Case Study 2. Wood-Based Bioenergy in Uganda: The Bukaleba Forest Reserve - *by David Kureeba, NAPE, Uganda*

Uganda is one of numerous African countries that seem to have a thirst for foreign investment in a number of sectors regardless of its impacts on the environment and people's livelihoods. This can be exemplified by the Government of Uganda's decision to lease over 347 ha of the south Busoga forest reserve in Bukaleba to Norwegian company Green Resources for commercial tree planting.[1] This project is located in eastern central Uganda along the fringes of Lake Victoria. The project borders the Madhvani sugar company's plantations, Lake Victoria water catchment areas (wetlands) and communities.

Firewood collection in the Bukaleba forest reserve. Photo courtesy: D. Kureeba

Background national context

Energy is sourced primarily from biomass (88.9%, of which fuel wood comprises 78.6%, charcoal 5.6% and agricultural residues 4.7%), with the remainder coming from petroleum products (9.7%), and electricity (1.4%). Access to electricity stands at 14% nationally and in rural areas it is just 7%. Per capita electricity consumption remains one of the lowest in the world at less than 100kWhrs per person.[2] With respect to renewables, solar use is about 1%, hydro and thermal electricity about 4%, and biogas and geothermal about 0.5%.

About 91% of Ugandans use wood-based energy for cooking, lighting and baking, and it is used as fuel in institutions such as schools, hospitals and households; most of the fuel wood used for cooking is used in highly inefficient 'three stone' cookstoves, especially in the rural areas where most of the population lives.

This is a clear threat to tree and shrub species in forests and woodlots. Uganda's renewable energy policy adds to that threat: its target is to blend biofuels and fossils fuels

[1] http://www.ndf.fi/project/ncf-bukaleba-charcoal-project-ndf-c3-b14
[2] https://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/Uganda_EOI.pdf

(with biofuels eventually expected to constitute at least 20% of the mix[3]). This has led to the promotion of plantations of crops such as oil palm, which is a biofuel feedstock crop.

In addition, according to a paper published by Renewable and Sustainable Energy Reviews[4] in 2013, there is a high level of wastage of biomass resources in Uganda. This is due to the fact that an estimated 72.7% of the population uses traditional cookstoves with efficiency estimated to be less than 10%. Inefficient cookstoves are also blamed for indoor air pollution and respiratory illness.

The policy context with respect to wood based energy in Uganda

There is no clear information on wood based bio-energy in Uganda. The information available at administrative centres is scanty.

Uganda developed a policy on climate change in 2013[5] and is also in the process of developing a national REDD+ strategy.[6] In addition it aims to scale up renewable energy provision in Uganda generally.[7]

Uganda's energy policies mainly focus on hydropower generation and rural electrification, but also include policies concerning the potential production of crops such as jatropha, oil palm and other crops, as potential biofuel feedstocks. According to the renewable energy policy 2007, Uganda aims to blend at least 20% of biofuels with fossil fuels. This will be disastrous for the environment, because of the land required to grow the feedstocks.

If plantations happen to be included in the definition of forests used in policies relating to REDD+ and biomass, this may have an impact on existing forests. It can be expected that most people will go for fast growing trees produced in plantations, potentially at the expense of slow growing indigenous species. Indigenous trees will most likely be replaced with exotic species.

There is also a guideline on governance of the charcoal sector. This is aimed at regulating charcoal, creating standards that lead to the use of improved technologies and increasing efficiency. It is believed that one of the challenges relating to local charcoal burning relates to the rudimentary way in which it is burned. Investment has thus been sought to introduce new kilns, which are intended to be more energy efficient. However, while this might be desirable, in practice it seems that the overall process is not involving local people at all. As a result, communities are increasingly becoming energy deficient. For instance, the charcoal kilns promoted by the government do not seem to be for producing charcoal for domestic use but for export to nearby towns and neighboring countries. There is no evidence that local communities are benefiting.

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[3] Renewable Energy Policy for Uganda 2007

[4] http://yadda.icm.edu.pl/yadda/element/bwmeta1.element.elsevier-093a9717-97ec-3e37-a43a-aee9ad3afc39

[5] http://www.ccu.go.ug/index.php/news-events/news-media-releases/90-approval-of-national-climate-change-policy-2013

[6] http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=7&ved=0CEsQFjAG&url=http%3A%2F%2Fmwe.go.ug%2Findex.php%3Foption%3Dcom_docman%26task%3Ddoc_download%26gid%3D659%26Itemid%3D223&ei=CWZPVNHDI_Ow7AaBi4HQCw&usg=AFQjCNEeoiEfh3rOem9QdqfMQVwl09VMjQ&sig2=XladPpGYuEXkaQM6fpzrSA&bvm=bv.77880786,d.ZGU

[7] https://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/Uganda_EOI.pdf

Uganda's Renewable Energy Policy which was published in 2007, is supposed to "*increase access to modern, affordable and reliable energy services as a contribution to poverty eradication"* [8] but it has not been well implemented so far. In reality the country's approach to renewable energy is heavily biased in favor of biomass technologies such as biomass gasification, co-generation, biogas generation, biomass densification, and energy-efficient cook-stoves (although these have not been widely disseminated so far). However, while these policies may look good on paper, they are not pro-people.

Left: Burning kiln for charcoal production at the Bukaleba forest; Right: Cooking with firewood. Photos courtesy: D. Kureeba

Current situation regarding bioenergy

Biomass is a supposedly renewable energy resource. However, its extensive exploitation in Uganda raises concerns about growing demand and its negative impacts on the environment, particularly in this era of climate change and low adaptive capacity in less developed countries, Uganda included. These concerns are more prominent on the African continent, particularly in countries like Uganda, where explosive population growth rates mean that the country's population is predicted to grow fivefold by 2050 (from 27.7 million to 130 million people).[9] If all these people continue to rely on wood as a fuel, the consequences for Uganda's remaining natural forests and small-scale farmers (whose land is being grabbed as plantations expand) are stark. The use of traditional and inefficient bioenergy technologies and appliances certainly exacerbates this problem, but Uganda needs to move away from wood-based fuel sources.

Key environmental, social, cultural, health and gender impacts

The excessive use of wood-based energy is leading to the destruction of the environment including the fragile ecosystems and biodiversity that would otherwise support the local climate and provide other environmental functions, such as pollination, soil aeration and enhancement, and decomposition.

Extensive loss of trees also impacts the communities who depend on them. For example, the destruction of Bukaleba forest has resulted in too much runoff into the low lands, meaning that soil fertility has been lost. This affects communities, as the soils can no longer support food crop plants (annual or perennial).

[8] http://www.reegle.info/policy-and-regulatory-overviews/UG
[9] http://www.worldwatch.org/node/4525

Wood-based bioenergy can also lead to the destruction of sacred and medicinal trees. In Bukaleba the communities say their treasured medicinal trees such as *Prunus africana* (locally known in Luganda as Entasesa or Ngwabuzito) were cut down, and other medicinal plants including lianas, epiphytic plants, strangler figs and other parasitic plants have all been lost because of the pine plantations and eucalyptus planted by Green Resources. Fruit trees were cut and these trees also formed part of local food sovereignty.[10] Their treasured tourist attraction, where the communities used to take their guests—Walumbe tree—was also destroyed. This was a spot the communities used to go to for cleansing and praying for blessings.

Indeed, with the arrival of Green Resources almost everything is gone. There is no energy sovereignty at all. Communities are only allowed to pick the dead wood from the plantation three days a week. This puts communities at risk, because in most cases the children and women responsible for this task may not be able to free up enough time to get what they need over those three days.

Furthermore, communities have to walk long distances to come to a designated area where the company directs them to pick firewood. They cannot simply pick freely from the forest without the clear consent of the company, but the company has a responsibility to ensure that they can get firewood from somewhere as part of its 'Corporate Social Responsibility'.

Overall the communities now have very limited land for agriculture because of the extensive amount of land now under pine and eucalyptus. The communities are not allowed to continue their 'taungya' system of farming in the forest.[11]

Unfortunately, the charcoal produced from Bukaleba does not benefit the local communities either. They continue to look for firewood, while the charcoal is taken to towns in Kampala, Jinja, Entebbe and even to neighbouring Sudan. There is no community-owned modern biomass conversion and Uganda's renewables policy does not provide for that.

Conclusion

Strategies and policies in which the communities are key players in the use and implementation of modern biomass technologies could ensure energy access and contribute much more effectively to the reduction of poverty.

However, what the Ugandan experience shows—as in the case of Green Resources—is that increasing land acquisition by foreign investors can restrict community access to energy and contradicts the Renewable Energy Policy's proposed goals. Instead the promotion of vast fields of monoculture tree plantations is the preferred solution to 'stop deforestation', at least with respect to charcoal production, and is regarded as the best method for supplying the increasing demand for woody biomass for electricity generation. Uganda needs to change course, and pursue policies that will accelerate the proliferation of more decentralized, accessible and efficient renewable technologies.

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[10] Further information on Green Resources' activities in Uganda and other African countries via http://www.foe.org.au/carbon-markets-and-failed-promise-new-green-gold-plantation-forestry-uganda

[11] Taungya is a form of shifting agriculture that was a forerunner to agroforestry. http://www.worldagroforestry.org/units/library/books/Book%2032/an%20introduction%20to%20agroforestry/html/6_taungya.htm?n=29