The Conservation, Policy, Education and Science Committee's (COPESCO) Position on the Use of Agrofuels in Africa Society for Conservation Biology (SCB) Africa Section

EXECUTIVE SUMMARY

Sub-Saharan Africa is suffering from biodiversity loss, alongside poverty, war, conflict, hunger, starvation, poor infrastructure, population pressure, the HIV/AIDS pandemic and other development challenges. Africa will undeniably need adequate energy to meet the Millennium Development Goals. The proposed role of agrofuels as a suitable and sustainable means to meet regional and global energy needs elevates, however, raises serious questions about biodiversity conservation, food security and human livelihoods, which all face increasing threats from the demands placed on limited land resources. MDG 7 calls for environmental sustainability, emphasizing that development is not undermined in the long run by inappropriate development practices.

The purpose of this position paper is to explore the means of sustaining both humans and wildlife while producing agro-fuels as an alternative energy source in sub-Saharan Africa. Production of agrofuels must be approached in a manner that prevents further biodiversity loss, livelihood loss and food scarcity on the continent. Some approaches to be considered by governments are: a) undertake full social and environmental impact assessments of all proposed biofuel projects according to recognized procedures and standards in order to ensure the energy needs in urban and rural areas are met in such a way to optimize sustainable social and economic benefits while minimizing environmental impacts; b) establish stringent policies and laws that monitor and control biofuel projects to maintain high standards and protocols to achieve an ecological and socioeconomic balance where biofuel plantations are developed with adequate soil conservation and water management measures while endangered species and biodiversity are protected; c) establish policies and strategies that ensure that people have access to adequate amounts of nutritious food supply; d) develop an appropriate basis for assessing production and processing methods (PPMs) of biofuels to meet local needs.

Background

The Africa Section of the Society for Conservation Biology herein expresses deep concern about the scope, scale and pace of corporate and government movements throughout Africa and the globe towards the diversion of food crops to agrofuel production and the conversion of land from food production to agrofuel production and its affects on the price of basic foodstuffs and the loss of biodiversity. The April 2008 Food and Agriculture Organization (FAO) special report estimates that the inflation rate on a year-on-year basis in Nigeria was 8.6% in January 2008 and was driven mainly by price increases in the food sector[1]. Several other African countries face similar challenges in the face of a global food crisis. Policy decisions of African States should be informed by a full range of factors associated with agrofuels within the context of present and future consequences. Several existing requirements exist for evaluation of policy consequences and they should be adhered to.

The New Partnership for Africa's Development (NEPAD) Environment Initiative document states that "All countries should undertake full social and environmental impact assessments of all energy projects according to recognized procedures and standards in order to ensure the energy needs in urban and rural areas are met in such a way as to optimize sustainable social and economic benefits while minimizing environmental impacts"[2] The Africa Section seeks to support and inform the NEPAD initiative with relevant science.

The Convention on Biological Diversity (CBD), to which all African nation-states are party, in Article 8 requires parties to make determinations concerning a range of different kinds of protected areas and land use and other controls and it requires that parties carry out environmental impact assessments of their proposed projects likely to have significant adverse affects on biological diversity and take any such adverse affects on their own country and other countries into account before proceeding with projects, programs or policies (Article 14). Such assessments should consider various combinations such as noting the difference between the vastly different impacts of different approaches to biomass production and replacing older vehicles with hybrid or electric vehicles over time and replacing diesel power generating facilities with solar (both thermal and photovoltaic) and wind generating capacity, for example.

African nations and those whose migratory wildlife may be affected by large conversions of land for agrofuel crops should also consider the implications for compliance with migratory wildlife treaties. Most European and African nations are party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as well as the CBD and adjust their plans accordingly to meet the goals of both the treaties and energy security.

A recent briefing for parties to the Convention on Biological Diversity, warned that: "large-scale biofuel production can have adverse impacts on biodiversity, including, *inter alia*, habitat fragmentation and degradation, increased greenhouse-gas emissions from

degraded carbon sinks and deforestation, water pollution and eutrophication, and overexploitation caused by land conflicts and increase in food prices."[3]

It is the intent of this paper to examine the current issues in Africa where biodiversity conservation, food security and human livelihoods are threatened as a result of the land that may be allocated for agrofuel production.

Definitions

Biofuels, agrofuels and woodfuel are terms that are frequently used interchangeably. Each has its own connotations and implications within the context of environmental governance and sustainability. For the purpose of clarity, the Africa Section of the SCB herein distinguishes between these terms.

A biofuel is any solid, liquid or gaseous fuel produced directly or indirectly from biomass[4], such as straw, grass, or processes such as collection of land-fill gas, and inclusive of the fuels mentioned below.

Agrofuels are obtained as products of agriculture biomass, by-products of farming, and/or industrial processing of agriculture-linked raw material. The term covers mainly biomass materials derived directly from crops and agricultural, agroindustrial and animal by-products[4] such as dung, corn and soy.

Woodfuels include all types of biofuels derived directly and indirectly from trees and shrubs which grow on forest and non-forest lands[4], including charcoal and methanol.

Africa Section Perspective

In this paper, we focus on agrofuels because they are derived from agricultural products such as sugar cane, corn, oil palm, soy bean, and cassava, which contribute directly to human livelihoods and often represent major staples in Africa, rather than biologically sustainable levels of by-product use, such as corn-stalks or recycled, used cooking oil that would otherwise be treated as waste. Consequently, origins of agrofuels are highly relevant to Africans for human security whilst production of agrofuels is of great concern to energy-conscious groups around the world.

The heightened drive by society to find alternative forms of energy results from the need to reduce carbon emissions to mitigate climate impacts, to reduce dependence on imported oil and find new markets for agricultural products. There is a trend to shift our dependence from non-sustainable fossil fuels (e.g., petroleum) to renewable sources of energy (including those of biological origin). Bio/agrofuel technology is believed by many to have the potential to alleviate some of the many problems associated with impacts from dependence on fossil fuels: carbon emissions, degradation of natural ecosystems, loss of biodiversity, political instability, conflict and war[5].

On the other hand, the production of agrofuels can lead to further clearing of land, as well as the reduction of human food production. For instance a 10% substitution of petrol and diesel is estimated to require 43% and 38% of current cropland area in the US and Europe respectively.[6] Substitution at this level would require in addition to existing arable land, clearing of forests and grasslands[7]. Righelato and Spracklen argue that the clearing of forest would create a large up-front emissions cost that would outweigh the net reduction in carbon emissions from fossil fuels[7].

Africa Section Positions

It is already a challenge to feed the human populations in Africa, so governments are struggling to balance modern food production, traditional agriculture and natural habitat for wildlife (and the growing ecotourism trade). Ecosystem risk will increase in the face of a conflict for space between agrofuel production and food security. Accordingly, land use planning must balance needs to ensure food security, without threatening wildlife (flora and fauna), especially in light of their ecotourism value to African nations. The Africa section identifies as a leading threat to this balance the designation of millions of hectares in Africa as tracts for production of agrofuels for export to the Northern hemisphere, resulting in the clearance of large expanses of land for monoculture[8, 9].

The Africa Section takes the position that large-scale agrofuel production for export presents a threat to Africa's biodiversity, environment, food and livelihood security for the continent's human populations. It must be noted that agrofuels derived from food crops to reduce our dependence on fossil fuels must be regulated to limit the impact on food availability for rapidly increasing human populations.

The Debate

Proponents of agrofuels raise several arguments, one of which is that the expansion of monoculture plantations of fuel crops will restore degraded land rather than destroy intact or biologically rich habitat. But these lands referred to as 'degraded' or 'marginal' actually have important functions for local communities and biodiversity. Also of critical note is that Jatropha (*Jatropha curcas*), a widely acclaimed biofuel crop touted as ideal for growth on 'degraded land' is widely considered a weed and is a potentially invasive species; a native of Central America, Jatropha could multiply dramatically if it is grown over vast areas.[10] Australians are already paying a high price for failing to carry out weed risk assessments with an agricultural cost estimated at $4 billion a year.[10] As noted by Raghu *et al*. in the journal *Science* of September 2006, "traits deemed ideal in a bioenergy crop are also commonly found among invasive species".[11] They further declare that "Experts must assess ecological risks before introducing biofuel crops, to ensure that we do not add biofuels to the already raging invasive species fire." Proponents maintain that agrofuels will reduce African dependence on fossil fuels. The Africa section would eagerly embrace local initiatives in energy conservation and even local production to meet local needs. But the International Energy Agency estimates that over the next 23

years global production of agrofuels could reach 147 million tons[12]; a production that will barely offset the yearly increase in global oil demand, without even achieving any offset of the current fuel demand. Therefore, the fear for conservation is that the benefit that could be realized from local energy production will be overshadowed by the motivation to garner 'big profits' from the international markets, resulting in much faster progress by international corporate programs than for local programs. It is also a concern that production of agrofuels from monoculture requires the use of large quantities of petroleum-based fertilizers, and pesticides which can be agents of soil, water and air pollution. Nitrogen fertilization is one of the main reasons the amount of biologically available nitrogen has more than doubled and, as a result, terrestrial and aquatic biodiversity are adversely affected.[13] And there is a noted contribution of nitrous oxide, a green house gas 300 times more potent than carbon dioxide[12]. Aside from the potential effects of fertilizers and pesticides on biodiversity, intensified monoculture has the potential to compete for water supplies from aquifers, rivers and lakes through irrigation[13], another resource challenge for many developing nations.

Finally crop residues targeted as alternative energy in many African countries serve to protect the soil from severe erosion as well as conserving nutrients and preventing water runoff. An understanding of these dynamics is absent from the grander schemes for energy production.

The Challenge

In accordance with the NEPAD statement above, African governments and policy makers need to ensure that any new energy-related development reflect a balance between local human population needs and natural resource conservation, even if a moratorium on new agro-fuel contracts is needed to allow time to gain a greater understanding of the impacts of agrofuel production on biodiversity, food security and environmental sustainability. Nigeria, Africa's most populous country with significant biodiversity resources (e.g., designated hotspots), has initiated projects on biofuel production. The group managing director of the Nigerian National Petroleum Corporation (NNPC), has been given the task of creating the new Automotive Biomass Ethanol project[14]. He claims that *"Nigeria would be $150 million (about N21bn) annually richer when she adopts the development and application of biofuel as an alternative energy source to crude oil"*[15]. In another development, a pact has been signed between Brazil and Nigeria to create a 'Biofuel Town' in Nigeria aimed at kick-starting a biofuel revolution on the African continent. The goal is to attract local investors to produce biofuels based on sugar cane, oil palm and castor[16]. Further, the Ekiti State Government has signed a Memorandum of Understanding with Global Biofuels Limited to construct an ethanol processing refinery worth $83 million dollars (N9.7b) in the state. Initial production targets are 20,000 metric tons of ethanol daily using 5,000 hectares of land of sweet sorghum, an already precariously priced crop[17].

The national biofuel strategies of Nigeria and several other African countries, such as South Africa, Uganda, Ethiopia, Tanzania, Zambia, Mozambique, Zimbabwe, Senegal

and Malawi, elicit critical self analysis. Have the policy decisions of these countries been informed by reliable data? Are rigorously considered strategies in place to ensure the maintenance of equilibrium between food sovereignty, the environment and energy security? What is the evidenced-based guarantee that agrofuels will improve energy security in African countries? Take the case of Nigeria, the largest producer of oil in Africa. Its refineries do not meet domestic needs and the country has to import 70% of its petroleum-based fuel.[3] Socio-economic development has also eluded oil-rich Nigeria with 71% of the population living on less than 1USD/day. Paradoxically, the inhabitants of the Niger Delta oil-producing region are the poorest of all[18].

It is of concern to the Africa Section that if the international trade model of fossil fuels has brought only limited benefit to African populations, then Africans have reason to fear that the agrofuel market strategy will meet the same pitfalls[19]. Many protected areas in Africa are already under pressure from monoculture practices for food production. It is crucial that African governments and investors in agrofuels avoid the urge for expansion of intensive monoculture to prevent severe consequences on ecological resources, food security and overall biodiversity. It is of central concern to the Africa Section that if African governments uncontrollably pursue agrofuels as an energy panacea, then environmental sustainability and biodiversity conservation will be overlooked, simply through the further loss of ecological habitat.

Action to be Taken

Action on these matters is urgently required. The following set of principles must be used to guide action by NGO's and governments. Based on the above analyses and others, the Africa Section of SCB concludes that:

1. African governments and policy makers need to ensure that any new energy-related development reflects a balance between local human population needs and natural resource conservation, even if a moratorium on new agro-fuel contracts is needed to allow time to gain a greater understanding of the impacts of agrofuel production on biodiversity, food security and environmental sustainability.

2. Current trends indicate that the scale of agrofuel production is already affecting food security globally, but this trend should not be misused to justify adverse impacts on biodiversity and ecosystems.

3. Further to the global imperatives, governments should explore innovative land-use practices that enforce control over, and give alternatives to, large scale global marketing of Africa's critical resources of space and biodiversity. Accordingly, an appropriate new direction as a corollary to global, corporate programs, can be developed through ecoagriculture such as that described by Milder *et al*. (2008)[20]. Milder and his colleagues analyze diverse approaches of biofuel production systems and conclude that biofuel development has the greatest potential when biomass production is an interstitial activity and when processing occurs at the local level. The Africa Section of the SCB advocates for small holder biofuel production for local use where "biofuel feedstocks are produced

on small farms and processed in on-site or nearby small-scale facilities to generate electricity, biogas for cooking or liquid biofuels for running machinery or vehicles".[20] And in cases where an African country's current domestic energy demand could be met through cultivation of a modest land area of the country (e.g. 0.3%) in biofuel crops, biofuel feedstocks are grown on small farms or community run plantations and then marketed to produce electricity or liquid fuels for national markets (see Milder *et al*. 2008).

In order to achieve the above, it may be necessary to adopt land-use regulations that resolve fairly the competing requirements of livestock, humans and native wildlife supported by research and analysis. The methods for such land-use regulation are well-proven in developed nations, so the first challenges are not Why or How? to do this, but rather establishing the political will to ask When? The answer to that is now, as parties interested in biofuels are getting started and government policies are being established.

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