The potential for Low Carbon Development for agriculture and energy in East Africa

By Harriet Smith, Student Intern at UCSD, September 2011

The need for Low Carbon Development

Traditionally, economic growth and development is associated with an increase in carbon emissions, but with a future hazed with the potential and unknown adverse impacts of climate change, countries in the East African Community (EAC) face the challenge of economic growth and development amidst a global community persistent on a low carbon-future.

Ellis et al. (2009) states that "many developing countries have struggled to achieve any kind of sustained growth however, and have contributed little to the problem of climate change", therefore the question for them, including many countries in the EAC, will be "how to achieve growth […] particularly in light of climate change and international mitigation policies and the impact these are having on their economies" (pp. vi).

It has been suggested that adopting adaptation and mitigation strategies, focussing on climate-resilient growth approaches,identifying and managing risks and opportunities to exploit, is the way forwards towards addressing this low-carbon future (Ellis et al., 2009; Urban and Sumner, 2009).

Low Carbon Development (LCD) is increasingly become a focus of policy debate, however there is no clear understanding of what low carbon growth will look like for developing countries, and there is limited experience and knowledge of appropriate incentives, costs, benefits and available funding.

Sectoral threats and opportunities in the EAC

Appropriate LCD programmes must be locally relevant. They must suitably determine threats and opportunities, and improve multi-level capacities to address and capitalise them.

EAC countries are typically of low income with economies preliminary reliant upon rain-fed agriculture (EAC, 2006). Although agriculture may be a leading sector across the region, the EAC is frequented by food shortages, with heterogeneous areas suffering from hunger. A key factor effecting agricultural productivity is climate variability.Climate projections suggest an increasingly erratic climate; therefore it is imperative that for the EAC region the agricultural sector be significantly included in LCD plans.

Another potential LCD area for the EAC is energy. Currently, over 80% of the region's population do not have access to modern energy services; the majority use biomass which exposes users to adverse health impacts contributes to rapid deforestation and forest degradation, resulting in high levels of carbon emissions (EAC, 2009).

Agriculture

As previously mentioned, food shortages and insecurity are common occurrences across the EAC region. Threats stem from a variety of areas, as summarised in Table 1.

Table 1: Summary of agricultural threats.

Climate	– Low and unstable productivity, over-reliance on rain-fed systems, – Increased severity of extreme weather such as droughts and floods
Infrastructure	– Inefficient water and irrigation systems, – Low capacity for rain-water harvesting
Social	– Insufficient knowledge and awareness of climate change impacts and actions for producers, – Disruption to production and distribution due to civil unrest and political instability, – Inadequate access among vulnerable populations, – Gender imbalances in access to opportunities in production, marketing, consumption and control of resources
Environmental	– Increased pressure on natural resources and environmental degradation

Source: EAC 2010a

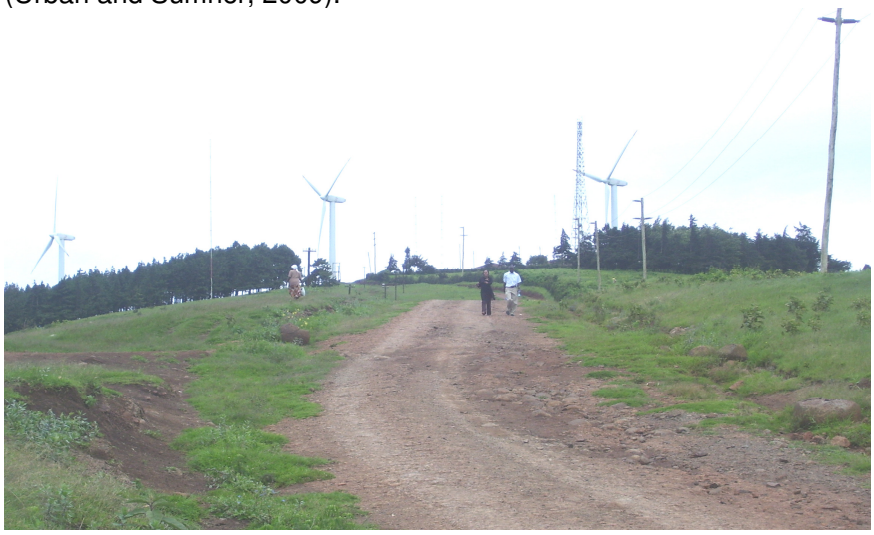
Agriculture has the opportunity to aid pro-poor development. However, increased agricultural production equates to an increase in carbon emissions, therefore under LCD, the agricultural sector needs to re-examine increased production approaches that fit in with low carbon production. Low carbon agricultural practices include improving soil management and agronomic practices through fertiliser and nitrogen run-off management, developing and switching to climate-resistant crop varieties, developing and implementing improved water management, harvesting and irrigation, educational programmes, introducing and promoting organic practices, reducing methane emissions through improved livestock management and switching from subsistence to commercial agriculture to reduce land conversion from agricultural expansion. Monitoring and control systems should additionally be strengthened to focus upon protected area borders to reduce the risk of agricultural encroachment (Ellis et al., 2009;Urban and Sumner, 2009; Government of Guyana, 2010).

Energy

With the vast majority of the population reliant upon biomass as a fuel source, low access to national power supplies and the fast development of power plants due to an increasing population and economic growth, there are massive opportunities for energy sector development to take a low carbon trajectory.

Nationswith low fossil fuel resources often place emphasis on renewable energy. The EAC is rich in renewable energy resources accounting for about 70% of geothermal, 16% of hydropower resources for the entire African continent.Therefore, LCD not only has the potential to reduce promote renewable energy sources, but also reduce energy poverty (EAC, 2010b; Urban and Sumner, 2009). For example, the African Rift Geothermal Development Facility (ARGeo), a project supported by UNEP through a GEF contribution of US$17 million, has been initiated in six East African countries: Djibouti, Eritrea, Ethiopia, Kenya, Tanzania and Uganda, to tap into the Rift Valley's vast, unexplored geothermal potential. Estimates suggest that the regional geothermal investments could lead to close to 900,000 tonnes of CO2 emission savings per year, and well over 17 million tonnes over 20 years (UNEP, 2008). However, as a result of limited finances restricting detailed exploration, compounded by institutional and regulatory barriers, the project has been constrained to a few generating units in Kenya and Ethiopia with only a total capacity of 210MegaWatts (Mwangi, 2010).

Hydropower is a major electricity generator across East Africa, with countries such as Uganda having a total estimated potential of 2,000 MegaWatt solely from the White Nile basin. Currently in Uganda, an estimated 15% of the capacity is used, resulting in demand exceed supply, therefore LCD has the potential to further develop hydropower capacity (UNESCO 2005),providing provisions of the World Commission on Dams are taken into account. In addition, LCD provides opportunities for local-level involvement through the application of smaller-scale, off-grid appliances such as photo-voltaics and the promotion of fuel efficient cooking stoves (Urban and Sumner, 2009).



Wind power generation at Ngong'o hills in Kenya: Photo UCSD

Discussion and Conclusion

Low Carbon Development has the potential to develop and promote alternative development mechanisms across East Africa within the agricultural and energy sectors. Such plans have already passed through the policy level, with governments incorporating low-carbon aspects into national energy, agricultural and adaptation policy documents. Policies include strategies to promote energy efficiency and alternative energy resources, water catchment management and support agricultural innovations, e.g. best agronomic practice, alternative high-yield crops and self-sustaining agro-ecosystems.

As the global agenda moves forwards in an attempt to develop and implement low carbon strategies, developing countries, like those in the EAC, will be expected to adopt a LCD approach. In addition, as the EAC has an abundance of hydropower and geothermal energy sources, promoting a LCD approach can contribute towards the development of such resources. By incorporating low carbon activities, and improving irrigation infrastructure, the EAC's agricultural sector may also benefit from a LCD approach.

While it may still be too early to judge the effectiveness of LCD impacts on growth, adaptation and climate change, on-going monitoring of implementation efficacy will be important not only in developing new potential areas for application, but also ensuring that the global community takes note of positive and negative outcomes in order todevelop an effective response to climate change.

References for further reading

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