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Review of Current and Planned Adaptation Action in Kenya

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Jo-Ellen Parry



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About CARIAA Working Papers

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Titles in this series are intended to share initial findings and lessons from research and background studies commissioned by the program. Papers are intended to foster exchange and dialogue within science and policy circles concerned with climate change adaptation in vulnerability hotspots. As an interim output of the CARIAA program, they have not undergone an external review process. Opinions stated are those of the author(s) and do not necessarily reflect the policies or opinions of IDRC, DFID, or partners. Feedback is welcomed as a means to strengthen these works: some may later be revised for peer-reviewed publication.

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Abstract

In recent years, Kenya has achieved economic and human development gains, and adopted a new constitution that decentralizes greater decision-making authority to its 47 counties. However, the country continues to be challenged by water scarcity, high dependence on rain-fed agriculture, an expanding population, gender inequalities, and high levels of multi-dimensional poverty. These factors contribute to Kenya's vulnerability to climate change, particularly within its extensive arid and semi-arid lands (ASALs). Kenya has recognized its vulnerability to climate change and is establishing a comprehensive policy framework to guide and help implement its response to climate change. This includes creating a climate change bill, finalizing both its National Climate Change Response Strategy and its National Climate Change Action Plan (2013-2017), and establishing a National Climate Change Secretariat. In collaboration with its development partners, Kenya is also implementing adaptation actions that reduce the vulnerability of its agriculture, livestock, and water sectors, among others, particularly in its ASALs. Yet there remains significant need to increase attention to climate change across key sectors, such as tourism and infrastructure, and strengthen the capacity of county governments to realize the benefits of devolution and fulfill their role in implementing adaptation actions. Greater efforts are also needed to strengthen knowledge development and exchange among communities of practice. These issues are explored within this report, which is one of a series of country reviews prepared to provide the Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA) with a snapshot of adaptation action in its countries of engagement.

Résumé

Examen des mesures d'adaptation actuelles et prévues au Kenya

Ces dernières années, le Kenya a fait des avancées au chapitre du développement économique et humain, en plus d'avoir adopté une nouvelle constitution qui décentralise le pouvoir décisionnel au profit de ses 47 comtés. Mais le pays reste confronté aux défis de la rareté de l'eau, d'une grande dépendance envers l'agriculture pluviale, d'une population croissante, des inégalités entre les sexes et de niveaux élevés de pauvreté pluridimensionnelle. Ces facteurs contribuent à la vulnérabilité du Kenya du point de vue des changements climatiques, en particulier dans ses vastes régions arides et semi-arides. Conscient de sa fragilité face aux changements climatiques, le Kenya travaille à l'établissement d'un cadre stratégique exhaustif visant à guider son intervention et à en faciliter la mise en œuvre. Ce cadre prévoit la rédaction d'un projet de loi sur les changements climatiques, la mise au point de la stratégie d'intervention nationale en matière de changements climatiques et du plan d'action national sur les changements climatiques (2013-2017) ainsi que la création d'un secrétariat national des changements climatiques. En collaboration avec ses partenaires en développement, le Kenya est également occupé à instaurer des mesures d'adaptation qui visent à réduire la vulnérabilité de divers secteurs, entre autres ceux de l'agriculture, de l'élevage et de l'eau, tout particulièrement dans les régions arides et semi-arides. Mais il faut encore considérablement accroître l'attention portée aux changements climatiques dans les principaux secteurs, notamment le tourisme et l'infrastructure, et renforcer la capacité des gouvernements des comtés à prendre conscience des avantages de la déconcentration des pouvoirs et à jouer leur rôle dans la mise en œuvre des mesures d'adaptation. Il faut également consentir davantage d'efforts pour renforcer l'acquisition et l'échange de connaissances parmi les communautés de pratique. Ces questions sont examinées plus en détail dans ce rapport, qui s'inscrit dans une série d'examen de pays menés dans le cadre de l'Initiative de recherche concertée sur l'adaptation en Afrique et en Asie (IRCAAA), pour donner un aperçu des mesures d'adaptation dans les pays où elle est déployée.

Acronyms

ACT!	Act, Change, Transform
AfDB	African Development Bank
ASALs	arid and semi-arid lands
ASSAR	Adaptation at Scale in Semi-Arid Regions
BMUB	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
CARIAA	Collaborative Adaptation Research Initiative in Africa and Asia
CIDP	County Integrated Development Plan
DFID	Department for International Development (United Kingdom)
ENSO	El Niño Southern Oscillation
GCM	General Circulation Model
GOK	Government of Kenya
ICPAC	Intergovernmental Authority on Development (IGAD) Climate Prediction and Analysis Centre
IGAD	Intergovernmental Authority on Development
IOD	Indian Ocean Dipole
IPCC	Intergovernmental Panel on Climate Change
ITCZ	Inter-Tropical Convergence Zone
KCCWG	Kenya Climate Change Working Group
M&E	monitoring and evaluation
MDP	Ministry of Devolution and Planning
MENR	Ministry of Environment and Natural Resources
MSDP	Ministry of State for Devolution and Planning
NAP	National Adaptation Plan

NCCAP	National Climate Change Action Plan
NCCACC	National Climate Change Activities Coordinating Committee
NCCRS	National Climate Change Response Strategy
NDMA	National Drought Management Authority
OECD	Organisation for Economic Co-operation and Development
RCM	Regional Climate Model
RCP	Representative Concentration Pathway
SEI	Stockholm Environment Institute
StARCK+	Strengthening Adaptation and Resilience to Climate Change in Kenya Plus
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	United Nations High Commission for Refugees
USAID	US Agency for International Development
WRI	World Resources Institute

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Synopsis

Climate risks	<ul style="list-style-type: none"> • Rising temperatures • Uncertain changes in rainfall patterns • Rising sea levels and stronger storm surges • Greater risk of extreme weather events (droughts, floods, and landslides) 	Key sources of vulnerability	<ul style="list-style-type: none"> • High levels of multi-dimensional poverty, particularly in arid and semi-arid lands (ASALs) • High reliance of national economy and local livelihoods on rain-fed agriculture • High level of water scarcity and mismanagement of water resources, particularly in ASALs • Insecure land tenure and land fragmentation • Marginalization of pastoralists • Population growth and migration to urban areas • Heavy disease burden and limited access to quality health care, particularly in rural and hard to reach areas • Gender inequality • Increased insecurity and persistent corruption at all levels • Environmental degradation, including loss of forest cover and unsustainable fishing in Lake Victoria 	
Vulnerable sectors	Illustrative potential impacts on vulnerable sector	Illustrative adaptation measures in each sector		Projects in sector¹
Water	<ul style="list-style-type: none"> • Lower lake and river levels, particularly in the dry season • Less water for agriculture, households, wildlife, and energy • Salt water intrusion in coastal areas 	<ul style="list-style-type: none"> • Prioritizing climate change into all water management plans and actions • Rehabilitating and restoring all water catchments • Expanding irrigation systems and improving drainage 		26%
Agriculture	<ul style="list-style-type: none"> • Decline in overall crop production, including potential reductions in the yield of maize and beans in some locations • Lower crop and livestock production in ASALs • Greater food insecurity 	<ul style="list-style-type: none"> • Prioritizing adaptation needs into agricultural extension • Establishing and maintaining climate change-related information for agriculture • Increasing focus on specific adaptation actions such as water harvesting, agro-forestry, and seed bulking of drought-tolerant traditional high value crops 		41%
Livestock	<ul style="list-style-type: none"> • Reduced productivity due to heat stress and loss of pasture 	<ul style="list-style-type: none"> • Implementing grazing management systems and fodder banks • Diversifying livelihood strategies (e.g. bees, ostriches) 		15%

¹ Percentage of total identified discrete adaptation projects and programs based upon research undertaken as part of this review. Note that individual projects may address more than one sector.

	<ul style="list-style-type: none"> • Changes in disease patterns 	<ul style="list-style-type: none"> • Implementing livestock insurance schemes and disease control 	
Forestry	<ul style="list-style-type: none"> • Increased risk of wildland fire, pathogens, and diseases 	<ul style="list-style-type: none"> • Increasing tree cover by 10% per year 	0%
Energy	<ul style="list-style-type: none"> • Reduced access to biomass with less forest productivity • Decline in hydropower production 	<ul style="list-style-type: none"> • Expanding solar power provision, notably in ASALs • Increasing small hydropower, geothermal, and wind power generation • Improving energy efficiency at household and industrial levels 	4%
Health	<ul style="list-style-type: none"> • Shift in malaria range • Increased risk of water-borne diseases (e.g. cholera) 	<ul style="list-style-type: none"> • Improving urban sewage services to reduce disease • Increasing water and sanitation strategies in rural areas 	4%
Coastal zones	<ul style="list-style-type: none"> • Submergence of low-lying areas and associated salt water intrusion • Greater risk of storm surge 	<ul style="list-style-type: none"> • Increasing climate resiliency of coastal infrastructure 	0%
Environment	<ul style="list-style-type: none"> • Changes in ecosystem health • Migration of species 	<ul style="list-style-type: none"> • Strengthen capacity of national and county institutions, including improving access to climate-related data 	7%
Tourism	<ul style="list-style-type: none"> • Changes in species composition and location 	<ul style="list-style-type: none"> • Promote sustainable and climate-resilient tourism and increase resource efficiency 	0%
Particularly vulnerable regions	Particularly vulnerable groups	Status of climate governance (policies, institutions)	
<ul style="list-style-type: none"> • ASALs • Low-lying coastal regions 	<ul style="list-style-type: none"> • Poor rural women • Pastoralists within the country's extensive ASALs • People living on steep slopes in the highlands • Urban slum dwellers 	<ul style="list-style-type: none"> • <i>National Climate Change Response Strategy</i> published in 2010 and <i>National Climate Change Action Plan</i> in 2013. These documents include plans for a Kenya Climate Fund. • <i>National Adaptation Plan</i> validated in November 2015 • Climate Change Bill, 2014 is in the process of being passed into law. This will enable the <i>National Climate Change Framework Policy</i> and a climate finance policy to be established. 	

Introduction

The East African country of Kenya extends from its southern coastal areas along the Indian Ocean westward to temperate highlands bordering Uganda. Its southern border is shared with Tanzania while its north territory borders Somalia and Ethiopia. While Kenya's productive central and western highland areas, bisected by the Great Rift Valley, have a temperate climate, low and unevenly distributed rainfall over much of the country means that more than 80% of Kenya is classified as arid or semi-arid (Government of Kenya [GOK], 2010a).

A commercial, transportation, and communications hub for eastern Africa, Kenya's capital of Nairobi serves as a regional aviation hub and Mombasa hosts the region's largest port. The country has experienced moderate economic growth over the last five years and seen improved indicators of human development in areas such as education and declining birth rates. The government is working to build on these accomplishments to achieve Kenya's national vision of becoming a middle-income country by 2030 (GOK, 2007).

For this vision to be achieved, the country will need to overcome a number of persistent challenges, including the continuing prevalence of multi-dimensional poverty, inadequate health care for a growing population, and inequalities between rural and urban areas, between genders, and between regions. The country also needs to improve its transportation and energy infrastructure and address ongoing ethnic tensions (Ministry of State for Devolution and Planning [MSDP] & United Nations Development Programme [UNDP], 2013; UNDP, 2015). Many of these problems are particularly acute in the country's arid and semi-arid lands (ASALs).

Climate change presents an additional challenge for the country. Kenya's economic and social well-being has been significantly affected in the past by extreme weather events, particularly droughts and floods. The potential for climate change to adversely influence the outcome of Kenya's near- and long-term development objectives is increasingly recognized by the national government. In response, it has developed a national strategy and supporting action plan to identify its priority adaptation actions, and is developing a national adaptation plan. It is also establishing additional legal and institutional mechanisms to support the integration of climate change considerations into sectoral strategies, programming, and decision-making, including a climate change bill and policy. Efforts are also underway to build the capacity of the country's 47 counties to plan for and take action to address climate change.

This paper provides a snapshot of Kenya's current and planned efforts to meet the challenge of adapting to climate change. Drawing upon available literature, it has been prepared to support the work of the Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA). Jointly funded by the UK Department for International Development (DFID) and Canada's International Development Research Centre, CARIAA aims to help build the

resilience of poor people to climate change in three hot spots in Africa and Asia: semi-arid areas, deltas in Africa and South Asia, and glacier- and snow-fed river basins in the Himalayas. To achieve this goal, it is supporting four consortia to conduct high-calibre research and policy engagement activities that will inform national and sub-national planning processes in 17 countries, including Kenya.

The paper begins by describing Kenya's current exposure to climate risks and how these are expected to change in the coming decades. It then outlines the factors that increase the vulnerability of Kenya and its people to changing climatic conditions. It describes Kenya's current development status and the potential implications of climate change for key sectors, regions, and groups. Section 4 provides an overview of the critical policies and plans shaping Kenya's efforts to adapt to climate change at the national and sub-national levels. To assess the extent to which efforts to address the country's critical adaptation priorities are presently underway, section 5 paints a general picture of current and planned adaptation-focused programs and projects in Kenya, as well as the level of adaptation-related finance flowing into the country. A profile of in-country efforts to advance adaptation learning and knowledge sharing is provided in section 6. The paper concludes with an assessment of the general status of adaptation planning at the national and sub-national levels in Kenya.

1. Current climate and projected changes

Kenya has a complex and variable climate due to its topography and the influence of several regional and global climatic processes, including movement of the Inter-Tropical Convergence Zone (ITCZ), the El Niño Southern Oscillation (ENSO), and the Indian Ocean Dipole (IOD). As the ITCZ swings southward during the months of October to December it brings the short rainy season, while from March to May its northward swing marks the long rainy season (Daron, 2014). The western highland and the coastline also receive substantial rainfall from June to September (Stockholm Environment Institute [SEI], 2009). Decadal variability in precipitation patterns is associated with oscillation of the ENSO and the IOD. During El Niño years there is typically an increased amount of rainfall in the country, while during La Niña years the opposite is true (Conway, 2009; Daron, 2014). Additionally, when the phase of the IOD brings warmer surface water temperatures in the western Indian Ocean, rainfall in East Africa is observed to be stronger. The relationship between climatic conditions in East Africa and ENSO and IOD patterns is not well understood and continues to be subject of study (Daron, 2014).

These climatic variations, in combination with the country's topography, contribute to climatic regimes that range from warm and humid in the coastal regions to arid and very arid in the interior. Almost 80% of Kenya receives less than 700 mm of rain per year and is classified as arid or semi-arid. Rainfall in these regions is highly variable over space and

time (MENR, 2002). The most temperate areas of the country are located in the western and central highlands, near Lake Victoria and the Rift Valley. While parts of these regions receive between 1,200 and 2,000 mm of rain per year (MENR, 2002), some valleys and basins can be very dry (AEA Group, 2008).

Kenya is frequently affected by weather-related disasters, particularly droughts and floods. In the 1994–2013 period, the country experienced an average of 44.95 deaths per year and losses of 0.131 per unit of GDP per year due to these events (Kreft, Eckstein, Junghans, Kerestan, & Hagen, 2014). Drought occurs cyclically and historically has affected Kenya's economy more significantly than floods (Earth Institute, n.d.). Floods are seasonal and localized, mostly affecting parts of what were Nyanza and Western provinces (particularly around the Lake Victoria Basin, Tana River drainage basin, and coastal settlements) (Downing et al., 2008). Six significant floods have occurred since 1950, with the last one in 2006 affecting an estimated 723,000 people (SEI, 2009). The country is also affected by landslides, which are largely associated with heavy rainfall in regions with steep slopes, such as the former provinces of Western and Nyanza, as well as the north Rift Valley (UNDP, n.d.).

1.1 Observed climate trends

Since 1960, Kenya has experienced a general warming trend (Met Office et al., 2011; GOK, 2010b), reported as being about 1°C, or 0.21°C per decade (McSweeney, New, & Lizcano, 2009). This temperature increase has been observed across all seasons, but particularly from March to May. Variation between locations has occurred, with a cooling trend observed in parts of eastern Kenya and a lower rate of warming (about 0.4°C–1.2°C from 1963–2012) along the coast (Daron, 2014).

Detecting clear signals of change in Kenya's precipitation levels is challenging given its high level of natural annual and decadal variability, as well as the potential influence of other factors such as deforestation (Daron, 2014). Looking at all of East Africa in this context, weak trends of rainfall increase have been observed in some locations over the last 50 years and rainfall decrease has been noted in other locations (Daron, 2014). In Kenya, rainfall increases have been observed during the short rains of October to December, particularly in northern Kenya but also in the Rift Valley and eastern Kenya (Njoka, 2015).² In northern Kenya, the short rains have been extending into the historically hot and dry months of January and February (Downing et al., 2008; GOK, 2010b). In contrast, there has been a decrease in rainfall during the long rains (March to May) of more than 100 mm in this region (Daron, 2014).

There is uncertainty whether there has been a change in the frequency or severity of extreme climatic events over the past few decades. For example, a United Nations

² The final report is available from http://prise.odi.org/wp-content/uploads/2016/01/Low-Res_Kenya-CSA.pdf.

Development Programme (UNDP) (n.d.) study found that droughts have increased over the past 40 years due to factors such as deforestation, while Ziervogel et al. (2008) found no indication of greater frequency or intensity of drought. The sparse amount of information available, combined with the inherent infrequency of extreme events, makes identification of trends inherently challenging (Daron, 2014).

1.2 Climate change projections

The current trend of rising mean annual temperatures is projected to continue in Kenya in all seasons (Daron, 2014). Climate modelling for the East Africa region using a high-emissions scenario projects that mean annual temperatures will increase by 0.9°C by 2035, 2.2°C by 2065, and 4.0°C by 2100³ (Christensen et al., 2013). Modelling for Kenya has suggested that mean annual temperatures could increase of 1°C by the 2020s and 4°C by 2100 (Downing et al., 2008). However, the degree of temperature increase will likely vary between regions; for example, the lowlands may experience a higher rate of temperature increase than Kenya's plateaus and highlands (Funk, Eilerts, Davenport, & Michaelsen, 2010). A study by Funk et al. (2010) estimated that temperatures in western Kenya could increase 0.9°C –1.1°C by 2025. The same study indicated that temperatures in the northern region could increase by a similar amount (1.1°C), but projected a lower rate of warming in the southern coastal region (of 0.5°C).

Precipitation projections are more uncertain, due in part to the natural variability of the region's climate system and limited understanding of how the atmospheric processes that affect Africa's current climate may alter in the future (Conway, 2009; Daron, 2014). The median of modelling projections by the Intergovernmental Panel on Climate Change (IPCC) for East Africa suggests that precipitation will be unchanged by 2035, increase by 4% by 2065, and increase by 11% by 2100. However, there is considerable variability in these modelling results regarding the magnitude and direction (increasing or decreasing) of potential change⁴ (Christensen et al., 2013).

Precipitation projections focused specifically on Kenya are uncertain and vary between studies. In a study using Regional Climate Models (RCMs), the AEA Group (2008) suggests that rainfall will increase during the long rains season (March to May), particularly in the highlands and along the coast. During the short rains (October to December), increases were projected only in locations to the west of Rift Valley, along the coast and in the extreme north-east region. A study by the UK Met Office (Met Office et al., 2011) projected that rainfall would increase by as much as 20% by 2100, particularly in central Kenya.⁵ In contrast, Funk et al. (2010), based on analysis that extended observed precipitation trends

³ These projections represent a 50% likelihood of occurrence, using 39 global models and the Representative Concentration Pathway (RCP) 8.5 scenario, and assessed against a baseline period of 1986–2005.

⁴ For example, projections for 2100 range from a decline of 11% to an increase of 34% (Christensen et al., 2013). These figures are for RCP8.5 and compared against a baseline period of 1986 to 2005.

⁵ This projection is based on the average outcome of 21 CMIP3 models and compared to a baseline of 1960 to 1990 (Met Office et al., 2011).

out to 2025, forecasts that precipitation levels in the long rains season will decline by more than 100 mm in large parts of the interior of Kenya. A more recent analysis using two coupled General Circulation Models (GCMs) and RCMs found considerable variability in projected precipitation changes, with some models projecting wetter and other drier conditions⁶ (Daron, 2014). These results suggest that the normal variability in Kenya's precipitation patterns will be the dominant influence on its climate over the coming decades (Daron, 2014).

Rising sea levels are a concern for Kenya's coastal areas. Globally, sea levels are projected to rise 26 cm–55 cm by the 2080s under a low-emissions scenario, and 45 cm–82 cm under a high-emissions scenario (IPCC, 2013). The rate of sea level rise along Africa's Indian Ocean coast is projected to be greater than the global average (Schaeffer et al., 2015). It has been estimated that rising sea levels will lead to 10,000 –86,000 Kenyans being affected by coastal flooding each year by 2030 (SEI, 2009). The economic impact of this change has been estimated to be US\$58 million per year by 2030 and US\$31 million to US\$313 million per year by 2050 (SEI, 2009).

2. Vulnerability to climate change

The vulnerability of Kenya's people, economy, and ecology to climate change will be determined by their capacity to manage, adapt to, and recover from, the climatic changes to which they are exposed. This section begins by exploring the economic, political, demographic, social, and environmental factors within Kenya that influence its adaptive capacity. This is followed by an assessment of the potential implications of projected climatic changes for key economic sectors and groups within Kenya.

2.1 Current drivers of vulnerability

Since gaining independence in 1963, Kenya has striven to alleviate the poverty of its people and increase its level of economic prosperity. After struggling in the 1980s and 1990s, the country began to make progress toward these goals in the late 1990s and early 2000s when it introduced economic reforms and returned to democratic, multi-party elections. This momentum led to adoption of a new constitution in August 2010, following a national referendum. This constitution significantly altered Kenya's governance structure by placing more checks on the power of the executive, creating a more independent judiciary and more powerful legislature, establishing a comprehensive bill of rights, and creating 47 new counties with additional responsibilities and more access to resources (Friedrich Ebert Stiftung, 2010). It came into effect in March 2013 following peaceful elections and a transfer

⁶ Analysis based on the use of combination of two GCMs (HadGem2 and ICHEC) and two RCMs (KNMI and CCLM4) driven by RCP8.5, with projections relative to a baseline of 1950 to 2000. The model combinations were HadGem2-CCLM4, ICHEC-CCLM4 and ICHEC-KNMI.

of power. Governance structures in Kenya are evolving as provisions in the constitution are implemented.

Reforms initiated over the past two decades have also improved Kenya's economic situation. The country's average rate of economic growth was 6.2% between 2010 and 2013, with GDP reaching US\$55.24 billion in 2013, as indicated in Table 1 (World Bank, 2015a). Today the services sector constitutes the largest portion of Kenya's economy (generating 50.7% of GDP in 2013), but agricultural production remains an important economic activity (29.5% of GDP in 2013) and a significant source of export earnings (Kenya National Bureau of Statistics, 2014). Agriculture also continues to be a vital source of employment, food security, livelihoods, and economic development, generating 65% of informal employment in rural areas (GOK, 2013a). In Kenya's ASALs, livestock production is particularly significant and this sector collectively generates about 13% of GDP (MSDP & UNDP, 2013).

Livestock and agricultural production in Kenya is highly dependent on rainfall. Only 1.7% of Kenya's agricultural lands is irrigated (GOK, 2010a), which leaves agricultural production and food security, as well as national economic performance, highly sensitive to changes in rainfall volumes and patterns (MSDP & UNDP, 2013). Land fragmentation is a further source of vulnerability. High population levels and traditional land-inheritance practices in high-potential agricultural areas have led to smaller, potentially less-economical landholdings. An estimated 75% of rain-fed agricultural output and 70% of marketed agricultural produce is derived from farms with an average size of 0.2–3 hectares (GOK, 2010a). Further difficulties facing the agricultural sector include insecure tenure, landlessness, and land degradation (GOK, 2010a).

Kenya has experienced improvements in its human development indicators in parallel with its political and economic gains. Its score on the Human Development Index has risen from 0.420 in 1980 to 0.535 in 2013 (MSDP & UNDP, 2013; UNDP, 2014). It is now classified as a lower-middle-income-country (World Bank, 2014) and has a growing middle class. Although these trends indicate that the lives of Kenyans are improving, a number of challenges remain. Poverty rates remain high, with 48% of Kenyans living in multi-dimensional poverty and 16% in severe multi-dimensional poverty (UNDP, 2015). Inequalities across the country and among population groups remain high, with the highest levels of poverty found in the ASALs, home to 14 million people, where over 60% of the population lives below the poverty line (Njoka, 2015).

Development progress in Kenya is influenced by, and in turn influences, the country's ongoing demographic change. Of its population of over 44.3 million people (UNDP, 2014), an estimated 70% currently reside in rural areas (World Bank, 2011). However, strong migration from rural to urban centres, estimated to be 250,000 people per year, has led to predictions that 37% of Kenyans will live in urban centres by 2020 and that Kenya will be a predominately urban country by 2030 (World Bank, 2011). In parallel, the country's overall

population is continuing to grow at a rate of 2.6% per year (World Bank, 2015b), largely due to higher survival rates and greater life expectancy as the birth rate has significantly declined in recent years (from 51 per 1,000 people in 1960 to 35 per 1,000 people in 2014) (World Bank, 2011, 2015b). The rate of population growth has challenged the capacity of the government to meet its desired job creation targets. Of particular concern is the rate of youth unemployment, estimated by some sources to be as high as 25% (Ministry of Devolution and Planning [MDP], 2013a).

Progress has been made in education, particularly since Kenya introduced free primary education for all in 2003 (World Bank, 2009). The Net Enrolment Rate at the primary level reached 95.3% in 2012, with just over three-quarters of students (equally between girls and boys) moving from primary to secondary school (MDP, 2013a). However, the level of enrolment in the north-eastern region remains below the national level, with only 40.3% of school age children enrolling in primary education (MDP, 2013a). Female literacy in some arid counties is less than 10% (MDP, 2013b).

Access to quality health care remains limited; while 52% of Kenyans are able to access basic health care services within 5 km of their home, significant disparities remain between urban and rural and hard-to-reach areas (MDP, 2013a). As maternal death remains a key challenge for the country — at 488 maternal death per 100,000 live births (GOK, 2013b) — the Government of Kenya (GOK) initiated free maternity services in all public facilities in 2013. These services are expected to encourage more women to deliver at health facilities and to result in fewer maternal deaths (GOK, 2013b). Under-five mortality has declined from 110 in 2000 to 73 in 2011 (UNDP, 2014). Malaria — which is sensitive to climatic changes — is a leading cause of disease and morbidity among Kenyans (Ministry of Public Health and Sanitation, 2009). HIV/AIDS, which was responsible for 14.8% of mortality in 2012 (World Health Organization [WHO], 2012), also remains a significant health concern for the country. Other health concerns include lower respiratory infections, tuberculosis, and diarrhoea (MDP, 2013a). Water-borne diseases due to poor sanitation are high and estimated to cost 0.9% of the GDP per year (MSDP & UNDP, 2013).

Gender inequality also continues to be a persistent challenge, with Kenya ranking 122 out of 187 countries on the Gender Inequality Index (UNDP, 2014). Fewer women move from primary to secondary school, and fewer again then move on to post-secondary education, and less than 30% of people engaged in wage employment are women. Access to and control over property remains a concern, particularly given that up to one-third of Kenyan households are now headed by women. Many of these households are in rural locations, largely due to men migrating to urban areas (Omondi, 2014). Female-headed households are more likely to suffer chronic food insecurity than male-headed households (Nakweya, 2014). The assurance of legal access for women under the new constitution may help to overcome these current inequalities (MSDP & UNDP, 2013).

Security is a growing concern in the country. Long considered to be one of the most stable countries in East Africa, this reputation was shaken in late 2007 by inter-ethnic conflict following a disputed presidential elections process widely perceived to be flawed (DFID, 2009). The political and ethnic tensions that led to these events continue to be of concern. In the ASALs, longstanding conflicts between pastoralists and between pastoral and agro-pastoral communities continue to affect the region's development. These tensions are largely driven by competition over scarce resources. The country also experiences terrorist attacks, particularly by Al-Shabaab in response to Kenya's military entering Somalia in October 2011. These attacks include the assault on Westgate Mall in September 2013 and Garissa University in April 2015. Kenya also hosts a large refugee population. The UN High Commission for Refugees (UNHCR) estimated that 596,740 refugees were in Kenya in January 2015, of which more than three-quarters were from Somalia and a growing number from South Sudan (UNHCR, 2015). Many of these refugees reside at the Dadaab refugee camp in northern Kenya, one of the largest in the world, where concern has been expressed about its impact on local natural resources, in particular on groundwater and wood supplies (Dadaab - locals vs refugees, 2011).

A further impediment to Kenya's development is widespread corruption within government and the business sector (GAN Integrity Inc., 2014). Perceived to be among the most corrupt countries globally, Kenya was ranked 145 of 174 countries by Transparency International (2014). The government has taken some steps to address this issue and officially committed to strengthening the capacity of agencies responsible for addressing this issue, such as the Ethics and Anti-Corruption Commission (MDP, 2013a).

Kenya also faces a number of environmental challenges, particularly surrounding water availability. One of the most water-scarce countries in Africa, Kenyans per capita access to renewable internal freshwater resources was estimated to be 467 cubic metres in 2013 (World Bank, 2015b). Water sources cover 1.9% of the country and include Lake Victoria, Lake Turkana, Lake Naivasha, Lake Baringo, and the swamps of the Loraine Plain (Matumba et al., 2010). These sources support agriculture, which uses 70% of Kenya's renewable freshwater, as well as fisheries, hydropower generation, manufacturing processes, and human consumption and sanitation (World Water Assessment Programme, 2006). Access to water is particularly acute in the ASALs, where groundwater is often the only reliable source of water (World Resources Institute [WRI] et al., 2007).

The country's five water towers — the Aberdare Ranges, Cherangani Hills, Mau Escarpment, Mt. Elgon, and Mt. Kenya — play a critical role in water availability. Covering more than one million hectares, they are the source of all but one of Kenya's major rivers. However, significant deforestation within these regions, spurred by factors such as population growth, agricultural conversion, and charcoal production, has disrupted the hydrological regime by reducing infiltration and increasing run-off and the siltation of water reservoirs (GOK, 2007). Deforestation also leads to the loss of economic and ecosystems service

benefits, including food, wood fuel, fodder, pasture and medicine, which are an important safety net for poor households (Mutimba, Mayieko, Olum, & Wanyatma, 2010).

In summary, in recent decades Kenya has seen improvements in economic performance and education, and these improvements have helped boost the country's overall level of human development. However, the continued poor performance of its health care system, significant infrastructure deficit, persistent corruption, and the potential for greater conflict limit the country's adaptive capacity. High levels of inequality in life expectancy, education, income per capita, and gender are additional concerns. The country's ASALs in particular face numerous economic, social, and ecological challenges that increase their residents' vulnerability to shocks and stresses, including those that may be generated by climate change.

Table 1 – Key indicators of development progress for Kenya				
Category	Indicator	Year	Value	Source
Human development	Human Development Index (score ^d /rank ^d out of 187 countries)	2013	0.535 / 147	UNDP (2014)
	Population in multi-dimensional poverty (%)	2013	48.2%	
	Under-five mortality rate (per 1,000 live births)	2013	73	
	Adult literacy rate (15 years of age and above)	2013	72.2 ^c	
	Improved water source, rural (% of population with access)	2012	55%	World Bank (2015a)
	Improved sanitation facilities (% of population with access)	2012	30%	
	Access to electricity (% of population)	2010	23.0%	
Gender	Gender Inequality Index (value ^e /rank ^d out of 187 countries)	2013	.548 / 122	UNDP (2014)
Demographics	Total population (in millions)	2013	44.354 ^a	UNDP (2014)
	Average annual population growth rate (%)	2010	2.7	
	Population, urban (% of population)	2011	24.0% ^b	
Economic development	GDP (in current US\$, millions)	2013	55,243.05	World Bank (2015a)
	GDP growth (annual %) (average of period 2010 to 2013)		6.2%	

	Agricultural land (% of land area)	2012	48.2%	
Governance	Corruption Perceptions Index (score ^f)	2014	25	Transparency International (2014)
	Corruption Perceptions Index (rank ^d out of 174 countries)	2014	145	
	Fragile States Index (score/status)	2014	99.0 / Alert	Fund for Peace (2014)
	Expenditure on education, Public (% of GDP)	2012	6.7 ^c	UNDP (2014)
	Expenditure on health (% of GDP)	2011	4.5%	
Environment	Population living on degraded land (%)	2010	31.0%	UNDP (2014)
	Change in forest area, 1990/2011	2013	-6.8%	
<p>^a Projections based on medium-fertility variant</p> <p>^b Because data are based on national definitions of what constitutes a city or metropolitan area, cross country comparison should be made with caution.</p> <p>^c Data refer to the most recent year available during the period specified</p> <p>^d Where 1 or first is best</p> <p>^e Where 0 is best</p> <p>^f Where 0 is highly corrupt and 100 is very clean</p>				

2.2 Vulnerability of key sectors, regions and groups

A number of factors contribute to Kenya's vulnerability to a changing climate. Among these are the country's high degree of absolute and relative water scarcity and its high reliance on climate-sensitive economic activities, such as crop production, livestock production, tourism, and hydroelectric power generation. Existing concerns such as limited access to improved sanitation facilities, a weak health care system, and inadequate infrastructure also increase the country's vulnerability to climate change. Additionally, Kenya's readiness to respond to the impacts of climate change is constrained by factors such as low enrolment in tertiary education and continuing concerns about its political stability. Taking into consideration these and other factors, Kenya was ranked 155 out of 178 countries in 2013 on the Notre Dame Global Adaptation Index (ND-GAIN) due the combination of its high level of vulnerability to climate change and low level of readiness (see Table 2) (ND-GAIN, 2015).

Table 2 – Comparison of Global Adaptation Index scores for Burkina Faso and neighbouring countries					
Country	Vulnerability*		Readiness**		Overall
	World rank	Score	World rank	Score	World rank
Kenya	148	0.516	162	0.311	155
Tanzania	141	0.493	125	0.370	135
Uganda	166	0.554	147	0.335	159
Rwanda	168	0.563	95	0.455	131
Burundi	178	0.623	168	0.298	176
<p>* Lower score indicates lower vulnerability. Vulnerability is measured for the following sectors: food, water, health, ecosystem services, human habitat, and infrastructure.</p> <p>** Higher score indicates higher degree of preparedness. Readiness is measured by looking at the economy, governance systems, and social readiness.</p>					

Source: ND-GAIN, 2015.

Kenya's agriculture, energy, and health sectors are particularly vulnerable to the impacts of climate change, as summarized in Table 3. Food availability, accessibility, utilization, and system stability are anticipated to be affected, which will increase food insecurity (GOK, 2010b). Such changes have direct economic implications for smallholder farmers and the national economy, as has been demonstrated by historical extreme climate events. The Kenya drought of 2008 to 2011 caused an estimated US\$12.1 billion in economic losses and damage (MDP, 2013b) and the floods from 1997 to 1998 caused US\$230 million in damages to the agriculture sector (SEI, 2009).

The vulnerability of the agriculture sector stems in large measure from the sector's high dependence on rain-fed production, with smallholder farmers being particularly dependant on the rains for their production (Harding & Devisscher, 2009). The government has prioritized irrigation expansion to address food security and climate vulnerability concerns, noting that that existing infrastructure supports irrigation of only 153,800 hectares of agricultural land while approximately 890,000 hectares could be irrigated (MDP, 2013a). However, irrigated agriculture may not be sustainable in the long-term given projected temperature increases, associated increases in evapotranspiration rates, and changes in rainfall patterns. Particular concern has been directed toward plans for large-scale irrigation systems in the north-eastern portion of Kenya due to their potential to undermine local pastoralist livelihoods (Irrigation scheme..., 2013).

How climate change will affect specific crops remains uncertain and is an area for further research. Crop impact assessments are challenging due to the uncertainty associated with future hydrological regimes, higher temperatures, and responses to high levels of atmospheric carbon dioxide levels (Kilroy, 2015). Existing studies have largely focused on

potential impacts on maize production, given its importance to food security, and suggest the potential for long-term declines in production (Kandji & Verchot, n.d.; Sivakumar et al., 2005). The situation is likely to be more nuanced, with maize production declining in some regions of the Kenya while increasing in others. A study conducted as part of a broader analysis of climate change's impact on agriculture in East Africa suggests that maize production in Kenya may increase by 2050 as its growth becomes possible in areas that previously were too dry, offsetting areas where its growth is no longer viable (Odera, Thomas, Waithaka, & Kyotalimye, 2012). Similarly, another study projected that maize production in the country's semi-arid regions would decline by as much as 20% or more by 2050, but would increase in central and western Kenya. Within the same study, widespread reductions in bean production were also modelled, except in the western highlands, where substantial yield increases were anticipated (Thornton, Jones, Alagarswamy, & Andresen, 2009).

Concerns about the impact of climate change on Kenya's energy sector focus on the vulnerability of its hydroelectric power sector, which supplies about 45% of the country's electricity (Power Africa, n.d.). In recent years, energy production from this source has become increasingly unreliable at the same time that demand is increasing, with negative economic consequences. Climate change is expected to further reduce hydroelectric power production capacity as river water flows decline (particularly in the dry season) and reservoir siltation potentially increases (GOK, 2010b). Higher temperatures will also increase evapotranspiration rates. One modelling exercise has estimated that hydropower generation could be reduced from 2,253 gigawatt-hours per year to between 1,763 and 2,144 gigawatt-hours per year by 2050 (Dyszynski, Droogers, & Butterfield, 2009).

Traditional energy sources such as wood, charcoal, dung, and agricultural residues continue to be the primary energy source for more than 85% of Kenyans (GOK, 2011). In the absence of providing significant numbers of Kenyans with access to clean, modern energy supplies, it is expected that declines in forest and agricultural productivity will have a knock-on impact on energy availability, particularly in rural areas and by the poor. These ramifications are particularly important for women and children, who most often collect fuelwood.

The health impacts of climate change for Kenya could also be significant. Potential increases in malaria and cholera, both of which are climate-sensitive diseases, are of particular concern. It is uncertain whether rising temperatures will lead to greater incidence of malaria at higher altitudes of the Kenyan highlands (see Dekens, Parry, Zamudio, & Echeverría, 2013), but it has been suggested that the number of rural Kenyans at risk could increase by 36%–89% by 2050. This means that 2.9–6.9 million more people could be at risk of contracting malaria, which would have significant economic consequences (SEI, 2009). Further research of malaria, cholera, heatstroke, malnutrition, and HIV/AIDS is needed to better understand the potential health-related risks of climate change for Kenyans.

Kenya's ASALs are acknowledged as being particularly vulnerable to the impacts of climate change. The highest incidence of poverty is found in these areas and they are currently experiencing greater competition over resources, rising populations due to natural growth and migration from the densely populated highlands, and lower access to infrastructure such as potable water, electricity, and telecommunication facilities (Njoka, 2015). The region's economy is highly dependent on climate sensitive activities, with pastoralism accounting for 90% of employment (International Fund for Agricultural Development, 2007). A fuller analysis of the vulnerability of Kenya's ASALs to climate change may be found in Njoka (2015).

Kenyan women are particularly vulnerable to the impact of climate change, due in part to their continuing challenges to access and own resources. Remote and pastoralist communities are also at increased risk, as they face environmental degradation and growing competition for land and water. In the highlands, those living along steep slopes are particularly vulnerable to droughts and floods. Concern has also been expressed regarding the vulnerability of people living in urban slums (MSDP & UNDP, 2013).

Sector	Likely impacts of climate change
Water	<ul style="list-style-type: none"> • Reduced availability of surface water supplies (rivers and lakes) for activities such as irrigation, livestock production, household use, wildlife, and industry (Andersen et al., 2008; Harding & Devisscher, 2009) • Salt water intrusion along the coast due to rising sea levels, with implications for domestic, industrial, and agricultural uses, as well as coastal ecosystems
Agriculture	<ul style="list-style-type: none"> • Decline in overall crop yields in the majority of the country due to insufficient availability of water, greater evapotranspiration, more pests, diseases, and weeds • Lower production in the ASALs due to temperature increases and lower precipitation, leading to reduced soil moisture (MENR, 2002; Kabubo-Mariara & Karanja, 2007) • Uncertainty regarding the impact of production of specific crops, with maize production projected to increase in some areas but decrease in others (Odera et al., 2012; Thornton et al., 2009) • Greater reliance on irrigation due to reduced precipitation (GOK, 2010b) • Greater food insecurity (UK Met Office, 2011)
Livestock	<ul style="list-style-type: none"> • Decline in production due to lack of pasture, reduced access to water, and heat stress (Thornton et al., 2009) • Impact on livestock diseases uncertain (Thornton & Gerber, 2010), but potential for re-emergence of tsetse flies and associated African trypanosomiasis in the highlands (Daron, 2014)
Forestry	<ul style="list-style-type: none"> • Increased exposure to fire, pathogens, and invasive species • Reduced provision of environmental resources and economic activity

(Mutimba et al., 2010)	
Tourism	<ul style="list-style-type: none"> • Tourist facilities affected by reduced water availability and greater demand for electricity (WRI et al., 2007) • Damage to roads and buildings due to more frequent flooding and storm surges (Murphy & Harris, 2014) • Adverse impacts on ecologically sensitive tourist destinations, such as the glaciers of Mt. Kenya, coastal rainforests, and marine ecosystems (Murphy & Harris, 2014) • Potential for migration of wildlife populations, with implications for park boundaries (Viner & Agnew, 1999) • Potential for loss of species, particularly those that might be already stressed by poaching
Energy	<ul style="list-style-type: none"> • Decline in forest productivity would further restrict availability of fuelwood • Further reduction of hydroelectric power production capacity as water flows in rivers decline (particularly in the dry season) and reservoir siltation potentially increases (GOK, 2010b) • Increased demand for energy as high temperatures encourage the use of air conditioners and refrigeration (GOK, 2010b)
Health	<ul style="list-style-type: none"> • Shift in the geographic range of malaria to the highlands • Increase in the incidence of malaria, Rift Valley fever, malnutrition, scabies, chiggers, and lice infestations (WHO, 2010) • Increase in water-borne diseases such as cholera and typhoid, particularly given Kenya's poor water and sanitation conditions (WHO, 2010; MSDP & UNDP, 2013)
Coastal zones	<ul style="list-style-type: none"> • Submergence of low-lying areas and increase in water logged areas (Awuor, Orindi, & Adwera, 2008) • Increase in salt water intrusion, particularly if accompanied by lower rainfall (MENR, 2002) • Damage to critical infrastructure such as the port of Mombasa (Awuor et al., 2008) • Greater exposure of storm surges (Kebede, Nicholls, Hanson, & Mokrech, 2010)

3. Adaptation planning context

The GOK has progressively established a robust framework of policies and institutions to support its efforts to address climate change, including the need to adapt to its impacts. Among these are the Kenya Climate Change Response Strategy and the Kenya Climate Change Action Plan, as summarized in Table 4. Implementation of these policies is influenced by the broader development objectives of the country, as set forth in Kenya

Vision 2030, and the ongoing process of devolution of responsibility and authority for key functions from the national to the county level.

Table 4 – National adaptation planning context: Summary of progress as of September 2015	
Indicator	Progress
Climate change recognized in the country’s guiding development vision/plan	<i>Kenya Vision 2030</i> released in 2007; climate change actions identified in <i>Second Medium Term Plan (2013–2017)</i>
National-level coordinating entity for climate change established and active	National Climate Change Secretariat housed in the Ministry of Environment and Natural Resources coordinates and provides technical assistance on matters related to climate change
Climate change policy and/or law in place	Climate Change Bill, 2014, currently being passed into law
Climate change strategy published	<i>National Climate Change Response Strategy</i> published in 2010
Climate change action plan published	<i>National Climate Change Action Plan</i> released in 2013
Adaptation plan published	<i>National Adaptation Plan</i> presently being finalized
Climate change fund or adaptation fund operational	Commitment to establish Kenya Climate Fund included in action plan and Medium Term Plans; climate finance policy has been drafted
Climate change units established in key ministries	Climate change issues being addressed by National Treasury and the Ministry of Devolution and Planning (MDP)
Climate change integrated into national sectoral policies	To some degree in several national sectoral policies, strategies, and plans, including those related to agriculture, drought risk management, water resources, and disaster risk management

3.1 National-level development policy context

Kenya’s development goals and objectives are articulated in Kenya Vision 2030. Released in 2007, this strategy document puts forth the vision of Kenya becoming a “globally competitive and prosperous country with a high quality of life by 2030” (GOK, 2007, p. xii). Kenya’s plans to achieve this vision and become an industrialized, middle-income country by 2030 are built around three pillars:

- The Economic Pillar, which strives to achieve a 10% rate of economic growth and sustain it until 2030 (GOK, 2007);

- The Social Pillar, which aims to achieve a “just, cohesive and equitable social development in a clean and secure environment” (GOK, 2007, p. xii); and
- The Political Governance Pillar, which focuses on creating “an issue-based, people-centred, result-oriented and accountable democratic system” (GOK, 2007, p. xii).

Climate change is identified in Kenya Vision 2030 as one of several potential environment-related risks that could slow the country’s expected rate of economic growth. The document specifically notes the risks associated with the country’s dependence on climate-sensitive economic sectors and weak capacity to cope with climate hazards (GOK, 2007). The ASALs are identified as particularly vulnerable areas of the country and a goal is set of piloting five programs that would support adaptation to climate change and desertification in these regions. Kenya Vision 2030 also highlights the need to integrate climate change adaptation into national disaster management planning and, more generally, to shift from disaster response to disaster risk reduction (GOK, 2007).

Kenya Vision 2030 identifies over 120 projects to support achievement of its goals, some of which may be expected to reduce Kenya’s vulnerability to the impacts of climate change. These include modernizing Kenya’s meteorological systems to strengthen the country’s disaster preparedness; the ASALs Development Projects, which aim to increase the irrigated land area in this region by 100,000 hectares per year; and the Rehabilitation and Protection of Indigenous Forests in Five Water Towers project, which aims to fully rehabilitate and protect the Mau Escarpment, Mt. Kenya, Aberdare Range, Cherangani Hills, and Mt. Elgon.

Kenya Vision 2030 is being implemented through a series of five-year plans. The First Medium Term Plan (2008–2012) included commitments to reduce Kenya’s vulnerability to climate risk, such as securing funding from international sources to support adaptation action in Kenya’s ASALs and other high-risk zones, implementing the Meteorological Systems Modernisation Programme, strengthening the National Climate Change Secretariat, and improving disaster response capacity (Ministry of State for Planning, National Development and Vision 2030, 2008).

The current Second Medium Term Plan (2013–2017) is subtitled Transforming Kenya: Pathway to Devolution, Socio-Economic Development, Equity and National Unity. Primary objectives of the plan include ensuring continued implementation of the devolution process underway in Kenya (described below), ensuring macro-economic stability, and sustaining growth in the agriculture, manufacturing, and service sectors (MDP, 2013a). The Second Medium Term Plan acknowledges the need to achieve its objectives while building resilience to climate change. The threats that climate change pose to agriculture, energy, environment, water, and sanitation are noted and several climate change actions are identified — many of which are consistent with recommendations contained in Kenya’s National Climate Change Action Plan (NCCAP) (which are described in section 4.2).

The plan includes commitments to finalizing Kenya's National Climate Change Response Strategy (NCCRS), revising a previously formulated climate change policy and bill to guide the country's mitigation and adaptation efforts, implementing the NCCAP, and establishing a Kenya Climate Fund. Sectoral commitments also address climate change adaptation. For example, in the agriculture sector, the government commits to adopting climate-smart agriculture, strengthening early warning systems, improving water harvesting, irrigating 404,800 hectares of land, introducing a national livestock insurance scheme, and promoting the growth of resilient food crops. Further, one of nine Foundations for National Transformation (MDP, 2013a, p. 41) is to "strengthen people's resilience to drought and improve the monitoring of, and response to emerging drought conditions." Implementation of this goal is linked to enhancing capacity to adapt to climate change by strengthening the institutional framework for drought management, developing an "integrated drought, climate, and food security information system and a harmonized data gathering and processing mechanism" (MDP, 2013a, p. 137).

A number of the priorities detailed in the Second Medium Term Plan reflect recommendations contained in the NCCAP. These include modernizing Kenya's meteorological services, rehabilitating and protecting the water towers, improving conservation and management of forests and wildlife, and the introduction of a water resources management program. Other objectives in the Second Medium Term Plan that could aid in reducing the country's vulnerability to climate change are: to continue to expand Kenya's physical infrastructure; to modernize the country's energy infrastructure network and increase renewable energy production; to complete the ongoing land reform process; to further increase access to primary and secondary education; to improve primary health care and the management of communicable diseases; to improve urban and rural housing; and to provide greater support to policies and institutions focused on advancing gender equity (MDP, 2013a).

As previously noted, one of the GOK's present core objectives is to ensure continued implementation of the legal and institutional changes required under the country's new constitution, which was put in to effect in August 2010. In particular, the constitution establishes a new bicameral political system. At the national level this system consists of an executive arm and a parliament, while at the sub-national level it comprises 47 counties each with their own assembly and executive (GOK, 2010c). Within the current Medium Term Plan, the government has committed to enacting the legislation required to implement the devolution process, prioritizing building the capacity of county governments to take on their new responsibilities, providing financial and human resources, and improving policy coordination and implementation (MDP, 2013a). Formal devolution of responsibility began following the March 2013 elections at the national and county levels.

With devolution, county governments now have greater decision-making authority and responsibility over key policy areas such as agriculture, livestock, fisheries, public health, early childhood education, and county roads (MDP, 2013a). Objectives of the process

include enhancing the participation of people in decision-making, ensuring equitable sharing of national and local resources, and protecting the rights of minorities and marginalized groups (GOK, 2010c). Devolution could also enhance the accountability of county governments in the provision and delivery of services (World Bank, 2011) and promote the emergence or strengthening of co-management regimes (Njoka, 2015). These changes might better enable the tailoring of policies and measures (such as those for climate change) to local contexts. Success will largely depend on the capacity of local and county level institutions to fulfill their new responsibilities.

3.2 National-level climate policy context

To support climate mitigation and adaptation efforts, the GOK is in the process of enhancing the legal and policy architecture needed to guide planning and implementation at the national and county levels. As described more fully below, it has prepared and released its NCCRS and NCCAP. It is also in the process of passing into law the Climate Change Bill, 2014, which will provide the framework for further policy and legislation, such as the draft National Climate Change Framework Policy and a draft climate finance policy. As well, the government has taken steps toward the development of a national adaptation plan, climate fund, and a system for monitoring and evaluating adaptation progress. Over and above these efforts, as part of its commitments under the United Nations Framework Convention on Climate Change (UNFCCC), Kenya is preparing its Second National Communication and has submitted its Intended Nationally Determined Contribution.

In 2010, the GOK released its NCCRS. Development of the strategy was partially spurred by concern that the implications of climate change for Kenya's development goals were not sufficiently recognized in Kenya Vision 2030 (GOK, 2010b). The strategy aims to advance integration of climate change adaptation and mitigation into "all government planning, budgeting and development objectives" (GOK, 2010b, p. 12). It prioritizes action in the country's most vulnerable sectors, namely water, agriculture, energy, rangelands, forestry, health, and physical and social infrastructure (GOK, 2010b). A variety of adaptation measures are proposed for implementation under the strategy such as strengthening the provision of downscaled weather forecasts to farmers, promoting water efficiency measures, encouraging coastal management, promoting sustainable pastoralism, climate-proofing infrastructure, and strengthening disaster preparedness (GOK, 2010b). Cross-cutting actions are also identified in relation to communications and awareness building, completing vulnerability assessments, research and technology, and climate change governance (GOK, 2010b).

To operationalize the NCCRS, in 2011 the GOK initiated development of its NCCAP. Led by the Ministry of Environment and Natural Resources (MENR) through an inter-ministerial, cross-sectoral taskforce, the NCCAP was developed based on analysis compiled in nearly 60 technical reports and consultations completed at the county and national levels (Ministry of Environment and Mineral Resources, n.d.). Released in March 2013, the NCCAP focuses on

the need for integrated planning that supports a vision for a low-carbon, climate resilient development pathway for Kenya. While addressing both adaptation and mitigation needs, adaptation is identified as the country's main priority. This focus is reflected in the statement that "low carbon actions should be considered as priority actions only if they also have climate resilience or significant sustainable development benefits" (GOK, 2013a, p. 26). In keeping with this objective, it prioritizes six "big wins" that are anticipated to deliver significant development, adaptation, and mitigation benefits: geothermal power generation, distributed clean energy solutions, improved water resources management, restoration of forests on degraded lands, climate-smart agriculture and forestry, and infrastructure that is climate-proof, reliable, expanded, and effective. The NCCAP also identifies enabling conditions to support its implementation, involving securing finance (including creation of a Kenya Climate Fund), strengthening institutional arrangements, capacity building, establishing a tool for tracking implementation of the plan, and advancing measurement and reporting systems.

The adaptation component of the NCCAP was informed by a combination of desk-based review and consultations at the county and national levels. A consultation team identified climate risks, assessed the likelihood and consequence of future climate impacts, and considered existing knowledge of current, planned, and recommended adaptation actions. Through this process, 340 potential adaptation actions were identified across eight sectors (agriculture, livestock, water, environment, infrastructure, sustainable livelihoods, energy infrastructure, and tourism). These actions were reviewed and validated by the taskforce and captured in the NCCAP's Adaptation Technical Analysis Report. The NCCAP listed priority adaptation actions in each sector (presented in Table 5), for which the estimated cost for implementation is Ksh 638 billion (US\$7.5 billion) over five years (GOK, 2013a).

The NCCAP recommends the establishment of a National Performance and Benefit Measurement Framework to monitor, evaluate, and report on progress toward the NCCAP's mitigation and adaptation goals. Part of the framework is the MRV+ system, which is expected to integrate measurement, reporting, and verification for greenhouse gas reductions and monitoring and evaluation (M&E) of adaptation actions. Kenya's emerging M&E for adaptation system is indicator-based and will assess outcomes and processes, drawing upon existing data collected through the country's established M&E systems and new, climate-specific indicators. The system is expected to inform government decisions related to the implementation of actions on climate change, help fulfill international reporting obligations, and aid in attracting finance. Although Kenya has developed plans for a robust and ambitious system of M&E for adaptation, concern has been expressed about its level of resource intensity, its potential to place additional burden on the country's already under-performing systems, and limitations such as access to long-term data sets (Hamill & Dekens, 2013).

Kenya's National Adaptation Plan (NAP) is expected to be completed in 2015. The draft NAP draws on the analysis in the NCCAP's Adaptation Technical Analysis Report and

contains 12 cross-cutting and 30 sectoral adaptation actions that were prioritized by an expert group. Finalization of the NAP is a priority of the Cabinet Secretary of the MENR and is expected to be completed as part of the UK-funded Strengthening Adaptation and Resilience to Climate Change in Kenya Plus (StARCK+) project.

To establish the legal and institutional framework required to support implementation of the NCCRS and NCCAP, a climate change bill was put forward as a Private Member's bill in 2012. This bill passed third reading in Parliament, but was rejected by former President Kibaki in 2013 due to concerns that insufficient public consultation had been undertaken, particularly with the private sector (Gathigah, 2014). The bill was re-introduced to the National Assembly in January 2014, and passed third reading in March 2015; it is currently awaiting Senate approval before being put forward for Presidential ascension. The bill includes significant amendments to the 2012 version, many of which were put forward by a taskforce established by the Cabinet Secretary, MENR. The amended Climate Change Bill, 2014 emphasizes the need to mainstream climate change considerations into development planning and implementation, and provide incentives to the private sector. Its provisions include requirements to prepare national climate change action plans every five years, mainstream climate change into County Integrated Development Plans (CIDPs), and establish a national climate fund. It also sets forward a revised institutional structure for coordinating governance of climate change in Kenya, as described in Section 3.3, and the framework for other policies, such as a draft climate change framework policy and draft climate finance policy.

The Cabinet Secretary appointed taskforce also prepared the National Climate Change Framework Policy. The draft framework policy aims to ensure the integration of climate change considerations into planning, budgeting, implementation, and decision-making at the national and county levels and across all sectors. It proposes establishment of a high-level institutional coordination mechanism, a regulatory framework, and an implementation framework. The draft policy includes commitments related to enhancing climate resilience and adaptive capacity that address the need for sustainable use of natural resources, incentives for action by the public and private sectors, implementation of actions under the NAP, and building capacity to mainstream adaptation concerns (particularly into disaster risk reduction and management efforts). Additional commitments related to research and technology, knowledge management, finance and monitoring, reporting and benefit management are also included (Ministry of Environment, Water and Natural Resources, 2014a).

The National Treasury has developed a draft climate finance policy that establishes the legal, institutional, and reporting frameworks to access and manage climate finance. The goal of the policy is to further Kenya's national development goals through enhanced mobilization of climate finance that contributes to its low carbon, climate-resilient development goals. The policy encourages mobilization of climate finance through the establishment of a national climate fund and enhanced capacity to develop projects that

attract funders and effectively manage and implement them. Processes to track climate finance will be established, which will improve transparency and accountability. Capacity building will be undertaken to help national and county governments to implement the policy and to assist civil society and the private sector in being strong implementation partners.

Finally, in July 2015, Kenya submitted its Intended Nationally Determined Contribution to the UNFCCC in preparation for the Paris Climate Conference. While presenting the country's greenhouse gas reduction commitments, the submission reiterates that the GOK's priority is adaptation and identifies priority adaptation actions as reflected in the NCCAP. These priorities include: enhancing climate information services; promoting climate smart agriculture and livestock development; climate proofing infrastructure, including current and future energy systems; enhancing the adaptive capacity of vulnerable groups and communities; and mainstreaming adaptation into the health, water, and tourism sectors, as well as ongoing initiatives such as public sector reforms, land reforms, and the devolution process. The GOK notes that its capacity to implement these priority actions is dependent on the provision of international support (MENR, 2015).

Table 5 – Priority adaptation actions by sector identified in Kenya's NCCAP for implementation between 2013 and 2017

Sector	Adaptation priorities
Agriculture	<ul style="list-style-type: none"> • Coordination and mainstreaming of climate change into agricultural extension • Establishment and maintenance of climate change-related information for agriculture • Up-scaling specific adaptation actions, namely: 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 • Promote climate-smart agriculture in Kenya • Development and application of Performance Benefit Measurement methodologies for adaptation, mitigation and development
Livestock	<ul style="list-style-type: none"> • Grazing management systems, fodder banks, and strategic reserves • Price stabilization schemes and strategic livestock based food reserves • Selection and breeding animals to adapt to climate change • Livelihood diversification (camels, indigenous poultry, beekeeping, rabbits, and emerging livestock such as quails, guinea fowls and ostriches) • Capacity building in areas such as an inventory of indigenous knowledge, livestock insurance schemes, early warning systems, early action, stocking rates, vaccination campaigns, and disease control
Water	<ul style="list-style-type: none"> • Mainstreaming of climate change into all water resource management plans and actions

	<ul style="list-style-type: none"> • Water conservation efforts including the reversal of degradation of the main water towers and rehabilitation and restoration of all water catchments • Increasing urban and rural domestic water supplies urban sewage services to help combat water-borne diseases and their social and economic impacts • Enhance irrigation and drainage to increase agricultural production and address water requirements for livestock production • Carry out effective trans-boundary water resources management • Carry out water resources assessment, documentation and dissemination of necessary information to stakeholders
Environment	<ul style="list-style-type: none"> • Strengthen the capacity of national and county institutions responsible for climate change coordination and for climate-related data and information collection, processing, and management, including the National Implementing Entity, among others • Increase tree cover to 10% per year to contribute to reduced erosion, flood risk, environmental integrity, improved livelihood sustainability and ecosystem-based adaptation • Mainstream climate change risks and opportunities within and across major vulnerable sectors including the <i>Coastal Zone Management Plan</i>, the <i>National Disaster Risk Management Response Plan</i> and the <i>National Environment Action Plan</i> • Improve and strengthen climate change information management systems and enhance awareness of climate risk management opportunities
Infrastructure	<ul style="list-style-type: none"> • Climate-proof roads in the ASALs
Sustainable livelihoods	<ul style="list-style-type: none"> • Support sustainable livelihoods in drought prone ASAL
Energy infrastructure	<ul style="list-style-type: none"> • Expand solar energy (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 • Increase small hydropower generation plants to provide electricity to large numbers of local community members and businesses in rural areas, enabling job creation • Promote energy efficient programs to reduce demand for generation to save the environment • Rehabilitate water catchment areas (which feed the various hydro dams), leading to regular flow in the rivers that serve the hydro dams, and hence more even power generation • Develop geothermal resources; due to uncertainty in future hydrologic conditions, geothermal will become the base load
Tourism	<ul style="list-style-type: none"> • Develop and implement action plans to build resilience of vulnerable tourism areas to climate change and variability • Identify and replicate sustainable tourism projects with full involvement

- of, and distribution of equitable benefits to, local communities
- Develop and disseminate guidelines on resource efficiency for the operation of existing tourism facilities and the design standards for new ones
 - Review and update tourism sector policies, laws, regulations and other quasi-regulatory guidelines, and governance and funding processes (within the context of Vision 2030 and the next Medium-Term Plan review) once the tourism risk assessments have been completed
 - Implement research, training, and capacity building programs in tourism to enhance the climate resilience of the tourism sector

3.3 Institutional structure for climate governance

Institutional arrangements for the governance of climate change issues in Kenya are currently in flux, in part due to the broader reform process underway to implement the new constitution. Historically, direction on climate change action in the country was informed by the National Climate Change Activities Coordinating Committee (NCCACC) established in 1992, which primarily served to coordinate the government's activities on climate change (Mutimba et al., 2010; Ogola, n.d.). It was comprised of representatives of government ministries, municipalities, universities, non-governmental organizations and the private sector, with the MENR serving as its secretariat. While not formally disbanded, the NCCACC has not met since completion of the NCCAP. Instead inter-departmental meetings with stakeholders are held to address specific issues.

Climate change falls within the portfolio of the Cabinet Secretary, MENR, and is under the direction of the Permanent Secretary of this ministry. The MENR also houses the National Climate Change Secretariat, which was established in 2010 to provide technical support on climate change matters (GOK, 2013a). The Secretariat oversees all issues and programs related to climate change, coordinates related efforts across sectors and ministries and, in partnership with the Ministry of Foreign Affairs and International Trade, coordinates Kenya's engagement in the UNFCCC process (GOK, 2010b; Mutimba et al., 2010). The National Treasury established a Climate Finance and Resource Mobilisation Division in 2015 to coordinate tracking of international financing and domestic spending related to climate change (both adaptation and mitigation), and to coordinate Kenya's mobilization of climate-related resources and finance.

The Climate Change Bill, 2014, put forward a revised vision of climate change governance in Kenya. It proposes establishment of a National Climate Change Council responsible for coordinating climate change actions and ensuring climate mainstreaming by national and county governments. Chaired by the President, the council would provide advice to different levels of government on legislative and policy matters, approve national climate change action plans, and oversee administration of the Climate Change Fund. The Cabinet Secretary responsible for climate change affairs would serve as Secretariat to the council. The Cabinet Secretary would be responsible for ensuring the preparation and review of

climate change policies, strategies, and actions plans for submission to the council, as well as coordination of Kenya's engagement in the UNFCCC process in consultation with the Cabinet Secretary responsible for foreign affairs, and reporting every two years to Parliament and county assemblies on implementation progress. Technical support would be provided through a Climate Change Directorate established within the government ministry responsible for climate change. The Directorate would provide analytical support on climate change, coordinate adherence to international obligations, and serve as a national knowledge and information management centre.

In the interim, the main player in the governance of climate change in Kenya is the MENR and its Climate Change Secretariat. However, as a ministry with relatively less power within the GOK, the capacity of the MENR to convene and direct coordination of climate change efforts across government, lead policy implementation, and advance mainstreaming efforts is constrained. Climate change action is also being supported by the National Treasury, which is taking on an increased role in climate-related finance. The climate change fund created in the Climate Change Bill, 2014 will be vested in the Treasury, which is the National Designated Authority for the Green Climate Fund. The Treasury is also responsible for funds and instruments with ties to climate change adaptation, such as the National Drought Contingency Fund, Arid and Semi-Arid Lands Drought Contingency Fund, Africa Risk Capacity, Kenya Livestock Insurance Program, and the Kenya Crop Insurance Program. The Ministry of Devolution and Planning (MDP) is developing indicators to track the mainstreaming of climate change in the Second Medium Term Plan.

Others institutions involved in shaping and enabling climate change adaptation in Kenya include:

- National Drought Management Authority (NDMA). Within the MDP, the NDMA coordinates and supervises drought management efforts in Kenya (GOK, 2013a) and is increasingly taking an active role in the implementation of adaptation actions, particularly in the ASALs.
- The National Environment Management Authority. Within MENR, the National Environment Management Authority is the principle government agency responsible for addressing environmental matters. It hosts Kenya's National Implementing Entity for the Adaptation Fund (GOK, 2013a) and is responsible for enforcement and compliance functions under Climate Change Bill, 2014.
- Kenya Meteorological Department. A part of the MENR, the Meteorological Department provides meteorological and climatological services to support decision-making by government and civil society. It works closely with the Nairobi-based Intergovernmental Authority on Development (IGAD) Climate Prediction and Analysis Centre (ICPAC).
- Kenya Agriculture and Livestock Research Organisation. Formally the Kenya Agricultural Research Institute, this organization has established a climate change

unit and undertakes research in areas such as the development of drought-tolerant seeds.

3.4 National-level sectoral policies

Climate change has been integrated to some extent into a number of Kenya's national sectoral policies, including those related to agriculture, water, and disaster risk reduction, as presented in Table 6. Among these is the Agriculture Sector Development Strategy, 2010–2020, which aims to support achievement of Kenya Vision 2030's Economic Pillar by “transforming smallholder agriculture from subsistence to an innovative, commercially oriented and modern agricultural sector” (GOK, 2010a, p. 6). The strategy also notes the need to transform key institutions, increase productivity, expand irrigable areas in the ASALs, improve smallholders' access to markets, and increase value addition to farm, livestock, and forestry products. The strategy recognizes climate change as a threat to achievement of its objectives, and articulates support for implementation of the NCCRS.

After two decades of discussion, the government released its National Policy for the Sustainable Development of Northern Kenya and other Arid Lands in 2012 (Odhiambo, 2013). Its goal is to “fast-track sustainable development” through increased investment and improved use of resources (Ministry of State for Development of Northern Kenya and Other Arid Lands, 2012). Among its objectives is to “strengthen the climate resilience of communities in ASALs and ensure sustainable livelihoods” (Ministry of State for Development of Northern Kenya and Other Arid Lands, 2012, p. 13). Following on recommendations of the policy, the government established the NDMA and a National Drought Contingency Fund, which aim to reduce the risk of and enhance Kenya's response to drought. More generally, it has been suggested that the policy is a significant step toward consideration of Kenya's ASALs being integrated into national development policy, but fulfillment of this potential will depend on its implementation and continued engagement with stakeholders (Odhiambo, 2013).

Kenya has also released a Sector Plan for Drought Risk Management and Ending Drought Emergencies to support the government's objective of ending drought emergencies within 10 years (MDP, 2013b). It compiles existing commitments to support drought resilience under other sectoral strategies and additional commitments by the NDMA. The strategy acknowledges the need to prepare for greater climate variability and change given its potential social, economic, and environmental impacts, particularly in the ASALs. It also presents specific commitments in areas such as climate-proofing infrastructure (e.g. roads, energy, water, and sanitation) and supporting adaptation in the livestock sector, such as through up-scaling the provision of livestock insurance. Specific commitments of the NDMA include investing in activities that strength capacity to adapt to climate change as well as reducing drought risks and preparedness (MDP, 2013b).

Climate change is acknowledged as a significant concern in the National Environment Policy of 2013. It includes commitments to implement a National Climate Change Policy, increase

capacity of institutions at the county and national levels to integrate climate change into their implementation strategies, raise awareness and build capacity related to adaptation opportunities, strengthen early warning and response systems, and enhance relevant research capacity (Njoka, 2015).

The key policy within the water sector is the Kenya Water Act of 2002, along with the Environmental Management and Coordination Act (GOK, 2013a). A number of strategies have been established to support implementation of the Water Act, some of which recognize the implications of climate change for water, sanitation, and health (GOK, 2013a). The Water Act also established the Water Resources Management Authority, which is Kenya's lead agency for water resource management. Within its strategic plan for 2012 to 2017, the Authority sets as one of its objectives the development and implementation of programs that will strengthen communities' capacity to adapt to climate change (Water Resources Management Authority, 2013). It also notes progress toward development of National Water Master Plan 2030, which will "[a]ssess and evaluate availability, reliability, quality, and vulnerability of country's water resources up to around the year 2050 taking into consideration climate change" (Water Resources Management Authority, 2013, p. 14).

Kenya has also released its National Disaster Management Policy, 2012, which aims to mainstream disaster risk reduction into development processes and increase the resilience of vulnerable communities (GOK, 2013a). The policy's overall goal is to prevent disasters and their impacts on people, infrastructure, and the environment, moving Kenya from a reactive to proactive approach. Links between disaster risk management and climate change adaptation are acknowledged.

Prior to approving its disaster management policy, the GOK released the Disaster Risk Reduction Strategy for Kenya 2006–2016, which aims to increase the resilience of communities to disaster events, mainstream disaster risk reduction into development programming, planning and implementation, and promote an integrated approach to disaster management (GOK, 2006). Some of the goals of the strategy are to reduce the impacts of climate change by supporting local adaptation, to build capacity to use climate forecasts and risk assessments, and to integrate climate projections into disaster management efforts (GOK, 2006).

In 2011, the government released the final version of its National Policy on Peace-building and Conflict Management. The policy notes that climate change has the potential to influence conflict risk, including through the increased likelihood of natural disasters occurring that affect access to natural resources (Ministry of State for Provincial Administration and Internal Security, 2011). By promoting conflict-sensitive development programming at all levels, implementation of the policy could reduce the risk of conflict generated by climate shocks and stresses (Njoka, 2015).

Finally, the Forest Policy, 2014 cites a growing awareness of the role forests can play in supporting mitigation and adaptation to climate change, as stated in the NCCRS. It is

acknowledged that there is inadequate data and research on the potential implications of climate change for Kenya's forest resources and biodiversity, and the policy calls for increased links between public forest agencies, research centres, and universities (Ministry of Environment, Water and Natural Resources, 2014b).

This review indicates that Kenya is making progress toward integrating climate change considerations into its sectoral policies, particularly as they are reviewed, revised, and updated. Given historical and potential future vulnerabilities of the country, as well as its current policy priorities, it is perhaps not surprising that climate change considerations are mainly considered within its drought risk management, agricultural development, and ASALs policies. As opportunities arise within the policy cycle, efforts to enhance the integration of climate change into other national policies, such as those focused on gender and health, could contribute the enhancing Kenya's adaptation efforts.

Policies	Absent	Climate change mentioned as potential risk	Possible actions for reducing risk identified	Targets identified for specific adaptation measures
<i>Agriculture Sector Development Strategy (2010–2020)</i>		✓		
<i>National Policy for the Sustainable Development of Northern Kenya and other Arid Lands (2012)</i>		✓	✓	
<i>Sector Plan for Drought Risk Management and Ending Drought Emergencies (2013–2017)</i>		✓	✓	✓
<i>National Environment Policy (2013)</i>		✓	✓	
<i>Water Resources Management Authority Strategic Plan (2012–2017)</i>		✓	✓	
<i>National Disaster Management Policy (2012)</i>		✓		
<i>Disaster Risk Reduction Strategy for Kenya (2006–2016)</i>		✓	✓	
<i>National Policy on Peace-building and Conflict Management (2011)</i>		✓		
<i>Forest Policy (2014)</i>		✓	✓	

3.5 Subnational policies

Given their expanded role under the new constitution, county governments should increasingly play a significant role in efforts to reduce the vulnerability of Kenyans to climate change. A key opportunity for advancing this role is integration of climate change considerations into CIDPs, which are required to be prepared under the constitution and the 2012 Public Finance Management Act (MPF, 2013a). These plans set the direction for implementation of each county's responsibilities in areas such as agriculture, health, education, and infrastructure. The MPF has established guidelines for the development of CIDPs and is to help build the capacity of counties to ensure that these documents guide their annual budgets and expenditure framework (MPF, 2013a).

Some counties have integrated climate change considerations into their first CIDPs. Siaya county's CIDP (2013–2017) acknowledges that climate change is “arguably the defining environmental challenge to the County's sustainable development” and notes the risk it poses in terms of changing rainfall patterns, reduced water quality and quantity, and greater risk of fires and floods (GOK, n.d., p. 20). Strategies to address this challenge are identified, such as enacting a climate change law to support implementation of the NCCRS and implementation of afforestation, reforestation, water harvesting, and land use zoning activities. The CIDP also calls upon all government ministries engaged in climate sensitive activities to integrate climate information into their plans and activities (GOK, n.d.). Murang'a county's Fiscal Strategy Paper notes the links between climate change, food insecurity, and loss of biodiversity. It also identifies challenges to be addressed, including the lack of an early warning system, weak environment and disaster management committees, lack of expertise at the county level, unreliable data, and inappropriate farming practices (Murang'a County Government, n.d.). How much counties will be able to take an active role in supporting vulnerability reduction remains to be seen, but it may be assumed to be dependent on factors such as institutional capacity, effective governance, and access to data, expertise, and finance.

The StARCK+ project is providing support to strengthen the capacity of county governments to engage in adaptation. It is supporting the development of adaptation plans in Garissa, Isiolo, Kitui, Makueni, and Wajir. It is also supporting county meteorological offices (ADA Consortium, 2014) and established a county adaptation fund in Isiolo that supports priority adaptation initiatives as identified at the ward level (NDMA, 2014). Funding priorities are determined in accordance with a set of common criteria by locally elected Ward Adaptation Planning Committees. These plans are then reviewed and approved by the Isiolo County Adaptation Planning Committee. Through the StARCK+ project, the Isiolo County Adaptation Fund has received £1 million in financing, of which 70% is to be invested in public goods prioritized by the Ward Adaptation Planning Committees. In its first year the fund supported investments in improved rangeland management, water infrastructure development, livestock disease control, access to climate information through a community radio system, and the strengthening of government institutions and processes. The

establishment of similar funds in Garissa, Kitui, Makueni, and Wajir is to be completed in 2016 (ADA Consortium, 2015).

4. Current and planned adaptation programs and projects

The extent to which Kenya will be able to achieve the ambitious agenda outlined in its NCCAP will be significantly influenced by the range and type of adaptation-focused projects and programs supported by the government and its international development partners. This section provides an overview of ongoing projects and programs focused on adaptation and the size and orientation of finance flowing from the GOK and international partners to support adaptation action.

4.1 Adaptation projects and programs

A range of initiatives are underway within Kenya that — either intentionally or not — help to build the adaptive capacity of Kenyans and increase the resilience of the country to the impacts of climate change. The GOK is responsible for a number of these initiatives, such as the work of the NDMA, efforts to strengthen the Kenya Meteorological Department, and research conducted by the Kenya Agriculture and Livestock Research Organisation. The government is also supporting reforestation efforts in the five water towers, establishing small dams in the ASALs, and promoting green schools. While acknowledging the importance of these efforts to reducing vulnerability to climate change, the focus of this section is on understanding the types of discrete adaptation-focused projects being implemented in Kenya with international support.

The range of projects and programs underway in Kenya financed by bilateral and multilateral donors was identified through a web-based review and application of a standard methodology (as described in Annex A). This methodology was used to select projects intentionally focused on supporting climate change adaptation and establish a common approach to classifying them by type and sector. Through the application of this process, as presented in Table 7 and elaborated in Annex B, a total of 27 significant internationally funded adaptation projects that were either currently underway or recently completed were identified.

Of the identified projects, nearly half aimed to support adaptation in the agricultural sector while a significant number focused on improving the climate resilience of pastoralists. Other primary areas of focus included building the capacity of governments to enable adaptation, increasing availability of freshwater sources, strengthening disaster risk management, and improving access to climate information. Based on this review, the

significant international funders of adaptation action in Kenya are the World Bank, the United Kingdom, and the United States.

Table 7 – Sectors of focus of current adaptation projects and programs identified in Kenya					
Sector of focus	Priority sectors for adaptation	Number of projects*	Percentage of total projects**	Geographical characteristics	
Agriculture	✓	11	41%	National projects	6
Pastoralism / Livestock	✓	4	15%	Regional projects	11
Freshwater supply	✓	6	22%	Global projects	4
Watershed management	✓	1	4%	Total	21
Ecosystem restoration / conservation		2	7%		
Disaster risk management		4	15%		
Gender		3	11%		
Energy		1	4%		
Human health		1	4%		
Climate information		7	26%		
Government		10	37%		
Civil society		4	15%		
Social protection		1	4%		
Multi-sectoral		3	11%		
*Individual projects may address one or more sectors.					
**Calculated by the number of projects active in this sector relative to the total number of projects identified. Sums to more than 100%, reflecting the potential for a single project to address adaptation needs in more than one sector.					

The greatest proportion of projects underway in Kenya provide capacity building support. Several projects also focus on helping governments at the national and county levels develop and implement policies that will advance efforts to prepare for the impacts of climate change. National projects (i.e. those being implemented solely in Kenya) also support the implementation of concrete actions at the field level (e.g. infrastructure development projects) and community-based adaptation projects. Few projects focus on

assessment and research to increase understanding of Kenya's vulnerability to climate change and appropriate response strategies.

As previously noted, the majority of projects underway in Kenya aim to build resilience in the agriculture sector. Among these are the UK Aid-funded Arid Lands Support Programme being implemented in northern Kenya; the second phase of the Kenya Adaptation to Climate Change in Arid and Semi-Arid Lands project funded by the Special Climate Change Fund and being implemented in Garissa, Turkana, Marsabit, Malindi, and Mwingi districts; the Building Climate Change Resilience and Food Security Program funded through the US Agency for International Development (USAID) being implemented in Siaya, Busia, Embu, Kitui, Machakos, and Makueni districts; and the large Rural Livelihoods' Adaptation to Climate Change in the Horn of Africa project being implemented in Kenya and Djibouti. These projects place emphasis on increasing resilience to drought and provide support for livelihood diversification. As well, the Swiss-funded Building Climate Change Resilience and Food Security Program is focused on complementary livestock redistribution, production, and animal health interventions, along with improving the livelihood of pastoralists.

A number of projects also focus on ensuring water security in a changing climate. These include the two largest projects underway in Kenya, both of which are financed by the World Bank and being implemented by the MENR: the Coastal Region Water Security and Climate Resilience Project (US\$200 million), which is focused on supporting dams in Mombasa and Kwale counties; and the Kenya Water Security and Climate Resilience Project (US\$182.7 million), which includes support for implementation of the Lower Nzoia Irrigation Project Phase 1 and improving flood mitigation structures on the Lower Nzoia River. In contrast to these large infrastructure focused projects, some projects that support the resilience of local community to climate change through activities that focus on strengthening water security are being implemented. These include a project funded by the Adaptation Fund, the Integrated Programme to Build Resilience to Climate Change and Adaptive Capacity of Vulnerable Communities in Kenya, as well as the regional project Planning for Resilience in East Africa through Policy, Adaptation, Research and Economic Development.

Several projects touch upon the need to strengthen the provision of climate information to inform decision-making. Amongst these are two USAID funded projects, the Low Emissions Climate Resilient Development project and Implementing a Resilience Framework to Support Climate Change Adaptation in the Mt. Elgon Region of the Lake Victoria Basin Project. Each project also emphasizes the need to increase coordination and knowledge-sharing between stakeholders. Kenya was also one of the countries (along with Ghana and Burkina Faso) in which pilot activities were undertaken as part of preparations for development of CLIM-WARN, a global early warning system for changes in climate.

One of the largest adaptation initiatives underway in Kenya is the StARCK+ program funded by the UK's International Climate Facility. This multi-pronged program aims to increase

private sector engagement in climate mitigation and adaptation, and enhance climate change governance and civil society demand for climate change action. The program aims to increase the resilience of farmers in the high productive zones by establishing a Climate Smart Agriculture initiative under the Finance Innovation for Climate Change Fund. It also aims to provide technical assistance to the GOK in implementation of the NCCRS and NCCAP, including development of Kenya's NAP. The StARCK+ program plans to provide support to the DFID-UN Work Programme in the establishment of a climate budget code to track climate spending and finance, including for adaptation, and to collaborate with partners on projects including the support of counties developing adaptation plans. The program also aims to strengthen civil society engagement on climate change.

Many of the projects underway in Kenya focus on addressing climate resilience needs in the ASALs. These include the Arid Lands Support Programme, the Kenya Adaptation to Climate Change in Arid and Semi-Arid Lands project, the Building Climate Change Resilience and Food Security Program, and two projects being implemented as part of the CARIAA program: Adaptation at Scale in Semi-Arid Regions and Pathways to Resilience in Semi-Arid Economies. The focus on addressing needs within Kenya's ASALs is consistent with the predominance of this ecoregion in the country and its understood vulnerability to climate change.

In addition to these project-based initiatives, funding for climate change adaptation is increasingly being mainstreamed into internationally supported sectoral programs. For example, the United Kingdom's International Climate Fund is providing finance to existing DFID programs to integrate climate change considerations into activities. This includes providing additional climate funding to make an infrastructure-improvement program for the Mombasa port more sustainable and climate-proofing school building infrastructure as part of investments in education programs. The World Bank is planning to investment in an agriculture program in which climate change will be mainstreamed throughout all activities. While these projects are not captured in Annex B, they are significant contributions to Kenya's efforts to prepare for the impacts of climate change.

Overall, there is significant support for adaptation planning and action underway in Kenya and this support addresses some of its most vulnerable sectors and regions. Gaps can be identified, though, between the focus of current adaptation projects in Kenya and the priority areas for investment identified by the GOK in its NCCAP and other policy documents. Tourism, for example, is not a focus of ongoing or recently completed initiatives, although it is an important economic sector for the country and sensitive to climatic changes. Likewise, few projects have a core focus on addressing the differential gender impacts of climate change and strengthening the capacity of women to adapt. Similarly, little attention is being given to adaptation needs along the country's vulnerable coastline, where resilience of coastal infrastructure could be enhanced. There also appears to be a lack of effort to enhance resiliency in Kenya's growing urban areas.

4.2 Climate finance

As significant domestic and international funding will be required for Kenya to implement the priority adaptation actions identified in the NCCAP, this section provides an overview of the scale, sources, and orientation of existing climate finance flows in the country. Information is presented from three perspectives: the scale of current funding reported by Kenya within its NCCAP and current government initiatives related to climate finance; current trends in financing through Official Development Assistance and other official flows as tagged by the Organisation for Economic Cooperation and Development (OECD); and tracking by the Climate Funds Update.

Based upon research conducted during preparation of the NCCAP, a picture of climate-related expenditures (mitigation and adaptation) by the GOK and its development partners between 2005 and 2015 is presented in Table 8. These figures are for projects and programs designated as having a “significant” or “principal” climate change component as defined by the Rio Markers developed by the OECD Development Assistance Committee. They therefore include investments that provide a mix of development and climate benefits (GOK, 2013a); as such, these figures do not represent funding for projects intentionally developed specifically to support climate change action (mitigation and/or adaptation). The NCCAP also notes that it identified funding in excess of that officially reported by the OECD.

While the figures in Table 8 do not differentiate spending on mitigation versus adaptation, given that the majority of expenditures are in the energy sector it may be presumed that more funding was directed to projects that provided mitigation benefits rather than adaptation benefits. International funding is supporting projects that address climate change-related needs in coastal areas, while any GOK investments in this sector that also meet these needs are not noted, and therefore are not reflected in the table. Also of note are the relatively low levels of climate-related investment reported provided by the GOK in the agriculture sector and for drought management. The presented figures do not appear to reflect the large GOK budgetary allocations and international support for drought management efforts in Kenya, such as through the NDMA and the Drought Contingency Fund.

As noted previously, once passed, the Climate Change Bill, 2014 will establish a climate change fund (MENR, 2015). The fund will be vested in the National Treasury, administered by the Council, and managed by the Principal Secretary responsible for climate change affairs. It will provide grants for climate change research and innovation; provide loans and grants to businesses, the private sector, civil society, academia, and other stakeholders for innovative actions that benefit climate change response; support implementation of adaptation and mitigation actions; and provide technical assistance to county governments. Additionally, the National Treasury is working with UNDP to undertake a Climate Public Expenditure and Budget Review. Part of this work involves the development of a climate budget code that will enable tracking of adaptation and mitigation expenditure in the

government accounts. Finally, it may be noted that the Kenya Resilience Investment Tracker has been established as part of the IGAD Drought Disaster Resilience and Sustainability Initiative. It provides information regarding what projects are underway in Kenya's ASALs, who is supporting these projects, their budgets, and links to achievement of Kenya's current Medium Term Plan. The database may be searched by county, donor, and Medium Term Plan sector.

Table 8 – Cumulative expenditure per sector on climate change 2005-2015		
Sector	2005-2015 Cumulative Expenditures (US\$)	
	GOK	Development partner funds
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 US\$	US\$ 438,240,616	US\$ 2,291,105,546
Total KSh	KSh 37.23 billion	KSh 194.735 billion

Source: GOK, 2013a, p. 85

Examining the data collected by the OECD can provide a perspective on the scale of international finance flowing into Kenya. The OECD Rio Markers report on climate-related Official Development Assistance and other official flows from both multilateral and bilateral sources. Its data from 2013 demonstrates greater provision of support mitigation-focused programming (US\$ 689.07 million) compared to adaptation-focused initiatives (US\$ 135.12 million) and programming that supported both mitigation and adaptation (US\$ 78.32 million). The majority of this funding (US\$ 472.74 million) was provided by the Global Environment Facility and multilateral development banks.

An examination of financing provided by bilateral donors between 2010 and 2013 provides more detailed information. Within this time period, approved bilateral funding with climate-related benefits flowing into Kenya averaged US\$550 million per year in constant 2012 prices; nearly 60% was designated for projects providing mitigation benefits and just over 30% to projects with a primary focus on adaptation. Of the funding designated as supporting adaptation, as demonstrated in Figure 1, the majority was for projects said to provide "significant" support to adaptation. Such projects include funding for the Kenyan Wildlife Service, research award schemes, water supply improvement projects, and

education centres that may indirectly address discrete adaptation priorities. From a sectoral perspective, half of approved bilateral funding between 2010 and 2013 was designated to support agricultural projects while more than one-quarter addressed water supply and sanitation needs. One percent or less of approved adaptation funding was designated for basic health care, disaster prevention and preparedness, food aid/food security, government and civil society, and forestry. Between 2010 and 2013, the largest donor supporting adaptation in Kenya is reported to be Japan, which provided approximately 47% of all funding over this time period. Its high level of financing may be due to Japan’s priority focus on supporting infrastructure developments in Kenya, including transportation and electricity access and transmission, that might provide adaptation co-benefits (Japan International Cooperation Agency, n.d.). Other significant donors based on the OCED Rio Markers system are the European Union (23%) and Germany (12%).



Figure 1 – Bilateral development aid marked identified as having as its principal or significant objective support adaptation in Kenya between 2010 and 2013, in US\$ million, constant 2012 prices (based on OECD, 2015)

A different perspective can be gained by examining information provided by the Climate Fund Update, which tracks financing flowing from dedicated multilateral and bilateral climate change funds. This source again reflects greater delivery of support for climate mitigation in Kenya since 2003. As illustrated in Figure 2, 36% of funding received by Kenya during this time period was directed toward supporting adaptation. Kenya has received significantly less funding for adaptation relative to its East African neighbours. In contrast, it is the second highest recipient of funding for mitigation focused projects, just behind Ethiopia. It should be noted that significant financing in Kenya’s energy sector has been directed toward developing the country’s geothermal energy sector, which reduces the country’s dependence on hydroelectric power production and therefore helps reduce its climate change vulnerability.

Some of the projects captured in these figures include the Kenya Adaptation to Climate Change in Arid Lands project funded in part by the Special Climate Change Fund and multiple-foci projects financed through the U.K. International Climate Fund, such as StARCK+ (Climate Funds Update, 2015). Kenya also benefits from regional projects financed through designated climate funds, such as the project Catalyzing Forest and Landscape Rehabilitation for Climate Resilience and Biodiversity Conservation in East Africa also being implemented in Ethiopia with funding from the Germany International Climate Initiative.



*Reducing emissions from deforestation and forest degradation

Figure 2 – Comparison of approved funding from designated bilateral and multilateral climate funds in East Africa since 2003, in USD millions, as of April 30, 2015 (based on Climate Funds Update, 2015)

5. Networks and communities of practice

Through their networks and communities of practice, civil society organizations can play a substantive role in promoting the iterative learning, knowledge sharing, and capacity building needed to advance adaptation action. Within Kenya there are a few key organizations actively engaged in encouraging climate action by the GOK, communicating the risks associated with climate change, and taking steps to reduce the vulnerability of Kenyans to the impacts of climate change.

The most prominent of these networks in the Kenya Climate Change Working Group (KCCWG). Established in 2009, the KCCWG links over 300 local, national, and international civil society organizations, media, and private sector actors engaged in addressing climate change concerns in Kenya. The work of the network has focused on: advocating for a policy and legislative framework in Kenya that takes into account climate change; supporting participation by civil society and the GOK in discussions on climate change at the local, national, and international levels; and supporting community based adaptation through awareness raising and capacity strengthening. The KCCWG is supported by Irish Aid and the civil society component of the StARCK+ program.

A few youth-led organizations are also engaged on the issue of climate change. The most prominent of these is the Kenya Youth Climate Network, which works on issues of governance and leadership as well as the environment and climate change. It seeks help youth build their capacity to positively contribute to society and help transform Kenya. This includes working with youth to build their capacity to engage in climate change policy and advocacy work and to implement climate change adaptation and mitigation projects in their communities. Norwegian Church Aid acts as the host organization for the network (Kenya Youth Climate Network, n.d.).

A number of Kenyan organizations with core mandates outside of climate change are becoming involved in the issue. Civil society engagement and outreach on climate adaptation, for example, is supported by Act, Change, Transform (ACT!). This leading non-governmental organization supports civil society organizations by providing technical assistance and guidance, strengthening organizational development, and managing donor grants. As part of its work in the area of environment and natural resources management, it is providing grants to civil society organizations to implement activities that will increase the resilience of ASAL communities to climate change. Through such initiatives, ACT! has established a broad informal network of civil society actors that have knowledge of adaptation. The work of ACT! is supported by a number of funders, including the Swedish International Development Agency, USAID, European Union, the Danish International Development Agency, and UK Aid through the StARCK+ program (ACT!, n.d.).

Engagement of the private sector on climate change mitigation and adaptation is facilitated in part by the Kenya Private Sector Association, which has initiated activities to raise awareness of the NCCAP among its membership. The association launched a series of briefing notes on climate change and different business sectors in 2015. Similarly, the Kenya Association of Manufacturers is actively engaged in the promotion of energy efficiency and renewable energy, with their associated adaptation co-benefits. Transparency International Kenya is working with partners to establish a Climate Governance Network that will facilitate information exchange and advocacy around the governance of climate finance (Transparency International Kenya, n.d.).

The National Council of Churches of Kenya is also engaged on the issue of climate change, in part through its involvement in the Southern Voices on Adaptation project, which is working to strengthen the capacity of civil society to engage in advocacy on climate change policies. One of the Council's five goals for the period of 2014 to 2018 is to contribute to "economic empowerment, governance and climate change mitigation and adaptation" (National Council of Churches of Kenya, 2014).

Knowledge exchange around climate forecasts and projections in Kenya is supported by the Greater Horn of Africa Climate Outlook Forum hosted by ICPAC. The forum brings together major climate centres from around the world to establish seasonal climate forecasts for the region. ICPAC also supports the dissemination of climate- and remote-sensing data, provision of early warning of climate-related hazards, capacity building, and identification of climate change adaptation options (ICPAC, n.d.). Similarly, the exchange of information regarding early warnings of food insecurity is supported by the Famine Early Warning Systems Network's work in Kenya. While not directly focused on climate change adaptation, the work of these networks helps to strengthen Kenyans' capacity to manage climate risks.

Finally, knowledge sharing and coordination of development-focused activities by the GOK and its development partners related to environment and natural resources is facilitated by a coordination group chaired by DFID and the Cabinet Secretary, MENR. Although a working group focused on climate change was established by this group, it has largely been inactive since the development and launch of the NCCAP. Effort are currently underway to revitalize this working group.

6. Conclusions

In recent years, Kenya has made strides towards developing a more robust and growing economy and establishing a more decentralized system of governance. These efforts have yielded some positive development results, such as adoption of the new constitution that decentralizes decision-making authority and control over resources to the country's 47 counties, higher economic growth rates, and greater access to primary schooling. While the country has seen improvements in its overall level of human and economic development, it continues to struggle with longstanding challenges such as population growth, high levels of multi-dimensional poverty, youth unemployment, gender inequalities, water scarcity, corruption, and loss of forest cover. Millions of Kenyans continue to be dependent on rain-fed agriculture, and many are growing crops on small, degraded plots of land. The country's economic, social, and environmental challenges are particularly acute in Kenya's ASALs, where the country's highest poverty rates, lowest levels of female literacy, and greatest water scarcity concerns can be found. The government has begun to recognize the contribution of these lands to Kenya's economy and their future potential, and begun to put in place the policies and investments required to support their development (Njoka, 2015). The ongoing process of decentralization aims to bring government and decision-making

closer to local communities and provides county governments in the ASALs with greater capacity to customize development interventions through devolved budgets.

Climate change has the potential to adversely impact important elements of the Kenyan national economy, such as crop production, livestock raising, hydropower production, and tourism, as well as place an additional burden on the country's limited water resources, weak health care system, and poor infrastructure. Climate projections clearly indicate that temperatures in Kenya will continue to rise, increasing the risk of heat stress, higher rates of evaporation, and reduced crop productivity. However, uncertainty remains regarding how the country's hydrological patterns will be altered due to climate change. It is unknown whether rainfall levels in different regions will increase or decrease in the coming decades, if there will be a change in the timing of the rains, or if the frequency and intensity of floods and droughts will change. Managing existing variability in rainfall patterns and the uncertainty of future changes may be strengthened by planning for a broad range of climate futures and supporting interventions that are flexible, that promote adaptability, and that respond to local needs (Nicholles, Vardakoulis, & Johnson, 2012; Kilroy, 2015).

The GOK has taken significant steps in recent years to identify and prioritize key actions for reducing its vulnerability to climate change, and to establish governance structures to support implementation of these actions. This includes preparation of the country's NCCRS, NCCP, and draft NAP. The GOP has also established the National Climate Change Secretariat in the MENR, has put forward a climate change bill, is developing a climate change framework policy and climate finance policy, and plans to establish a climate change fund.

Work to mainstream climate change across government is underway, albeit at a slow and uncoordinated pace. The National Treasury is undertaking an exercise to understand and track climate finance, MENR is identifying actions that have been undertaken to implement the NCCAP, and the MDP is developing adaptation and mitigation indicators to track progress on climate change. Yet much remains to be done to mainstream climate change in critical sectoral ministries and with county governments, who will be key implementation partners. The Climate Change Bill, 2014 is intended to promote mainstreaming across national and county governments, and improve coordination and reporting. The commitment to implement this bill, including mainstreaming, will be demonstrated over the coming years.

At the county level, devolution of responsibility and authority over vulnerable resources and sectors provides an important opportunity for advancing adaptation efforts that respond to local needs. For this opportunity to be realized, however, county governments must have the capacity to assess risks, identify and prioritize adaptation actions, integrate climate change considerations into CIDPs, and mobilize the human, technical, and financial resources required for successful implementation. While the GOK has committed under its current Medium Term Plan to prioritizing capacity building of county governments to better enable them to take on their new responsibilities, and some current adaptation programs

are working to build this capacity, greater support is needed if the opportunities created by devolution are to be realized.

The GOK is financing various climate change actions, as documented in the NCCAP. However, the country continues to rely significantly on funding from multilateral and bilateral sources. Much of this funding is being directed towards priority adaptation areas such as agriculture and livestock management, as well as improving water access and management. Reflecting its greater vulnerability to climate change, many projects focus on adaptation needs within the ASALs. While continuation (and scaling-up) of these actions will help Kenya meet the challenge of climate change, greater attention could also be given to other priority areas such as improving infrastructure resilience (particularly in urban slums) and building a more resilient tourism sector. Greater attention could also be given to meeting the adaptation needs of the country's coastal areas and the particular vulnerabilities of women.

Greater opportunities for knowledge sharing and research could also strengthen the capacity of Kenya to respond to climate change. This review has identified relatively few networks and communities of practice engaged on the issue of climate change. There appears to be limited opportunity to share experiences and the tacit knowledge gained through the development and implementation of adaptation actions. There remains a number of gaps in Kenya's knowledge base, such as limited understanding of impacts on Lake Victoria's fisheries sector, how productivity of important subsistence and export crops could be affected, and the human health implications of climate change. Greater investment in research initiatives, such as those being undertaken as part of the CARIAA program, would help to build this critical knowledge base.

7. Annexes

Annex A: Methodology

This section presents the research parameters established to guide development of the standardized reviews of current adaptation action in the CARIAA program's countries of engagement. It sets forward definitions used in this study, particularly with respect to the identification, selection, and classification of programs and projects considered in the review. This methodology was previously developed by the International Institute for Sustainable Development to support a review of current and planned adaptation action in 12 regions, which was completed in 2011 for the Adaptation Partnership. Modest updates to this original methodology were made to support the current review undertaken for the CARIAA program. For more information, see Adaptation Partnership (2015).

A.1 Adaptation actions included in the review

Within the review, adaptation action was defined as “policies, programs, and projects designed and implemented specifically to address the current and projected impacts of climate change.” Therefore, the review focused on examining policies, programs, and projects in which specific reference has been made to supporting adaptation to climate change or climate risk reduction.

Consistent with this definition, the review gave attention to discrete, time-bounded programs and projects designed and implemented specifically to support preparation for or implementation of practical adaptation actions within the broader context of achieving development objectives. Therefore, at least one of the following terms appeared in the title, goals statement, or objectives statement of each program or project included in the review: “adaptation,” “climate change adaptation (CCA),” “climate risk management,” or “climate vulnerability reduction.”

Based upon these parameters, the following types of programs and projects were not included in the review: disaster risk reduction, prevention, or management projects, unless they specifically reference that this activity is being undertaken in support of CCA; primary scientific research studies (for example agrology, botany, or meteorology) on the potential impacts of climate change (for example on changes in crop production, glacial melt rates, or typhoon patterns); long-term monitoring efforts (whether climatic or socioeconomic) needed to inform decision-making; stand-alone workshops, conferences, and training programs; and capacity building to support participation in processes related to the UNFCCC (such as training for negotiators, enabling activities to prepare reports).

The following additional parameters were established to guide the selection of programs and projects incorporated in the study:

- *Official start date.* To ensure that only “current” projects were included in review, selected projects needed to have begun on or after January 1, 2012, with the

exception of projects that began before this date but were still ongoing as of January 1, 2015.

- *Official end date.* Ongoing projects are those whose official completion day is on or after January 1, 2015. Projects completed after January 1, 2012, were classified as completed.
- *Funding characteristics.* Projects with a value of US\$100,000 or more were included in the study. However, reflecting the greater level of adaptation action underway in Bangladesh and India, the minimum value of projects included in the reviews for these two countries was raised to US\$250,000. Projects financed by international and domestic sources of funding were considered.

Additionally, identified projects were classified by geographical scale in accordance with the following definitions:

- **Global:** Projects involving countries throughout the world, including the profiled country.
- **Regional:** Multi-country projects within a particular subregion, be it a continent or subcontinental area (such as South Asia or West Africa), that includes the profiled country.
- **National:** Projects occurring within one country.

A.2 Type of project being undertaken

To better understand the orientation of the projects underway in the countries examined as part of the review, projects were classified by type using the following definitions:

- *Research.* Encompassing efforts to develop new knowledge or organize existing information so as to increase understanding of the links among climate change, human society, and ecosystems and inform adaptation decision-making.
- *Assessment.* Encompassing risk, impact, and vulnerability assessments, as well as monitoring of ecological and societal trends.
- *Capacity building.* Encompassing the provision of technical training, technical assistance, institutional strengthening, and education.
- *Knowledge communication.* Encompassing efforts to share information, knowledge, and practices related to CCA, including awareness raising and engagement of media.
- *Policy formation and integration.* Encompassing efforts to inform, develop, and implement CCA plans, strategies, frameworks, and policies at the local, subnational, national, and international levels.
- *Field implementation.* Encompassing physical measures to reduce vulnerability to the impacts of climate change, including the implementation of pilot projects, construction of infrastructure, development and modification of technologies, and management of physical resources.

- *Community-based adaptation*. Encompassing actions that directly engage community members in efforts to understand, plan for, and respond to the impacts of climate change.

A.3 Sector or area of focus

To further inform analysis of the range of adaptation action taking place in each country reviewed, programs and projects examined in the study were classified by sector using the following definitions:

1. **Food, fibre, and forests.** Defined as the management and use of terrestrial natural resources to directly improve human well-being. Its subcategories are:
 - *Agriculture*. Encompassing subsistence agriculture, commercial agriculture, and the rearing of confined domestic animals.
 - *Pastoralism*. Encompassing the use of domestic animals as a primary means for obtaining resources from habitats (UNEP, 2007), particularly in nomadic and semi-nomadic communities.
 - *Forestry*. Encompassing afforestation, reforestation, agroforestry, commercial forestry, community-based forest management, and woodland management.
 - *Fire management*. Encompassing monitoring, planning, and management to address the impact of fires on settlements and ecosystems, including forested and grassland ecosystems.
 - *Aquaculture*. Food production through the rearing of aquatic animals, such as fish, crustaceans, and molluscs, or the cultivation of aquatic plants in natural or controlled marine or freshwater environments.
2. **Ecosystems.** Defined as a system of living organisms interacting together and with their physical environment, the boundaries of which may range from very small spatial scales to, ultimately, the entire Earth (IPCC, 2001). Its subcategories are:
 - *Biodiversity protection*. Encompassing activities related to the maintenance of living organisms at various spatial scales, including the establishment and protection of parks and bioserves.
 - *Ecosystem conservation*. Encompassing efforts to *maintain* the health of particular ecosystems, such as wetlands, grasslands, forests, mangroves, and coral reefs.
 - *Ecosystem restoration*. Encompassing efforts to *restore* the health of particular ecosystems, such as wetlands, grasslands, forests, mangroves, and coral reefs.
3. **Freshwater resources.** Defined as the management and use of freshwater contained in terrestrial ponds, lakes, rivers, and watersheds, among others. Its subcategories are:
 - *Freshwater fisheries*. Encompassing the catching, packing, and selling of fish and shellfish derived from lakes, rivers, and ponds, as well as through freshwater aquaculture.

- *Watershed management.* Encompassing management of the basins that supply water to different streams, rivers, lakes, and reservoirs, including integrated watershed management.
 - *Freshwater supply.* Encompassing efforts to access and preserve freshwater for human consumption and use, including drinking water sources, groundwater resources, rainwater harvesting, and water infrastructure such as wells, dams, and dikes.
4. **Oceans and coastal areas.** Defined as the management and use of coastal areas and oceans. Its subcategories are:
- *Coastal zone management.* Encompassing the management of land and water resources in coastal areas, including through integrated coastal zone management and the establishment and maintenance of coastal infrastructure.
 - *Marine management.* Encompassing the management and use of offshore ocean and sea resources.
 - *Marine fisheries.* Encompassing the catching, packing, and selling of fish, shellfish, and other aquatic resources found in the oceans and seas, including through marine and coastal aquaculture.
5. **Disaster risk management.** Defined by the United Nations International Strategy for Disaster Reduction (2009) as the “systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster” (p. 10). It includes emergency response measures, preparation for extreme events and early warning systems. No sub-categories were established in relation to this macro project category.
6. **Migration and security.** Defined as efforts to support the movement of people and maintain their personal security in the face of incremental climate changes or climate shocks.
- *Migration.* Encompassing preparations for and responses to the potential movement of people from one location to another due to climate change impacts.
 - *Security.* Relating to personal security and freedom from violence, crime, and war due to natural and human-induced disasters (UNEP, 2007) and encompassing peace building, conflict reduction, and conflict avoidance.
7. **Gender.** Defined as the social attributes and opportunities associated with being male and female and the relationships between women and men, and girls and boys, as well as the relations among women and among men. These attributes, opportunities, and relationships are socially constructed and are learned through socialization processes (United Nations Entity for Gender Equality and the Empowerment of Women, n.d.). This category includes efforts to understand the vulnerability of women to the impacts of climate change, gender-sensitive adaptation strategies, and measures to improve the

situation of women at the local and policy level, including through gender mainstreaming. No subcategories were established in relation to this macro project category.

8. **Business.** Defined as the purchase and sale of goods and services with the objective of earning a profit. Its subcategories are:
 - *Tourism.* Encompassing the adjustment and development of tourist facilities and operations to account for current and future vulnerabilities, including these actions in relation to ecotourism.
 - *Private sector.* Encompassing potential impacts of climate change and potential adaptation strategies on the diverse activities underway in the portion of the economy in which goods and services are produced by individuals and companies including industry, mining, and other economic sectors.
 - *Trade.* Encompassing the exchange of goods and services within and between countries.
 - *Insurance.* Encompassing the development, testing, and adjusting of insurance and risk-management schemes, including weather-based index systems.

9. **Infrastructure.** Defined as the basic equipment, utilities, productive enterprises, installations, institutions, and services essential for the development, operation and growth of an organization, city or nation (IPCC, 2001). Its sub-categories are:
 - *Energy.* Encompassing energy-related systems and infrastructure, including small-scale and large-scale energy generation through hydroelectric power generation, wind, solar, and other forms of traditional and new energy sources, as well as transmission networks.
 - *Transportation.* Encompassing the components of the system required to move people and goods, including roads, bridges, railway lines, shipping corridors, and ports.
 - *Waste management.* Encompassing sanitation, sewage systems, drainage systems, and landfills.
 - *Buildings.* Encompassing actions related to built structures such as houses, schools, and offices, including changes to building codes, building practices, and green ways of construction.

10. **Human settlements.** Defined as a place or area occupied by settlers (IPCC, 2001). Its subcategories are:
 - *Peri-urban areas.* Encompassing the outskirts of urban centres and the transition zones between rural and urban areas.
 - *Urban areas.* Encompassing municipalities, towns, and cities, as well as areas in these centres (such as slums).
 - *Rural areas.* Encompassing villages and other small settlements, as well as rural landscapes and integrated rural development.

11. **Human health.** Defined as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (WHO, n.d.). It includes efforts to assess vulnerabilities to and the impacts of climate change on human health directly and indirectly, and the development and implementation of appropriate adaptation strategies at the local, regional, and national levels. No subcategories were established in relation to this macro project category.
12. **Climate information services.** Defined as the production and delivery of authoritative, timely, and usable information about climate change, climate variability, climate trends, and impacts to different users at the local, subnational, national, regional, and global levels. It includes efforts to develop, adjust, and provide short- and long-term climate forecasts, including climate change projections, to different audiences. No subcategories were established in relation to this macro project category.
13. **Governance.** Defined as the institutions (laws, property rights systems, and forms of social organization) through which societies define and exercise control over resources (UNEP, 2007). Its subcategories are:
- *Government.* Encompassing efforts to build the capacity of government officials, either at the national or subnational level, to prepare for and facilitate adaptation to climate change, including through the development of policies, plans, frameworks, and strategies, as well as the establishment and operation of climate change trust funds.
 - *Civil society.* Encompassing efforts to build the capacity of the public, including NGOs, to understand, prepare for, and respond to climate change.
14. **Social protection.** Based on DFID's definition of social protection, projects within this category focus on three sets of instruments to address chronic poverty and vulnerability:
- *Social insurance.* Referring to "the pooling of contributions by individuals in state or private organizations so that, if they suffer a shock or change in circumstances, they receive financial support."
 - *Social assistance.* Encompasses "non-contributory transfers that are given to those deemed vulnerable by society on the basis of their vulnerability or poverty."
 - *Workplace safety.* Involves the "setting and enforcing of minimum standards to protect citizens within the workplace" (DFID, 2006, p. 1).
- Adaptation projects that focus on labour market interventions and social assistance would be included in this category. No subcategories were established in relation to this macro project category.
15. **Multisectoral.** Defined as actions that simultaneously address more than one sector in one or multiple locations. It includes efforts that address more than one sector, which are challenging to tease apart, and in the context of this review includes large, multi-

country projects in which the specific sector of focus is nationally determined and, therefore, varies from country to country. No subcategories were established in relation to this macro project category.

16. **Other.** To capture areas of focus not clearly identified in the previous categories.

Annex B: Projects and programs

Projects either recently completed or under way in Kenya are presented alphabetically in the table below.

Name of project	Objectives	Funder(s) and budget	Implementing agencies	Type of project	Sectors	Duration	Scale and location(s)
Adaptation at Scale in Semi-Arid Regions (ASSAR)	This project will enable proactive, longer-term approaches to climate change adaptation in semi-arid regions, while supporting the management of current risks. It draws on a number of disciplines to address the complex interactions among climatic, biophysical, social, political, and economic dynamics. Research on each of these aspects will be integrated through transformative scenario planning, involving stakeholders throughout. The project will generate credible information that decision-makers and others can use to develop robust adaptation strategies.	DFID and IDRC, through CARIAA CA\$13.5 million	University of East Anglia; International START Secretariat; Oxfam; Indian Institute for Human Settlements; and University of Cape Town, South Africa	Research; capacity building; knowledge communication	Multisectoral	2014–2019	Global India, Ethiopia, Kenya, Uganda, Ghana, Mali, Botswana, Namibia, South Africa, Niger
Adaptation of People to Climate Change in East Africa	This project aims to analyze the potential and effectiveness of ecosystem-based adaptation strategies to address climate challenges in East Africa. Processes and results will inform rural stakeholders, district resource managers, and national policymakers regarding the sustainability of different adaptation strategies.	The Rockefeller Foundation	World Agroforestry Centre, Makerere University, Kenya Forestry Research Institute	Research; knowledge communication; policy formation and integration	Ecosystem conservation; ecosystem restoration; climate information; government	2011–2015	Regional Kenya, Uganda
Adaptation Learning Programme for Africa	This project's goal is to increase the capacity of vulnerable households in Sub-Saharan Africa to adapt to climate variability and change. The	UK Aid, Danish International Development Agency,	CARE International, with local partners in all four countries	Capacity building; community-based adaptation	Gender; climate information	2010–2015	Regional Kenya, Ghana,

	<p>program’s purpose is to facilitate the inclusion of community-based adaptation approaches for vulnerable communities in development policies and programs in Ghana, Kenya, Mozambique, and Niger, with plans in place to replicate this across Africa. To achieve this, the program works in five key areas: (1) developing and supporting the implementation of innovative approaches to community-based adaptation by communities and local partners; (2) strengthening local voices in decision-making on adaptation; (3) demonstrating good practice models for community-based adaptation and using them to make recommendations for improvements in policies and practices of government and other development organizations; (4) promoting community-based adaptation approaches to influence the policies and plans of governments, and regional and international organizations; and (5) contributing to the global knowledge base on community-based adaptation.</p>	<p>Government of Finland, Austrian Development Agency</p>					<p>Niger, Mozambique</p>
<p>Arid Lands Support Programme</p>	<p>This program aims to improve the coping strategies of over 500,000 of the poorest people in Northern Kenya (Turkana, Wajir, Mandera, and Marsabit counties) to help them to adapt to climate change and improve their livelihoods. The program will provide opportunities to support the poorest people during drought, provide benefits for livestock insurance, increase the average real value of assets owned by households,</p>	<p>UK Aid £14,309,997</p>	<p>BOMA Project, Oxfam, Trócaire</p>	<p>Capacity building; policy formation and integration; field implementation</p>	<p>Agriculture; pastoralism; disaster risk management; government</p>	<p>December 2012– December 2016</p>	<p>National</p>

	and allow 64,000 beneficiaries to become less poor relative to non-beneficiaries in the four counties.						
Building Climate Change Resilience and Food Security Program	The goal of this program is to increase food security and resilience to environmental shocks among smallholder farmers. The program mitigates the negative effects of climate change by increasing the use of improved varieties of crops and inputs like fertilizer, building an understanding of and ability to implement good soil and water management techniques, and providing better access to poultry vaccination.	USAID US\$2 million	Farm Input Promotions Africa, Kenya Agricultural Research Institute, Agricultural Sector Coordination Unit, Kenya Plant Health Inspectorate Services	Capacity building; field implementation	Agriculture; private sector	February 2012–November 2014	National
Building Resilient Governance, Markets and Social Systems	This program aims to build the absorptive, adaptive, and transformative capacities of households and communities to be more resilient in the face of increasing climate risks, referred to as shocks and stresses.	DFID through the Building Resilience and Adaptation to Climate Extremes and Disasters program	Mercy Corps. Wajir South Development Association, University of Nairobi, Uganda Land Alliance, TANGO International, Makerere University	Capacity building; community-based adaptation	Agriculture; gender; private sector; energy; government	Unknown	Regional Kenya, Uganda
Building the Capacity of Civil Society Organizations in Africa and Asia	This project aims to strengthen the effectiveness of civil society organizations to work with communities to adapt to climate change and ensure food security, to test innovative approaches that improve livelihood opportunities, and to support gender equality.	Canadian Department of Foreign Affairs, Trade and Development; Aga Khan Foundation Canada through the Partnership for Advancing Human Development in Africa and Asia	Aga Khan Development Network agencies	Capacity building; knowledge communication	Civil society	June 2012–December 2017	Global Bangladesh, India, Pakistan, Tajikistan, Kenya, Tanzania, Uganda, Mali, Egypt, Afghanistan, Kyrgyzstan,

CA\$100 million							Madagascar, Mozambique
Catalyzing Forest and Landscape Rehabilitation for Climate Resilience and Biodiversity Conservation in East Africa	The aim of this project is to support the restoration of forest ecosystems and natural landscapes in Kenya and Ethiopia, as they support critical livelihood activities as well as act as a carbon sink.	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) €1,498,594	William J. Clinton Foundation, Clinton Climate Initiative Partners: Ethiopia: Ministry of Environment and Forest, Kenya: MENR	Assessment; capacity building	Ecosystem restoration	February 2014– January 2016	Regional Ethiopia, Kenya
Climate Change Decision Support Simulation Tools	This program aims to develop decision support simulation tools that combine indigenous, traditional, and formal knowledge on sustainable agricultural technologies for use by low-income farmers.	African Union Research Grant Programme through the 10th European Development Fund	Botswana Institute for Technology Research and Innovation with the University of Mauritius; Durban University of Technology, South Africa; Kenyatta University	Research; knowledge communication	Agriculture	Unknown	Regional Botswana, Kenya, South Africa, Mauritius
Climate for Development in Africa	To increase the climate resilience of Africa's population, address the need for improved climate information, and strengthen the use of such information for decision-making.	Global Climate Change Alliance, Norway, Sweden, and the UK €8 million	African Climate Policy Centre	Research; capacity building; knowledge communication	Agriculture; pastoralism; climate information	January 2012– December 2015	Regional Ethiopia, Kenya, Tanzania, Uganda, Burkina Faso, Ghana, Mali, Senegal, Botswana, Namibia, South Africa, Egypt
Climate-Smart Villages	This project aims to sustainably increase productivity and incomes, build resilience to climate change,	CGIAR Research Program on Climate Change, Agriculture	Led by International Center for Tropical	Assessment; capacity building; knowledge	Agriculture; climate information	2011– unknown	Global Bangladesh,

	reduce greenhouse gas emissions, and enhance national food security and development goals. It will do this by establishing climate-smart villages that will act as models of local actions that ensure food security, promote adaptation, and build resilience to climatic stresses. Researchers, local partners, farmers' groups, and policymakers will collaborate to select the most appropriate technological and institutional interventions that support climate-smart agriculture, taking into consideration global knowledge and local conditions.	and Food Security	Agriculture and Earth First	communication; community-based adaptation			India, Nepal, Ethiopia, Kenya, Tanzania, Uganda, Burkina Faso, Ghana, Colombia, Guatemala, Honduras, Nicaragua, Vietnam, Laos, Cambodia
Coastal Region Water Security and Climate Resilience Project	This project aims to sustainably increase bulk water supply to Mombasa County and Kwale County, and to increase access to water and sanitation in Kwale County. This will primarily be achieved through the construction of dams that will support the provision of water to urban areas in Mombasa County and investments in water, sanitation, and irrigation in Kwale County.	World Bank US\$182.67 million	MENR	Field implementation	Freshwater supply	December 2014–December 2021	National
Complementary Livestock Redistribution, Production, and Animal Health Intervention Support to Improve Pastoralists' Livelihoods	The project aims to impact the livelihoods of pastoralist communities in the greater Isiolo District through redistribution of small ruminants and camels that will provide communities with short- and long-term solutions for household food security and increased income. This is seen as an adaptive strategy to pastoralist communities, as the impacts of climate change are expected to increase the frequencies of heat stress, drought, and flooding	Swiss Agency for Development and Cooperation CHF 700,000	Vétérinaires Sans Frontières Suisse	Community-based adaptation	Agriculture; pastoralism	April 2012–March 2014	Regional Ethiopia, Kenya

	events, which would have a negative effect on crop and livestock productivity.						
Global Early Warning System for Climate Change — A Case Study as the Basis for System Design	This project is the first stage in the development of CLIM-WARN, a global early-warning system for changes in climate. CLIM-WARN will issue warnings to the most severely affected regions of the world, allowing sufficient time for these regions to respond to the situation (time horizon between six months and 10 years). In order to acquire the basic data required for planning the system, the project is to conduct a case study in West Africa. In designing this comprehensive early-warning system with a focus on those developing countries most at risk, the project partners are to identify potential users, develop sample plans, and improve the efficiency of data dissemination.	BMUB through the International Climate Initiative €618,451	United Nations Environment Programme, World Meteorological Organization, UN International Strategy for Disaster Reduction In Kenya: MENR, National Environment Management Authority	Research	Agriculture; pastoralism; disaster risk management; climate information	December 2012–October 2014	Regional Kenya, Burkina Faso, Ghana
Implementing a Resilience Framework to Support Climate Change Adaptation in the Mt. Elgon Region of the Lake Victoria Basin Project	This project aims to enhance coordination and adaptive action between stakeholders, informed by timely, accurate, and comprehensive information for the Mt. Elgon water tower. Activity objectives are to improve scientific knowledge of climate change and demonstrate increased social and ecological resilience in hot spots of climate vulnerability using adaptation strategies.	USAID East Africa, International Climate Initiative US\$2 million	International Union for Conservation of Nature, African Collaborative Centre for Earth Systems Science, Lake Victoria Basin Commission	Capacity building; knowledge communication	Freshwater supply; climate information	2012–2015	National
Integrated Programme to Build Resilience to Climate Change and	This program aims to enhance resilience and adaptive capacity to climate change for selected communities in various counties in Kenya in order to increase food	Adaptation Fund US\$9,998,302	National implementing agency: National Environment Management	Capacity building; community-based adaptation	Agriculture; freshwater supply; coastal zone management;	2013–2016	National

Adaptive Capacity of Vulnerable Communities in Kenya	security and environmental management. It develops and implements integrated adaptive mechanisms to increase community livelihood resilience to climate change. The project has five components: (1) enhancing climate change resilience for improved food security in selected counties; (2) improving climate-resilient water management systems to enhance food security in selected counties in Kenya; (3) increasing resilience to the effects of sea level rise and shoreline changes through integrated shoreline and mangrove ecosystem management in the coastal region of Kenya; (4) disaster risk reduction and increasing preparedness among targeted vulnerable communities; and (5) strengthening institutional capacity and knowledge management on climate change adaptation.	Authority Executing agencies: Kenya Forestry Research Institute, Tana and Athi Rivers Development Authority, Coast Development Authority	disaster risk reduction				
Kenya: Adaptation to Climate Change in Arid and Semi-Arid Lands, Phase 2	The project aims to “improve the ability of participating districts and communities in the arid and semi-arid lands to plan and implement climate change adaptation measures” (World Bank, 2010, p. 1). This goal is to be achieved by: “(i) strengthening climate risk management and natural resource-based related knowledge; (ii) building institutional and technical capacity for improved planning and coordination to manage current and future climate risks at the district and national levels; and (iii) investing in communities’ priorities in sustainable land and water management and alternative livelihoods that helps them adapt to climate risk” (World	Special Climate Change Fund, GOK US\$6.32 million	Ministry for the Development of Northern Kenya and Other Arid Lands, World Bank, UNDP	Capacity building; policy formation and integration; community-based adaptation	Agriculture; government	June 2010–October 2016	National

	Bank, 2010, p. 1). The project supports the Arid Lands Resource Management Project of the GOK.						
Kenya Integrated Climate Risk Management Project	The project aims to strengthen the country's capacity to design and implement activities aimed at addressing the changing patterns of climate-related disasters, build national and sectoral capacity for climate analysis and application, and help mitigate climate-induced risks and impacts on development processes and community livelihoods. It will seek to better position climate-vulnerable sectors to be identified in consultation with national counterparts to effectively use disaster risk reduction and adaptation resources based on analytical evidence concerning the nature and level of climate-related risks to their development plans.	Swedish Embassy US\$5 million	NDMA	Capacity building	Disaster risk management; government	April 2014–December 2016	National
Kenya Water Security and Climate Resilience Project	This project aims to increase project beneficiaries' access to irrigation water, improve flood control in the Nzoia watershed, improve flood early warning, and strengthen the institutional capacity of the Mombasa Water and Sanitation Company.	World Bank US\$200 million	Ministry of Environment, Water and Natural Resources	Policy formation and integration; field implementation	Freshwater supply; government	October 2013–October 2020	National
Low Emissions Climate Resilient Development	This project aims to support Kenya's efforts to pursue long-term, transformative development and accelerate sustainable climate-resilient economic growth, while slowing the growth of greenhouse gas emissions. Specific objectives: <ul style="list-style-type: none"> • Strengthen capacity for low-emission development in Kenya • Build national and county institutions' capacity to better 	USAID US\$7.76 million	UNDP; MENR; Ministry of Energy and Petroleum; Ministry of Devolution and Planning; Kenya Meteorological Department; Kenya Association of Manufacturers	Capacity building; policy formation and integration	Agriculture; climate information; government	September 2014–September 2017	National

	<p>coordinate climate change activities and climate finances</p> <ul style="list-style-type: none"> • Enhance decision-making for increased resilience to climate change impacts • Promote climate-smart technologies and business opportunities 						
Partners for Resilience: Climate-Proof Disaster Risk Reduction Programme	<p>To reduce the impact of natural hazards on the livelihoods of 750,000 to 1 million vulnerable community members. Outcome objectives of the program are to: (1) increase the resilience of communities to disasters, climate change and environmental degradation; (2) increase the capacity of civil society organizations to apply disaster risk reduction, climate change adaptation and ecosystem management and restoration measures and conduct policy dialogue; and (3) make the institutional environment, from the international to the grassroots level, more conducive to integrating disaster risk reduction, climate change adaptation, and ecosystem-based approaches.</p>	<p>Dutch Ministry of Foreign Affairs, Partners for Resilience</p> <p>€69,547,700</p>	<p>Partners for Resilience: Netherlands Red Cross (lead), Red Cross/Red Crescent Climate Centre, Cordaid, Wetlands International, CARE Netherlands</p>	<p>Assessment; capacity building; policy formation and integration</p>	<p>Ecosystem restoration; disaster risk management</p>	<p>2011–2015</p>	<p>Global</p> <p>India, Ethiopia, Kenya, Uganda, Mali, Guatemala, Indonesia, Nicaragua, the Philippines</p>
Pathways to Resilience in Semi-Arid Economies	<p>This project aims to spur climate-resilient development in African and Asian semi-arid lands by identifying economic threats and opportunities resulting from climate change. The project will work with stakeholders in government, business, civil society, and regional economic organizations to research five areas: climate risk, institutional and regulatory frameworks, markets, natural capital, and human capital. Focusing on</p>	<p>DFID and IDRC through CARIAA</p>	<p>Overseas Development Institute (UK); Innovation, Environnement, Développement Afrique (Senegal); Centre for Climate Change Studies, University of Dar es Salaam (Tanzania);</p>	<p>Research; capacity building; knowledge communication; policy formation and integration</p>	<p>Multisectoral</p>	<p>2014–2019</p>	<p>Global</p> <p>Pakistan, Tajikistan, Kenya, Tanzania, Burkina Faso, Senegal</p>

	practical needs, the project will shed light on climate risks and opportunities, leading to better-informed policies and investments for climate resilience.		Grantham Research Institute; London School of Economics (UK); Sustainable Development Policy Institute (Pakistan)				
Planning for Resilience in East Africa through Policy, Adaptation, Research and Economic Development	The program addresses three key development challenges facing the East African Community: (1) increasing resilience to climate change; (2) managing transboundary freshwater biodiversity conservation; and (3) improving access to drinking water supply and sanitation services. This will be done by: <ul style="list-style-type: none"> • Strengthening regional climate change policy • Accessing global climate change adaptation funds, by accrediting the Secretariat as a regional implementing agency • Managing East Africa’s biologically significant transboundary freshwater ecosystems • Facilitating sustainable water supply, sanitation, and wastewater treatment services in the Lake Victoria Basin 	USAID East Africa US\$40 million	East African Community Secretariat’s Climate Change Coordination Unit, Lake Victoria Basin Commission, IGAD’s Climate Prediction and Applications Centre, Regional Center for Mapping of Resources for Development, East African Community Partner States and Tetra Tech ARD	Capacity building; knowledge communication; policy formation and integration	Freshwater supply; human health	2012–2016	Regional Kenya, Tanzania, Uganda, Burundi, Rwanda
Rural Livelihoods’ Adaptation to Climate Change in the Horn of Africa	To improve the resilience to climate change of pastoral and agro-pastoral communities in targeted areas, and to increase the adaptive capacity of their livelihoods.	African Development Bank, Global Environment Facility US\$64 million	Ministry of Agriculture, MENR	Capacity building; field implementation; community-based adaptation	Agriculture; gender; multisectoral	2013–2017	Regional Kenya, Djibouti
Southern Voices on Adaptation	The Southern Voices on Adaptation will develop and test the Joint Principles for Adaptation to become code of practice on what constitutes	Danish International Development Agency through the	DanChurchAid, Oxfam IBIS, CARE Denmark, National Council of	Capacity building; policy formation and integration	Agriculture; pastoralism	2014– unknown	Global Nepal, Kenya,

	good national policies for adaptation to climate change in the Global South. These Joint Principles will become a tool for cooperation and information sharing between civil society networks and governments in countries with different geographic, climatic, and political realities.	Climate and Development Fund	Churches of Kenya				Ghana, Mozambique, Niger, Cambodia, Sri Lanka, Vietnam, Bolivia, Nicaragua, Guatemala
StARCK+	This project aims to achieve transformational change by scaling up private sector innovation and investment in low-carbon and adaptation action through the provision of targeted support to critical aspects of climate change governance and stimulation of civil society demand. The six components of StARCK+ are: (1) Renewable Energy and Adaptation Technologies Window of the Africa Enterprise Challenge Fund to incentivize the private sector to provide adaptation goods and services in ASALs; (2) Kenya Climate Innovation Centre to support climate innovation in Kenya's private sector; (3) Finance Innovation for Climate Change Fund to provide accountable grants and a climate-smart agriculture program working with microfinance institutions and value chain actors to provide loans and services to farmers in the high-productive zones; (4) Technical assistance to the GOK for the implementation of the NCCAP; (5) Adaptation consortium to enhance climate resilience and provide decentralized support at the county level, including the establishment of a county adaptation fund in Isiolo; and	UK Aid £28,089,997	Development Alternatives Incorporated, IISD, Matrix Development Consultants, Kenya Association of Manufacturers, ClimateCare, United Nations, AGRA; PricewaterhouseCoopers, infoDev in the World Bank, International Institute for Environment and Development, NDMA, Christian Aid, Kenya Meteorological Department, UK Met Office, ACTI, local NGOs	Research; Capacity building; knowledge communication; policy formation and integration; field implementation	Government; civil society; private sector	March 2013– March 2017	National

	(6) ACT! for its natural resource management program designed to strengthen Kenyan civil society engagement in climate change advocacy.						
Water Infrastructure Solutions from Ecosystem Services Underpinning Climate -Resilient Policies and Programmes	This program aims to test, develop, and demonstrate approaches for the use of a mixed water infrastructure that combines natural river courses with artificial elements such as reservoirs. It thereby improves water supplies and increases resilience to climate change in the basins of the Tana (Kenya) and Volta (Ghana, Burkina Faso). Furthermore, it supports sustainable development in the areas of poverty reduction, conservation of biodiversity, food security, and secure supplies of energy and water.	BMUB through the International Climate Initiative €5,312,063	International Union for Conservation of Nature, Tana and Athi Rivers Development Authority, Volta Basin Authority	Assessment; capacity building	Agriculture; watershed management	August 2013–July 2017	Regional Kenya, Burkina Faso, Ghana

8. References

- Act, Change, Transform (ACT!). (n.d.). Retrieved from <http://www.act.or.ke/>
- ADA Consortium. (2014). Strengthening adaptation and resilience to climate change in Kenya plus (StARCK+). Retrieved from <http://www.adaconsortium.org/index.php/starck.html>
- ADA Consortium. (2015). County adaptation fund support local priorities for climate resilient development [Briefing paper]. Retrieved from http://www.adaconsortium.org/images/publications/Briefing_Paper_Final_for_Printing-2015.pdf
- AEA Group. (2008). Kenya: Climate screening and information exchange [Flyer]. Harwell, UK: AEA Group.
- African Development Bank (AfDB). (2007). Kenya: Country gender profile. Retrieved from <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/ADB-BD-IF-2008-16-EN-KENYA-GENDER-PROFILE.PDF>
- Awuor, C. (2009). Increasing drought in arid and semi-arid Kenya. In J. Ensor & R. Berger (Eds.), *Understanding climate change adaptation: Lessons from community-based approaches* (pp. 101–114). Rugby: Practical Action Publishing.
- Awuor, C., Orindi, V., & Adwera, A. (2008). Climate change and coastal cities: The case of Mombasa, Kenya. *Environment and Urbanization*, 20(1), 231–242.
- Boko, M., Niang, I., Nyong, A., & Vogel, C. (2007). Africa. In M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden, & C.E. Hanson (Eds.), *Climate change 2007: Impacts, adaptation and vulnerability. Working group II contribution to the fourth assessment report of the Intergovernmental Panel on Climate Change* (pp. 433–467). Cambridge, UK: Cambridge University Press.
- Central Bank of Kenya. (2015). Diaspora remittances. Retrieved from <https://www.centralbank.go.ke/diaspora-remittances>
- Central Intelligence Agency (CIA). (2014). The world factbook: Kenya. Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/ke.html>
- Christensen, J.H., Krishna Kumar, K., Aldrian, E., An, S.-I., Cavalcanti, I.F.A., de Castro, M., ... Zhou, T. (2013). Climate phenomena and their relevance for future regional climate change. In T.F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, ... P.M. Midgley (Eds.), *Climate change 2013: The physical science basis. Working group I contribution to the fifth*

assessment report of the Intergovernmental Panel on Climate Change (pp. 1217–1308). Cambridge: Cambridge University Press.

Climate Funds Update. (2015). The data: Climate finance recipients. Retrieved from <http://www.climatefundsupdate.org/data>

Conway, G. (2009). The science of climate change in Africa: Impacts and adaptation (Discussion paper no. 1). London, UK: Imperial College London, Grantham Institute for Climate Change. Retrieved from [https://workspace.imperial.ac.uk/climatechange/public/pdfs/discussion_papers/Grantham_Institutue - The science of climate change in Africa.pdf](https://workspace.imperial.ac.uk/climatechange/public/pdfs/discussion_papers/Grantham_Institutue_-_The_science_of_climate_change_in_Africa.pdf)

Dadaab—locals vs refugees. (2011, September 2). IRIN. Retrieved from <http://www.irinnews.org/report/93635/kenya-dadaab-locals-vs-refugees>

Daron, J.D. (2014). Regional climate messages: East Africa (Scientific report from the CARIAA adaptation at scale in semi-arid regions [ASSAR] project). Retrieved from https://www.weadapt.org/system/files/force/east_africa_climate_messages_-_version_1_-_regional_level.pdf

De Wit, M. (2006). Climate change and African agriculture: The economic impacts of climate change on agriculture in Kenya (Policy note no. 12). Retrieved from http://www.ceepa.co.za/uploads/files/POLICY_NOTE_12.pdf

Department for International Development (DFID). (2006). Social protection in poor countries. Social protection briefing note series, number 1. Retrieved from GSDRC website: <http://www.gsdrc.org/docs/open/SP17.pdf>

Department for International Development (DFID). (2009). Elections in Kenya in 2007. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/67654/elections-ke-2007.pdf

Dekens, J., Parry, J., Zamudio, A., & Echeverría, D. (2013). Climate risk management for malaria control in Kenya: The case of the western highlands. New York: UNDP. Retrieved from <http://www.iisd.org/publications/climate-risk-management-malaria-control-kenya-case-western-highlands>

Downing, C., Preston, F., Parusheva, D., Horrocks, L., Edberg, O., Samazzi, F., ... Nyangena, W. (2008). Kenya: Climate screening and information exchange (ED 05603, Issue 2). Harwell, UK: AEA Group.

Dyszynski, J., Droogers, P., & Butterfield, R. (2009). Climate adaptation economics: Kenya water sector. Oxford, UK: Stockholm Environment Institute (SEI). Retrieved from

https://www.weadapt.org/sites/weadapt.org/files/legacy-new/knowledge-base/files/4e25a6035cad51D-Final_Kenya_Water_Sector_Report.pdf

Earth Institute at Columbia University. (n.d.). Kenya natural disaster profile. Retrieved from http://www.ldeo.columbia.edu/chrr/research/profiles/pdfs/kenya_profile1.pdf

Friedrich Ebert Stiftung. (2010). Implementation of the new constitution. Retrieved from <http://www.fes-kenya.org/pages/activities/implementation-of-the-new-constitution.php>

Fund for Peace (FFP). (2014). Fragile states index 2014. Retrieved from <http://fsi.fundforpeace.org/rankings-2014>

Funk, C., Eilerts, G., Davenport, F., & Michaelsen, J. (2010). A climate trend analysis of Kenya—August 2010 (United States Geological Survey fact sheet 2010-3074). Retrieved from <http://pubs.usgs.gov/fs/2010/3074/>

GAN Integrity Inc. (2014). Kenya corruption report. Retrieved from <http://www.business-anti-corruption.com/country-profiles/kenya>

Gathigah, M. (2014, June 4). Kenya's climate change legislation takes shape to save struggling farmers. Inter Press Service News Agency. Retrieved from <http://www.ipsnews.net/2014/06/kenyas-climate-change-legislation-takes-shape-to-save-struggling-farmers/>

Government of Kenya (GOK). (n.d.). County integrated development plan 2013–2017: Siaya County integrated development plan. Retrieved from <http://iscrc.ilegkenya.org/documents/Siaya%20CIDP-2013-17.pdf>

Government of Kenya (GOK). (2006). Disaster risk reduction strategy for Kenya 2006–2016: A resilient and safer nation. Unpublished.

Government of Kenya (GOK). (2007). Kenya vision 2030: A globally competitive and prosperous Kenya. Nairobi: Government of Kenya. Retrieved from http://www.researchictafrica.net/countries/kenya/Kenya_Vision_2030_-_2007.pdf

Government of Kenya. (2010a). Agricultural sector development strategy 2010–2020. Retrieved from http://www.gafspfund.org/sites/gafspfund.org/files/Documents/5.%20Kenya_strategy.pdf

Government of Kenya (GOK). (2010b). National climate change response strategy. Retrieved from <http://cdkn.org/wp-content/uploads/2012/04/National-Climate-Change-Response-Strategy-April-2010.pdf>

Government of Kenya (GOK). (2010c). The Constitution of Kenya, 2010. Nairobi: National Council for Law Reporting. Retrieved from <https://www.kenyaembassy.com/pdfs/the-constitution-of-kenya.pdf>

- Government of Kenya (GOK). (2011). Scaling-up renewable energy program (SREP): Investment plan for Kenya (Draft). Retrieved from http://www.renewableenergy.go.ke/downloads/policy-docs/Updated_SREP_Draft_Investment_Plan_May_2011.pdf
- Government of Kenya (GOK). (2013a). National climate change action plan 2013–2017. Retrieved from <http://cdkn.org/wp-content/uploads/2013/03/Kenya-National-Climate-Change-Action-Plan.pdf>
- Government of Kenya (GOK). (2013b). Policy changes to benefit women: Ministry of Health implements free maternity services nationwide. Retrieved from http://www.healthpolicyproject.com/ns/docs/MaternalNewbornHealthCare_Kenya_Oct2013.pdf
- Hammill, A., & Dekens, J. (2013). Monitoring and evaluating adaptation at aggregated levels: A comparative analysis of ten systems. Bonn and Eschborn, Germany: Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH. Retrieved from https://gc21.giz.de/ibt/var/app/wp342deP/1443/wp-content/uploads/filebase/me/me-guides-manuals-reports/GIZ_2014-Comparative_analysis_of_national_adaptation_M&E.pdf
- Harding, B., & Devisscher, T. (2009). Ecosystems chapter, Kenya. In Review of the economic impacts of climate change in Kenya, Rwanda and Burundi. Retrieved from <http://www.oceandocs.org/bitstream/handle/1834/6920/ktf0032.pdf>
- Hove, H., Echeverría, D., & Parry, J. (2011). Review of Current and Planned Adaptation Action: East Africa. Adaptation Partnership. Retrieved from https://www.iisd.org/pdf/2011/East_Africa_Adaptation_Action.pdf
- Intergovernmental Authority on Development (IGAD) Climate Prediction and Applications Centre (ICPAC). IGAD Climate Prediction and Applications Centre. (n.d.). Retrieved from <http://www.icpac.net/>
- Intergovernmental Panel on Climate Change (IPCC). (2001). Annex B. Glossary of terms. In Climate change 2001: Impacts, adaptation and vulnerability. Retrieved from <http://www.ipcc.ch/pdf/glossary/tar-ipcc-terms-en.pdf>
- Intergovernmental Panel on Climate Change (IPCC). (2013). Summary for policymakers. In T.F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, ... P.M. Midgley (Eds.), Climate change 2013: The physical science basis. Working group I contribution to the fifth assessment report of the Intergovernmental Panel on Climate Change (pp. 3–29). Cambridge and New York: Cambridge University Press.
- International Fund for Agricultural Development. (2007). Republic of Kenya: Country strategic opportunities programme (Document no. EB 2007/91/R.12). Retrieved from <http://www.ifad.org/gbdocs/eb/91/e/EB-2007-91-R-12.pdf>

- International Monetary Fund (IMF). (2014). World economic outlook: Legacies, clouds, uncertainties. World economic and financial surveys series. Retrieved from <http://www.imf.org/external/pubs/ft/weo/2014/02/pdf/text.pdf>
- Irrigation scheme locks horns with Kenya's pastoralists. (2013, July 10). IRIN. Retrieved from <http://www.irinnews.org/report/98394/irrigation-scheme-locks-horns-kenya%E2%80%99s-pastoralists>
- Japan International Cooperation Agency. (n.d.). Activities in Kenya. Retrieved from <http://www.jica.go.jp/kenya/english/activities/activitiy01.html>
- Kabubo-Mariara, J., & Karanja, F.K. (2007). The economic impact of climate change on Kenyan crop agriculture: A Ricardian approach (Policy research working paper no. 4334). Washington, DC: World Bank Development and Research Group. Retrieved from <http://documents.worldbank.org/curated/en/791561468273328968/pdf/wps4334.pdf>
- Kandji, S.T. (2006, November/December). Drought in Kenya: Climatic, economic and socio-political factors. New Standpoints. Retrieved from <http://www.worldagroforestry.org/downloads/Publications/PDFS/NL06291.pdf>
- Kandji, S.T., & Verchot, L.V. (n.d.). Impacts of and adaptation to climate variability and climate change in the East African community: A focus on the agricultural sector. Nairobi: World Agroforestry Centre. Retrieved from <http://www.worldagroforestry.org/downloads/Publications/PDFS/RP07172.pdf>
- Kebede, A.S., Nicholls, R.J., Hanson, S., & Mokrech, M. (2010). Impacts of climate change and sea-level rise: A preliminary case study of Mombasa, Kenya (Working Paper 146). Southampton, UK: University of Southampton, Tyndall Centre. Retrieved from www.tyndall.ac.uk/sites/default/files/twp146.pdf
- Kenya National Bureau of Statistics. (2014). Highlights of the revision of national accounts. Retrieved from http://www.knbs.or.ke/index.php?option=com_content&view=article&id=272:highlights-of-the-revision-of-national-accounts&catid=82:news&Itemid=593
- Kenya National Drought Management Authority. (2014). Isiolo County adaptation fund: Activities, costs and impacts after the 1st investment round. Retrieved from <http://pubs.iied.org/G03806.html>
- Kenya Youth Climate Network. (n.d.). Kenya Youth Climate Network. Retrieved from <http://kenyayouthclimatenetwork.org/>
- Kilroy, G. (2015). A review of the biophysical impacts of climate change in three hotspot regions in Africa and Asia. *Regional Environmental Change*, 15(5), 771–782. Retrieved from <http://link.springer.com/article/10.1007%2Fs10113-014-0709-6>

Kreft, S., Eckstein, D., Junghans, L., Kerestan, C., & Hagen, U. (2014). Global climate risk index 2015. Who suffers most from extreme weather events? Weather-related loss events in 2013 and 1994 to 2013. Retrieved from <http://germanwatch.org/en/download/10333.pdf>

Mango, L.M., Melesse, A.M., McClain, M.E., Gann, D., & Setegn, S.G. (2010). A modeling approach to determine the impacts of land use and climate change scenarios on the water flux of the upper Mara River. *Hydrology & Earth System Sciences Discussions*, 7(4), 5851–5893.

McSweeney, C., New, M., & Lizcano, G. (2009). Kenya. UNDP climate change country profiles series. Retrieved from <http://ncsp.undp.org/sites/default/files/Kenya.oxford.report.pdf>

Met Office, Gosling, S.N., Dunn, R., Carrol, F., Christidis, N., de Gusmao, D., ... Warren, R. (2011). *Climate: Observations, projections and impacts: Kenya*. Retrieved from <http://eprints.nottingham.ac.uk/2040/16/Kenya.pdf>

Ministry of Devolution and Planning (MDP). (2013a). *Second medium term plan (2013–2017). Transforming Kenya: Pathway to devolution, socio-economic development, equity and national unity*. Nairobi: Government of Kenya. Retrieved from <http://www.devolutionplanning.go.ke/wp-content/uploads/2015/04/MTP2.pdf>

Ministry of Devolution and Planning (MDP). (2013b). *Sector plan for drought risk management and ending drought emergencies: Second medium term plan 2013–2017*. Retrieved from <http://www.ndma.go.ke/index.php/resource-centre/send/5-policy-documents/608-vision-2030-sector-plan-for-drought-risk-management-and-ed>

Ministry of Environment and Mineral Resources. (n.d.). Kenya launches a national climate change action plan (NCCAP). Retrieved from <http://www.kccap.info/>

Ministry of Environment and Natural Resources (MENR). (2002). *First national communication of Kenya to the conference of the parties to the United Nations Framework Convention on Climate Change (UNFCCC)*. Nairobi: National Environment Secretariat. Retrieved from <http://unfccc.int/resource/docs/natc/kennc1.pdf>

Ministry of Environment and Natural Resources (MENR). (2015). Kenya's intended nationally determined contribution (INDC). Retrieved from http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Kenya/1/Kenya_INDC_20150723.pdf

Ministry of Environment, Water and Natural Resources. (2014a). *Draft national climate change framework policy (version of 22 September 2014)*. Retrieved from <http://iscrc.ilegkenya.org/documents/Draft-Climate-Change-Policy.pdf>

Ministry of Environment, Water and Natural Resources. (2014b). Forest policy, 2014. Retrieved from [http://www.kenyaforestservice.org/documents/Forest Policy, 2014 \(Revised 20-2-2014\).pdf](http://www.kenyaforestservice.org/documents/Forest Policy, 2014 (Revised 20-2-2014).pdf)

Ministry of Public Health and Sanitation. (2009). Towards a malaria-free Kenya: National malaria strategy 2009–2017. Retrieved from http://www.nationalplanningcycles.org/sites/default/files/country_docs/Kenya/kenya_national_malaria_strategy_2009-2017.pdf

Ministry of State for Development of Northern Kenya and Other Arid Lands. (2012). National policy for the sustainable development of northern Kenya and other arid lands: “Releasing our full potential” (Sessional paper no. 8 of 2012). Retrieved from <http://csdes.uonbi.ac.ke/sites/default/files/cavs/csdes/Sessional Paper on National policy for development of ASALs.pdf>

Ministry of State for Devolution and Planning (MSDP) & United Nations Development Programme (UNDP). (2013). Kenya national human development report 2013: Climate change and human development: Harnessing emerging opportunities. Retrieved from http://hdr.undp.org/sites/default/files/knhd_report_2013.pdf

Ministry of State for Planning, National Development and Vision 2030. (2008). First medium term plan, 2008–2012. Nairobi: Government of Kenya. Retrieved from <http://www.imf.org/external/pubs/ft/scr/2010/cr10224.pdf>

Ministry of State for Provincial Administration and Internal Security. (2011). National policy on peace-building and conflict management. Retrieved from <http://www.i4pinternational.org/files/220/6.+kenya-2011-national+policy.pdf>

Ministry of State for Special Programmes. (2009). National disaster management policy [Final draft September 2009]. Nairobi: Government of Kenya.

Mogaka, H., Gichere, S., Davis, R., & Hirji, R. (2006). Climate variability and water resources degradation in Kenya: Improving water resources development and management (World Bank working paper no. 69). Washington, DC: World Bank. Retrieved from <http://documents.worldbank.org/curated/en/990211468283546915/pdf/348540KE0Clima101OFFICIAL0USE0ONLY1.pdf>

Murphy, D., & Harris, M. (2014). Climate change and the tourism sector. Climate change and your business briefing note series. Retrieved from <http://cdkn.org/wp-content/uploads/2015/04/Climate-Change-and-the-Tourism-Sector.pdf>

Murang’a County Government. (n.d.). Fiscal strategy paper. Retrieved from http://muranga.go.ke/index.php?option=com_content&view=article&id=120:fiscal-strategy-paper&catid=79&Itemid=489

Mutimba, S., Mayieko, S., Olum, P., & Wanyatma, K. (2010). Climate change vulnerability and adaptation preparedness in Kenya. Nairobi: Heinrich Böll Stiftung. Retrieved from https://www.boell.de/sites/default/files/assets/boell.de/images/download_de/worldwide/Kenya_Climate_Change_Adaptation_Preparedness.pdf

Nakweya, G. (2014, May 28). Female-headed households “prone to food insecurity.” SciDev.Net. Retrieved from <http://www.scidev.net/sub-saharan-africa/food-security/news/female-households-food-insecurity.html>

National Council of Churches of Kenya. (2014). Our programme approach. Retrieved from <http://www.ncck.org/newsite2/index.php/our-work/k2-categories/our-programme-approach>

Nicholles, N., Vardakoulias, O., & Johnson, V. (2012). Counting on uncertainty: The economic case for community based adaptation in North-East Kenya. London, UK: new economics foundation. Retrieved from http://b.3cdn.net/nefoundation/06ffd7ab24bcec4ef2_f0m6bu9ld.pdf

Njoka, J. (2015). Assessing adaptation in semi-arid lands: Kenya. Country situation assessments series [Unpublished draft].

Notre Dame Global Adaptation Index (ND-GAIN). (2015). Kenya. Retrieved from <http://index.gain.org/country/kenya>

Odera, M., Thomas, T., Waithaka, M., & Kyotalimye, M. (2012). East African agriculture and climate change: A comprehensive analysis—Kenya. In M. Waithaka, G. Nelson, T.S. Thomas, M. Kyotalimye (Eds.), East African agriculture and climate change: A comprehensive analysis. Washington, DC: International Food Policy Research Institute. Retrieved from <https://www.ifpri.org/publication/east-african-agriculture-and-climate-change-comprehensive-analysis-kenya>

Odhiambo, M. (2013). Releasing our full potential: The ASAL policy, its promise and challenges (A briefing note for members of county assemblies, community representatives, leaders, CSO and ASAL stakeholders). Retrieved from http://www.fao.org/fileadmin/user_upload/drought/docs/ASAL_Policy_Analysis_Final.pdf

Omondi, G. (2014, November 10). Women now head a third of Kenyan households. Business Daily. Retrieved from <http://www.businessdailyafrica.com/Women-now-head-a-third-of-Kenyan-households/539546-2518008-regymnz/index.html>

Organisation for Economic Co-operation and Development (OECD). (n.d.). Rio markers: Integrated bilateral and multilateral climate-related flows in 2013. Retrieved on February 21, 2015, from https://public.tableausoftware.com/views/Climate-Related-Aid/IntegratedBi-multi?:embed=y&:display_count=no?&:showVizHome=no - 1ht

- Ogola, J.S. (n.d.). Climate change: Kenya's responses. In Voices from Africa, Number 6: Sustainable development part 2. Retrieved from <https://www.un-ngls.org/orf/documents/publications.en/voices.africa/number6/vfa6.11.htm>
- Power Africa. (n.d.). Investment brief for the electricity sector in Kenya. Retrieved from [https://www.usaid.gov/sites/default/files/documents/1860/Kenya%20 IG 2015 05 03.pdf](https://www.usaid.gov/sites/default/files/documents/1860/Kenya%20IG%202015%2005%2003.pdf)
- Schaeffer, M., Baarsch, F., Balo, G., de Bruin, K., Calland, R., Fallasch, F., ... Hare, B. (2015). Africa's Adaptation Gap 2: Bridging the gap—mobilising sources. Retrieved from [http://apps.unep.org/piwik/download.php?file=/publications/pmtdocuments/-Africa%E2%80%99s Adaptation Gap 2 .pdf](http://apps.unep.org/piwik/download.php?file=/publications/pmtdocuments/-Africa%E2%80%99s%20Adaptation%20Gap%202015.pdf)
- Seitz, J., & Nyangena, W. (2009). Economic impact of climate change in the East African Community (EAC). Retrieved from [http://www.global21.eu/download/Economic Impact Climate Change EAC.pdf](http://www.global21.eu/download/Economic_Impact_Climate_Change_EAC.pdf)
- Sørensen, C.K. (2015, April 14). About the southern voices. Southern voices on climate change. Retrieved from <http://www.southernvoices.net/en/about.html>
- Stockholm Environment Institute (SEI). (2009). The economics of climate change in Kenya. Retrieved from <https://www.sei-international.org/mediamanager/documents/Publications/Climate-mitigation-adaptation/kenya-climatechange.pdf>
- Thornton, P., & Gerber, P. (2010). Climate change and the growth of the livestock sector in developing countries. *Mitigation and Adaptation Strategies for Global Change*, 15(2), 169–184.
- Thornton, P., Jones, P., Farrow, A., Alagarswamy, G., & Andresen, J. (2008). Crop yield response to climate change in East Africa: Comparing highlands and lowlands. *IHDP Update*, 2, 23–26. Retrieved from <https://cgspace.cgiar.org/handle/10568/55567>
- Thornton, P.K., Jones, P.G., Alagarswamy, G., & Andresen, J. (2009). Spatial variation of crop yield response to climate change in East Africa. *Global Environmental Change*, 19(1), 54–65.
- Transparency International. (2014). Corruption perceptions index 2014: Results. Retrieved from <http://www.transparency.org/cpi2014/results>
- Transparency International Kenya. (n.d.). The Climate Governance Network (CGN). Retrieved from <http://www.tikenya.org/index.php/the-climate-governance-network>
- United Nations Development Programme (UNDP). (n.d.). Kenya natural disaster profile. Retrieved from

<http://meteorology.uonbi.ac.ke/sites/default/files/cbps/sps/meteorology/Project on Disasters.pdf>

United Nations Development Programme (UNDP). (2014). Human development index 2014: Sustaining human progress: Reducing vulnerabilities and building resilience. Retrieved from <http://hdr.undp.org/en/content/human-development-report-2014>

United Nations Development Programme (UNDP). (2015). Human development reports: Kenya. Retrieved from <http://hdr.undp.org/en/countries/profiles/KEN>

United Nations Entity for Gender Equality and the Empowerment of Women. (n.d.). Gender mainstreaming: Concepts and definitions. Retrieved from <http://www.un.org/womenwatch/osagi/conceptsanddefinitions.htm>

United Nations Environment Programme (UNEP). (2007). Glossary. In Global environment outlook 4. Retrieved from <http://www.unep.org/geo/geo4/report/Glossary.pdf>

United Nations High Commission for Refugees (UNHCR). (2015). Kenya. Retrieved from <http://www.unhcr.org/pages/49e483a16.html>

United Nations International Strategy for Disaster Reduction (UNISDR). (2009). 2009 UNISDR terminology on disaster risk reduction. Retrieved from http://unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf

Viner, D., & Agnew, M. (1999). Climate change and its impacts on tourism. Norwich, UK: University of East Anglia, Climatic Research Unit. Retrieved from http://www.wwf.org.uk/filelibrary/pdf/tourism_and_cc_full.pdf

Water Resources Management Authority. (2013). Strategic plan for 2012–2017 (Abridged version, June 2013). Retrieved from http://www.wrma.or.ke/downloads/SP_bridged_2015.pdf

World Bank. (2009). Kenya: Poverty and inequality assessment: Executive summary and synthesis report (Report no. 44190-KE). Retrieved from <http://documents.worldbank.org/curated/pt/425611468089394594/pdf/441900ESW0P0901IC0Dislosed071171091.pdf>

World Bank. (2010). Kenya—Second phase of the arid lands resource management project. Washington, DC: World Bank. Retrieved from <http://documents.worldbank.org/curated/en/373231468273655913/Kenya-Second-Phase-of-the-Arid-Lands-Resource-Management-Project>

World Bank. (2011). Kenya economic update: Turning the tide in turbulent times—making the most of Kenya's demographic change and rapid urbanization (Edition no. 4). Retrieved from

<http://documents.worldbank.org/curated/en/104401468048252004/pdf/632650WP0Kenya00Box0361511B0PUBLIC0.pdf>

World Bank. (2014, September 30). Kenya: A bigger, better economy. Retrieved from <http://www.worldbank.org/en/news/feature/2014/09/30/kenya-a-bigger-better-economy>

World Bank. (2015a). Indicators. Retrieved from <http://data.worldbank.org/indicator>

World Bank. (2015b). Kenya. Retrieved from <http://data.worldbank.org/country/kenya>

World Health Organization (WHO). (n.d.). Frequently asked questions. Retrieved from <http://www.who.int/suggestions/faq/en/index.html>

World Health Organization (WHO). (2010). Report on a consultation meeting: Essential public health package to enhance climate-change resilience in developing countries. Geneva: WHO. Retrieved from [http://www.who.int/entity/globalchange/mediacentre/events/2010/EssentialPublicHealthPackage September 2010 Consultation Meeting Report.pdf](http://www.who.int/entity/globalchange/mediacentre/events/2010/EssentialPublicHealthPackage%20September%202010%20Consultation%20Meeting%20Report.pdf)

World Health Organization (WHO). (2012). Kenya: WHO statistical profile. Retrieved from <http://www.who.int/gho/countries/ken.pdf?ua=1>

World Resources Institute (WRI), Ministry of Environment and Natural Resources (MENR), Ministry of Planning and National Development, & International Livestock Research Institute. (2007). Nature's benefits in Kenya: An atlas of ecosystems and human well-being. Washington, DC, and Nairobi: World Resources Institute. Retrieved from http://pdf.wri.org/kenya_atlas_fulltext_150.pdf

World Water Assessment Programme. (2006). Case study: Kenya. Kenya national water development report (Report no. UN-WATER/WWAP/2006/12). Report prepared for the 2nd UN world water development report: "Water: A shared responsibility." Retrieved from <http://unesdoc.unesco.org/images/0014/001488/148866e.pdf>

Zwaagstra, L., Sharif, Z., Wambile, A., de Leeuw, J., Said, M.Y., Johnson, N., ... Herrero, M. (2010). An assessment of the response to the 2008–2009 drought in Kenya. Nairobi: International Livestock Research Institute. Retrieved from http://mahider.ilri.org/bitstream/handle/10568/2057/assessment_drought_2010.pdf?sequence=3



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