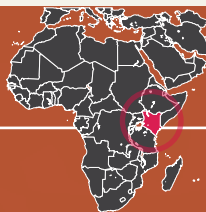


KENYA



Population: 38,300,000 (2008)

Source: Demographic Yearbook 2008,
Table 5 Estimates of mid-year population: 1999-2008
<http://unstats.un.org/unsd/demographic/products/dyb/dyb2008.htm>

Carbon emissions per country: 2007: 11 236

Source: (CDIAC) Carbon dioxide emissions (CO₂), thousand metric tons of CO₂.
<http://unstats.un.org/unsd/mdg/SeriesDetail.aspx?srid=749&crd=>

Carbon emissions per capita: 2007, Kenya: 0,2976

Source: (CDIAC) Carbon dioxide emissions (CO₂), metric tons of CO₂ per capita.
<http://unstats.un.org/unsd/mdg/SeriesDetail.aspx?srid=751&crd=>

Population below \$1 (PPP) per day, percentage: 2005: 19,7 %

Source: <http://unstats.un.org/unsd/mdg/Data.aspx>

GDP per capita: Kenya \$ 1,600 (2010 est.)

Source <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html>





KENYA

This section on Kenya constitutes to a large extent an extract and analysis of the WWF commissioned national review titled “Climate innovation and entrepreneurship in Kenya”, produced by KGroup Consultants and Innogate Aps in 2010. More elaborate description and analysis of Kenya’s national climate innovation system can be found in the full report at www.climatesolver.org.

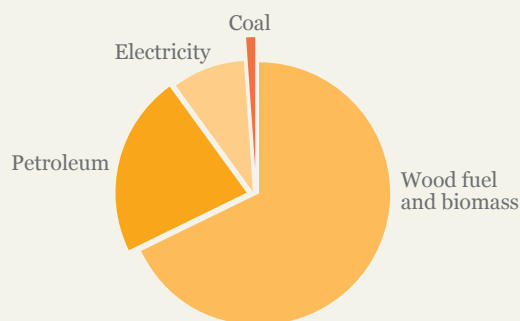
The effects of climate change on the poor and vulnerable population groups in Kenya today are already devastating to millions of lives and livelihoods. Prime Minister Rt. Hon. Raila Odinga has acknowledged that, as a consequence, Kenya’s economic development may be impaired because of the negative effects of climate change. This indicates that Kenya has to develop strategies of adapting and curbing climate change urgently to avoid a further drop in the economy. However, in order to succeed with such a considerable endeavour the government and people of Kenya are in great need of capacity building and increased resources in key areas of climate mitigation and adaptation.

For example, according to Kenya’s Climate Change Technology Needs and Needs Assessment in the UNFCCC report of November 2005, the country’s technological needs are massive. International support and transfer of knowledge, innovations, and technologies are all imperative in order for Kenya to achieve industrial transformation targets by 2020 and eradicate poverty by 6.6% as required by the National Poverty Eradication Plan.

A large number of the climate change mitigation solutions existing in Kenya today are drawn from the private sector. These are entrepreneurs, students and non- governmental organizations that have developed or adopted innovative and cost-effective technologies, which benefit local communities through job creation, environmental protection and energy-efficiency. Kenya is currently grappling with an energy crisis, due to its overdependence on hydro facilities, rapid depletion of forest cover, and lack of investment incentives from the government on clean energy. As a consequence, a power rationing programme has been implemented by Kenya Power and Lightning Company (KPLC), stating the number of hours and days electricity will be provided to those connected to the national grid. This has had adverse effects on businesses countrywide, highlighting the need for clean energy innovations and low-carbon technologies.

The Kenya Vision 2030, states that, “Kenya is likely to use more energy in the commercial sector by 2030. Wood fuel and other biomass account for 68% of the total primary energy consumption, which explains the gradual degradation of forest cover in Kenya. Figure 21 illustrates current energy consumption in Kenya divided by energy sources.¹⁰⁵

Figure 21: Current energy consumption in Kenya divided by energy sources.



ADAPTED FROM: GOVERNMENT OF KENYA (2007)

105 Government of Kenya (2007).

The Climate Innovation System in Kenya

The role of the Government

Through support to various local and national initiatives, the Government of Kenya is making an effort to reduce greenhouse gas emissions and transform the energy industry by focusing more on cleaner technology solutions. As examples of such efforts the government is currently targeting support to up-scaling geothermal and wind power generation as well as reducing costs of solar and wind energy technologies. However, several weaknesses within these government initiatives can be identified, and there is little collaboration between the government and key stakeholders – such as knowledge institutions and the private sector – in combating climate change.

In Kenya the Ministry of Environment is concentrating on the rehabilitation of the environment, particularly the restoration of the nation's largest forest cover - the Mau Complex - through support to a number of tree-planting projects. The Ministry of Energy works towards promoting equitable access to quality energy services at minimal cost while protecting the environment. At policy level, the Ministry of Energy developed a policy on renewable energy in 2004 titled "Framework for Renewable Energy and Other Forms."

At implementation level, the ministry supports a number of initiatives on clean technology and climate-related innovations. Among these, is the running of an energy centre at Jamhuri Park in Nairobi, providing technical and advisory services as well as training individuals on biogas technologies for management of biomass waste. The government is furthermore funding solar electrification projects in schools in Northeastern Kenya, and in collaboration with the NGO Practical Action, supporting efforts to improve the quality of ceramic cook stoves to create low-carbon cooking tools.

Entrepreneurs and the private sector

There are quite a number of climate innovators and entrepreneurs in Kenya who are trying to capitalise on existing energy-efficient technologies. While many of these entrepreneurs find themselves unable to advance because of insufficient funds or incentives from the government, there are a number of successful examples of local and national initiatives. The following three examples present an illustration of entrepreneurship in climate innovation in Kenya today:

- Martha Wambui is a small-scale farmer, with five dairy cattle, who grows both cash and food crops on a five-acre piece of land. She is involved in biogas production, which was started by Martha's father, who had travelled to India on business and came across the gas production. He travelled back to Kenya and constructed a digester in his home and made many others for individuals and schools in Kenya. Martha took over the business when her father passed away and together with her brother she has now constructed 60 biogas systems, mainly within Central Province in Kenya.
- Kenya Bio- Solid Energy Limited (KENBIO) was started by Lynn Miller, the Managing Director at KENBIO, to promote green charcoal and waste as alternative energy sources. KENBIO has interactions with Columbia University in the US and Scripts University in Latin America, both of which are researching and analysing green charcoal as an alternative energy source.
- Jeremiah Murimi and Pascal Katana are fourth-year students studying Electrical Engineering at the University of Nairobi. They have invented a cell-phone charger that uses energy generated from riding a bicycle. Jeremiah and Pascal have

been able to protect the Smart Charger concept at the Kenya Industrial Property Institute (KIPI), for Ksh. 3000, from their own savings. Jeremiah and Pascal's Electrical Engineering class interacts with students from Massachusetts Institute of Technology (MIT) on innovative ideas.

Although there are a number of individuals and established entrepreneurs in Kenya with innovations with potential to succeed, the high initial costs of establishing new climate technologies on the market is perceived as a major prohibitive factor. If supported by the government, private sector institutions, and NGOs, Kenya would be able to capitalise on a much larger group of entrepreneurs and climate innovations.



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Climate change is causing severe effects, such as drought, in Kenya.

Knowledge Institutions

Knowledge institutions in Kenya are aware of climate change and are working toward integrating climate aspects into education and research. Universities have academic programs addressing sustainable environments and climate change mitigation measures. Students are also encouraged to carry out research on sustainable development projects that address local situations.

The University of Nairobi (UoN) is the pioneer institution of higher education in Kenya. Among its programs, the Department of Architecture has academic programs on sustainable architecture, including Building Science and Sustainable Design. At the department, research and education on energy-efficiency and climate responsive architecture is emphasised and promoted. The Jomo Kenyatta University of Agriculture and Technology (JKUAT) offer an academic program that focuses on environment conservation, construction of biogas plants for electricity generation, as well as energy waste management. While the government generally offers very little

financial support for research, these programs have been sponsored by the Ministry of Energy.

Non-governmental Organizations

NGO Practical Action is a good example of a local organisation in Kenya driving the climate change agenda forward both in policy and in practice. Practical Action focuses on innovation of various environmentally-friendly technologies, working to influence policies for wider support and scaling up of technologies, such as micro-hydro. A micro-hydro project developed by Practical Action and the Kenyan Ministry of Energy was piloted in a village north of Nairobi with support from the United Nations Development Programme (UNDP). The project convinced the Kenyan government to include micro-hydro dams as a factor in its renewable energy policy.

The Green Belt Movement is a nationally-based NGO that since 1977 has consistently pursued tree planting country wide - to date planting 45 million trees in Kenya. GBM works with more than 4,000 communities in Kenya to advocate for sustainable management of forests for future generations. The GBM is also in the final stages of becoming registered as a CDM project.

Apart from the above mentioned NGOs there are numerous non-governmental and international actors engaged in climate change issues in Kenya. These include: UNEP, WWF, IUCN, Bill Clinton Foundation, as well as several National Funds for environment and climate change set up by international donors. Among the most common projects are tree-planting initiatives, environment conservation projects, and baseline studies and research on the impact of climate change on Kenya.

Challenges and Recommended strategies

Strengthening systems for knowledge development and information-sharing

One of the key challenges for knowledge institutions to contribute to climate innovation entrepreneurship is the very limited access to funding for Research and Development (R&D). Research funds given by the government are inadequate to develop innovative solutions through prototypes. Therefore, a large number of these home-grown ideas with high potential face the risk of being shelved in institution libraries. Very few students and academics get sponsored by actors in the private sector, and there is a lack of reward mechanisms and incentives for commercial collaboration. Most importantly, engagement in partnerships with entrepreneurs is usually not rewarded with academic merits - if, say a university researcher develops a climate innovation, the intellectual property rights will remain with the university.

Since there is a weak linkage between knowledge institutions and the private sector and government, the latter stakeholder groups do not benefit from the research findings produced at universities and knowledge institutions all around Kenya. Increased investments in R&D and dissemination of existing knowledge seem to be of extreme necessity in Kenya, if the national innovation system is to be strengthened. Furthermore, the government needs to increase its collaboration with knowledge institutions for policy formulation and decision-making purposes, in order to capitalize on the latest research findings on climate change in Kenya.

Building capacities and increasing resources

As already indicated in the sections above, the lack of finance for entrepreneurs and knowledge institutions constitutes a major challenge in strengthening clean energy technologies in Kenya. There is a general lack of funding to carry out more research on climate innovations. The government offers few funds for research and

development of prototypes for climate innovations. Therefore, JKUAT has adopted measures to send funding proposals to international donor bodies as well as foreign universities. Apart from scarce funding sources, there is also an apparent shortage of equipment and specialised staff at research institutions.

NGOs and CSOs often suffer from similar circumstances, lacking adequate funds to enable them to significantly move beyond test projects to scaling up. As a result, their efforts to accelerate both climate innovation and entrepreneurship risk becoming isolated one-off events without any possibility of replication and outreach. Another challenge identified among NGOs in Kenya is that the programmes carried out by NGOs and CSOs are often fragmented and scattered in many parts of the country, weakening possibilities of potential strong partnerships.

Establishing an enabling institutional framework

Government policy-making processes tend to be slow, with key ministries lacking capacity to formulate policy guidance and regulations for low-carbon technology, renewable energy, and climate innovations. Furthermore, government ministries and departments do not coordinate sufficiently. Climate innovation and entrepreneurship cut across a number of ministries and departments, including private sector development, agriculture, research, and environment and policy development. It is thus critical that there is an increase in government coordination and efficiency in the coming years.

As in many other developing countries, the government has yet to set up a national framework for incentives to encourage development and deployment of climate innovations - technology transfer initiatives, subsidies, and tax schemes. Limited and even lack of technology transfer amongst local institutions is a major hindrance to the country's economic development in relation to climate change. It is therefore advised that steps should be taken with the aim of establishing a national fund to facilitate technology transfer within and outside Kenya's borders. Whether such a fund could be linked to the UNFCCC Green Fund under establishment is a question that should be explored

Due to the lack of collaboration between government and research institutions, as explained above, the government has not been able to establish appropriate nationwide standards in renewable energy use or development of low-carbon technologies. Likewise, researchers have not been focussing on policy-making procedures and the applicability of research findings to Kenyan societies.

Markets for climate innovation products and services are perceived by many stakeholder groups as underdeveloped in Kenya. As a consequence, many Kenyans are today unaware of local climate innovations or the solutions developed to tackle small and large effects of climate change on daily life. As mentioned, structures that enable access to funding in initial stages of up-scaling climate technologies and innovations are important. This is the same for the system for Intellectual Property Rights (IPR), which is not embraced by many and is seen as too expensive and laborious.

Establishing a national platform for coordination and information exchange

Collaboration among the triple-helix actors is generally too weak to ensure widespread and sustained impact in Kenya. However, there are commendable efforts from each of the key stakeholder groups in the climate innovation system as they individually strive towards curbing climate change and improving livelihoods. Information asymmetry is another apparent challenge among the triple-helix actors,



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Improved cook stoves reduce the need for wood fuel by 40 percent in Kenyan homes.
Nairobi, Kenya

since information on climate innovations is not shared amongst the stakeholders for fear of hijacking ideas.

Kenya does not have any national organization that brings government officials, climate entrepreneurs, and knowledge institutions together to share skills and knowledge on climate technologies. There is a need for a national platform to exchange ideas and generate collaboration on industrial development in general, and on climate innovation entrepreneurship in particular. Another form of national coordination mechanism that is deemed to be useful for the future is the set-up of a research development unit that would aim to promote and coordinate knowledge expansion in Kenya.

Finally, it is important to note that although the government can and should have an important role to play in bolstering investments in climate change innovations, entrepreneurs and other actors should not rely too much on government funding in order to move forward with their ideas and activities. For example, there would seem to be an opportunity for developing a national platform for larger companies to meet small innovative entrepreneurs – with a view in particular to sharing experiences and enabling private joint ventures.