



Sustainable bioenergy: an opportunity for Africa and global sustainable development

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With a new solid and credible policy and certification framework, thanks to environmental bodies and international financial institutions, biofuel is today seen as a way to reduce dependence on fossil fuels. Sub-Saharan Africa, with its extensive amounts of under-utilized land and water resources, favourable climates for biomass accumulation and increasingly investment-friendly policies is particularly well adapted for growing sugarcane for ethanol production and, in the process, improve farm management and logistics, for example the Addax Bioenergy sugarcane-based project in Sierra Leone.



Addax Bioenergy factory site overview, Mabilafu, Sierra Leone

Never has the dynamic towards sustainable development been stronger, with the evolution of the United Nations' Rio+20 initiatives and the creation of the New Partnership for Africa's Development (NEPAD), which reflects the commitment of African nations to eradicate poverty and underdevelopment on their continent.

As the world gears towards the definition of the Sustainable Development Goals (SDGs) which will guide the period post 2015, Africa and sustainable bioenergy can make a significant contribution both in their formulation and achievement, including the reduction of reliance on

fossil fuels and the necessary reduction of greenhouse gas emissions.

Sustainable bioenergy

Although the bioenergy debate continues, with some reason, past mistakes have largely become part of the lessons learnt. As a consequence, strict social, environmental and economic criteria have emerged, defined both by international development organizations (e.g. the World Bank, the African Development Bank, the Roundtable for Sustainable Biomaterials) and economic blocks like the European Union (for example, the EU's Renewable

Energy Directive - RED). A series of projects now implement these standards, which have become a solid and credible policy and certification framework.

Bioenergy from sugarcane is widely recognised as the most efficient and sustainable crop for biofuel production, thanks to its high fermentable sugar content. In addition, its residual fibres are ideal for power generation and the recycling of by-products into fertilizer. Sugarcane grows best in sunny, hot and humid climates, with the best conditions found in Brazil, but also in sub-Saharan Africa and other tropical areas.

The African opportunity

The poverty rate has declined in Africa, but the continent remains in urgent need of jobs, an efficient agricultural sector, infrastructure investment, health and education facilities, as well as improved access to energy.

According to the World Bank, African farm yields are among the lowest in the world. Traditional farming practices produce low yields and contribute to environmental degradation (including deforestation), while slash-and-burn methods contribute to land erosion, carbon emissions and air pollution.

At the same time, Africa has extensive amounts of under-utilized land and water resources, favourable climates for biomass accumulation and increasingly investment-friendly policies. With the farming practices that commercial agriculture can bring, it is possible to make better use of land for food, fibre and fuel production. The crop yields achieved by subsistence farmers can be further increased through outreach programmes and access to agricultural inputs and equipment that would otherwise not be available at affordable costs in rural areas. Thus, Indirect Land Use Change and potential displacement of food production need not be compromised if improved agricultural yields can be achieved to provide the necessary food security for an expanding population. In addition, African soils in general contain low levels of carbon, which under proper agricultural practices result in minimal carbon emissions from Land Use Change.

Africa is one of the last frontiers for industrial development that can be undertaken sustainably and without negative impacts to communities and the environment

The commercial farming techniques introduced for sustainable bioenergy projects can improve farm management and logistics, helping reduce hunger, poverty

and environmental degradation, while improving the skill sets and livelihoods of entire populations. The knowledge transfer on improved agricultural practices and modern farming techniques in planting, irrigation and harvesting benefit the sector as a whole. Farming cooperatives and contract farmers find opportunities to either supply the ethanol factory with feedstock, or use the plantation land left fallow in the crop cycle to plant food crops for their own use or for cash.

Bioenergy projects thus create direct employment and trigger infrastructure development, as well as opportunities for a diverse range of economic and social activities within the communities concerned. As income rises, other benefits are seen, reflected in improved housing and the ability to pay for schooling, as a virtuous circle of development kicks in.

Bioenergy crops are thus a promising option for farming in Africa. Sustainable projects can increase energy independence, optimise the use of precious foreign currency reserves currently spent on food and energy imports, as well as improve the overall land carbon balance. They have the potential to be a powerful vector of sustainable and inclusive development, both locally and internationally.

Africa contributing to global sustainable development: market access - the EU example

Africa needs predictable access to international markets, under binding trade agreements, in order to be fully successful. This ensures the volume of sales that enables the industry to be competitive on domestic and international markets. Under these conditions, Africa could become a major contributor to the EU's 10 per cent target for the replacement of fossil fuels with sustainable biofuels by 2020, fulfilling the area's stringent sustainability standards.

This could create a win-win situation, as African development advances and the EU has every interest to maintain its ambitious targets for fossil fuel substitution with renewable bioenergy, coupled with tough sustainability criteria. "Bad" bioenergy, which does not meet the EU's high sustainability standards, should not

count towards its RED (Renewable Energy Directive) target. This creates a powerful deterrent to unsustainable bioenergy production. A "stretch" target would also justify further investments in R&D to achieve 2nd generation bioenergy from cellulose, which could logically be added onto existing sugarcane-based bioenergy factories.

In terms of sugarcane ethanol, based on current levels of productivity, barely 4 million hectares of land is needed to fulfil the EU's 10 per cent target for ethanol. This represents only 0.2 per cent of the African landmass or 0.5 per cent of potential arable land (FAO figures). And there is no need or interest to tap the African ecosystems for agricultural development, thanks to the vast expanses of degraded land that are either abandoned or irregularly used and could be returned to productive cropping. Furthermore, only 2.3 per cent of the surface water in Africa is currently used (UNEC) and tropical rainfall in parts of Africa removes the need for supplementary irrigation during the rainfall season.

Nevertheless, there is currently a threat of lower EU volume targets for the replacement of fossil fuels, following recent EU proposals to limit cereal-based bioenergy, including sugarcane. This would unnecessarily cap low-carbon and low-impact bioethanol that has been certified as sustainable by the highest standards and certification bodies. This could create a physical entry barrier to even the best performing and lowest cost bioenergy producers. In addition, the proposals create uncertainty for investors in the African and European bioenergy supply chain and run the risk that projects currently being considered in Africa may not be pursued, creating another lost opportunity for the African agricultural sector.

The Addax Bioenergy example

The models exist today to accelerate progress towards sustainable and inclusive development.

Addax Bioenergy's sugarcane-based project in Sierra Leone is an example of a sustainable model in the making. It is the first and only bioenergy project to be brought to financial close in Africa and



Sugarcane plantation in Sierra Leone, Addax Bioenergy project



Addax Bioenergy site, Mabilafu, Sierra Leone

is partially funded by eight international development finance institutions that require the respect of the highest sustainability standards. The project, which is due to be commissioned at the end of 2013, includes a 10,000 hectare sugarcane estate, an ethanol factory, a renewable electricity plant (to be fed by the sugarcane biomass) that will power the ethanol factory and provide approximately 20 per cent of Sierra Leone's national grid, a farmer development program to improve local food security and income generation, and a potential sugarcane out grower program.

The project began in 2008 with a two-year in-depth social and environmental study (EISHA), which is recognised as one of the most thorough ever performed, and one of the most extensive and transparent stakeholder dialogue and consultation processes ever carried out in the country,

according to the nation's Environmental Protection Agency and local NGOs. The project also introduced a major innovation by integrating local landowners in the land lease payments process, enhancing land rights and enabling direct lease payments.

The Addax Bioenergy project is designed to comply with the environmental criteria under the EU Renewable Energy Directive (RED) and the social and land rights criteria under the IFC Performance Standards and Guidelines. Independent audits undertaken twice annually have confirmed that the project is in compliance with the applicable standards of the EU RED, IFC, the Africa Development Bank environment and social safeguard policies and the relevant Sierra Leone legislation. In addition, the project is the first in Africa to be certified by the Roundtable for Sustainable Biomaterials (RSB). The

RSB global sustainability standard represents a global consensus of over 120 organizations including farmers, fuel refiners, regulators and NGOs, and is intended to ensure the sustainability of biofuels production practices, while streamlining compliance for industry.

Ensuring a win-win situation

Addax Bioenergy fully supports the strengthening of certification criteria for bioenergy production. However, in view of global economic, social and environmental goals, it would be difficult for companies like Addax Bioenergy to understand a rise in the sustainability threshold, while reducing the volume target. It is more logical to raise the standards and to ensure that certified sugarcane-based biofuels have access to EU and other international markets ◀

About the author

Simon Cleasby became CEO of Addax Bioenergy in January 2013. Prior to that, he was Regional Director at Illovo Sugar Ltd, in charge of the company's operations in Swaziland and Mozambique. Mr. Cleasby has had an extensive career spanning 25 years within the sugar and food industries in Africa and has developed a broad experience in agricultural operations, ethanol production and power cogeneration. He has a degree in chemical engineering and an MBA from the University of Cape Town, South Africa.