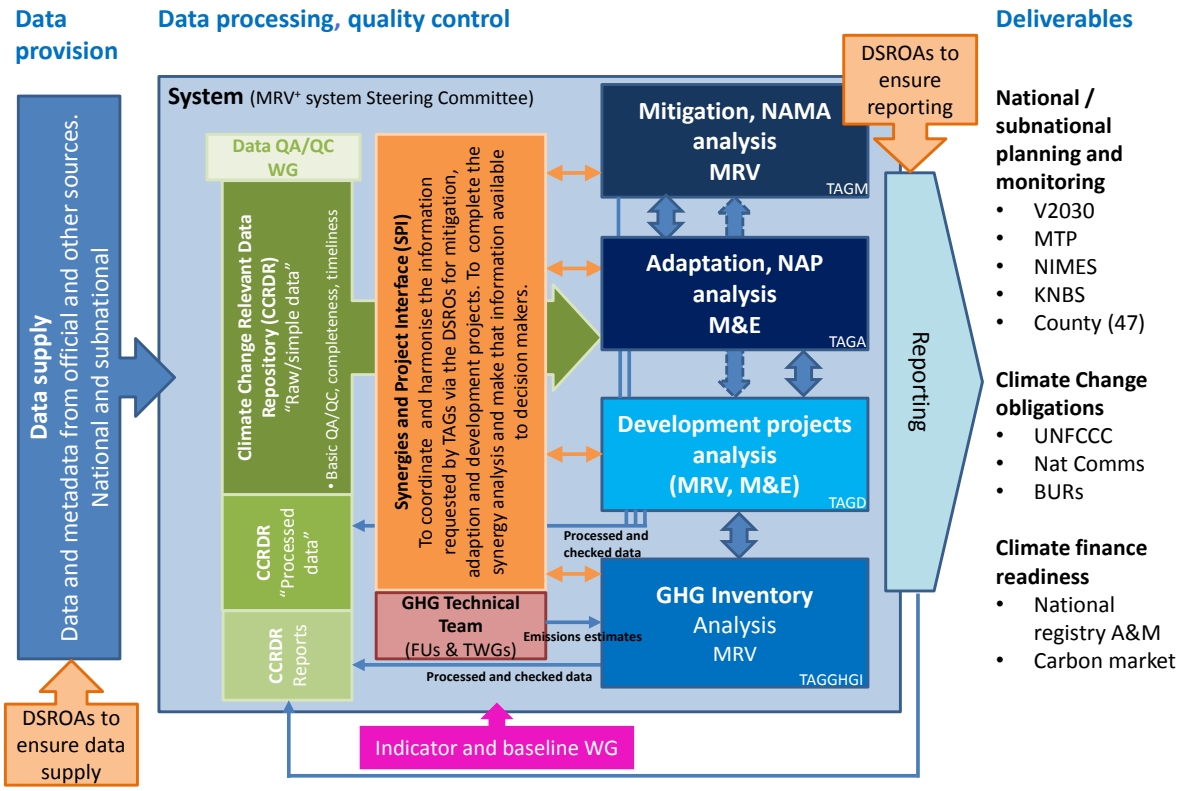

Figure 11.1: The proposed MRV+ system for Kenya

The common core components of the system are as follows:

- Data Supply and Reporting Obligation Agreements (DSROAs): these ensure that all relevant parties to the system provide the data required.
- Climate Change Relevant Data Repository (CCRDR): this stores the data required for estimating GHG emissions, and for monitoring progress towards mitigation, adaptation and synergy indicators and reports and other outputs produced by the system. These data will be geo-coded where possible.
- Indicators and Baselines Working Group: this is responsible for determining indicators required to monitor performance and quantifying the baselines for each.

- Data and QA/QC Working Group: this is responsible for setting up the CCRDR, defining the DSROAs, and setting out data specifications and processes and quality control procedures.

Components of the system that focus on particular technical areas include:

- Technical Analysis Groups (TAGs) for Adaptation (TAGA), Mitigation (TAGM), Development (TAGD) and GHG inventory (TAGGHGI).

- Synergies and Project Interface (SPI).

- GHG Technical Team comprising Focal Units (FUs) and Thematic Working Groups (TWGs) for different sectors.

It is proposed that the MRV+ system be overseen by a steering committee (see Figure 11.2). The members of the steering committee must have the knowledge to oversee the system, the time to devote to getting the system set up and the power to make things happen. There should be a reporting line up to Cabinet Affairs via the National Climate Change Commission, so that the system and its performance is highly visible, and to help harness sufficient political will to ensure the system is set up and implemented to the required timelines. The MRV+ system needs to endure changes in government structures and be able to preserve key functions and institutional memory even when key technical and management staff move on.

The underlying principles of the MRV+ system design are to build on existing institutions and skills wherever possible and to take into account the planned climate change governance structures. Existing M&E systems within the Ministries, Departments and Agencies (MDAs) and M&E related governance structures for the National Integrated Monitoring and Evaluation System (NIMES) proposed by the MPND have important roles to play in the MRV+ system. These include:

- Existing Ministries, Departments and Agencies (MDAs): National Climate Change Secretariat in the Ministry of Environment and Mineral Resources; Monitoring and Evaluations Directorate of the Ministry of Planning, National Development and Vision 2030; Kenya National Bureau of Statistics (KNBS); Kenya Bureau of Standards (KEBS); representatives from the T21 modelling team; Central Planning and Projects Monitoring Units (CPPMUs) and/or Climate Change Units in MDAs covering all the sectors necessary for the GHG inventory and those relevant for adaptation.

- Proposed Climate Change and M&E Governance structures: National Climate Change Council (NCCC); National Climate Change Secretariat (NCCS); National GHG Inventory Coordination Unit; County Monitoring and Evaluation Committees (CMECs, proposed for NIMES); Ministerial M&E Committees (MMECs, proposed for NIMES); and National Monitoring & Evaluation Steering Committee (NMESC, proposed for NIMES).

The governance and reporting structures of the MRV+ system have been kept as simple as possible to avoid complex management structures. The MRV+ system has been designed to minimise the number of extra staff needed, although some new working groups and TAGs will need to be set up, as described in Figure 11.2.

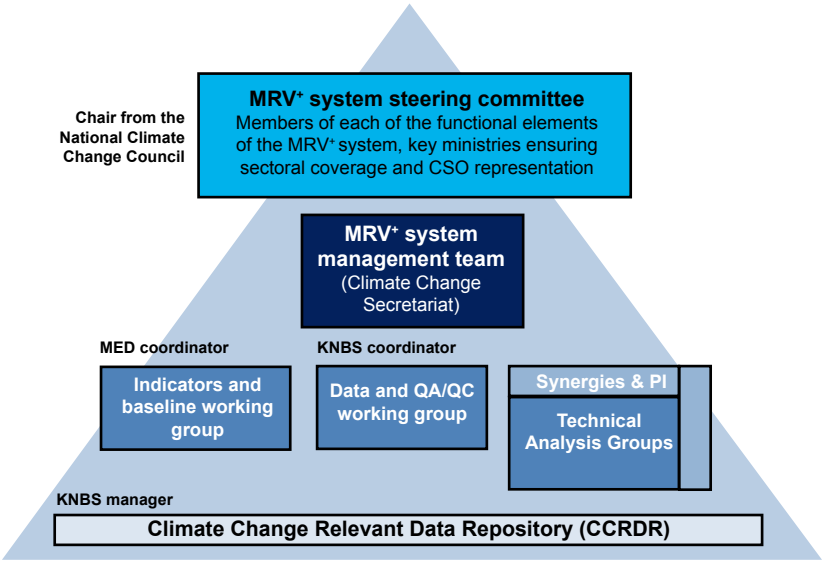

Figure 11.2: Diagram showing the governance hierarchy for the MRV+ system

It is estimated that up to 100 people will be involved in setting up and running the MRV+ system. It should be noted that these staff are not necessarily all new staff; in some cases existing staff could take on some of the new roles as part of their current jobs, since not all the roles would represent full-time posts.

11.2.2 Climate change indicators

One of the difficulties of developing indicators for the MRV+ system is that the exact nature of the mitigation and adaptation actions that are to be monitored are still provisional and will require further consideration when implementation begins. The mitigation chapter includes 30 low carbon development options to be taken forward by the various sectors and the prioritised adaptation actions proposed by the sectors will undergo further refining during the MTP process and as part of their inclusion in Kenya's National Adaptation Plan. Performance related targets can be identified and agreed once these steps have been taken.

The NPBMF and MRV$^+$ System Design Report provides detailed guidance on measuring and reporting information on Nationally Appropriate Mitigation Actions (NAMAs) for both domestic and international purposes (unilateral and supported NAMAs). The MRV$^+$ System Design Report also sets out guidance for improving the quality of our country's GHG inventory.

The implementation of a system for reporting on NAMAs and the creation of a GHG inventory will generate much of the information required to measure and monitor performance of climate mitigation activities. Once the specific NAMA actions have been agreed, targets for the performance indicators can be set by the relevant MDAs. Although mitigation activities will affect a wide range of sectors, the ability to measure mitigation performance in a common unit, tonnes of carbon dioxide equivalent, greatly simplifies monitoring and evaluation processes.

In contrast, measurement of adaptation performance is less straightforward. Adaptation actions also span multiple sectors, but there is no common unit of measurement. The design of a suitable set of indicators to capture adaptation outcomes is, therefore, a significant challenge and careful attention has been paid to the identification and selection of adaptation indicators.

The method used is known as Tracking Adaptation and Measuring Development (TAMD). It has been developed by the International Institute for Environment and Development and has been trialled on projects in a number of countries with some success. The TAMD methodology describes the development of indicators that reflect institutional adaptive capacity (measuring top-down adaptations) and vulnerability (measuring bottom-up adaptations), rather than climate impacts or risk. By adopting this approach, the MRV$^+$ system measures adaptation actions that also support development aims, rather than simply measuring costly technological fixes that may have limited development benefits.

Top-down institutional adaptive capacity indicators

In total, 62 national level, process-based indicators measuring institutional adaptive capacity were identified, based on the adaptation actions described in the adaptation analysis. From these indicators, a total of 28 county-level, outcome-based indicators were identified, subsequently reappraised and reduced to a shortlist of 10. The idea is that these indicators measure the effectiveness of national initiatives to build institutional adaptive capacity at the county level(their effectiveness in reducing vulnerability to climate change at a national level is captured by the indicators in the next section.) All ten indicators are important to the sectors they represent, so there is no prioritisation. They are listed in the box below:

Top-down county-level institutional adaptive capacity indicators

- Percentage of county roads that have been made "climate resilient" or that are not considered to be vulnerable
- Percentage of new hydroelectric projects in the county that have been designed to cope with climate change risk
- Percentage of population by gender in areas subject to flooding and/ or drought in the county who have access to KMD information on rainfall forecasts
- Percentage of people by gender in the county permanently displaced from their homes as a result of flood, drought or sea-level rise
- Percentage of poor farmers and fishermen in the county with access to credit facilities or grants
- Percentage of total livestock numbers killed by drought in the county
- Percentage of area of natural terrestrial ecosystems in the county that have been disturbed or damaged
- Percentage water demand that is supplied in the county
- Percentage of poor people by gender in drought prone areas in the county with access to reliable and safe water supplies
- Number of ministries that have received training for staff operating at county level on the costs and benefits of adaptation, including valuation of ecosystem services.

Bottom-up vulnerability indicators

There are a wide range of ad hoc adaptation projects, carrying out valuable work at the local level in reducing vulnerability. However, linking indicators to an uncoordinated set of local level adaptation activities will not create a sufficiently broad set of vulnerability indicators for the NCCAP. Instead, vulnerabilities that were flagged by stakeholders during the county consultations were used. In total, 62 county-level indicators measuring vulnerability were derived. The county-level indicators are a mixture of process-based and outcome-based indicators.

Based on these county level indicators, a total of 27 national level, outcome-based indicators were identified, subsequently reappraised and reduced to a shortlist of 10. The idea is that these indicators measure the effectiveness of local and county initiatives to reduce vulnerability at the national level. A large proportion of the national level indicators are taken from Vision 2030. These are relevant to adaptation because of the close alignment of adaptation with development goals. The indicators are listed in the box below:

Bottom-up vulnerability indicators

- Number of people by gender permanently displaced from their homes due to drought, flood or sea level rise
- Number of hectares of productive land lost to soil erosion
- Percentage rural households with access to water from a protected source
- Percentage urban households with access to piped water
- Cubic meters per capita of water storage
- Percentage of land area covered by forest
- Percentage of classified roads maintained and rehabilitated
- Number of urban slums with physical and social infrastructure installed annually
- Number households in need of food aid
- Number of County Stakeholder Fora held on climate change.

11.2.3 Synergies

One area that is frequently neglected in national climate change response strategies is the interaction between climate change adaptation and mitigation activities. These interactions may take the form of "synergies", where mitigation and adaptation actions support each other, or "trade-offs", where action in one area conflicts to some extent with actions in the other.

The method used for the screening of potential synergies and trade-offs across multiple sectors was based on a CDKN Innovation Fund project, called 'Achieving triple wins: identifying climate smart investment strategies for the coastal zone', which is currently being field tested in Kenya. Criteria for mitigation, adaptation and development are applied in a screening process. Each proposed climate action is scored against these criteria for positive and negative impacts. This provides a view of potential synergies and trade-offs for each action. Using this method, a comprehensive screening process was conducted to assess potential synergies and trade-offs for the NCCAP.

Based on the mitigation actions (proposed by SC4) and adaptation actions (proposed by SC3), synergies with the greatest potential are:

- Increased fuel security from reduced reliance on external imports
- Increased productivity and quality of life from climate resilient electricity generation
- Improved water storage potential of soils from reduced occurrence of grassfires
- Improved human health from improvements in vehicle efficiencies and reduced air pollution
- Improved human health from replacement of kerosene lamps with renewable lamps in the home
- Reduced vulnerability to floods and storm surges from increased climate change resilience of sanitation
- Improved water storage potential in soils, reduced run off and floods from forestry investments
- Increased carbon sequestration from reforestation, agroforestry and conservation tillage.

Trade-offs identified as having the greatest potential adverse impact are:

- Food shortages and price rises for cereals caused by increased growth of biofuels
- Water shortages for local communities caused by unsustainable geothermal energy expansion
- Higher priced goods due to heavy duty vehicle fuel efficiency
- Improvements in passenger vehicle emissions resulting in lower mobility for the poor if cost passed onto consumer.

It is difficult to assess the extent of a synergy or trade-off until specific actions have been proposed, the means of implementation has been described and the beneficiaries have been identified. Therefore, it is not yet possible to quantify the synergies or trade-offs identified above. However, the inclusion of synergy indicators in the NPBMF will ensure that positive and negative impacts are measured and evaluated, and that a suitable response is taken to maximise positive impacts and minimize negative impacts. Therefore, a number of indicators have been proposed:

Indicators of synergy or trade-offs

- Percentage imported fuel for each MW of energy produced from renewable sources
- No. of power cuts in areas targeted for climate resilient investment in the electricity grid
- Water storage in areas targeted for enforcement of the Grassfires Act
- Air pollution in urban areas following measures to improve vehicle emissions
- Incidences of respiratory disease in households using kerosene lamps
- Incidences of respiratory disease in households using renewable lamps
- Cases of water-borne diseases following flood events or storm surges
- No. of water trucks delivering water to downstream areas during periods of drought following investment in forests

- Tonnes of soil carbon per hectare in agricultural land targeted for conservation tillage practice
- Cereal crops index
- Hectares of biofuel grown
- Additional un-recycled water demand from geothermal power generation
- Cost of road freight per km
- Average cost of public transport per journey.

Many of these indicators are drawn from existing indicators proposed in sector strategies and action plans.

11.2.4 Capacity development for the MRV+ system

The new arrangements required by the MRV+ system and the additional functions of the various participants in the NPBMF require a significant capacity building effort. A set of activities that expand the scale, reach, efficiency and effectiveness of programmes and institutions will be required.

In order to understand capacity needs, a range of activities were carried out, including a desk review of documents from MDAs and Non-State Actors (NSAs); case studies of three MDAs, key stakeholder interviews, meetings and workshops, and internal consultations within the NCCAP team. A Capacity Development Plan was produced that assesses existing institutional capacities and identifies gaps at various levels, with particular attention to data generation, data processing, data analysis, data sharing, outcomes and impact level reporting, and existing information technology support (i.e. computers, software).

The key findings are as follows:

- Some capacity for climate change MRV already exists and is mainly located within non-state actors (NSAs) that make up over 70 per cent of climate change actors in Kenya. Some of these organisations have experience with assessment and reporting on climate outcomes for their projects.
- The MRV/ M&E of climate change projects is a new field and therefore this capacity has not yet evolved to the required levels in Government. MDAs are operating far

below required capacity, both in terms of human resources and also in terms of awareness and knowledge of climate change measures and reporting requirements and frameworks.

- Awareness of climate change indicators and reporting requirements is generally low. Therefore, efforts to increase this knowledge through awareness raising strategies and training are key to building capacities in this area.

- The myriad of electronic reporting systems already in existence within government presents a challenge for reporting on climate change outcomes. Ownership is often unclear and level of usage limited.

- Duplication of M&E efforts between MDAs and by state and NSAs poses a special challenge. This problem will be addressed if the MRV+ system proposed above is properly developed and widely adopted.

- The formal arrangements amongst key institutions such as MEMR, KMD, MED and NEMA as well as NSAs for data sharing need to be expanded and strengthened in order to avoid potential risks for non-compliant climate change reporting.

In summary, capacity development for the MRV+ System and NPBMF requires a deliberate, pre-planned and budgeted capacity building and training programme for GoK officials, especially those in the CPPMUs responsible for ensuring information transmission on progress and outcomes of development projects through the existing electronic M&E and financial systems of government. Specific issues include:

- Human resources (number and qualifications) need to be increased

- Climate change knowledge needs building, particularly in the context of MRV/ M&E, indicators and reporting requirements

- A programme of awareness raising and training is required to encourage utilisation of electronic information management systems, such as the proposed CCRDR, for inputting, analysing and reporting data on climate change

- Communication and collaboration mechanisms need to be established between state actors and NSAs, including data sharing and utilization agreements

- GoK should ensure that the individuals selected for the MRV+ governance structure have appropriate qualifications and the necessary skills for the job

- The NPBMF requires the involvement of many actors; therefore, further studies on capacity requirements are needed to provide specific capacity development solutions to fit with the new government structure and devolution.

11.3 Recommended Actions

It could take up to three years before the MRV+ system is fully operational. However, some core elements of the system will need to be fast tracked in order to:

- Meet international reporting obligations such as Kenya's first Biennial Update Report to the UNFCCC, which is due at the end of December 2014 and National Communications. GHG inventories will need to be produced on a regular basis from 2014 onwards, so there should be a clear methodology and team in place to repeat the process cycle, aiming to continually improve the transparency, accuracy, completeness, comparability, consistency of the GHG inventory each time it is produced.

- Ensure that GoK funds and funds from bilateral development agencies and others, whose assistance is needed to maintain the NCCAP process, can demonstrate to their stakeholders that their funds are generating positive outcomes in Kenya. There is considerable competition for development funds. A robust MRV+ process provides reassurance to funders that their money is being well spent.

Funding for the MRV+ system and for the various supporting organisations should be put in place as soon as possible. The amount required for the basic building blocks should be based on the estimates provided in the action fact sheets. Note that the capacity building elements are incorporated within the actions and are not broken down separately.

Once funding is in place, the following actions are recommended to "kick start" the process:

- The GHG inventory team needs to be expanded and strengthened, building on current arrangements. It should be structured in such a way that it can endure reorganisations, government structures and movement of staff. The system will need to access a wide range of climate change relevant data and information to operate effectively, so provision of data must be obligatory in an appropriate way for Kenya.

- Institutional arrangements for the MRV+ system should be put in place. This will involve: appointing a steering committee, management team, and technical working

groups; securing office space and equipment; setting up the Climate Change Relevant Data Repository (CCRDR) and the Technical Analysis Groups (TAGs).

- The TAGs need to convene in order to establish what they need to report (now and in the future – immediate, intermediate and longer term), and to determine what data they need from which organisations.

- Key data sources for the proposed systems and indicators need to be identified. Existing flows of data need to be tracked and mapped. Gaps need to be highlighted and data sources sought. It is recommended that this tracking and mapping exercise be carried out for all proposed outcome indicators and baselines calculated.

- Agreements (DSROAs) with all organisations relevant to the collection, collation, measurement, verification and reporting of GHG emissions, mitigation and adaptation data need to be put in place. The TAGs need to participate in providing specifications for the DSROAs.

- The structure and operation of the CCRDR needs to be discussed with MDAs and key stakeholders. The CCRDR should be designed and a trial version developed for testing. This project should be carried out in phases, since the requirements of the CCRDR will evolve in parallel with the institutional structures required to support the MRV+ system.

- A series of adaptation indicator demonstration projects should be carried out in MDAs and, once formally constituted, in county governments, to demonstrate the operation of certain key components of the NPBMF. These demonstration projects will show how MRV can be implemented and what the benefits are to the MDA concerned. It will help to secure the broad buy-in required for a successful NPBMF by other MDAs.

- Targets for the measurement of mitigation and adaptation performance need to be agreed with MDAs responsible for their implementation. It has not been possible, at this stage, to cover issues relating to evaluation of adaptation actions, but once specific actions and targets have been set, a process for evaluating the performance against the targets can be mapped out. This will become a key part of the implementation of the NCCAP.

These recommendations are covered by the actions listed in Section 4 and are addressed in more detail in the SC6 action fact sheets.

11.4 Summary of Actions

(See Annex 6 for detailed actions)

Table 11.1 Priority actions for the national performance benefit measurement system

Number	Action	Estimated Cost KSh
NPBM-1	**Establish MRV+ System Governance Structures**: the aim of this task is to set up the governance structure, teams and components of the MRV+ system delivering both MRV of greenhouse gas (GHG) emissions and mitigation activities and monitoring and evaluation (M&E) of the adaptation activities.	**630 million**
NPBM-2	**Climate Change Relevant Data Tracking and Mapping**: the aim of this action is to map the data flows (sources and destinations) required for reporting of all the data necessary for the MRV+ system, including the GHG inventory.	**20 million**
NPBM-3	**Indicators and Baselines**: the aim of this action is to define the mitigation and adaptation indicators that the GoK will use, and to create baselines to support these indicators from the available data where possible. Where the information for the baselines is not available, this action would initiate work programmes to gather the necessary data.	**20 million**
NPBM-4	**Institutional Capacity Strengthening and Staff Capacity Building in MDAs and LGAs:** the aim of the action is to build institutional as well as individual capacities of the Government agencies and staff involved in providing data for the MRV+ system.	**215 million**
NPBM-5	**GHG inventory, Biennial Update Reports (BURs) and National Communications (NCs)**: the aim of this action is to update the current GHG inventory, to write the first BUR, and to write the next in the series of NCs.	**Part of Action 1**
NPBM-6	**M&E of Institutional Adaptive Capacity Indicators (demonstration)**: the aim of this action is to demonstrate effective adaptation M&E within a key MDA, such as forestry and wildlife, water and irrigation, or agriculture/ livestock/ fisheries, in order to facilitate roll-out across all relevant MDAs.	**11 million**
NPBM-7	**M&E of Vulnerability Indicators (demonstration)**: the aim of this action is to demonstrate the effective adaptation M&E within a suitable county, in order to facilitate roll-out across all counties.	**11 million**
NPBM-8	**Effectiveness Assessment of Adaptation at the County Level (demonstration):** the aim of this action is to show how adaptation M&E can be used to guide collective action for local climate adaptation, and to assess how well collective action on climate adaptation benefits the climate vulnerable poor.	**20 million**
NPBM-9	**Climate Change Relevant Data Repository (CCRDR)**: the aim of this action is to set up an extensive data repository to enable currently fragmented data sets to be readily accessed, viewed and queried with associated geospatial information. It is a subcomponent of NPBM-1, but described separately because it could be implemented independently.	**Part of Action 1**
Total for 5 years		**927 million**

Nation/Anthony Omuya

12. Implementation and Conclusions

12.1 Implementing and Mainstreaming of the Action Plan

The National Climate Change Action Plan (2013 – 2017) sets out Kenya's first comprehensive effort to achieve low carbon climate resilient development. The Action Plan, in addition to providing prioritised actions for adaptation and mitigation, provides a road map for the necessary enabling conditions in the form of policy, legislation and institutional frameworks. The next step is implementation of the plan by all sectors and stakeholders through development of workplans for each of the actions captured in the Action Sheets.

The development of the Action Plan coincided with the development of the second Medium Term Plan (2013-2017) of the country's Vision 2030 development blue print. One of the key objectives of the MTP2 was to mainstream climate change and environment. The mainstreaming process, which is being spearheaded by the Ministries of State for Planning, National Development and Vision 2030 (MPND) and Environment and Mineral Resources (MEMR), has been informed by the NCCAP. Mainstreaming climate change into the MTP ensures the recommendations of this plan are captured in the national development plan and also raises awareness across the sectors on low carbon and climate resilient initiatives.

It is also crucial that these climate change actions are incorporated into the Medium Term Expenditure Framework (MTEF) and that a climate change budget code is developed to enable the tracking of the flow of climate change funds.

This Action Plan is seen as the first step in an iterative process to move forward with actions to achieve low carbon climate resilient socio economic development for the country and it is expected that the NCCAP will be revised and updated every five years to provide input to the medium term planning process.

The total estimated investment costs required to adapt to climate change impacts and to implement the low carbon development options presented in this plan is in the range of one trillion Kenyan Shillings or USD12.76 billion.

The costs are summarised in Table 12.1 and are shown in more detail in Section 12.3.

Table 12.1 Total costs for next five years (2013 -2017) associated with Kenya's NCCAP

Total Costs of Kenya's NCCAP	KSh	USD
Projected investment costs for mitigation actions for next five years (Table 12.4)	391 – 494 billion	4.6 – 5.8 billion
Projected adaptation costs for next five years in key sectors (Table 12.5)	638 billion	7.5 billion
Costs associated with administration and process actions for next five years (Table 12.6)	5.0 -5.3 billion	59-62.3 million
Estimated Investment Range	1034 – 1137.3 billion	12.2-13.4 billion
Total Estimated Investment Required 2013-2017 (average of above range)	**1085 billion**	**12.76 billion**

12.1.1 Institutional, policy and regulatory framework

The Action Plan provides for a clear institutional framework to ensure effective implementation of the recommended actions. The establishment of a high-level National Climate Change Council in the Office of the President will ensure that climate change is addressed as a cross-cutting developmental issue. A reinforced National Climate Change Secretariat (NCCS) in the Ministry responsible for climate affairs would be the lead technical agency on climate change issues. The Action Plan also provides for the strengthening of Climate change desk officers in Government ministries and institutions to facilitate implementation.

The Action Plan also recommends the development of climate change policy and law to underpin the implementation of the priority actions.

12.1.2 Finance

The Action Plan is an ambitious programme which will require substantial funding and investment from both local and international sources. The Action plan has the potential to catalyse mobilisation of funds. The establishment of the Kenya Climate Fund will improve coordination of climate change funding flows and facilitate effective implementation of the Action Plan.

The country also needs to put in place a mechanism to enhance access to carbon markets including exploring emerging opportunities and improve the environment for climate investment.

12.1.3 tracking, measuring and reporting

A key output of the Action Plan is the design of an integrated framework for measuring, monitoring, evaluating, verifying and reporting results of mitigation actions, adaptation actions and the synergies (known as the MRV+ system).The next step is the operationalisation of the MRV+ system.

A prototype web-based tracking tool has been developed to enable the National Climate Change Secretariat to track the implementation of the NCCAP. The database will be hosted by the NCCS and will contain up-to-date information on the status of each of the actions in the NCCAP implemented by relevant sectors and stakeholders. The tracking tool will be integrated into the MRV+ system once it is established.

12.1.4 knowledge management and capacity development

The establishment of a climate change knowledge management system to serve as a one-stop electronic space where most climate change-related information and knowledge in Kenya will reside is a priority action. There is need to implement the national climate change capacity development and the public awareness strategy for all stakeholders. This will help safeguard against misinformation and sensitize stakeholders on their potential roles in the implementation the NCCAP.

12.2 The Opportunities or 'Big Wins'

This section summarises some of the big win opportunities which if implemented, will make a significant impact on adaptation, mitigation and sustainable development. These opportunities combine climate resilience benefits and their significant mitigation potential represents over two-thirds of the mitigation potential identified in the low carbon assessment (Chapter 6).

12.2.1 Geothermal power generation

Geothermal power is clean, renewable, reliable and a large-scale domestic resource with up to 10,000 MW potential in Kenya. Geothermal development is one of the goals of Vision 2030, which calls for increased electricity generation to support Kenya's development ambitions. Geothermal will provide for improved energy security by allowing Kenya to reduce fossil fuel imports and also to decrease reliance on hydroelectricity which is

vulnerable to climate variability and change, while providing the increased electricity required for economic growth. As a clean energy source, it has significant mitigation potential of 14.1 MtCO2e per year by 2030.

12.2.2 Distributed clean energy solutions

Vision 2030 recognises the importance of increasing access to electricity, including through off-grid solutions and by improving energy efficiency such as distributed solar photovoltaics, improved cookstoves, liquefied petroleum gas cookstoves, renewable lanterns and other clean technologies. A shift to improved cookstoves supports the Government's efforts to reduce over-reliance on fuelwood and reduces deforestation and increases access to clean reliable energy. It also enables income generating activities while providing access to communication and improved education outcomes. Improved cookstoves and alternative lighting sources to kerosene have health benefits resulting from the reduced indoor air pollution and the reduced time require to gather fuelwood. Moving away from kerosene also normally results in cost savings for households. These distributed clean energy solutions result in increased adaptive capacity for households due to the opportunities to diversify livelihoods, reduce pressure on Kenya's forests due to the decreased demand for fuelwood in addition to having a mitigation potential of 9.4 MtCO2e per year in 2030.

12.2.3 Improved water resources management

Improved water resources management (including increased water retention and storage) will contribute to the Vision 2030 goal of improved access to water, which views effective water management as a prerequisite to achieving development goals and the country's transformation to a middle-income status. Improved water resources management will provide opportunities for the ASALs to achieve food security, improve human health and enable irrigated agriculture. In addition to these socio-economic benefits, water resource management has significant resilience benefits by reducing the impact of droughts and floods, reducing reliance on rain-fed agriculture and improved watershed management. Some mitigation may result from the reduced need to boil water.

12.2.4 Restoration of forests

Reforestation and restoration of forests on degraded lands including in rangelands will contribute to Kenya's goal of 10 per cent forest cover and provide sustainable development benefits in the form of sustained water availability. Improved access to drinking water, water for irrigation and hydropower and sustainable forest products will deliver benefits

for livelihoods and biodiversity. In terms of climate resilience benefits, efforts to maintain and increase forest cover will help offset anticipated changes in forest growth patterns due to climate change. Forests are vitally important for water catchment management, for mitigating flooding and landslides, for reducing erosion and sediment discharge and for improving soil health. Restoration of forest lands have the significant mitigation potential of 38.7 MtCO2e (32.6+6.1) per year in 2030.

12.2.5 Climate-smart agriculture and agroforestry

The agriculture sector offers great potential for synergies among the objectives of food security, poverty reduction, adaptation and mitigation. Many climate-smart agricultural practices that reduce climate vulnerability also reduce emissions and improve agricultural production potential. Agroforestry, for example, has the potential to abate 4.2 MtCO2e by 2030, while offering climate resilience benefits of improved soil quality, improved water retention in the soil, reduced erosion, and perennials that are better able to withstand climatic changes. Improved livestock management has the scope to contribute to the Arid and Semi-Arid Lands (ASALs) strategy by improving the livelihoods of pastoralists and achieving climate resilience benefits through healthier livestock and reduced degradation of rangeland. Improved livestock management also has large mitigation potential since the sector is responsible for 30% of GHG emissions. However actions to mitigate GHG emissions in the livestock sector will need to be considerate of economic and cultural issues.

12.2.6 Infrastructure

Climate-proofing of improved, expanded, effective and reliable national physical infrastructure is an important and necessary enabler of socio-economic development. For the ASALs, this means a road network that can stand up to a changing climate, the establishment of strategic multipurpose dams and expanding renewable energy capabilities (wind, solar and biogas), both decentralised and connected to the national grid. Developments of the transport sector to meet the needs of the rapidly growing population and economic development will be required to meet Kenya's low carbon strategy and will also have to take account of the extreme weather events and flooding. The climate-proofing of infrastructure related to electricity generation will be a priority if the ambitions to ensure a stable and secure supply of power are realised.

12.3 Costs Associated with the National Climate Change Action Plan

12.3.1 Projected budget for adaptation actions

Detailed primary costing for priority adaptation actions will only be generated during the preparation of the National Adaptation Plan. However, during the development of this NCCAP, secondary data cost estimates for adaptation actions were provided by priority sectors. These are presented in detail in Chapter 5, Table 5.1 and summarised here in Table 12.2. The total estimated cost for the next five years is KSh638 billion (USD7.5 billion).

Table 12.2 Adaptation costings for a five year period as provided by sector agencies

	Sector	Estimated Cost billion KSh for 5 years
ADAP-1	Agriculture	44.91 billion
ADAP-2	Livestock	27.1 billion
ADAP-3	Water & Sanitation	278.76 billion
ADAP-4	Environment	115 billion
ADAP-5	Infrastructure related to roads in ASALs	107 billion
ADAP-6	Sustainable livelihoods related to ASALs	59 billion
ADAP-7	Energy Infrastructure	5.3 billion
ADAP-8	Tourism	1.3 billion
Total KSh for next five years		**KSh 638 billion**
Total USD equivalent for five years		USD7.5 billion

12.3.2 Projected investment costs for mitigation actions

Implementing the six priority low carbon actions would require investments of KSh1,371–1,773 billion (USD16.12 – 20.84 billion) until 2030 (equivalent to a Net Present Value of KSh600 – 770 billion at a real discount rate of 10 per cent) or 391 – 495 billion over the next five years (2013-2017)- See Chapter 6, Table 6.2 for detailed investment costs for implementing the six low carbon options to 2030 and Table 12.3 for summary costs.

The methodology used for calculating these primary costs is detailed in the Low Carbon – Mitigation Annexes. It is estimated that KSh839 – 1,110 billion of these investment costs would have to be borne by the public sector, with the remaining costs covered by private sector and household investments. Kenya sees clear potential to make effective use of bilateral and multilateral funding, as well as international climate finance mechanisms – such as the Green Climate Fund and emerging NAMAs and REDD+ mechanisms– in moving forward with the implementation of these actions.

Table 12.3: Projected investment costs for priority mitigation actions

Number	Action	Estimated Cost KSh to 2030
MITI-1	Restoration of Forests on Degraded Lands	186-290 billion
MITI-2	Geothermal	877-1115 billion
MITI-3	Reforestation of Degraded Forests	48-61 billion
MITI-4	Improved Cookstoves and LPG Cookstoves.	20 billion
MITI-5	Agroforestry	70-117 billion
MITI-6	Bus Rapid Transit and Light Rail Corridors	170 billion
MITI-7	Development of GHG inventory and improvement of emissions data	42 million
MITI-8	Measuring, reporting on & monitoring forestry emissions &sinks	624 million
MITI-9	Mainstreaming of low-carbon development options into planning	21 million
	Total Cost	1371-1773 billion KSh
Total KSh for next five years (USD4596–5815 million equivalent)		391 – 495 billion
Total USD Equivalent to 2030		16-22 billion

12.3.3 Administration and operational costs to implement NCCAP

The following administrative and operational actions are recommended to effectively implement the adaptation and mitigation actions. Costs were generated for these actions and totalled KSh5.3billion or USD62 million. The detailed actions and associated costs are captured in each of the chapters and the summary actions and costs are captured in Table 12.4.

Table 12.4 Administration and operational costs to implement NCCAP

Action No.	Action Title	Cost Ksh
FINA-1	Establish the Kenya Climate Fund (38-94 Million/Yr)	190-470 Million
FINA-2	Create climate change code in the government budget system	Negligible
FINA-3	Coordinate and harmonise Government of Kenya and development partner funding with priority interventions	60 Million
FINA-4	Open/Accelerate Negotiations with various countries to overcome the lack of carbon market access for Kenya.	4-6 Million
FINA-5	Enhance the capacity of the Designated National Authority	17-25 Million
FINA-6	Determine the appropriate institutional home for, and then establish, a unit that develops and promotes projects responsible for generating carbon credits	100 Million
FINA-7	Support a series of ongoing actions to improve the regulatory and policy framework for low-carbon investment	40 Million
FINA-8	Establish a regular platform for engagement and dialogue between the Government of Kenya and investors	0.5 Million
FINA-9	Support the creation of a one-stop shop to expedite the process of acquiring renewable energy permits and licenses	25 Million
	Sub-total related to finance actions	436-727 Million
EPLF-1	Consult on and adopt the draft Climate Change Policy currently being developed.	10 Million
EPLF-2	Enact a stand-alone, overarching, framework Climate Change Law.	10 Million
EPLF-3	Amend key sectoral laws consistent with NCCAP priority actions through a Miscellaneous Amendments Bill.	10 Million
EPLF-4	Establish a high-level National Climate Change Council (150 Million/yr).	750 Million
EPLF-5	Strengthen and support NCCS to implement NCCAP within the sectoral Ministry responsible for climate affairs (300 million/Yr).	1500 Million
	Total	2280 Million

Action No.	Action Title	Cost Ksh
KMCD-1	Develop and maintain a robust and up-to-date climate change knowledge management system.	100 Million
KMCD-2	Develop a physical climate change resource centre	400 Million
KMCD-3	Address the capacity gaps required to implement the NCCAP in the agencies coordinating and leading climate change efforts.	200 Million
KMCD -4	Provide capacity development support to actors at national and county level to move forward with implementing the NCCAP (based on an annual identification of priorities).	200 Million
KMCD-5	Establishment of an effective public awareness associated with the climate change resource centre.	100 Million
KMCD-6	Integration of climate change into all levels of Kenya's education system.	450 Million
	Total	1450 Million
Number	Action	Estimated Cost Ksh
NPBM-1	Establish MRV^{+} System Governance Structures	630 million
NPBM-2	Climate Change Relevant Data Tracking and Mapping:	20 million
NPBM-3	Indicators and Baselines:	20 million
NPBM-4	Institutional Capacity Strengthening and Staff Capacity Building in MDAs and LGAs.	215 million
NPBM-5	GHG inventory, Biennial Update Reports (BURs) and National Communications (NCs).	Part of Action 1
NPBM-6	M&E of Institutional Adaptive Capacity Indicators (demonstration).	11 million
NPBM-7	M&E of Vulnerability Indicators (demonstration).	11 million
NPBM-8	Effectiveness Assessment of Adaptation at the County Level (demonstration).	20 million
NPBM-9	Climate Change Relevant Data Repository (CCRDR	Part of Action 1
	Total for 5 years	927 million
	Total for process & administration	5.0 – 5.3 billion
	USD Equivalent	59 –62.3 Million

12.4 Concluding Remarks

Climate change is a cross-cutting development issue that requires high level political goodwill and support to effectively address the risks and maximise opportunities it presents. For Kenya, adaptation to climate change remains the top priority to reduce vulnerability and enhance resilience of the social and bio-physical systems, especially the vulnerable communities and groups. Similarly, mitigation actions that deliver sustainable development benefits are of importance as the country strives to remain a low emitter in the context of the national economic development as set out in Vision 2030. Therefore, this comprehensive Action Plan sets out the path towards a low carbon, climate resilient development for the country.

This Action Plan also provides for the establishment of an enabling climate change policy and law, governance structure, funding mechanism and investment framework, capacity development and management framework and national measurement reporting and verification (MRV+) system to support effective implementation of the adaptation and mitigation actions.

It is important to integrate climate change into Kenya's development planning process. The first step towards this was the mainstreaming of climate change in the Medium Term Plan 2013-17. Implementation of the NCCAP will require all the stakeholders within and outside Government at the national and county levels to play their role, building on the partnerships forged through the NCCAP process.

Considering the ambitious nature of the Action Plan, support, partnerships, investments and partnerships, investment and technology innovations are required for the implementation of the actions and the achievement of the goal of a low carbon climate resilient pathway. The Government may need to intervene to encourage investment in adaptation actions, ensuring that climate resilience is the priority climate change response action. Domestic, bilateral and multilateral funding, as well as international climate finance mechanisms – such as the Green Climate Fund, Adaptation Fund and emerging funding for NAMAs and REDD+ mechanisms – are required to implement the Action Plan. The evidence base provided through Kenya's National Climate Change Action Plan will help international partners to align their funding and investments with Kenya's climate change priorities – and ensure that these investments are nested within Vision 2030 and the national planning process.

The findings of the analysis and recommendations within this action plan will guide Kenya to create the enabling environment required to attract international support and private sector investment to support the transition to a low carbon climate resilient development pathway.

Kenya welcomes support from the international community to move forward with the implementation of the National Climate Change Action Plan 2013-2017.

Panos/Marcus Rose

Tom Morton

13. Annex 1a: NCCAP Thematic Working Group Members

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Dr. Joseph G. Mureithi, *KARI*

Michael Mbaka, *Financial Sector - Deepening Kenya*

Habil Olaka, *Kenya Bankers Association (CEO)*

Grace Akumu, *Climate Network Africa*

Judy Ndichu, *Transparency International*

Sally Yagan, *MPND & V2030 (Macro Planning Directorate*

Obadiah Kungu, *Ministry of Finance*

14. Annex 1b: NCCAP Sub-Components and Respective Consulting Agencies

Sub-component Number and Title		Consulting Agencies
SC1	Long-term National Low Carbon Development Strategy	International Institute for Sustainable Development (IISD)
		Energy Research Centre of the Netherlands (ECN)
		ClimateCare Kenya
SC2	Enabling Policy and Regulatory Framework	International Development Law Organization (IDLO)
SC3	Adaptation Analysis and Prioritisation	LTS-Africa
		Acclimatise UK
SC4	Mitigation and nationally appropriate mitigation action (NAMA)	International Institute for Sustainable Development (IISD)
		Energy Research Centre of the Netherlands (ECN)
		ClimateCare Kenya
		World Agroforestry Centre (ICRAF)
SC5	Technology Action Plan	Professional Training Consultants (PTC)
SC6	National Performance and Benefit Measurement	LTS-Africa
		Ricardo-AEA UK
		Baastel
SC7	Knowledge Management and Capacity Development	Arid Lands Information Network (ALIN)
SC8	Finance	Adam Smith International
		Vivid Economics
SC9	Coordination and Management	HTSPE
		Matrix Development Consultants

15. Annex 2 Action Sheets for Chapter 6 – Low Carbon Option

Action 1: RESTORATION OF FORESTS ON DEGRADED LANDS	**Action Reference Number:** MITI- 1

Action summary

Restore forests on 960,000 hectares of degraded lands by 2030 to abate 32.6 $MtCO_2e$.

Building on Kenya's on-going work to develop a National REDD+ strategy, the forestry low-carbon scenario assessment, and a concept paper for dryland forest conservation developed under SC4, a programme of work should be undertaken to restore forests on 960,000 hectares up to 2030. This programme of work could include, *inter alia*: dryland forest restoration activities; awareness raising, consultation and demonstration; capacity building for communities and the Kenya Forest Service (KFS), development, testing and application of compensation and benefits-sharing mechanisms; measuring, monitoring and reporting; and research.

Rationale: REDD+ is potentially an important mechanism to help Kenya meet its forest-related goals, including the goal of 10 per cent forest cover stated in the constitution. Actions to restore forests on degraded lands could potentially be funded as REDD+ activities.

Impact: Funding and implementation of actions to restore forests on degraded lands will eventually lead to reduced deforestation and improved forest management and associated co-benefits, such as improved water availability, hydropower generation, reduced flooding and landslides, and sustainable use of forest products such as fuelwood, charcoal and medicines. Many of the areas to be restored will be used for grazing animals and actions could have significant impacts on pastoralists and forest-dependent communities. Free, prior and informed consent will be needed from these communities, and actions will need to consider these trade-offs – for example, how to compensate for lost access to grazing land and how to avoid grazing in the protected areas.

Areas of relevance

Sectors: Environment, Water and Sanitation; 2.2 Forestry

Adaptation √ , Mitigation √ Development √ - REDD+ actions can have strong adaptation benefits if properly designed.

Current status

The Government of Kenya has not submitted REDD+ proposals to potential funders or to the UNFCCC.

Lead Agency to take this Action forward The KFS is requested to lead the work to restore forests on degraded lands. The MEMR could provide assistance to present funding proposals to the UNFCCC.
Stakeholder support required to take the action forward The KFS could engage the National REDD+ Steering Committee to provide oversight and advice on the development of the project. Stakeholders include Community Forest Associations, forestland owners, and pastoralists and local communities impacted by the REDD+ actions.
Indicative timeframe - Quick win opportunity ❒ Launch timeframe: By 2015 Duration of the Action: 15 years, beginning in 2015
Cost associated with the Action in Kenyan Shillings The cost of achieving the full mitigation potential in estimated to be KSh 186 – 290 billion. Short-term costs include Ksh 21 million for the development of a full REDD+ proposal that is fundable and implementable, building on the REDD+ concept paper.
Immediate next steps 1. Submission to UNFCCC to seek support for preparation of proposal building on the REDD+ concept paper, and discussions with potential funders – January to June 2013 2. Proposal development for REDD+ activities to restore forests on degraded lands (either with outside consultants, or through capacity building process) – July 2013 to December 2013 3. Submission of activity proposal to UNFCCC, and discussions with potential funders – January 2014 to June 2014 4. Finalization of activity design and financial arrangements, and activity start-up – July 2014 to December 2014

Action 2: GEOTHERMAL	**Action Reference Number:** MITI-2

Action summary

Development of an additional 2,275 MW of geothermal capacity by 2030 to abate 14.1 Mt-CO_2e by 2030 (in addition to the 2,734 MW of geothermal capacity in 2030 assumed in the baseline). Additional support for the development of geothermal electricity generation will be required to achieve the ambitious goals of capacity expansion. A programme providing such support should be based on existing initiatives, complementing them where required and addressing barriers to deployment which are not yet targeted. Given the large investment requirements and the inherent limits to public funding, the support program should aim at encouraging private sector investment. Potential elements of a such programme could include the provision of: additional grants for the early phases of geothermal development, access to loans for latter stage development, risk mitigation instruments, capacity building programmes to ensure adequate technical capacity to undertake planned expansion of the sector, and harmonization and improvement of the regulatory framework. Support programmes will have to be adjusted regularly given that geothermal development has long lead-times and the energy sector in Kenya is expected to stay dynamic in the coming years.

Rationale: Surface studies suggest that 5,000 to 10,000 MW of electricity could be generated through geothermal. The initial high cost and risk of resource exploration have slowed down the development of geothermal power despite its cost competitiveness on a life-cycle basis. The development of geothermal electricity generation has been identified as priority in Kenya's Updated Least Cost Power Development Plan and other Government of Kenya planning documents.

Impact: Increasing the share of geothermal electricity can improve energy security (through decreased energy imports) and reduce costs of generation. Geothermal power can provide low-cost base load electricity generation, facilitating economic activity and development. It also reduces the current reliance on hydropower thereby improving climate resilience.

Areas of relevance

Sectors:; 3. Physical Infrastructure Sector

Adaptation ❒ Mitigation √ Development √

Current status

A number of activities have been started to support geothermal development including the formation of the Geothermal Development Corporation (GDC) by GoK, the formulation of the Scaling up Renewable Energy Programme (SREP) and a number of bilateral initiatives supporting different stages of the geothermal development chain.

Lead Agency to take this Action forward The Ministry of Energy is requested to lead the work on geothermal. The MEMR could provide assistance to present funding proposals to the UNFCCC.
Stakeholder supportrequired to take the action forward The Ministry of Energy would need to engage the GDC, Kenya Power and Lighting Company, Energy Regulatory Commission, independent power producers and others.
Indicative timeframe - Quick win opportunity ❒ Launch timeframe: can be started immediately Duration of the Action: 15 years
Cost associated with the Action in Kenyan Shillings The cost of achieving the full mitigation potential to 2030 is estimated to be Ksh 877– 1,115 billion. Short-term costs include Ksh 21 million for the barriers and needs analysis, and development of a full NAMA proposal that is fundable and implementable.
Immediate next steps 1. Undertake a detailed analysis of remaining barriers to geothermal deployment in Kenya and identify gaps in current initiatives supporting geothermal development – October 2012 to March 2013 2. Prepare detailed proposal for a support programme, potentially in the form of a proposal for a supported NAMA – April 2013 to October 2013 3. Submit NAMA proposal to UNFCCC, and hold discussions with potential funders – August 2013to December 2013 4. Start implementation of NAMA – January 2014

Action 3: REFORESTATION OF DEGRADED FORESTS	**Action Reference Number:** MITI- 3

Action summary

Reforest 240,000 hectares of degraded forests by 2030 to abate 6.06 $MtCO_2e$.

A programme of work can be undertaken to replant forests on 240,000 hectares of land that were previously forests. This could include, *inter alia*: tree planting activities; awareness raising, consultation and demonstration; policy development; capacity building for communities, county governments, Community Forest Associations and the KFS; measuring, monitoring and reporting; and research.

Rationale: Extensive reforestation is need to help Kenya meet its forest-related goals, including the goal of 10 per cent forest cover stated in the constitution. The tree cover is significantly diminished in many areas and natural regeneration inhibited, requiring tree planting activities.

Impact: Funding and implementation of actions to reforest degraded forests will eventually lead to improved forest management and associated co-benefits, such as improved water availability, hydropower generation, reduced flooding and landslides, and sustainable use of forest products such as fuelwood, charcoal and medicines. Reforestation has strong adaptation co-benefits and can help to increase climate resilience. Clear policies are needed on the tree species to be used for reforestation, considering the trade offs between fast-growing exotic tree species that could meet fuelwood demand and the more comprehensive ecosystem services of natural forests.

Areas of relevance

Sectors: Environment, Water and Sanitation; 2.2 Forestry

Adaptation √, Mitigation √ Development √ - Forestry actions can have strong adaptation benefits.

Current status

The MEMR has a flagship project to rehabilitate, reforest and protect indigenous forests in the five water towers. The Green Belt Movement spearheads three CDM initiatives: Aberdare Range/ Mt. Kenya Small Scale Reforestation Initiatives (located in Kirimara-Kithithina, Kamae-Kipipiri, and the Kibaranyeki areas respectively); the Clean Air Action Corporation is implementing five International Small Group and Tree Planting Programs in the Central, Rift Valley, and Eastern Provinces; and Eco2librium is implementing one CDM project, Forest Again Kakamega project. The government engages in annual tree planting campaigns. Despite ongoing efforts to encourage tree planting, there is no national data as to the extent of the area of reforestation per year.

Lead Agency to take this Action forward
The KFS is requested to lead the work to reforest degraded forests. The MEMR could provide assistance to present funding proposals to the UNFCCC.

Stakeholder support required to take the action forward

KEFRI, Community Forest Associations, county governments, forestland owners, forest communities and civil society organizations involved in tree planting campaigns

Indicative timeframe - Quick win opportunity ❒
Launch timeframe: By 2015

Duration of the Action: 15 years, beginning in 2015

Cost associated with the Action in Kenyan Shillings
The cost of achieving the full mitigation potential in estimated to be Ksh 48 – 61 billion.

Short-term costs include Ksh 21 million for the development of a full NAMA proposal that is fundable and implementable.

Immediate next steps

1. Submission to UNFCCC to seek NAMA support for preparation of proposal, and discussions with potential funders – January to June 2013

2. Development of a NAMA proposal to restore forests on degraded lands (either with outside consultants, or through capacity building process) – July 2013 to December 2013

3. Submission of NAMA proposal to UNFCCC, and discussions with potential funders – January 2014 to June 2014

4. Finalization of NAMA design and financial arrangements, and activity start-up – July 2014 to December 2014

Action 4: IMPROVED COOKSTOVES AND LPG COOKSTOVES	Action Reference Number: MITI-4
Action summary: Programme to support the use of improved cookstoves and of LPG cookstoves to abate 7.3 $MtCO_2e$ by 2030. A detailed list of potential intervention options to support improved cookstoves (especially in rural areas where penetration of improved stoves is lower than in urban areas) and LPG cookstoves (especially in urban areas) has been developed by the"Global Alliance for Clean Cookstoves".[93] Potential interventions can happen on three levels: improving the enabling environment, strengthening demand and enhancing supply. Interventions could include increasing awareness of improved cooking practices, undertaking pilot initiatives which promote the use of LPG, increasing awareness of stove quality, increasing access to soft loans, capacity building for stove producers, and improving access to testing facilities. *Rationale:* The overreliance on fuelwood is specifically mentioned in Vision 2030 as a challenge in increasing efficiency in energy consumption. The 2012 draft Energy policy aims at encouraging the use of LPG by reducing overreliance on fuelwood and kerosene in households. *Impact:* Improved cookstoves can better the lives of individual, particularly women, in rural and urban areas – both by reducing time to collect fuelwood and reducing indoor air pollution. The actions may also present cost savings to consumers, depending on the price of alternatives. Increased climate resilience through lower fuelwood demand and reduced deforestation.	
Areas of relevance Sectors: 1. Agriculture and Rural Development; 2. Environment, Water and Sanitation; 3. Physical Infrastructure Sector; and 4. Tourism Trade and Industry. Adaptation ❒ Mitigation √ Development √- including building climate resilience where applicable	
Current status A number of initiatives on clean cookstoves are ongoing in Kenya undertaken by NGOs and development organizations and by carbon credit companies.	
Lead Agency to take this Action forward The Ministry of Energy is requested to lead the work on geothermal. The MEMR could provide assistance to present funding proposals to the UNFCCC.	

Stakeholder support required to take the action forward Consumers, local and international cookstoves manufacturers, other local entrepreneurs in retail and distribution, CSOs, development organizations, gas companies, commercial banks, microfinance institutions
Indicative timeframe Launch timeframe: Short-term – within one year Duration of the Action: 5 years
Cost associated with the Action in Kenyan Shillings The cost of achieving the full mitigation potential in estimated to be Ksh 20 billion. Short-term costs include Ksh 21 million for the development of a full NAMA proposal that is fundable and implementable.
Immediate next steps a. Based on existing studies on potential interventions in the cookstove market in Kenya, develop a detailed proposal for a support programme in the form of a proposal for a supported NAMA – January to June 2013 b. Submit NAMA proposal to UNFCCC, and hold discussions with potential funders – July to November 2013 c. Start implementation of NAMA – December 2013

Action 5: AGROFORESTRY	**Action Reference Number:** MITI- 5

Action summary

Convert 281,000 hectares of existing arable cropland and grazing land that have medium or high agricultural potential to agroforestry by 2030 to abate 4.16 $MtCO_2e$.

A programme of work can be undertaken to encourage land use practices in which trees and other woody perennials are spatially or temporally integrated with crops and livestock on a given unit of land. This could include, *inter alia*: research to identify appropriate agroforestry practices; technological development; extension services and training of extension workers; capacity building and education for farmers; pilot projects; research to determine potential in more marginal lands; and measuring, monitoring and reporting.

Rationale: Agroforestry is a combination of agricultural and forestry techniques that aims to build more robust, productive, resilient and diverse agro-ecological systems. The Agriculture (Farm Forestry) Rules 2009, introduced under the Agriculture Act, aim to promote and maintain farm forest cover of at least 10 per cent of every agricultural land holding.

Impact: Funding and implementation of agroforestry actions will improve foods security, livelihoods, and climate resilience, in addition to sequestering carbon.

Areas of relevance

Sectors: Agriculture

Adaptation √, Mitigation √ Development √ - Agroforestry actions have strong adaptation benefits if properly designed.

Current status

The current extent of tree cover on agricultural land is not known, and the extent to which agroforestry practices are employed overall on Kenyan farms is uncertain, since evidence of its deployment is anecdotal. Project work to promote and spread agroforestry practices is underway in Kenya. The SCC-Vi Agroforestry project in Kisumu promotes agroforestry practices in the target region by providing outreach services to farmer groups through trained community facilitators[94]. Input at the county consultations indicated that several agroforestry projects are ongoing including in Kisii, Nyamira, Nyeri, Embu, Kisumu, Siaya, Garissa, Kakamega, Uasin Gishu, Kitale, Kericho, Bomet. In arid and semi-arid regions, such as Garissa County where pastoralism dominates, agroforestry is gradually being introduced as a coping strategy against drought and hunger shocks.

Lead Agency to take this Action forward The Ministry of Agriculture is requested to lead the work to promote agroforestry. The MEMR could provide assistance to present NAMA proposals to the UNFCCC.
Stakeholder support required to take the action forward KARI, extension workers, county governments, farmers, agroforestry project developers and civil society organizations involved in tree planting campaigns
Indicative timeframe - Quick win opportunity ❒ Launch timeframe: By 2015 Duration of the Action: 15 years, beginning in 2015
Cost associated with the Action in Kenyan Shillings The cost of achieving the full mitigation potential in estimated to be KSh 70 – 117 billion. Short-term costs include Ksh 21 million for the development of a full NAMA proposal that is fundable and implementable.
Immediate next steps 1. Submission to UNFCCC to seek NAMA support for preparation of proposal, and discussions with potential funders – January to June 2013 2. Development of a NAMA proposal to promote agroforestry (either with outside consultants, or through capacity building process) – July 2013 to December 2013 3. Submission of NAMA proposal to UNFCCC, and discussions with potential funders – January 2014 to June 2014 4. Finalization of NAMA design and financial arrangements, and activity start-up – July 2014 to December 2014

Action 6: BUS RAPID TRANSIT WITH LIGHT RAIL TRANSIT CORRIDORS	**Action Reference Number:** MITI- 6

Action summary

Implement an extensive Mass Transit System for greater Nairobi, based predominantly on Bus Rapid Transit Corridors complemented by a few Light Rail Transit Corridors to abate 2.8 $MtCO_2e$ by 2030. A recent feasibility study[95] for an even more extensive public transport system for Nairobi has estimated that such a system could serve about 3.2 and 4.5 million passengers by 2030, depending on growth rates and city planning. Implementing a Mass Transit System requires significant investments into the public transport infrastructure (e.g. for constructing dedicated bus lanes, purchasing buses and setting-up fare collection systems), integration the Mass Transit System into city planning and getting buy-in from stakeholders in the public transport sector.

Rationale: The transport sector is a critical enable in achieving Vision 2030, and mass rapid transit systems are a key component of the pending Nairobi Metro 2030 plan.

Impact: An improved mass transit system for Nairobi is a priority for relieving current traffic congestion and meeting the expected growth in future transportation demands. Bus rapid transit systems are increasingly being implemented in developing cities across the world. They can change the trend of modal shifts to private vehicles towards public transportation, thereby bringing about a range of development benefits. If designed well, a BRT system can deliver metro-quality service at a significantly lower capital cost. An improved mass transit system can also improve local air quality, improve road safety, increase Nairobi's attractiveness in terms of ease of doing business and quality of living. In addition, an affordable high-quality mass rapid transit has the potential to help improve social equality and reduce poverty.

Areas of relevance

Sectors: Physical Infrastructure Sector;

Adaptation ❒ Mitigation √ Development √

Current status

Feasibility studies for a Mass Transit System in Nairobi have been undertaken and some plans for Mass Rapid Transit corridors have already been announced, such as the light rail system stretching from the Nairobi station to the international airport.

Lead Agency to take this Action forward The Ministry of Transport is requested to lead the work to promote agroforestry. The MEMR could provide assistance to present NAMA proposals to the UNFCCC.
Stakeholder support required to take the action forward Ministry of Roads, Kenya Urban Roads Authority, public transport operators, development banks
Indicative timeframe - Quick win opportunity Launch timeframe: Short-term – within one year Duration of the Action: 18 years until the full public transport system has been realized
Cost associated with the Action in Kenyan Shillings The cost of achieving the full mitigation potential in estimated to be Ksh 170 billion. Short-term costs include Ksh 21 million for the development of a full NAMA proposal that is fundable and implementable.
Immediate next steps 1. Submission to UNFCCC to seek support for preparation of proposal for a public transport NAMA January to June 2013 2. Development of a proposal for a public transport NAMA – July 2013 to December 2013 3. Submission of activity proposal to UNFCCC, and discussions with potential funders – January 2014 to June 2014 4. Finalization of activity design and financial arrangements, and activity start-up – July 2014 to December 2014

Action 7: DEVELOPMENT OF GHG INVENTORY, IMPROVEMENT OF EMISSIONS DATA AND ANALYSIS OF MITIGATION OPTIONS (ENABLING ACTION)	**Action Reference Number:** MITI– 7

Action summary

Develop Kenya's GHG inventory, building on the information developed in the SC4 reference case of GHG emissions, and build capacity to develop, use and monitor data and impacts. Kenya would benefit from a centralized government agency with continued funding and support to collect inventory data and prepare and complete rigorous emission inventories in accordance with IPCC guidelines. The work would include capacity building, developing a planning process for preparing and reporting, identifying a strategy and priority areas for improvement in data and methodologies, establishing a reliable mechanisms to ensure appropriate documentation, quality control and completeness, and integration with other government planning processes. The work would also include capacity building for making emission projections and assessing low-carbon development options to enable the updating of the SC4 low-carbon analysis over time; and capacity building for monitoring the impacts of policies and programmes.

Rationale: SC4 used the best available data to generate historical emissions data up to 2010, which provides a substantive base for Kenya's GHG inventory. But this is not a substitute for reporting to the UNFCCC, which would require substantially more effort, quality assurance and sensitivity analysis.

Impact: Robust and reliable inventory that meets UNFCCC reporting requirements; improved low-carbon policy development, improved assessment of needed emission reduction actions and impacts of these actions – all contributing to improved planning decisions regarding climate change, investment and sustainability. The improved understanding of GHG emissions could help Kenya to leverage climate financing.

Areas of relevance

Sectors: Sectors: 1. Agriculture and Rural Development; 2. Environment, Water and Sanitation; 3. Physical Infrastructure Sector; and 4. Tourism Trade and Industry.

Adaptation Mitigation √ Development

Current status

The Government of Kenya submitted a GHG inventory to the UNFCCC in 1994. The MEMR received capacity building on inventory development in June 2012.

Lead Agency to take this Action forward

The MEMR is requested to develop the GHG inventory. Relevant ministries, such as the Ministries of Agriculture, Transport and Roads should be involved in specific actions to improve data availability and build capacity to interpret data in their sectors.

Stakeholder support required to take the action forward The MEMR will engage stakeholder groups in the six sectors to validate information; the MEMR will also draw on information from the Bureau of Statistics and relevant ministries.
Indicative timeframe - Quick win opportunity ❒ Launch timeframe: Short-term – within one year to develop 2010 GHG inventory Duration of the Action: beginning August 2012, and on-going to meet UNFCCC reporting requirements and to develop Kenya-specific emissions factors.
Cost associated with the Action in Kenyan Shillings The cost associated with developing a 2010 inventory is Ksh 21 million (to build on the SC4 development of the 2010 inventory), plus Ksh 21 million for a two-year capacity building process to fill data gaps, build capacity for future inventory development and undertake longer-term research to develop processes and fill data gaps.
Immediate next steps 1. MEMR to identify approach for development of 2010 inventory: August 2012 2. Capacity building on use of IPCC methodologies and additional information gathering through consultations with required departments and stakeholder consultations: September-December 2012 3. Finalization of 2010 GHG inventory: January to April 2013 4. Submission of GHG inventory to UNFCCC: May 2013 5. Research and study to fill emission data gaps, develop UNFCCC reporting processes, and develop Kenya-specific emission factors: January 2013 to January 2015 (two-year process)

Action 8: CAPACITY BUILDING FOR MEASURING, REPORTINGON AND MONITORING FORESTRY EMISSIONS AND SINKS	**Action Reference Number:** MITI-8

Action summary

Develop a national forest inventory, forest reference scenario, and a monitoring and reporting system that allows for transparent accounting of emissions and removals in the forestry and land-use sectors. Developing these measurement and monitoring tools requires increased capacity for carbon stock assessment, remote imagery interpretation, community monitoring, applying IPCC methodologies, economic analysis and information management systems.

*Rationale:*The development and implementation of an effective REDD+ strategy requires accurate and rigorous information. Of importance, and identified in the REDD+ Readiness Preparation Proposal, are: i) an updated national forest inventory: ii) the development of a reference scenario that projects emissions and removals of CO_2 into the future in the absence of REDD+ incentives, and iii) a monitoring and reporting system that allows for transparent accounting of emissions and removals. Estimates of Kenya's current forest cover and associated GHG emissions from the sector are uncertain, incomplete and out of date. The most recent forest assessment was conducted between 1990 and 1994 for the Kenya Forest Master Plan (1994), and current estimates of emissions from the forestry sector are based on a simple tier estimation approach. Updated information is needed regarding the state of Kenya's forests. Support is needed to measure, monitor and report on changes in forest cover, including the development of a forest reference scenario. The GoK recognized the need for improved information on the country's forest resources in its Technology Needs Assessment, National Climate Change Response Strategy and Medium Term Plan (2008-2012).

Impact: Improved capacity to measure, monitor and report on (including reporting to the UNFCCC) on the forestry sector, which will enable improved policy and program development in the sector.

Areas of relevance

Sectors: 2. Environment, Water and Sanitation; 2.2 Forestry; 1. Agriculture and Rural Development

Adaptation √ Mitigation √ Development√ - REDD+ actions if well designed have climate resilience benefits

Current status

The KFS is undertaking a forest mapping exercise funded by the Government of Japan, but has not developed a National Forest Inventory. The UNDP supports aerial surveys under its Forestry Recovery Strategies and Policies project. The World Bank's Natural Resource Management project includes a national forest resource assessment component, and the Government of Australia is supporting the Clinton Initiative to deliver regional activities on national carbon monitoring systems. The Government of Finland has provided institutional support for REDD+ readiness activities.

Lead Agency to take this Action forward

The KFS will lead the national forest inventory & the development of a monitoring and reporting system in the forestry sector.

Stakeholder support required to take the action forward

The KFS could engage the National REDD+ Steering Committee to provide oversight and advice the national forest inventory, forest reference scenario, and monitoring and reporting initiatives.

Indicative timeframe - Quick win opportunity ❒
Launch timeframe: Short-term – within one year

Duration of the Action: Three years, beginning January 2013

Cost associated with the Action in Kenyan Shillings

The establishment of a national forest inventory is capital-intensive, requiring technical and institutional capacity building and training. Based on costs of developing national forest inventories in other countries, an estimated cost is Ksh 438 million (US$5.15 million). The development of the reference scenario and monitoring system is estimated to cost Ksh 186 million (US$ 2.186 million), for a total cost of Ksh 624 million.

Immediate next steps

1. KFS to develop proposals and seek funding for the National Forest Inventory, and a monitoring and reporting system, building on the forest mapping exercise: by June 2013

2. Funding approved and project start-up: December 2013

3. Development of forest inventory, reference scenarios, measurement and monitoring; including capacity building for KFS officials, CFAs and other stakeholders: January 2014 to January 2016

Action 9: MAINSTREAMING OF LOW-CARBON DEVELOPMENT OPPORTUNITIES INTO PLANNING PROCESSES	Action Reference Number: MITI-9

Action summary

Develop a process to mainstream low-carbon development opportunities into the Government of Kenya planning process. The action would include identification of potential intervention points, assessment of the climate impacts of policy decisions and informing the policy process. All domains of planning, policy and regulation should consider low-carbon development opportunities – including removing barriers to implementation. This could include spatial planning to support mass transit, planning of waste landfills so that they are well managed and compatible with methane capture, assessment of current policies (such as the feed-in tariff), assessment of impacts of renewable energy development, land-use planning to support forest restoration, and assessment of impact of agricultural extension services. The work could also include a low-carbon assessment of current and new flagship projects.

The mainstreaming process would include capacity building on the use of the tools developed in the low-carbon scenario assessment, and how to use the information generated by the tools to inform policies and programmes. The low-carbon scenario analysis should be viewed as an iterative process that is updated on a regular basis to take advantage of new and improved information. This was a recommendation of TWG4.

*Rationale:*Many of the low-carbon development opportunities will only gain traction if they are recognized and taken up in the formal Government of Kenya planning process. The MPND is involved in the Action Plan process and taken steps under SC1 to mainstream climate change considerations in the MTP2. It will be important to extend this mainstreaming process to other aspects of national planning, including the county and sectoral plans. Capacity building is needed to allow Government of Kenya officials to maintain the low-carbon scenario analysis over time, and to take up and effectively use the tools to inform the policy process.

Impact: Climate change and low-carbon considerations embedded across the planning process, including the MTP2, county plans and sectoral plans. This would differentiate Kenya's action plan process from that of many other countries, where the action plan remains marginalized because it is not owned or acted upon by relevant departments. Improved ability of the Government of Kenya to identify intervention points to mainstream low-carbon development actions, and to raise external funds to support these actions.

Areas of relevance

Sectors: 1. Agriculture and Rural Development; 2. Environment, Water and Sanitation; 3. Physical Infrastructure Sector; and 4. Tourism Trade and Industry

Adaptation √ Mitigation √ Development √

Current status The MPND and MEMR have initiated a process under SC1 to mainstream low-carbon and climate resilience considerations into the Second Medium Term Plan.
Lead Agency to take this Action forward The MPND is requested to lead the mainstreaming of low-carbon development options in the planning process, with support from MEMR and other ministries as required.
Stakeholder support required to take the action forward County and line ministry officials will be engaged in the county and sectoral plans, as will Kenyan experts from civil society and the private sector.
Indicative timeframe - Quick win opportunity ❒ Launch timeframe: Short-term – within one year Duration of the Action: December 2012 to December 2013
Cost associated with the Action in Kenyan Shillings The cost of a capacity building program that builds on the SC1 process to expand capacity building on the low-carbon development tools, and to mainstream low-carbon considerations in flagship project, county plans and sectoral plans is estimate to be Ksh 21 million (US$250,000).
Immediate next steps 1. MPND and MEMR to develop proposal and seek funding for mainstreaming low-carbon development in the planning process: by September 2012 2. Funding approved and project start-up: December 2012 3. Capacity building and tool development: January 2013 to December 2013

16. Annex 3 Action Sheets for Chapter 7 – Climate Finance

Action 1: ESTABLISH THE KENYA NATIONAL CLIMATE FUND	**Action Reference Number:** FINA-1
Action summary Establish the Kenya National Climate Fund – a body that will become the main financing mechanism for the Kenyan Climate Change Action Plan. This vehicle will help to ensure that climate finance in Kenya is mobilised and disbursed according to the adaptation and mitigation priorities and the criteria identified in the Kenya Climate Change Action Plan and allow the creation of a centralized body of expertise on climate finance within the country.	
Areas of relevance Public Administration – Finance Adaptation √ Mitigation √ Development √	
Current status This would be a new initiative although the proposed design builds heavily from the experience from established trust funds in Kenya, e.g. the Community Development Trust Fund	
Lead Agency to take this Action forward Ministry of Finance	
Stakeholder support required to take the action forward A multi-departmental Task Force to steer the establishment of the Fund with representatives from, amongst others, the Ministry of Finance and Ministry of Environment and Mineral Resources. Civil society, Kenya Private Sector Alliance, Kenya Association of Manufacturers and Kenya Bankers Association should be involved in design.	
Indicative timeframe Launch timeframe: launch feasible in 18 to 24 months Duration of the Action: permanent action Quick win opportunity ❒ The quick win box should be checked when the SC team recommends that this is an obvious 'quick win' action. If the action is designated as 'quick win' it should have been agreed with the Lead Agency.	

Cost associated with the Action in Kenyan Shillings
Based on the assumption that the Kenyan National Climate Fund should have costs that are no more than 10% to 25% of those of the Green Climate Fund, indicative costs might be around KES 38 to 94 million per annum. [GCF costs from January 2012 to June 2013, 18 months, estimated at $6.7 million.]

Immediate next steps

i. Agree on the design of the Fund based on the detailed analysis accompanying document (GoK and stakeholders);

ii. Appoint a multi-departmental Task Force within the GoK to steer the process of establishing the Fund (GoK);

iii. Convene a climate finance pledging conference (Task Force);

iv. Create a Trust Fund by legal decree (GoK);

v. Communicate and consult nationwide about the Fund, its mandate, and date for the launch (TF);

vi. Appoint the Governing Board (Task Force and stakeholders);

vii. Draft terms of reference for the Fund Administrator (Governing Board with temporary assistance from Task Force);

viii. Establish a joint financing agreement with development partners (TF and Governing Board);

ix. Recruit the Fund Administrator (Governing Board and Task Force);

x. Prepare an initial budget (Fund Administrator);

xi. Develop and approve key policies, guidelines, procedures and templates (Board and Fund Administrator);

xii. Appoint the Operations Committee (Governing Board and Fund Administrator); and approve the initial budget (Governing Board and Operations Committee).

Whole process: 6 to 8 months

Action 2: PRIORITISE CLIMATE CHANGE FUNDING IN THE BUDGET INCLUDING THE CREATION OF A CLIMATE CHANGE CODE	**Action Reference Number:** FINA-2
Action summary This involves the integration of climate change finance into the 2013/14 annual budget and budget policy statement, and the Medium Term Expenditure Framework 2013-2017. It also involves the creation of a specific budgetary code for climate change within the Integrated Financial Management Information System. These steps would enable flows of domestic and development partner climate change finance throughout the Government of Kenya and the monitoring and reporting of those flows. This is important in the context of the financial flows to and from the National Climate Fund. At present, the absence of prioritisation and a code inhibits the targeting and monitoring of climate change-related expenditures which is important both for effective government spending as well as for reporting to development partners and the UNFCCC.	
Areas of relevance Public Administration – Finance Adaptation √ Mitigation √ Development ❒	
Current status Initiative under discussion in the Ministry of Finance and Ministry of Planning	
Lead Agency to take this Action forward Ministry of Finance	
Stakeholder support required to take the action forward Ministry of Planning Ministry of Environment and Mineral Resources Development partners	
Indicative timeframe Launch timeframe: action can begin immediately and be completed within three months Duration of the Action: Permanent Quick win opportunity √ The quick win box should be checked when the SC team recommends that this is an obvious 'quick win' action. If the action is designated as 'quick win' it should have been agreed with the Lead Agency.	

Cost associated with the Action in Kenyan Shillings The actual creation of a climate change code and associated meetings and discussions would be virtually cost neutral.
Immediate next steps i. Determine the necessary specific actions to be undertaken to create a climate change code (1 month) ii. Determine the dynamics and implications of a climate change code for the IFMIS and the whole Government of Kenya's public financial framework (1 month) iii. Ministry of Finance and Ministry of Planning institute the change (1 months)

Action 3: HARMONISE GOVERNMENT OF KENYA AND DEVELOPMENT PARTNER FUNDING REQUIREMENTS	**Action Reference Number:** FINA-3

Action summary

This will include standardising the financial requirements and fiscal calendars of the government and development partners according to the principles of Kenya's Joint Assistance Strategy. Currently different development partners require compliance with different practices, procedures and calendars when disbursing funds to the Treasury, raising transaction costs and reducing absorptive capacity. In developing the modalities for providing resources to the National Climate Fund it will be necessary to establish the processes by which development agency and government resources (as appropriate) are provided to the Fund through a joint financing agreement.

Areas of relevance

Public Administration – Finance

Pan-Kenya

Adaptation √ Mitigation √ Development ❒

Current status
Initiative under discussion in the Ministry of Finance and Ministry of Planning

Lead Agency to take this Action forward
Ministry of Finance

Stakeholder support required to take the action forward
Ministry of Finance

Development partners

Indicative timeframe
Launch timeframe: action is ongoing and further efforts can begin immediately. It would likely take at least three years to complete.

Duration of the Action: Permanent

Quick win opportunity ❒

The quick win box should be checked when the SC team recommends that this is an obvious 'quick win' action. If the action is designated as 'quick win' it should have been agreed with the Lead Agency.

Cost associated with the Action in Kenyan Shillings
This initiative would require significant government engagement with development partners, studies into the necessary steps for harmonisation and possibly further public financial management reform efforts. It could cost KES 60 million.

Immediate next steps

i. Convene regular meetings consisting of the Ministry of Finance and development partners as well as other Government of Kenya stakeholders to discuss the Joint Assistance Strategy and funding harmonisation (6 months)

ii. Determine the requirements and modalities for harmonisation (6 months)

iii. Make necessary changes to development partner and Government of Kenya public financial management systems to achieve alignment and promote trust and accountability, possibly aided by technical assistance (18 months)

iv. Launch a trial period (12 months)

Action 4: OPEN/ACCELERATE NEGOTIATIONS WITH VARIOUS COUNTRIES TO OVERCOME THE LACK OF CARBON MARKET ACCESS FOR KENYA.	**Action Reference Number:**FINA-4

Action summary

Article 11 (a) (4) of Directive 2009/29/EC of the European Union, states that in the event that a project is registered by the CDM Executive Board after 2012, it will only be eligible for compliance purposes in the European Union Emissi0ns Trading Scheme (EU ETS) if it comes from a least developed country, which Kenya is not. However, the Directive also opens the possibility of the EU concluding bilateral deals that would continue to allow market access for credits from other countries.

As the EU ETS represents the overwhelming source of demand for certified emission reductions (CERs) at present, removing access to this market severely threatens Kenya's opportunities to engage in international carbon markets.

One option is to acquire a bilateral deal with the EU to overcome this. Discussions might be held through a number of channels including direct discussions, through identifying potentially sympathetic European development partners and in conjunction with other affected African countries (possibly through the African Union).

In addition, Japan is in the process of finalising a carbon offset credit mechanism – the Bilateral Offset Credit Scheme – that would purchase credits other than CERs, and for which certification from the Clean Development Mechanism (CDM) Executive Board would not be required. A particular focus of Japan's scheme is likely to be on geothermal electricity generation. This is also a key mitigation opportunity for Kenya (as shown in Subcomponent 4). Therefore the Government of Kenya should open negotiations with the Government of Japan to explore the possibility of using the Bilateral Offset Credit Mechanism to help finance Kenya's geothermal ambitions.

Areas of relevance

Public Administration – Finance

Adaptation ❒ Mitigation √ Development ❒

Current status
Initial (internal) discussions already held

Lead Agency to take this Action forward Ministry of Finance
Stakeholder support required to take the action forward Ministry of Environment and Mineral Resources The carbon market community in Kenya Ministry of Energy Geothermal Development Company KenGen
Indicative timeframe Launch timeframe: discussions can begin immediately Duration of the Action: 2 to 3 years
Cost associated with the Action in Kenyan Shillings Costs should be minimal, perhaps KES 4 to 6 million to include the costs of a consultancy study to assess the potential impacts of the EC decision on Kenya. The costs associated with discussions with the Japanese government are expected to be negligible.
Immediate next steps i. Open or continue with engagement with EU on this topic (1 to 6 months) ii. Engage with potentially supportive development partners (2 to 3 months) iii. Open discussions with other affected African countries e.g. Nigeria, possibly through the African Union (3 to 4 months) iv. Fund research study to identify likely impacts of continued exclusion from EU ETS (2 months) v. Open/continue with engagement with Japan on its BOCS (1 to 6 months)

Action 5: ENHANCE THE CAPACITY OF THE DESIGNATED NATIONAL AUTHORITY	**Action Reference Number:** FINA-5
Action summary The Designated National Authority under the National Environment Management Authority (NEMA) is the regulatory body governing CDM activity in Kenya. Although stakeholders perceive that it is performing well, there are a number of steps it might take to improve its performance and increase the efficiency with which it discharges its regulatory duties. This would reduce the costs of undertaking carbon market activity in Kenya and also increase awareness of the possibilities of such actions. A number of the reforms may also assist voluntary carbon market activity even though the DNA has no explicit responsibility for such activity.	
Areas of relevance Public Administration – Finance Adaptation ❒ Mitigation √ Development ❒	
Current status Consistent with the interventions identified in the National Policy on Carbon Investments and Emissions Trading	
Lead Agency to take this Action forward Ministry of Finance	
Stakeholder support required to take the action forward Ministry of Environment and Mineral Resources NEMA Kenyan carbon market community	
Indicative timeframe Launch timeframe: action can begin immediately Duration of the Action: 2 to 3 years Quick win opportunity ❒ The quick win box should be checked when the SC team recommends that this is an obvious 'quick win' action. If the action is designated as 'quick win' it should have been agreed with the Lead Agency.	

Cost associated with the Action in Kenyan Shillings
The substantial costs for this activity are likely to be largely or exclusively met by development partners such as the World Bank's proposed Climate Initiative for Development programme. Typical grants associated with such programmes may be in the region of $200,000 to $300,000 (KES 17 to 25 million) although would vary significantly by programme.

Immediate next steps

i. Prioritize reform and capacity building initiatives with stakeholders (Government of Kenya; 6 months)

ii. Open discussions with the World Bank on their Climate Initiative for Development and Partnership for Market Readiness programmes. The former has informally indicated interest in supporting Kenya (Government of Kenya; 6 to 12 months)

iii. Open discussions with the African Development Bank on African Carbon Support Programme of the African Development Bank (Government of Kenya; 6 months)

Action 6: DETERMINE THE APPROPRIATE HOME FOR, AND THEN ESTABLISH A UNIT THAT DEVELOPS AND PROMOTES PROJECTS RESPONSIBLE FOR GENERATING CARBON CREDITS	**Action Reference Number:** FINA-6

Action summary

The intention is to create an agency explicitly tasked with developing and marketing Kenyan carbon market projects and their associated credits. The roles it might perform could include organizing conferences and other events for project developers to pitch their ideas; creating a permanent 'match-making' platform where sellers can post projects for buyers to bid or transact; and providing (and coordinating the provision by others of) technical assistance for project developers to develop business plans for projects and to financial institutions to increase their knowledge and willingness to provide finance. This body would be legally and functionally separate and independent from the Designated National Authority within National Environment Management Authority, which would allow it to lobby for regulatory reform.

Areas of relevance

Public Administration – Finance

Adaptation ❒ Mitigation √ Development ❒

Current status
Initiative identified in the National Policy on Carbon Investments and Emissions Trading

Lead Agency to take this Action forward
Ministry of Finance

Stakeholder support required to take the action forward
Ministry of Environment and Mineral Resources

Kenyan carbon market community

Indicative timeframe
Launch timeframe: action can begin immediately and be established in 12-18 months

Duration of the Action: Permanent

Quick win opportunity ❒

The quick win box should be checked when the SC team recommends that this is an obvious 'quick win' action. If the action is designated as 'quick win' it should have been agreed with the Lead Agency.

Cost associated with the Action in Kenyan Shillings
The body would require a smaller resource outlay than the climate fund as it would not require so many specialized skills or as elaborate a governance structure. Potentially costs may be 75% lower than for the National Climate Fund (NCF) implying a cost of KES 10 to 20 million per annum.

Activities and costs could be scale up over time.

Immediate next steps

i. Determine the appropriate home for this body (Ministry of Finance; 6 months)

ii. Ensure funding through budgetary processes (Ministry of Finance; 6-12 months)

iii. Determine the appropriate delivery model for the agency, including the possible role for contracting services to the private sector, and (6-18 months)

iv. Communicate and consult nation-wide about the body, its mandate, and target date for operational start (Task Force; 6-12 months)

Action 7: SUPPORT A SERIES OF ONGOING ACTIONS TO IMPROVE THE POLICY AND REGULATORY FRAMEWORK FOR LOW-CARBON INVESTMENT	**Action Reference Number:** FINA-7
Action summary This action comprises support for and promotion of ongoing efforts by government institutions to improve the policy and regulatory environment for low-carbon investment. The three primary tasks will be to accelerate and promote improvements to the structure of the renewable energy feed-in tariff as permissible under the draft Energy Policy and Bill 2012; to accelerate and promote the establishment of a standardised Power Purchase Agreement template for renewable energy as permissible under the draft Energy Policy and Bill 2012; and to implement the national energy efficiency policy, strategy and regulations as laid out in Sessional Paper No.4 of 2004, the Energy Act 2006 and the draft Energy Policy and Bill 2012. This action would complement that of other actors and development partners in this area.	
Areas of relevance Public Administration – Finance Adaptation ❒ Mitigation √ Development ❒	
Current status Regulatory reforms are currently proposed in the draft Energy Bill 2004, being promoted by the Ministry of Energy and Ministry of Finance.	
Lead Agency to take this Action forward Ministry of Energy	
Stakeholder support required to take the action forward Ministry of Finance, Office of the Prime Minister, Ministry of Environment and Mineral Resources, Ministry of Industrialisation, Ministry of Energy (Feed-in Tariff Committee), Energy Regulatory Commission, Kenya Power, Kenya Revenue Authority, Kenya Bureau of Standards, Centre for Energy Efficiency and Conservation, Kenya Private Sector Alliance, Kenya Association of Manufacturers, Kenya Bankers Association, Development partners (e.g. World Economic Forum)	

Indicative timeframe
Launch timeframe: action can begin immediately and be established in 12-18 months

Duration of the Action: Permanent

Quick win opportunity ❒

The quick win box should be checked when the SC team recommends that this is an obvious 'quick win' action. If the action is designated as 'quick win' it should have been agreed with the Lead Agency.

Cost associated with the Action in Kenyan Shillings
Sustained efforts of the Ministry of Energy, the Ministry of Finance and other Government of Kenya bodies, the possible establishment of new units and some technical assistance will require up to $500,000 or KES 40 million.

Immediate next steps

i. Ensure that the proposed reforms in the draft Energy Policy and Bill 2012 go through the legislative process (4 months)

ii. Promote the implementation of reforms in the Sessional Paper No.4 of 2004 and the Energy Act 2006 that have not yet been enacted

iii. Promote the implementation of reforms in the draft Energy Policy and Bill 2012 once passed (12 months)

iv. Support the establishment of the one-stop shop under the ERC (6 months)

Action 8: ESTABLISH A REGULAR PLATFORM FOR ENGAGEMENT AND DIALOGUE BETWEEN THE GOVERNMENT OF KENYA AND INVESTORS	**Action Reference Number:**FINA-8
Action summary This action involves the establishment of a regular (i.e. every three months) platform for continued engagement and dialogue between the Government of Kenya and both domestic and international representatives of the private sector on matters relating to Kenya's low-carbon growth strategy. It should be hosted by the Ministry of Energy and involve other government bodies as appropriate. It would allow the Government of Kenya to present its plans to the international and domestic investors, to seek investment and to hear the views and plans of investors. It would build on the Prime Minister's roundtable, which has the same purpose, and would build on the Prime Minister's call for such an initiative at the WEF in Davos in 2011.	
Areas of relevance Public Administration – Finance Pan-Kenya Adaptation ❒ Mitigation √ Development ❒	
Current status Regulatory reforms are currently proposed in the draft Energy Bill 2004, being promoted by the Ministry of Energy and Ministry of Finance.	
Lead Agency to take this Action forward Ministry of Energy	
Stakeholder support required to take the action forward Office of the Prime Minister Kenya Private Sector Alliance	
Indicative timeframe Launch timeframe: action can begin immediately and the first session held in 3 months Duration of the Action: Permanent Quick win opportunity √ The quick win box should be checked when the SC team recommends that this is an obvious 'quick win' action. If the action is designated as 'quick win' it should have been agreed with the Lead Agency.	
Cost associated with the Action in Kenyan Shillings Minimal costs – convening and holding each session would cost circa KES 500,000	
Immediate next steps i. Establish a consensus for dialogue and discussion platforms within the Ministry of Energy and Office of the Prime Minister, including which government bodies will take part and what plans the government would like to present (4 months) ii. Identify and engage international and domestic investors and invite them to the first session (4 months)	

Action 9: SUPPORT THE PLANNED CREATION OF A ONE-STOP SHOP TO EXPEDITE THE PROCESS OF ACQUIRING RENEWABLE ENERGY PERMITS AND LICENSES	**Action Reference Number:**FINA-9
Action summary The recommendation is to support the already planned creation of a one-shop where renewable energy firms (and in the future possibly firms in other low-carbon sectors) can acquire all the necessary permits and licenses to develop their projects. The one-stop shop, which is under planning by the Ministry of Energy, Kenya Power and the Energy Regulatory Commission, amongst others, would be domiciled under the Energy Regulatory Commission (ERC). Currently, firms have to go to a number of different institutions to acquire licenses and permits, so the creation of this one-stop shop would significantly expedite the process of renewable energy investment.	
Areas of relevance Public Administration – Finance Adaptation ❒ Mitigation √ Development ❒	
Current status The process is under discussion within the Government of Kenya.	
Lead Agency to take this Action forward Ministry of Energy	
Stakeholder support required to take the action forward Energy Regulatory Commission	
Indicative timeframe Launch timeframe: action can begin immediately and be completed within 12 months Duration of the Action: Permanent Quick win opportunity ❒ The quick win box should be checked when the SC team recommends that this is an obvious 'quick win' action. If the action is designated as 'quick win' it should have been agreed with the Lead Agency.	
Cost associated with the Action in Kenyan Shillings Running the one-stop shop could cost KES 5 million per year	
Immediate next steps i. Convene all relevant stakeholders on a regular basis that may be concerned with the establishment of the one-stop shop (2 months) ii. Establish plans for what practical, procedural and regulatory reforms may be require to establish the one-stop shop (4 months) iii. Promote the implementation of reforms and the staffing of the unit within the ERC (4 months)	

17. Annex 4 Action Sheets for Chapter 8 – EPRF

Action 1: CONSULT ON AND ADOPT THE DRAFT CLIMATE CHANGE POLICY CURRENTLY BEING DEVELOPED	**Action Reference Number:** EPLF-1
Action summary Widely consult on and eventually adopt the draft Climate Change Policy currently being developed as a Parliamentary Sessional Paper. The Policy will frame Kenya's climate change response within the attainment of climate resilient and low-emission development. This Policy will provide the overall direction and approach of climate change response and maybe translated into law through new draft framework Climate Change Law. At present Kenya lacks a climate change policy and as a result climate change response is fragmented across and various arms of Government. A clear and coherent articulation of Kenya's climate change response policy is required that draws on the NCCRS and provides the direction that will ensure the NCCAP can be successfully implemented across all levels of Government. Such a policy will play a vital role in building consensus and raising awareness amongst civil society, the private sector and the public at large as to the seriousness the GoK affords climate change and how all stakeholders will be engaged in the response effort. The impact of the action will be better coordinated, more effective and clearly articulated climate change response in Kenya.	
Areas of relevance All sectors, national relevance Adaptation √ Mitigation √ Development √	
Current status A draft Climate Change Policy has been in development since June 2012 by the Climate Change Secretariat and Ministry of Environment and Mineral Resource under the auspices of the NCCAP. Following extensive consultations, revision and validation process, NCCS have prioritised the finalisation of the draft policy, approval by Cabinet, and public consultations with a view to present it for approval as a Sessional Paper during the term of the current parliament.	
Lead Agency to take this Action forward The Ministry of Environment and Mineral Resources will lead consultations and finalisation of the draft Climate Change Policy.	
Stakeholder support required to take the action forward To ensure broad consensus and widespread support for the Climate Change Policy, particularly given its cross-sectoral nature, Members of Parliament, key sectoral Ministries, the Office of the Prime Minister / President, civil society, the private sector and the public at large will need to be extensively consulted and engaged. Public hearings will need to be conducted by MEMR and the relevant committee of Parliament, with the feedback being utilised to revise and refine the policy.	

Indicative timeframe Launch timeframe: currently underway Duration of the Action: 3-6 months Quick win opportunity √
Cost associated with the Action in Kenyan Shillings KES 10,000,000 (drafting committees and consultation processes)
Immediate next steps Once the draft Climate Change Policy is finalised, extensive consultation, validation and redrafting processes will need to be conducted to build consensus, ensure political support and ensure the relevance of the policy for affected communities. Following this, the policy should be presented to Parliament for debate and adoption as a Sessional Paper. Timeframe: within 3-6 months of the NCCAP being finalised.

Action 2: ENACT A STANDALONE, OVERARCHING, FRAMEWORK CLIMATE CHANGE LAW	Action Reference Number: EPLF-2

Action summary
Enact a standalone, overarching, framework Climate Change Law to provide the general legal framework for implementation of Kenya's National Climate Change Policy and related actions under the NCCAP. At present, no unified legal framework for addressing climate change exists in Kenya and the relevant laws and institutions that are currently in place are fragmented across multiple sectors and institutions. The impact of the action will be to demonstrate the GoK's high-level commitment to addressing climate change, put in place through a single piece of legislation, crucial institutional, financial and technical architecture and thereby ensure that the NCCAP has a sound overarching legal framework to facilitate successful implementation.

Areas of relevance
All sectors, national relevance.
Adaptation √ Mitigation √ Development √

Current status
Analysis and research during the NCCAP process have resulted in realisation that a standalone law on climate change is necessary. The findings have resulted in proposals for an institutional framework at the national and county government level, and the recommendation of climate change mainstreaming within sectoral functions. This needs to be consolidated in legislation in order to provide mechanisms to underpin the national climate change response for Kenya.

Lead Agency to take this Action forward
The Ministry responsible for climate affairs is the lead agency to push forward an overarching, framework Climate Change Law.

Stakeholder support required to take the action forward
It will be necessary for MEMR to constitute a technical task force that will build on the institutional and legislative proposal, and the climate change policy, in order to draft a comprehensive standalone climate law for Kenya. The task force will focus the law on: (i) coordinative and technical aspects of institutions; (ii) mainstreaming of climate change functions through vertical integration; and (iii) the facilitative role of legislation using dynamic climate strategies to detail specific actions in the short, medium and long term. The technical taskforce should comprise members from sectoral ministries and agencies, private sector, academia, civil society and the general public. A broad cross-section of stakeholders from Members of Parliament, key government officials, civil society and the public at large will need to debate on a draft law, and build consensus and political support for enactment by Parliament.

Indicative timeframe
Launch timeframe: (1-3 months)
Duration of the Action: (6-12 months)

Cost associated with the Action in Kenyan Shillings
KES 10,000,000 (drafting committees and consultation processes)

Immediate next steps
Establish the path forward for the legislative drafting process, including constituting of a technical task force to undertake the drafting of initial provisions consistent with NCCAP recommendations, and build consensus amongst key stakeholders for the approach taken.
Timeframe: September-December 2012.

Action 3: AMEND KEY SECTORAL LAWS CONSISTENT WITH PRIORITY ACTIONS IDENTIFIED UNDER THE NCCAP THROUGH A MISCELLANEOUS AMENDMENTS BILL	**Action Reference Number:** EPLF-3
Action summary Priority NCCAP actions will be given an enabling legal basis by amendment of key sectoral laws. These amendments will ideally occur simultaneously through a Statute (Miscellaneous) Amendments Bill, or in the alternative through separate legislative amendments, occurring over a period of time, to reform sectoral laws. The impact of this initiative will be to ensure priority actions can be translated from concept into practice by achieving the necessary sector specific legislative reform.	
Areas of relevance All sectors, national relevance Adaptation √ Mitigation √ Development √	
Current status This action is currently being developed based on specific NCCAP priority actions.	
Lead Agency to take this Action forward This action will be led by the Ministry responsible for Climate Change but will require coordination and buy-in from the National Climate Change Council and key sectoral Ministries to ensure the relevance and acceptance of the proposed sectoral legislative amendments.	
Stakeholder support required to take the action forward Broad stakeholder participation and consensus building, particularly from key sectoral agencies and ministries with mandates over Energy, Transport, Agriculture, Finance, Planning, Forestry and Disaster Management, amongst others, will need to be achieved to garner support for sectoral legislative amendments and ensure a climate change mainstreaming approach can be implemented. Support from Members of Parliament and the State Law Office will be required to ensure high-quality legislative reform can be passed through Parliament.	
Indicative timeframe Launch timeframe: (2 -3 months) Duration of the Action: (1-2 months) Quick win opportunity √ (depending on parliamentary priorities)	
Cost associated with the Action in Kenyan Shillings KES 10,000,000 (drafting committees and consultation processes)	
Immediate next steps Develop and draft sector specific enabling legislative or regulatory provisions for all NCCAP priority actions and where necessary compile these into a Miscellaneous Amendments Bill for tabling before Parliament. Timeframe: September - December 2012.	

Action 4: ESTABLISH A HIGH-LEVEL NATIONAL CLIMATE CHANGE COUNCIL	**Action Reference Number:** EPLF-4
Action summary As part of broader institutional reform under a standalone Climate Change Law, a high-level National Climate Change Council (NCCC) should be established to play the primary coordination, legislative and policy direction, technical oversight and guidance role in relation to climate change response. Effective response to climate change requires an institutional framework that involves the senior members of the executive and provides high-level convening power across the many sectoral Ministries and County level authorities relevant to climate change, and oversees clear, coherent policy direction across all levels of Government. This will add the necessary political impetus to the technical tasks to be performed by the Climate Change Secretariat. Such a Council may be chaired by the Secretary to the Cabinet. Without such a high-level institution, climate change response will unlikely be perceived as more than an environmental issue and will be unlikely to receive the political backing and resources required to achieve effective results. Established by integrating the NCCC concept into a standalone Climate Change Law, the NCCC would be the primary institution tasked with overseeing, monitoring and ensuring successful implementation and sufficient resourcing of the NCCAP in order to ensure mainstreaming across sectoral departments and agencies of the National and County governments. It will further play the leading role in achieving effective integration of climate change response into Kenya's broader sustainable development objectives.	
Areas of relevance All sectors, national relevance Adaptation √ Mitigation √ Development √	
Current status Although the National Climate Change Council is conceived as a new institution with a specific mandate it will ideally build on existing structures. Thus to ensure existing institutional capacity is built upon, a Permanent Secretariat for the NCCC, to be established within the Presidency and Cabinet Affairs Office for coordination purposes, could emerge from the current Climate Change Coordination Unit within the Office of the Prime Minister.	
Lead Agency to take this Action forward Ministry responsible for climate change in conjunction with the Office of the Prime Minister, or Office of the President is action is implemented after the 2013 General Elections	
Stakeholder support required to take the action forward The support of all key political stakeholders engaged in climate change response – Office of the Prime Minister / President, major sectoral Ministries, Parliament, civil society – will be required to establish such a high-level, climate change coordination body.	

Indicative timeframe Launch timeframe: 6-12 months The legislative mandate for a National Climate Change Council could be included in a framework Climate Change Law with the institution made operational in the near-term subject to sufficient resourcing.
Cost associated with the Action in Kenyan Shillings Establishment of the National Climate Change Council in law (no additional cost). Establishment and operationalisation of the NCCC: estimated annual operational cost KES 150 million.
Immediate next steps Integrate the NCCC concept into a draft framework Climate Change Bill. Timeframe: September-December 2012.

Action 5: ESTABLISH A CLIMATE CHANGE SECRETARIAT WITHIN THE MINISTRY RESPONSIBLE FOR CLIMATE CHANGE AFFAIRS	**Action Reference Number:** EPLF-5

Action summary

To establish the primary national government technical mechanism for climate change response, a Secretariat of Climate Change within the sectoral ministry responsible for climate change affairs, at present the Ministry of Environment and Mineral Resources, may be created that builds on existing structures and reform proposals. With functions defined in a standalone Climate Change Law, key among them the proposal and continuous revision of climate policy to the NCCC, ongoing implementation and review of the climate change response strategy and action plan, and proposal of climate change legislation and regulations, the Secretariat would be the main implementing agency of the NCCAP. Without such a Secretariat established and defined in law, with the requisite scientific and technical expertise, implementation of the NCCAP may face challenges in terms of constitutional and legal competence, capacity, resources and political support.

Areas of relevance

All sectors, national relevance

Adaptation √ Mitigation √ Development √

Current status

To ensure new institutional initiatives build on current structures, legislation for a Climate Change Secretariat could strengthen and adapt the current Climate Change Secretariat in the Ministry of Environment and Mineral Resources for the purposes proposed in the NCCAP. A future NCCS would be under the Ministry for the time being responsible for climate change. Given the NCCS has successfully implemented its mandate to lead the GoK's climate change response efforts and operationalise the NCCRS, existing capacity should be strengthened further. The Public Service Commission (PSC) has approved the establishment of a National Climate Change Secretariat within the MEMR and this concept could be adapted through legislation in order to establish the Secretariat as a statutory department that undertakes the core technical functions related to climate change response, deriving authority from law. The potential resources available to an institution with a legislative rather than administrative status are likely to be greater as the law could mandate Parliament to allocate specific resources for climate change response to this Secretariat.

Lead Agency to take this Action forward

Ministry of Environment and Mineral Resources.

Stakeholder support required to take the action forward The support and engagement of technical experts on climate change will be required to legislatively Climate Change Secretariat.
Indicative timeframe Launch timeframe: 6-12 months The legislative mandate for a Climate Change Secretariat could be included in a framework Climate Change Law with the institution made operational in the near-term subject to sufficient resourcing.
Cost associated with the Action in Kenyan Shillings Establishment of the Climate Change Secretariat in law (no additional cost). Establishment and operationalisation of the Climate Change Secretariat: estimated annual operational cost KES 300 million.
Immediate next steps Integrate the Climate Change Secretariat concept into a draft framework Climate Change Bill. Timeframe: September-December 2012.

18. Annex 5 Action Sheets for Chapter 9 – KM & CD

Action 1: DEVELOPMENT AND MAINTENANCE OF A ROBUST AND UP-TO-DATE CLIMATE CHANGE KNOWLEDGE MANAGEMENT SYSTEM	**Action Reference Number:** KMCD-1
Action summary: The key requirement for strategic decision making is good knowledge and information and, with this objective, use of ICT can significantly contribute to easing of collection, storage, access, collation and dissemination of climate change knowledge and information. Since the current climate change knowledge management systems existing in Kenya are developed independently by the various organisations, they are likely to be incompatible and difficult to integrate because they are based on disparate standards. It is recommended that Climate Change Resource Centre when it is established develops a network of climate change actors and implements a technology-based climate change knowledge management system using the Dublin Core Metadata standard. This standard will be adopted by knowledge partners to enable the integration of the knowledge they generate into the system. It is also recommended that the implementation is based on a phased approach. The system will serve as a one-stop online space where most of the climate change information and knowledge in Kenya reside. The system will also have cross linkages with similar systems outside Kenya to capture experiences and lessons learned from other regions. It can be scaled incrementally from the prototype developed as part of deliverables for the sub-Component that dealt with knowledge management during the development of NCCAP. The prototype has an online roster of experts and institutions engaged in climate change activities. It has document management, mapping and graphing functionalities.	
Areas of relevance: *Adaptation* √ *Mitigation* √ *Development* √	

Current status:

Many organisations dealing with climate change host large databases of research work. These information and knowledge repositories are not interlinked to facilitate ease of sharing and wider access. Examples of these repositories include: databases; web portals and libraries.

- The University of Nairobi's Institute of Climate Change and Adaptation uses library services, web-based and in-house databases.
- The Ministry of State for Development of Northern Kenya and other Arid Lands uses databases and publications
- The Kenya Association of Manufacturers (KAM) uses a database documented best practices
- The World Agroforestry Centre (ICRAF) uses databases, library services, online scientific journals, web portals and scientific content management sites.
- Others include the Kenya Environment Information Network (KEIN) used by NEMA as well as a large base of none-codified indigenous knowledge that communities have adopted as coping techniques in response to climate change effects.

Although the organisations are developing these repositories of information and knowledge, the next step of interlinking those repositories to make them widely accessible is yet to take place. Furthermore, the systems are likely to be incompatible and difficult to integrate because they have been developed on diverse platforms, do not have common standards.

Lead agency to take this Action forward:

The Climate Change Resource Centre when established will lead the development of a full climate change knowledge management system.

Stakeholder support required to take the action forward:

Inputs from relevant stakeholders, such as ministry focal points, research institutions, universities and colleges, the private sector, civil society organisations, individual climate change researchers, the ICT Board, among others. Donor support in terms of funding to implement the system.

Indicative timeframe:

One year is required to develop a functional and tested climate change knowledge management system.

Cost associated with the Action in Kenya Shillings:

Estimated cost of system development without hardware costs: approximately Ksh100 million.

Immediate next steps

Scaling of the prototype or calling for consultants to bid for development of a complete technology-based climate change knowledge management system using a phased approach.

Action 2: ESTABLISH A PHYSICAL CLIMATE CHANGE RESOURCE CENTRE	**Action Reference Number:** KMCD-2
Action summary: The physical dimension of climate change information and knowledge management entails having, an organized physical space to house hard copies of published multimedia materials and other knowledge products. Our recommendation is to establish one national climate change resource centre and use existing infrastructure to devolve to the counties. We recommend partnership with Kenya National Library Services (KNLS) to house climate change information and knowledge products at the county levels. These materials will be acquired by the ministry responsible from commercial establishments or other agencies involved in climate change-related activities.	
Areas of relevance: *Adaptation* √ *Mitigation* √ *Development* √	
Current status: Many of organisations dealing with climate change host large number of publications like books, journals, magazines and multimedia knowledge products of climate change. Most of these are housed in in-house libraries as well as other forms of physical storages. A number of institutions having in-house libraries include: The University of Nairobi's Institute of Climate Change and Adaptation; The World Agroforestry Centre (ICRAF); KMD and; NEMA among others. Most of these are not accessible to public as they are set-up for institution internal use. Moreover, the availability of these libraries is not widely known.	
Lead agency to take this Action forward: The Climate Change Resource Centre when established will lead the development of establishing a national climate change resource centre.	

Stakeholder support required to take the action forward: Inputs from relevant stakeholders, such as ministry focal points, research institutions, universities and colleges, the private sector, civil society organisations, individual climate change researchers, the ICT Board, among others. Donor support in terms of funding to implement the centre.
Indicative timeframe: One and half years are required to put up the physical infrastructure and stock the resource centre with the require climate change knowledge products.
Cost associated with the Action in Kenya Shillings: Estimated cost of system development without hardware costs: approximately Ksh 400 million.
Immediate next steps Scaling of the prototype or calling for consultants to develop a complete technology-based climate change knowledge management system using a phased approach where each phase is used as a building block for the next phase.

Action 3: ADDRESS THE CAPACITY GAPS REQUIRED TO IMPLEMENT THE NCCAP IN THE AGENCIES COORDINATING AND LEADING CLIMATE CHANGE EFFORTS.	**Action Reference Number:** KMCD-3
Action summary: The capacity analysis of the core agencies leading climate change in Kenya identified capacity gaps which are specific to climate change and also to wider organisational development capacities. A capacity building programme is required to address those gaps and additional capacities required to lead the implementation of the NCCAP.	
Areas of relevance: *Adaptation* √ *Mitigation* √ *Development* √	
Current status: The Climate Change Secretariat of MEMR is currently leading the implementation of the action plan and wider coordination of climate change in Kenya. The Secretariat was formally established by the Public Service Commission in August 2012 and recruitment of the staff for the Secretariat will take place in early 2013. Once staff are in place, an up-to-date assessment of the capacity gaps will be required. As there is expected to be significant change in the Ministerial arrangements post 2013 elections, it is recommended that further capacity gap analysis takes place once agencies have been adjusted.	
Lead agency to take this Action forward: The Climate Change Secretariat will take the lead in capacity development	
Stakeholder support required to take the action forward: Inputs from a range of actors/service providers will be required . Donor support in terms of funding to provide the capacity development support.	
Indicative timeframe: Three years	
Cost associated with the Action in Kenya Shillings: Estimated cost of system development without hardware costs: approximately Ksh200 million.	
Immediate next steps **(i)** Recruitment of the NCCS staff **(ii)** Map the job descriptions of the NCCS to the actions of the NCCAP	

Action 4: PROVIDE CAPACITY DEVELOPMENT SUPPORT TO ACTORS AT NATIONAL AND COUNTY LEVEL TO MOVE FORWARD WITH IMPLEMENTING THE NCCAP (BASED ON AN ANNUAL IDENTIFICATION OF PRIORITIES).	**Action Reference Number:** KMCD-4
Action summary: A wide range of capacities will be required to implement the NCCAP. A capacity analysis tool is required to enable actors to assess existing and required capacities and a wide range of service providers will be required to address the capacity gaps. Capacity development at the county level will be critical if the NCCAP is to be implemented at local level.	
Areas of relevance: *Adaptation* √ *Mitigation* √ *Development* √	
Current status: A wide range of initiatives are taking place to build capacity on various aspects of the NCCAP from geothermal to REDD+. More in-depth capacity analysis will be required as implementation of the various actions takes place. It is important that lessons on capacity development are learned and shared across the various sectors.	
Lead agency to take this Action forward: The Climate Change Secretariat will lead the process of documenting lessons learned on capacity development to implement the NCCAP and a range of actors will take the lead with capacity development for climate change in their sector.	
Stakeholder support required to take the action forward: Inputs from relevant stakeholders, such as ministry focal points, research institutions, universities and colleges, the private sector, civil society organisations, individual climate change researchers, the ICT Board, among others. Donor support in terms of funding to implement the centre.	
Indicative timeframe: Three years.	
Cost associated with the Action in Kenya Shillings: Estimated cost of system development without hardware costs: approximately Ksh200 million.	
Immediate next steps **(i) Prioritise the capacity development needs for 2013**	

Action 5: ESTABLISHMENT OF AN EFFECTIVE SOCIAL MOBILISATION FRAMEWORK AND FUNCTIONAL COMMUNICATION STRUCTURE	**Action Reference Number:** KMCD-56
Action summary: Social mobilisation is a broad-scale movement to enlist people's participation in achieving a specific development goal through self-reliant efforts. It involves all relevant segments of society: decision and policy makers; opinion leaders; bureaucrats and technocrats; professional groups; religious associations; commerce and industry; communities; and individuals. Climate change is a serious challenge requiring the active participation of all members of the society to manage. An effective social mobilisation framework and a functional communication structure can help to rally all segments of the society to take appropriate action towards climate change mitigation or adaptation.	
Areas of relevance: Using a social mobilisation approach anchored on a functional communication structure will be relevant to: *Adaptation* √ *Mitigation* √ *Development* √	
Current status: There is no coordinated approach to creating awareness on climate change in Kenya. Whilst various stakeholders have diverse initiatives to create awareness on climate change, there is need for a mobilisation conceptual framework and focal point to coordinate the disparate efforts for optimum impact.	
Lead agency to take this Action forward: The ministry responsible for environmental management, through the Climate Change Secretariat, is proposed to lead in implementing this suggestion in close collaboration and partnership with the relevant sectors, government ministries and research institutions, universities and colleges, private sector and civil society organisations.	

Stakeholder support required to take the action forward: The full participation of stakeholders in the identification and prioritisation of climate change tools and techniques as well, as messages to communicate climate change information, is imperative.
Indicative timeframe: The initial processes and setting up will take one to six months after which the planning cycle of five years will take its course.
Cost associated with the action in Kenya Shillings: About 100 million Kenya Shillings will initially be needed to mobilise and harness the support of the key publics through consultative forums and engagement activities.
Immediate next steps: (i) Mobilise the different stakeholders and win their commitment and support; (ii) Create and fill at least one public awareness and communication position at the Climate Change Secretariat to coordinate the function; (iii) Develop and implement a collaboration framework with the Kenya Meteorological Department (RANET project) and district information offices; and (iv) Establish climate change information desks at the Kenya National Library Service and all community libraries countrywide.

Action 6: INTEGRATION OF CLIMATE CHANGE INTO KENYA'S EDUCATION SYSTEM	**Action Reference Number:** KMCD-6

Action summary:

Target infusing climate change into the education system at all levels in order to create awareness and produce skilled labour and experts in climate change-related areas, such as energy management and other areas.

- At primary schools introduce children early to climate change adaptation practices using subjects such as science and nature and where possible all other subjects
- At secondary school level introduce content on climate change particular aspects relevant to the Kenyan situation – aforestation; clean energy alternatives and climate smart agriculture
- At middle level colleges, train technicians in needed skills such as solar energy systems development and maintenance; geothermal energy; wind power generation and agriculture extension that emphasises technologies for growing drought tolerant crop varieties and livestock
- At university, infuse climate change into all professional courses

Areas of relevance:

Targeted measures towards developing expertise in climate change need to be taken proactively. Some of the areas of interest include renewable energy sources, such as geothermal, solar and wind power. Support through infusing climate change into education and establishment of climate change-related institutes, such as the proposed Kenya Energy Institute, is critical.

These measures would have relevance for:

Adaptation √ *Mitigation* √ *Development* √

Current status:

Climate change education and awareness has not benefitted from any structured focus. Policy papers in education have also not fully addressed this area.

Lead agency to take this Action forward:

Ministry of Education, in collaboration with the ministry responsible for environmental management.

Stakeholder support required to take the action forward: The relevant Government of Kenya ministries and agencies, civil society and the private sector.
Indicative timeframe: The action to integrate climate change into Kenya's education will commence with the development of national policies and the enactment of relevant bills. The initial processes can be accomplished within 1 to 2 years.
Cost associated with the Action in Kenya Shillings: KES 450 million.
Immediate next steps: Policy formulation, addressing the need to infuse climate change into education, will precede curriculum development.

19 Annex 6 Action Sheets for Chapter 11 National Performance and Benefit Measurement Framework

Action:1 ESTABLISH MRV+ SYSTEM GOVERNANCE STRUCTURES	**Action Reference Number:**NPBM-1

Action summary

A National Performance and Benefit Measurement Framework (NPBMF) is needed in Kenya to support the NCCAP by measuring, monitoring, evaluating, verifying and reporting results of mitigation actions, adaptation actions and the synergies between them. The key component of the proposed NPBMF is n MRV+ system. The aim of the action is to set up the governance structure, teams and components of the MRV+ system.The MRV+ system will assist Kenya by:

- Guiding GoK on the implementation of the response to climate change;
- Helping Kenya fulfil its international climate reporting obligations;
- Demonstrating Kenya's climate finance readiness and providing a strong platform for attracting climate finance from multilateral and bilateral development partners.

A detailed set of activities is provided in the MRV+ Road Map set out in the "NPBMF and MRV+ System Design, Road Map and Guidance Report", (Stage 2 report).

Areas of relevance

This action is relevant to all geographic areas in Kenya and all sectors.

Adaptation √ Mitigation √ Development √

Current status

Most ministries currently carry out some M&E activities and Central Planning and Projects Monitoring Units (CPPMUs) access some of the data sets required for climate change MRV in their normal operations. However, only MED attempts to draw all the data together when it reports against Vision 2030 objectives. The introduction of GHG emissions reporting requirements, mitigation and adaptation indicators adds complexity that is beyond the remit of the MED.

Lead Agency to take this Action forward

The NCCS will manage the MRV+ system. The National Climate Change Council(NCCC) will chair the MRV+ system steering committee, and the steering committee will oversee the functioning of the whole MRV+ system. MED will lead the Data and QA/QC Working Group, KNBS will lead the Indicators and Baselines Working Group and KNBS or NCCS will house the Climate Change relevant Data Repository (CCRDR).

Stakeholder support required to take the action forward
A wide range of stakeholders will be needed to implement the MRV+ system. These include:

- *Existing MDAs*: NCCS; MED; Kenya National Bureau of Statistics (KNBS); Kenya Bureau of Standards (KEBS); representatives from the T21 modelling team; CPPMUs, and Climate Change Units in MDAs covering all the sectors necessary for the GHG inventory and for adaptation; also other NSAs and CSOs with relevant expertise.
- *Proposed Climate Change and M&E Governance structures*: NCCC; NCCS; National GHG Inventory Coordination Unit; County Monitoring and Evaluation Committees (COMECs); Ministerial M&E Committees (MMECs); and National Monitoring & Evaluation Steering Committee (NMESC).

Indicative timeframe
Launch timeframe: (9 months) Short term,

Duration of the Action: long term and possibly post V2030

*Quick win opportunity*þ

Cost associated with the Action in Kenyan Shillings
The indicative cost for the action is TBC.

Immediate next steps
The plan for implementing the MRV+ system is set out in a roadmap (Gantt chart), which accompanies the Stage 2 report. This lists all the main activities, and the outputs and milestones.

The first 3 activities to be completed are to:

- Secure funding for the MRV+ System (December 2012);
- Identify and appoint the chair of the steering committee (MRV+ SC) (December 2012);
- Appoint the MRV+ SC members (February 2013).
- Appoint the MRV+ management team (February 2013).

Action: 2 CLIMATE CHANGE RELEVANT DATA TRACKING AND MAPPING	**Action Reference Number:**NPBM-2

Action summary

Both climate change mitigation and adaptation monitoring systems require detailed data from a very wide range of sources. The aim of the action is to map data flows required for reporting of outcome-based indicators covering the GHG inventory, mitigation, adaptation and synergies for national level reporting. The benefits of this action are:

- All current climate change relevant data sets are identified and gaps assessed;
- Clear process for data collection, collation, quality assurance (QA)/quality control (QC), validation and reporting are established;
- All necessary data are supplied to the CCRDR via DSROAs to enable the development of the GHG inventory and measurement, monitoring, evaluation, verification and reporting of mitigation and adaptation actions and analysis of the synergies between them.

The actions will be led by the MRV+ system data QA/QC working group in consultation with the MRV+ system Technical Analysis Groups (TAGs), Synergies and Project Interface (SPI) and GHG technical team.

Areas of relevance

This action is relevant to all geographic areas in Kenya and all sectors.

Adaptation √ þ Mitigation √ Development √

Current status

Most ministries currently carry out some M&E activities and Central Planning and Projects Monitoring Units (CPPMUs) access some of the data sets required for climate change MRV in their normal operations. However, only MED attempts to draw all the data together when it reports against Vision 2030 objectives. The introduction of GHG emissions reporting requirements, and mitigation and adaptation indicators adds complexity that is beyond the remit of the MED. This action will provide the data to the CCRDR that is required by the MRV+ system to produce the required deliverables (data analysis and reports).

Lead Agency to take this Action forward

This action should be taken forward by KNBS in close collaboration with the proposed NCCS. KNBS is proposed as the coordinator of the MRV+ data and QA/QC working group and is one option for managing the CCRDR. NCCS is the overall manager of the MRV+ system and an option for managing the CCRDR.

Stakeholder support required to take the action forward NCCS will need to work in close collaboration with KNBS. All relevant MDAs and NSAs that generate climate change relevant data for mitigation and adaptation action and the GHG inventory will need to be involved in this action. For example some of the key ministries will be: KMD, KARI, DRSRS, WRMA, KFS, NEMA, Ministry of Energy, Ministry of Transport, Ministry of Tourism and Industry.
Indicative timeframe *Launch timeframe*: short term *Duration of the Action*: 5 months This is a short term, priority action. It will underpin the MRV^{+} system and processes. The action should be completed as soon as possible, and ideally by the end of 2013, in order to ensure a smooth roll-out of the NPBMF. *Quick win opportunity* √
Cost associated with the Action in Kenyan Shillings The indicative cost for the action is TBC.
Immediate next steps For a successful outcome, the MRV^{+} steering committee and management team need to be in place and the following system components need to be set up: the data and QA/QC working group, TAGs, SPI and GHG technical team. Assuming the MRV^{+} system steering committee and management team and system components can be put in place by August 2013, this action should be able to start in September 2013.

Action: 3 INDICATORS AND BASELINES	**Action Reference Number:**NPBM-3
Action summary Both mitigation and adaptation actions are needed as part of Kenya's climate change response strategy. Currently it is not possible to judge whether mitigation baselines could be quantified now or whether additional data collection would be required. This action will create an agreed list of indicators and their respective baselines which will allow the performance of the NCCAP to be measured. The action will also produce produce guidelines to supplement the NIMES guidelines for indicator reporting, in close consultation with MED. The benefits of the action are: • A list of mitigation and adaptation indicators and relevant baselines are created, which are then kept under review and amended as necessary to adjust to changes in Kenya's priorities; • Ability to set meaningful targets for indicators.	
Areas of relevance This action is relevant to **all** geographic areas in Kenya and all sectors. Adaptation √ Mitigation √ Development √	
Current status Most ministries currently carry out some M&E activities and Central Planning and Projects Monitoring Units (CPPMUs) access some of the data sets required for climate change MRV in their normal operations. However, only MED attempts to draw all the data together when it reports against Vision 2030 objectives. The introduction of GHG emissions reporting requirements, and mitigation and adaptation indicators adds another layer of complexity that is beyond the remit of the MED. This action will provide the underlying indicators and baselines required by the proposed MRV+.	
Lead Agency to take this Action forward This action should be taken by MED, as MED are the coordinators of the Indicators and Baseline Working Group.	
Stakeholder support required to take the action forward Relevant stakeholders from the MED and the KNBS. KNBS should be involved because they will lead the data and QA/QC working group. The following institutions should be involved in the project, since they contain some of Kenya's most relevant datasets: KMD, KARI, DRSRS, WRMA, KFS, NEMA, Ministry of Energy, Ministry of Transport, Ministry of Tourism and Industry. This list is not exhaustive and other key stakeholders should also be involved.	

Indicative timeframe

Launch timeframe: short term (depending on the speed of progress on the NAMAs and NAP)

Duration of the Action: 6 months for the data mapping, 9 months to 3 years for baselines (some will be relatively quick to agree others will need research and take much longer)

This is a short term, priority action. It will help with the structuring and operation of the MRV+ system and processes. The action should be completed as soon as possible and ideally by the end of 2013, in order to ensure a smooth roll-out of the NPBMF.

Quick win opportunity √

Cost associated with the Action in Kenyan Shillings

The indicative cost for the action is TBC. The costs associated with the baseline derivations are excluded because it is extremely difficult to quantify them.

Immediate next steps

The MRV+ system needs to have been created, and all MDAs need to agree to share data relevant to climate change indicator measurement. This action could then be implemented from April 2013. The first step is to identify all the data sources required for the MRV+ system. It is important to make progress on the following before December 2013:

- Capacity development for the CPPMUs and MPND staff seconded to the ministries instigated;
- Support of the CCUs in the MDAs delivered.

Action 4: INSTITUTIONAL CAPACITY STRENGTHENING AND STAFF CAPACITY BUILDING IN MDAS AND LGAS	Action Reference Number:NPBM-4

Action summary

Currently, MDAs and LGAs carry out some M&E of actions that relate to mitigation and adaptation. However, there is no systematic approach to monitoring, reporting and verifying greenhouse gas emissions or monitoring and evaluating and climate change adaptation actions either within or between ministries. Training on MRV and M&E of climate change actions and indicator development, measurement and reporting is ad hoc and not institutionalised.

The aim of the action is to build institutional as well as individual capacities of Government agencies and staff involved in providing data for the MRV+ system. The scope of the action includes government operations at both the national and county levels. The action will pay particular attention to the identification, monitoring, consolidation, analysis and flow of relevant climate change data from counties to central government.

The proposed activities under the action are to:

- Engage and raise awareness on climate change MRV and M&E;
- Train the trainers in data collection, data set management, data processing, calculation of greenhouse gases and measurement of indicators;
- Provide training materials and develop a training plan for each MDA and LGA
- Identify and procure assets required for data collection by M&E units at national and county levels; and
- Identify and procure assets for data processing and storage at national and county levels.

Areas of relevance

This action is relevant to all geographic areas and all sectors.

Adaptation √ Mitigation √ Development √

Current status

Most ministries currently carry out some M&E activities. Central Planning Units (CPUs) and Project Monitoring Units (PMUs) access some of the data sets required for climate change MRV+. However, the CPUs, PMUs and staff within at national and county levels need capacity strengthening and capacity building to cope with the additional demands of the MRV+ system.

Lead Agency to take this Action forward

The NCCS would be required to assist with coordination of inter-ministerial activities. However, it is important that all ministries involved in the capacity building process are actively engaged and can provide representation both centrally and across the counties.

Stakeholder support required to take the action forward
A wide range of stakeholders will be needed to implement the MRV+ system. These include:

- *Existing MDAs*: CPUs and PMUs and/or Climate Change Units in MDAs covering all the sectors necessary for the GHG inventory and those relevant for adaptation.
- *Proposed CC and M&E Governance structures*: NCCS; National GHG Inventory Coordination Unit; County Monitoring and Evaluation Committees (COMECs); Ministerial M&E Committees (MMECs)

Indicative timeframe
Launch timeframe: (9 months); Duration of the Action: 3 year implementation phase followed by a 2 year hand-over phase.

Quick win opportunity √

Cost associated with the Action in Kenyan Shillings
TBC

Immediate next steps
The first 3 activities to be completed are to:

- Secure funding for capacity building (December 2012);
- Raise profile of the action across the MDAs (March 2013);
- Secure formal agreement from the MDAs for capacity building (April 2013);
- Appoint the capacity building management team (June 2013).

Action: 5 GHG INVENTORY, BIENNIAL UPDATE REPORTS (BURS) AND NATIONAL COMMUNICATIONS (NCS)	**Action Reference Number:**NPBM-5
Action summary GoK will need to submit a Biennial Update Report (BUR) to the UNFCCC by December 2014, and will probably need to submit its second National Communication (NC) at some point after its first BUR but before the second BUR. Both the BUR and NC will need to include the results of Kenya's GHG inventory, and the contents of the BUR and NC must follow the guidelines set out by the UNFCCC. Since the GHG inventory is a common component of the BUR and NC, we have created this action to deliver all three items. The GHG inventory and BUR need to be fast-tracked through the MRV+ system in order to meet the first BUR international reporting deadlines of December 2014. The benefits of the action are: • A complete and modern GHG inventory; • Fulfilment of Kenya's climate change reporting obligations under the UNFCCC. The proposed activities under the action are to: • Update the current GHG inventory; • Plan and write Kenya's first Biennial Update Report; • Plan and write Kenya's second National Communication (2NC).	
Areas of relevance This action is relevant to all geographic areas in Kenya and all sectors. Adaptation ❒ Mitigation √ Development ❒	
Current status Kenya has created a GHG inventory, and reported it in its first NC. The GHG inventory needs updating. No work has started on the BUR or the second NC.	
Lead Agency to take this Action forward The GHG inventory will be led by the National GHG Inventory Coordinating Unit which will sit in the NCCS within the Ministry of Environment and Mineral Resources (MEMR). The BUR and NC will be also be led by the NCCS.	
Stakeholder support required to take the action forward A wide range of institutions would be needed which would include all the main participants of the MRV+ system. These are set out in Action Sheet SC6-1 which establishes the MRV+ system. The GHG inventory would not specifically require any adaptation expertise.	

Indicative timeframe *Launch timeframe*: short term *Duration of the Action*: GHG inventory to be created by June 2014. BUR to be created by December 2014. 2NC to be ideally created to accompany the BUR, but likely to be created several months later. This is a short term, priority action. *Quick win opportunity* √
Cost associated with the Action in Kenyan Shillings The indicative cost for the action is TBC.
Immediate next steps The technical team to generate the GHG inventory needs to be established – including the FUs, the TWGs and the GHG inventory Technical Analysis Group (TAGGHGI). The data tracking and mapping exercise must have commenced and needs to have delivered the data to allow the GHG technical teams to produce a complete GHG inventory by June 2014.

Action: 6 M&E OF INSTITUTIONAL ADAPTIVE CAPACITY INDICATORS IN [MDA TBC] (DEMONSTRATION)	**Action Reference Number:** NPBM-6

Action summary

Currently, ministries carry out some M&E of adaptation actions. However, there is no systematic approach to measuring output and outcome adaptation indicators in any government ministry, nor is there any coordination of adaptation M&E effort between ministries.

The aim of the action is to demonstrate the effective application of adaptation M&E within a selected MDA, in order to facilitate roll-out across all relevant MDAs. The benefits of the action are the creation of an operational adaptation M&E framework for the target MDA; substantially enhanced M&E capabilities; and the creation of a model for roll-out across other ministries.

The proposed activities under the action are to: engage senior staff in the MDA; select suitable national level indicators in order to measure performance against agreed NAP actions; select suitable county level indicators in order to measure effectiveness of measures at county level; identify and agree suitable targets by which to measure performance; agree M&E roles within the MDA; identify data sets for indicator measurement and review data quality; establish data sharing agreements; collect baseline data and measure baseline value for each indicator; define additional internal processes for data collection, quality control, measurement and reporting; identify capacity building requirements; and provide adaptation M&E training for staff.

Areas of relevance

The action is relevant to all geographic areas. The sector will depend on the MDA selected.

Adaptation √ Mitigation ❒ Development √

Current status

Most ministries currently carry out some M&E activities and M&E units provide the foundations on which to build additional capacity. However, the indicators used tend to be linked to projects or programmes and are usually process-based, output indicators. They are not specific to adaptation. This makes it very difficult to ascertain the outcome of adaptation activities. Further development of capacity across all ministries is required to fulfil the requirements of the proposed NPBMF in the NCCAP.

Lead Agency to take this Action forward

The choice of lead agency is currently open. It is recommended that an MDA is drawn from a priority sector for adaptation. The priority sectors include agriculture, livestock, fisheries, water and irrigation, forestry and wildlife, tourism and roads.

Stakeholder support required to take the action forward

It would be useful if relevant stakeholders from the MED and the NCCS could be involved, since they will play a key role in new MRV+ structure. The choice of representatives is left to the institutions involved.

Indicative timeframe *Launch timeframe*: short term (depending on the speed of progress on the ATAR/ NAP) *Duration of the Action*: 9 months *This is a short term, priority action*. It will help to demonstrate the value of M&E and assist with the roll out of the NPBMF across relevant MDAs. The action should be completed as soon as possible, and ideally by the end of 2013, in order to ensure a smooth roll-out of the NPBMF. *Quick win opportunity* √
Cost associated with the Action in Kenyan Shillings The indicative cost for the action is TBC.
Immediate next steps For a successful outcome, the following conditions need to have been met before the action is implemented: a target MDA needs to be identified (by end of October 2012); the relevant ATAR or NAP actions need to have been agreed with the target MDA (by end of November 2012); the target MDA needs to have agreed to collaborate on the action and to provide relevant staff input (by end of December 2012); funding sources for the action need to have been put in place (by end of December 2012). Assuming these conditions are met, the action could be implemented after the elections (from April 2013).

Action: 7 M&E OF VULNERABILITY INDICATORS IN [COUNTY TBC] (DEMONSTRATION)	Action Reference Number:NPBM-7

Action summary

Currently, the districts carry out some M&E of adaptation actions. However, there is no systematic approach to measuring output and outcome adaptation indicators in any district, nor is there any collation of district level adaptation indicators at a national level. The aim of the action is to demonstrate the effective application of adaptation M&E within the county, in order to facilitate roll-out across all counties. The benefits of the action are: an operational adaptation M&E framework for the target county; substantially enhanced M&E capabilities; and a model for roll-out across other counties

The proposed activities under the action are to: engage senior staff in the MDA; select suitable national level (process) indicators in order to measure performance against agreed NAP actions; select suitable county level (outcome) indicators in order to measure effectiveness of measures at county level; identify and agree suitable targets by which to measure performance against both sets of indicators; agree M&E roles within the MDA; identify data sets for indicator measurement and review data quality; establish data sharing agreements; collect baseline data and measure baseline value for each indicator; define additional internal processes data collection, quality control, measurement and reporting; identify capacity building requirements; provide adaptation M&E training for staff; and produce a proposal for further staff training, procurement of computer and data monitoring equipment, additional staff recruitment.

Areas of relevance

The action is relevant to all sectors. The geographic area will depend on the county selected.

Adaptation √ Mitigation ❒ Development √

Current status

There are structures within MDAs for district level M&E, and upward reporting, although no coordinated approach to adaptation. Counties have not yet been established and the procedures are likely to change over the next year. Key to the process will be County Development Officers, as well as MDA-based M&E at county level.

Lead Agency to take this Action forward

The lead agency will be a county government, to be determined in consultation with counties.

Stakeholder support required to take the action forward

County level support from the MDAs will be essential, along with involvement of institutions responsible for coordinating upward reporting. These will include the relevant COMEC, MED and the MRV+ system.

Indicative timeframe
Launch timeframe: medium term (in 2014), depending on the time taken for the establishment of relevant county governance structures in the target county.

Duration of the Action: 12 months

This project will help to demonstrate the value of M&E and assist with the roll out of the NPBMF across relevant counties. The action should be completed by mid 2015, in order to ensure a smooth roll-out of the NPBMF across the counties.

Quick win opportunity ❒

Cost associated with the Action in Kenyan Shillings
The indicative cost for the action is TBC.

Immediate next steps
A target county needs to be identified (by end of 2o13); the relevant county level ATAR or NAP actions need to have been agreed with the target county (by end 2013); the target county needs to have agreed to collaborate on the action and to provide relevant staff input (by end 2013); funding sources for the action need to have been put in place (by end 2013). Assuming these conditions are met, the action could be implemented from early 2014.

Action: 8 EFFECTIVENESS ASSESSMENT OF ADAPTATION AT THE COUNTY LEVEL (DEMONSTRATION)	**Action Reference Number:** NPBM-8
Action summary There are currently many adaptation activities being undertaken at county and local level. However, the effectiveness of these actions is largely unknown. It is still far from clear what needs to be measured in order to assess progress. The best way to gather the information is to involve vulnerable communities in the M&E process. The aim of the action is to show how adaptation M&E can be used to guide collective action for local climate adaptation, and to assess how well collective action on climate adaptation benefits the climate vulnerable poor. The benefits of the action are: information for County governments to help improve climate adaptation planning and implementation and improvements in climate risk management of County authorities. The proposed activities under this action are to: identify suitable county cases; assess climate risk management by local authorities and customary groups through planning and other activities; negotiate how M&E system design, baselines setting and other interventions can be achieved with local stakeholders; survey available data on vulnerability, climate observations, local organisation for collective action, map formal and informal planning processes etc; set baselines; design M&E system with local actors; implement M&E system; assess changes in climate risk management; assess how well collective action for climate adaptation benefits the climate vulnerable poor; and derive lessons for County level support of climate adaptation by local groups.	
Areas of relevance The action is relevant to all sectors. The geographic area will depend on the county selected. Adaptation √ Mitigation ❒ Development √	
Current status There are structures within MDAs for district and ward level M&E, and upward reporting, although no coordinated approach to adaptation. Counties have not yet been established and the procedures are likely to change over the next year. Key to the process will be County Development Officers, as well as MDA-based M&E at county level.	
Lead Agency to take this Action forward The lead agency will be a county government, such as Isiolo or Garissa, to be determined in consultation with the counties.	
Stakeholder support required to take the action forward County level support from the MDAs will be essential, along with involvement of institutions responsible for coordinating upward reporting. These will include the relevant COMEC, MED and the MRV+ system.	

Indicative timeframe Launch timeframe: short term (in 2013). The action can be initiated prior to the formation of county governments, as much of the work is at a sub-county level, involving local authorities and customary groups. Duration of the Action: 12 months The action should be completed by mid 2014. Quick win opportunity ❒
Cost associated with the Action in Kenyan Shillings Costs for the first phase of the project are already available through IIED/ DFID, but implementation funding will be required from April 2013. The indicative cost for the action is TBC.
Immediate next steps For a successful outcome the relevant county level ATAR or NAP actions need to have been agreed (by end 2012). Assuming this condition is met, the action could be implemented from early 2013.

Action: 9 CLIMATE CHANGE RELEVANT DATA REPOSITORY (CCRDR)	**Action Reference Number:** NPBM-9

Action summary

NPBM-9 is a sub-component of NPBM-1. However, it is presented separately because it forms a discrete, valuable action that can be implemented independently of the MRV+ system.

Many data sets are required to permit quantification of greenhouse gas emissions and measurement of indicators. These data sets and the reports generated need to be stored in one place, so that they can be quality checked and easily accessed by individuals involved in Kenya's MRV^{+} system. The aim of the action is to set up an on-line geo-spatial data sharing system between ministries, NGOs, donors and the research community to allow currently fragmented and siloed data sets to be readily accessed and queried.

The proposed activities under the action are to:

- Carry out a user analysis to determine how the CCRDR needs to be structured to provide users with the data they need
- Store a list of data custodians, status and relevance to mitigation, adaptation and development, ensuring data providers are acknowledged for the data they supply;
- Categorise relevant data assets (e.g. maps of agricultural productivity, water scarcity, biomass availability, scenarios of climate impacts);
- Set-up a demonstration system for user testing;
- Ensure that sensitive data are protected and set up a process for data access/requests.

Research could then be commissioned to fill data gaps in consultation with the data and QA/QC working group and data mapping action. This might include remote sensing activities.

Areas of relevance

This action is relevant to all geographic areas in Kenya and all sectors.

Adaptation √ Mitigation √ Development √

Current status

There are currently multiple databases in Kenya, many of which contain high quality data, for example the databases held by the KNBS. However, these databases are not linked, not all contain data that are properly verified and gaining access to them tends to be a slow process.

Lead Agency to take this Action forward

This action should be led by the NCCS through the Data and QA/QC working group.

Stakeholder support required to take the action forward The following institutions should consulted, since they contain some of Kenya's best datasets: KMD, MED, KARI, DRSRS, WRMA, KFS, NEMA. Kenya's universities could play an important role in the CCRDR and should also be consulted. Private sector technology providers, particularly those with experience of software-as-a-service (SAAS) internet technologies should be involved, since secure remote hosting may be the most sensible option. The CCRDR should be designed and set up in close cooperation with the knowledge management system being developed in SC7 so that they are compatible.
Indicative timeframe *Launch timeframe*: short term *Duration of the Action*: 12 months (August 2013 – July 2014) This is a short term, priority action. It will help with the design of the CCRDR and operation of the MRV^{+} system and processes. The action should be completed as soon as possible, and ideally by the July 2014, in order to ensure a smooth roll-out of the NPBMF. *Quick win opportunity* √
Cost associated with the Action in Kenyan Shillings The indicative cost for the action is TBC.
Immediate next steps The action could be implemented after the MRV^{+} system components are established and teams put in place. The first step is to carry out a user analysis, which will take a period of 6 months.

Footnotes

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86 In addition, the consultancy team also prepared a separate overview report describing the overall climate finance landscape.

87 Kenya Climate Change Action Plan (2012) Subcomponent 8: Kenya National Climate Fund

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90 Kenya Climate Change Action Plan (2012) Subcomponent 8: Investment climate for climate investment

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