Climate Change Profile
Kenya
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Introduction

This climate change profile is designed to help integrate climate actions into development activities. It complements the publication 'Climate-smart = Future-Proof!’ – Guidelines for Integrating climate-smart actions into development policies and activities’ and provides answers to some of the questions that are raised in the step-by-step approach in these guidelines.

The current and expected effects of climate change differ locally, nationally and regionally. The impacts of climate change effects on livelihoods, food and water security, ecosystems, infrastructure etc. differ per country and region as well as community and individual, with gender a particularly important vulnerability factor. This profile aims to give insight in the climate change effects and impacts in Kenya, with particular attention for food security and water. It also sheds light on the policies, priorities and commitments of the government in responding to climate change and important climate-relevant activities that are being implemented, including activities being internationally financed.

Summary

Kenya is very vulnerable to climate change with current projections suggesting that its temperature will rise up to 2.5ºC between 2000 and 2050, while rainfall will become more intense and less predictable. Even the slightest increase in frequency of droughts will present major challenges for food security and water availability, especially in Kenya’s Arid and Semi-Arid Lands (ASALs) in the north and east (see Map 1). Other parts of the country, most notably in the Rift Valley province, are also vulnerable to climate change due to increasing extreme events (droughts and floods, combined with landslides) while glacier melt will further reduce future water availability. Coastal areas will suffer from rising sea levels and associated floods and saltwater intrusion.

Overall ranking

Kenya ranks 156 out of 188 countries in per capita GHG emissions¹ and contributes 0.13% of global emissions² of which 75% are from the land use, land-use change and forestry (LULUCF) and agriculture sectors. For climate vulnerability, Kenya ranks 151 out of 181 countries in the ND-GAIN index³ (2017). Kenya is the 31st most vulnerable country and the 37th least ready country – meaning that it is very vulnerable to, yet unready to combat climate change effects. Vulnerability measures the country’s exposure, sensitivity, and ability to cope with the negative effects of climate change by considering vulnerability in six life-supporting sectors: food, water, ecosystem service, health, human habitat and infrastructure. Readiness measures a country’s ability to leverage investments and convert them to adaptation actions by considering economic, governance and social readiness.

Biophysical vulnerability

Current climate. Kenya has a tropical climate, hot and humid at the coast, temperate inland, and very dry in the north and northeast parts of the country. Most of the country is arid or semi-arid: 80% of the country receives less than 700 mm of rainfall per year, while some areas in the northwest and east receive only 200 mm per year. Areas near Lake Victoria and the central highlands east of the Rift Valley however can receive 1,200-2,000 mm rain per year⁴. Maximum 24-hour precipitation can equal around 76 mm⁵. The rainfall pattern is characterized by the migration of the Inter-Tropical Convergence Zone (ITCZ, a belt of low pressure and heavy precipitation near the equator), resulting in four periods of seasonal rainfall⁶.

- long wet season: April – June;
- cool dry season: July – September;
- short wet season: October – December;
- warm dry season: January – March.

Significant rainfall also occurs during the cool dry season in the western highlands and along the coast. Rainfall in Kenya is variable, especially in the ASALs. Annual variations follow El Niño and La Niña episodes (higher and lower than average rainfall)⁷.

Current trends. The first rains of the long-wet season have become unreliable and on average significantly reduced. The first rains are sometimes insufficient to support a harvest or even livestock rearing, especially in the east of the

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¹ https://en.actualitix.com/country/wld/co2-emissions-per-capita.php
⁵ GAIN index summarizes a country’s vulnerability to climate change and other global challenges in combination with readiness to improve resilience. http://index.gain.org/country/kenya
⁷ Parry et al. (2012); United Nations Office at Nairobi. https://dcs.unon.org
country. While the average number of rainy days during the short-wet season has reduced from 60 to 30, rainfall has become more intense and the season is being prolonged into January and February, leading to higher total rainfall for this season. Rainfall intensity has increased all over the country, but especially in the coastal area. The area of west-central Kenya receiving 500 mm of rain or more has shrunk since 1960 and is likely to keep shrinking over the next 30 years. Mean annual temperatures have increased significantly, at a rate of 0.36°C per decade over the last 30 years.

These trends are accompanied by an increase in extreme events such as droughts and floods. Kenya is already counted as one of the most disaster-prone countries in the world, ranking 6th among all countries in terms of population affected by natural disasters (annual average, 2000-2009) and first among East African countries. In 2012, it was ranked 7th by number of victims caused by disasters of which half concerned climatological and the other half hydrological events. Major droughts currently occur every ten years, and moderate droughts or floods every three to four years, with devastating results. Droughts have affected more people and had the greatest economic impact (8% of GDP every five years). As many as 28 droughts have been recorded in the past 100 years, at an increasing frequency.

Droughts are often nation-wide, but normally have the most severe effects in the ASALs. While droughts affect most people, floods have caused the greatest losses of human lives (see Map 2). They are more localized than droughts, seasonally affecting parts of Nyanza and western provinces, especially around the Lake Victoria basin, the Tana River drainage basin, and coastal settlements. ASALs periodically experience flash floods. Since 1950 six serious floods occurred in the country, on average resulting in a loss of 5.5% of GDP every seven years. Of particular concern is the glacial melt at Mount Kenya. The mountain had 18 glaciers in 1900, but in 2008 only seven of them still existed. Since these glaciers supply water to the Tana and Nzoia rivers, there has been a serious decrease in water availability.

Climate change. Current temperature and rainfall trends as well as the increasing frequency of extreme events are expected to continue. Rainfall forecasts vary, depending on which model is used. Projections suggest a tendency towards an increase in annual total precipitation. For 2100, an increase ranging from +3% to +41% is likely. Further, more intense and more frequent heavy rainfall as well as a slight decrease in the duration of dry spells, is predicted. Although rainfall at the national level is expected to increase, projections suggest that changes will be different according to location and season:

- the highest increases (or the lowest decreases) are expected for the north of the country (see Map 3) with increases up to 40% projected until 2100, in the form of more intense rains;
- for the long-wet season, 100 mm decline of precipitation is expected, although a slight increase may occur in highlands and coast;
- for the short-wet season, an increase in rainfall is predicted, especially for the Rift valley.

Temperature projections are more consistent across climate change models. An average increase of 0-2.5 °C is expected for the country between 2000 and 2050, with 1-2°C as the most likely range. For 2100 a warming ranging between 1.3°C and 3.9°C is likely, with some models suggesting an increase of 4°C by 2100. Highest increases are expected for the far northeast, and smallest increases for the southeast (see Map 4). In general, the plateaus, mountain ranges and coastal area will remain cooler than inland lowlands. Temperature increases will be seasonal, with the smallest increase expected for the start of the long wet season (March–May).

Increasing rainfall intensities will result in more frequent and heavier floods (accompanied by landslides) and simultaneously prolonged periods of drought. Nationwide droughts will occur more frequently, but they will mainly affect farmers and pastoralists in the east and north of the country. Glacial melt is expected to continue, eventually leading to complete disappearance of Mount Kenya’s glaciers. Finally, rising sea levels will increase the...
Climate Change Profile: Kenya April 2018

risk of floods in coastal areas. Coastal erosion, a loss of coastal wetlands, and saltwater intrusion are expected, resulting in total economic costs of sea level rise equal to USD 7.5-8 million per year by 2030 and USD 31.3 million per year by 205019.

Current and future climate change effects impact water availability and food security in Kenya. The country is already one of the water-scarcest areas in Africa. The projected increase in evaporation, altered rainfall patterns, sea level rise, and accelerated loss of glaciers will further decrease available water for agriculture and other purposes. Climate change is expected to affect all four dimensions of food security: availability, access, utilization and stability20. While these problems occur all over the country, they are least severe in Nyanza and the western province. Even there, however, important crop production areas are expected to shrink if (seasonal) rainfall decreases21 (see Map 5). Moreover, productivity per hectare will change. Under a 3.5°C increase and a 20% precipitation change by 2030, production in high-potential areas will only face a small decrease or even an increase (up to 1%), but production in medium- and low-potential areas will decrease by 21.5%. In the ASALs especially, yields may decline by 20% even if temperatures increase only 2.5°C22. See Map 6 for an overview of primary climate risks for food security per area in the country.

Socio-economic vulnerability

Key facts:

GDP (PPP) per capita (2016)23: USD 3,155.9
Population (July 2017)24: 49,694,862
Projected population (2050)25: 95,467,000
Population density per km2 (2016)26: 85
Human Development Index (2016)27: 146 out of 188 countries

Corruption Perceptions Index (2016)28: 145 out of 176 countries
Gender Inequality Index (2016)29: 135 out of 188 countries
Adult literacy (2015)30: 78% (male 81.1%; female 74.9%)

Kenya’s most vulnerable areas to climate change are the ASALs in the north and east, where both crop and livestock production are expected to suffer increasingly from droughts. In these areas, the population is poor and access to infrastructure and markets is low, which limits adaptive capacity to climate change.

A large portion of Kenya’s population lives in poverty. There are major regional differences: poverty is highest in the Rift Valley, Eastern, and Nyanza provinces (40-70% live on less than USD 2 per day) and lowest in some better-off areas in the Central, Rift Valley, Coast, and Nairobi provinces (10-20%)31. Poverty levels have increased in recent years, especially in the densely populated central highlands, where also the most intensive agriculture is found. Over ten million Kenyans suffer from chronic food insecurity, while nearly 30% of children are undernourished32. Economic gains mainly benefit the wealthiest quintile of Kenyans, thus contributing to increasing social and economic inequality33. Poverty contributes to people’s vulnerability to climate change as it limits their social and financial options for adaptation.

Another factor contributing to Kenya’s vulnerability to climate change is weak administration and management of land due to a lack of comprehensive national policies. This has caused land fragmentation and disparities in ownership34, potentially resulting in a lack of conservation measures that could help farmers to adapt to (effects of) climate change. Lack of clarity on ownership of resources, combined with resource degradation due to climate change, has already caused conflicts in various parts of the country in recent years35.

20 Parry et al. (2012)
29 Odera et al. (2013a)
30 Patel et al. (2012)
31 Parry et al. (2012)
32 Odera et al. (2013a)
33 Odera et al. (2013a)
34 Odera et al. (2013a)
Women are among the people most vulnerable to climate change. They manage over 40% of Kenya’s smallholder farms and provide 80% of the labour for crop production. A majority of women (80%) spends 1-5 hours per day looking for firewood, and in the ASALs women spend 3-5 hours per day collecting water – and more in periods of drought. Because firewood and water are women’s responsibilities, decreased availability of natural resources due to climate change will seriously affect them. Indirect effects on women and girls include climate change-induced conflicts and disease outbreaks (particularly malaria), which cause an extra household care burden. Women’s adaptive capacity to climate change is limited by their restricted access and ownership over resources (women own only 1-5% of land titles in Kenya) and capital.

A major contributor to Kenya’s vulnerability to climate change is the agricultural sector, which is declining in economic importance (generating 25% of annual GDP) but still employing 80% of its population. Adaptive capacity to climate change is low in Kenya’s agricultural sector due to various factors. Limited economic resources cause limited opportunities for investment in more resilient production systems, while adoption levels of developed technologies are low. Heavy reliance on rain-fed agriculture combined with frequent droughts and floods, endemic crop and livestock diseases, and frequent pests present another challenge. Post-harvest losses are generally high. The general poverty among smallholders further limits their adaptive capacity.

Nearly all of Kenya’s crop production is rain-fed (98%), and the small portion of irrigated land is primarily used for export crops. It is estimated that only 15% of the country (in the southwest) receives sufficient rainfall to support the growth of maize and similar crops, while another 13% is suitable for special dry farming or irrigated agriculture. Rain-fed cultivation in the ASALs has a very high risk of crop failure (25-75% in semi-arid, and 75-100% in arid areas) and is therefore extremely vulnerable to climate change. Most farmers in the ASALs therefore resort to mixed agriculture (crops and livestock) or only livestock production. The livestock sector however is also highly vulnerable to climate change due to limited water availability in the ASALs, where droughts have historically led to significant losses of animals. The livestock sector accounts for 90% of employment and 95% of pastoralists’ household income in these areas, which makes the ASALs extremely vulnerable to climate change and extreme (drought) events.

The main crops produced in Kenya are maize, beans, and pigeon peas (in terms of production area) or maize, tea, and potatoes (in terms of value). Maize is Kenya’s primary staple crop, grown throughout the country (except in arid areas). It is sensitive to drought and temperature, which makes it vulnerable to climate change. Nationwide, a production decline of 90,000 metric tons has been predicted for 2055. Projections for maize cultivation under climate change suggest large regional differences. Before 2050, new maize production areas will be gained in central Kenya, particularly in highlands that were previously too cold for it. Small yield gains are expected in areas along the Tanzanian border (Rift Valley). Total maize production in these areas may increase by 20%. This is not the case in the ASALs, where production decreases of 20% will harm the already vulnerable sector.

Wheat and rice are two other crops that are important for food security. For wheat, climate change projections are mixed: yield gains are expected in the central east of the Rift Valley and parts of the Central province, while losses are predicted for the far west of the Rift Valley, areas around Mount Kenya and east of Mount Elgon, and parts of the Eastern province. For rice, which is cultivated mainly in the densely populated Lake Victoria basin, climate change will have severe effects. Water for rice production is taken from Nzoia river the flow of which is projected to decrease in the long run due to deforestation and glacier melt at a high pace.

Climate change has already encouraged some farmers to start cultivating drought-resistant crops such as cassava, millet and cowpeas. The fact that these are traditionally considered ‘poor men’s crops’ however inhibits some farmers from cultivating them.

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\(^{36}\) Parry et al. (2015)
\(^{37}\) Odera et al. (2015b)
\(^{38}\) Parry et al. (2013)
\(^{40}\) Odera et al. (2013b); Waithaka et al. (2013)
\(^{42}\) Maina et al. (2015)
National government strategies and policies

In 2010, Kenya launched its National Climate Change Response Strategy (NCCRS). Kenya’s Vision 2030 (a long-term development plan, launched in 2008) failed to adequately document the impacts of climate change on national development. The NCCRS recognises the threat climate change poses to sustainable development and advocates the need to integrate climate change information into national government policy. A National Climate Change Action Plan (NCCAP) followed in 2013 (and runs until 2017), which is considered Kenya’s first Action Plan on climate change.

It has been developed with the aim of implementing the NCCRS. Its focus is on enabling Kenya to reduce vulnerability to climate change and to improve the country’s ability to take advantage of the opportunities that climate change offers. Examples of noteworthy farming practices mentioned in the Action Plan include agroforestry, conservation tillage, the limited use of fire in agricultural areas, the cultivation of drought tolerant crops, water harvesting and integrated soil fertility management.

The Action Plan also recognizes the critical role that climate change related information, index based insurance schemes, agricultural advisory services and capacity development play in ensuring that options for addressing climate change are widely understood. The aim is to create a low carbon climate resilient development pathway and contributes with concrete actions to Vision 2030 that aims to transform Kenya into a newly industrialising, middle-income country providing a high quality of life to all its citizens in a clean and secure environment. As the coordinating ministry for all environmental issues, the Ministry of Environment and Natural Resources (MEMR) is responsible for coordinating climate change at the ministerial level. A Climate Change Secretariat has been established within the ministry to strengthen this function and to oversee the technical development and implementation of the NCCRS and NCCAP.

Kenya ratified the UN Convention on Biological Diversity (CBD) for which it elaborated a Biological Diversity National Strategy and Plan of Action, and the Convention to Combat Desertification (CCD) for which it elaborated a National Plan of Action to Combat Desertification. Kenya is also a signatory to the Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. It signed the Paris Agreement in April 2016 and ratified the agreement in December 2016 with it entering into force in January 2017 (see Nationally Determined Contributions below).

The country has been an active participant in the Conferences of the Parties (COP) and associated itself with the Copenhagen Accord in 2010. It submitted its Initial National Communication to the UNFCCC in 2002, and completed its Greenhouse Gas (GHG) inventory as part of the Initial National Communication. The Initial National Communication identified mitigation options as well as key sector vulnerability and adaptation issues for agriculture, water, aquatic and marine resources, energy, health, and the social economic context in general.

A Second National Communication was submitted in 2015 which included an update of its GHG inventory and highlights the potential of agroforestry and forest restoration for emissions abatement. Kenya is one of only nine countries which has submitted a National Adaptation Plan (NAP) (2015-2030) to the UNFCCC. The NAP builds on the foundation laid by the NCCRS and the NCCAP and is the basis for the adaptation component of Kenya’s Nationally Determined Contribution (NDC). The NAP consolidates the country’s vision on adaptation supported by macro-level adaptation actions that relate with the economic sectors and county level vulnerabilities to enhance long term resilience and adaptive capacity.

It proposes macro-level adaptation actions and sub-actions in 20 planning sectors, categorising them into short-, medium- and long-term time frames. For each sector, the NAP identifies gaps, estimates costs of the macro-level actions projected to 2030, and identifies key institutions required for their implementation. Prioritised actions that have not yet been mainstreamed into Kenya’s development plans are expected to be integrated in the third Medium Term Plan (2017-2022).

Kenya has submitted a Nationally Appropriate Mitigation Action (NAMA) to the UNFCCC to mobilise private
investment by channelling targeted international climate finance and technical support for accelerated geothermal energy development99.

Nationally Determined Contributions (NDC)

Kenya submitted its Intended Nationally Determined Contributions (INDC) in July 2015 to the UNFCCC which was subsequently submitted as its First NDC in December 2016100. In its NDC, Kenya presents itself as highly vulnerable to climate change effects. Implementation of mitigation and adaptation measures are expected to cost USD 40 billion and Kenya requires international support to realize its ambitions. Unlike most NDCs, it does not provide explicit detail on what actions are conditional on international support.

Mitigation. Kenya aims to reduce GHG emission by 30% by 2030 compared to a Business-as-Usual (BAU)-scenario and suggest the following mitigation measures:

- expansion in geothermal, solar and wind energy production;
- enhanced energy and resource efficiency;
- establishment of a forest tree cover of at least 10%;
- low carbon and efficient transport;
- climate smart agriculture (aligned with the National CSA Framework);
- sustainable waste management systems.

For priority adaptation measures the NDC refers to Kenya’s NCCAP and NAP.

Climate finance

Over the past decade, there have been numerous projects and programmes financed by donors aimed at improving Kenya’s climate preparedness, including water basin management projects, national capacity building, and agricultural strategy development. Donors include UNDP, African Development Bank, UN and the European Union for development investing mainly in agriculture and rural development101. The Ministry of Finance has recently established a carbon-trading unit to explore the potential of attracting additional funding through the clean development mechanism102. According to OECD, Kenya’s NCCAP is rather ambitious; therefore domestic, bilateral and multilateral funding, as well as international climate finance mechanisms (such as the Green Climate Fund, Adaptation Fund and emerging funding for NAMAs and REDD+ mechanisms) are indispensable for the success of implementation103. Kenya received USD 33,670,000 in climate funding between 2004 and 2014 – placing the country at number 35 of the climate finance approved ranking list composed of 135 countries104.

Kenya joined the Global Environment Facility (GEF) in April 1994 and completed GEF enabling activities (to qualify for funding), including a National Biodiversity Strategy and Action Plan (NBSAP)105 and a country self-assessment. Kenya received GEF grants totalling USD 70.5 million that leveraged USD 269.4 million in co-financing resources for 31 national projects. These include twelve projects in biodiversity, seven in climate change, six in multi-focal areas, three in land degradation, two in persistent organic pollutants, and one in international waters106.

In 2016, Kenya received a concessional loan from CIFs Clean Technology Fund (CIF-CTF), cofounding two geothermal projects building on the successful pilot ‘Menegai Geothermal Field’107. Kenya is a pilot country of CIF’s Scaling Up Renewable Energy in Low Income Countries Program (SREP). According to CIF, 80% of the Kenyans live without access to basic energy services and greenhouse gas emissions are expected to increase rapidly. Therefore, the CIF/SREP funding is targeted principally at leveraging Kenya’s abundant renewable energy supply and recent government policy initiatives to increase both energy access and attention to climate change. The SREP Investment Plan has allocated 80% of its funding towards geothermal power projects in Menengai, and 20% to energy modernization to improve energy access from mini-grid systems108. Kenya is also expected to access the Forest Carbon Partnership Facility (FCPF) and has so far applied for its Readiness Grant109. Between 2010 and 2014 Kenya submitted ten projects for Clean Development Mechanism funding, all in the area of reforestation and renewable energy supply.

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100 http://www.unfccc.int/ndcregistry/PublishedDocuments/Kenya%26 First/Kenya_NDC_20150723.pdf
106 http://allAfrica.com/stories/zm602082062.html

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Kenya was awarded a grant of almost USD 10 million from the Adaptation Fund for a project on building resilience to climate change and adaptive capacity of vulnerable communities with activities in food security, water management, coastal areas, and disaster risk reduction. The approval of Kenya’s National Environment Management Authority (NEMA) as an accredited entity enables Kenya to have direct access to potential climate finance from the Green Climate Fund.

Climate change projects

Projects in Kenya that are involved in climate change adaptation and mitigation in relation to water and food security are numerous. Programmes under implementation in 2017 include:

- UNDP’s programmes in Kenya include the project ‘Adapting to Climate Change in Arid and Semi-Arid Lands (KACCAL) in Kenya’ (2013-2017) to facilitate adaptation of key national and local level stakeholders to long-term climate change through capacity development, policies and programmes adjustment, and pilots for coping mechanisms for smallholder farmers and pastoralists.
- Sustainable Environment and Restoration Programme’ (SERP) (2014-2018) by the Government of Kenya, the Kenya Red Cross Society, and the International Federation of Red Cross and Red Crescent Societies (IFRC), a programme aimed at improving environmental and climate change management in the country.
- UNDP’s programmes in Kenya include the project ‘Adapting to Climate Change in Arid and Semi-Arid Lands (KACCAL) in Kenya’ (2013-2017) to facilitate adaptation of key national and local level stakeholders to long-term climate change through capacity development, policies and programmes adjustment, and pilots for coping mechanisms for smallholder farmers and pastoralists.
- Sustainable Environment and Restoration Programme’ (SERP) (2014-2018) by the Government of Kenya, the Kenya Red Cross Society, and the International Federation of Red Cross and Red Crescent Societies (IFRC), a programme aimed at improving environmental and climate change management in the country.

The following regional programmes with a focus on food security and/or water are currently also being implemented in Kenya:

- Several climate relevant regional programmes executed by GIZ, including: 1) ‘Tapping into new markets: Project Development Programme’ (2012-2016) to support German businesses from the renewable energy sector in accessing the Ghanaian, Kenyan, Mozambican and Tanzanian markets; and 2) ‘Support to trans boundary water cooperation in the Nile Basin’ (2012-2016) to contribute to consensus building and cooperation in water resources management and development between the Nile Basin’s riparian countries.
- EAGLO-net: ‘Great Lakes ecosystem services management including climate change adaptation’.

For a list of projects in Kenya funded through international and multilateral climate funds, see the Annex.

Climate contribution of the Netherlands

The Netherlands supports climate-relevant projects in Kenya through a variety of channels and in cooperation with range of actors with a focus on food security/sustainable value chains, water management, renewable energy and disaster risk reduction:

- **Sustainable value chains**: investing in sustainable value chain development and market orientated agricultural entrepreneurship which will contribute to:
  - diversifying sources of household income and improve market access;
  - improved agricultural techniques, such as integrated soil management, improved seeds, enhanced food safety and reduction in post-harvest losses;
  - crop diversification through horticultural crop rotation;
  - commercialization of fodder for continuous forage supply even in dry seasons;
  - introduction of appropriate water efficient irrigation technologies.

One of the programmes implemented in Kenya is ‘2SCALE’, which aims to improve rural livelihoods and food and nutrition security in Africa by creating partnerships to enable farmers and entrepreneurs to grow together in their agribusiness.

- Integrated water resources management: introducing and strengthening integrated water resources management approaches to improve water security, including by:
  - investing in improved access to water for domestic, agricultural and industrial production and consumption, including improving water accessibility through developing innovative financing options.
  - introduction and Implementation of payment for ecosystem services for enhanced catchment management
  - Improved riparian zone management
  - Strengthening data collection and monitoring to support adequate planning, policy direction and informed decision making

- **Renewable energy**: promoting access to modern cooking energy by promoting improved cookstoves (ICS) as well as access to off-grid electrification by promoting small solar systems (Energising Development); provision of access-to-energy services through the installation of biogas digesters in partnership with local enterprises, NGOs and government (Africa Biogas Partnership Programme).

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• **Disaster risk reduction**: To strengthen the resilience of vulnerable communities to climate-related natural hazards, Partners for Resilience promotes the Integrated Risk Management (IRM) approach in disaster risk management policies, plans and strategies at regional, national and county level.
Maps
**Map 1** Agro-ecological zones of Kenya, including ASALs

Source: [http://www.infonet-biovision.org/default/st/l4o/agrozones](http://www.infonet-biovision.org/default/st/l4o/agrozones)
Map 2  Flood-prone and flood-affected areas

Map 3  Observed and projected precipitation changes, 1975-2025

Map 4  Observed and projected temperature changes, 1975-2025

Source: Parry et al. (2012)
Map 5  Reduction of a selected crop production area due to climate change

Figure 1. Climate change in Kenya:
Average location of the 500 millimeter rainfall isohyets for the years 1975 (light brown), 1995 (dark brown), and 2025 (predicted, orange). The green polygon in the background shows the main crop surplus region of Kenya.

Source: USGS and USAID (2010)
Main regional climate risks for food security:
- General: crop/livestock disease (all regions) and
drought (all except KE18, 21, 23)
- KE01, 20, 23, 24: drinking water shortage
- KE02, 07, 11-14, 16, 23: floods
- KE03: landslides
- KE06: bush fires

Source: USAID and FEWS NET (2011)
Annex

International and multilateral climate projects (since 2012)
### Climate Change Profile: Kenya April 2018

**Source** Climate Funds Update (2017) and World Bank (2017)

<table>
<thead>
<tr>
<th>Name of Project</th>
<th>Fund</th>
<th>Amount of Funding Approved (USD millions)</th>
<th>Disbursed (USD millions)</th>
<th>Dates</th>
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<td>Scaling-Up Renewable Energy Program for Low Income Countries (SREP)</td>
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26 [http://www.climatefundsupdate.org/data](http://www.climatefundsupdate.org/data)
