



Biofuels development in Africa: illusion or sustainable alternative?

The international dynamics around Biofuels development

The international energy community has recently seen an increased interest in biofuels. These alternative energies are perceived not only as one of the answers to the present energy crisis on a global level, but also as one of the solutions to the global warming problem attributed to greenhouse gas emissions.

While the European Union considers biofuels to be a sustainable source of energy, the United States tends to see them as an alternative for reducing oil-dependency and as a technical option to respond to climate change. In addition, several developing countries have engaged in an export-oriented development of biofuels. The cases of Brazil, Mexico and Malaysia are good examples of this tendency.

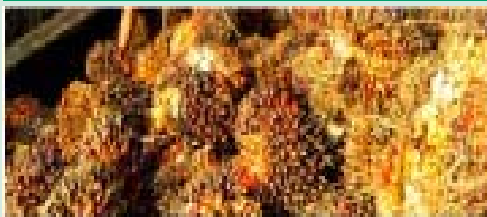
Africa, meanwhile, is attempting to position itself in the dynamics around biofuels with a particular concern about maintaining a balance between food and energy security. This position is motivated by its strong demographic growth, the urgent need for the improvement of access to energy and, more broadly, by the need for a sustainable economic development.

Biofuels are not a new source of energy. They have long been used in Asia and the Pacific Islands, and have been in use in Africa for a few decades (Mali, in particular, has used *Jatropha* for biofuel). Even though the production has generally been limited to domestic use, biofuels have succeeded in sowing hope for a more large-scale development, particularly to help reduce the dependence on fossil fuels, which are under threat of exhaustion, increase access to energy for the poor, and improve incomes in local communities.

At the global level, the current interest in biofuels is mainly seen in the context of industrial production operating within the framework of an international market governed by the globalization rules. Two trends have emerged from the biofuels scene. On one hand, fossil fuel-importing nations who are seeking an immediate solution to reduce their growing energy expenditures, and on the other hand, countries which are currently- or are interested in becoming- biofuels exporters, are attempting to position themselves strategically within the global energy market. This reflects the great hope for biofuels as key in overcoming the energy crisis, promoting alternative energy, and reducing global warming and its consequences. The industrial-scale production of biofuels practiced to date has focused primarily on the conversion of crops such as sugarcane, corn, soy, etc as a fuel base. This *first generation* of biofuels remains contested and is currently the source of a heated debate on the threat that energy security poses to food security.

This debate has stimulated a new interest in the exploration of a *second generation* of biofuels, based on the conversion of agricultural and forestry wastes or the conversion of lignocellulosic substances into energy. However, this second generation has not yet reached an acceptable level of economic viability. The use of *Jatropha* for energy production is particularly noteworthy in the debate on biofuels, especially in Africa and Asia. This plant, which can be cultivated in semi-arid, arid, or sub-humid soils, appears to offer the compromise sought between use of lands and water for food or energy needs. Questions naturally arise about the requirement of converting arable lands and forest spaces for a large-scale production and supplying a commercial *Jatropha* oil market.

Energy, environmental and social balances of biofuels production



If environmental protection is considered by the proponents of biofuels as being an important and positive factor in the *biofuel equation*, other theses have emerged to draw attention to the negative energy, environment and social balances which offset the advantages attributed to biofuels as a clean alternative to fossil fuels.

In terms of energy, these theses suggest that the biofuel conversion process, from cultivation to transport and delivery to end use "from field to wheel", is energy intensive. The commercial production and transport of biofuels seems to present negative energy balances in certain cases, and even for the most favorable case of ethanol, the ratio of the energy produced to the energy consumed in the complete process does not exceed 1.8¹. Ultimately, the production and commercial transport of biofuels rely, paradoxically, on an industrial process that is itself fossil fuel dependant.

The loss of biodiversity, degradation and pollution of soils and clearing of forests for large-scale fuel-crop monocultures², referred to as "Monoculture Deserts", are some of the other negative impacts which draw into question the sustainability of the use of biofuels.

Also paradoxical is that the intensification of energy monoculture for the production of biofuels requires the use of dangerous agricultural inputs such as chemical fertilizers and pesticides, creating serious problems in terms of soil and water resources degradation.

¹ M. A. Altieri and E. Holt-Gimenez, *The Berkeley Daily Planet*, 6 Feb. 2007

² System of cultivation where only one crop is grown on the same piece of land over a number of years



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At the social level, criticism is currently directed towards the contribution of the biofuels production to raise in agro-food products prices and increase poverty in developing countries. This situation currently seems to replace the charge of the dumping long practiced by Northern farmers through the flow of their surplus of agricultural production supported by political incentives. The same scenario seems to be repeating itself today with measures supporting biofuels in Europe and the USA. The absence of incentives for large-scale production of biofuels in Africa threatens to undermine the sector, to exclude the region from reductions of fossil fuel dependency, and leave it strongly exposed to oil market volatility. Appropriate regulation should also be mindful of small farmers and also subsistence crops that do not have the capacity to be competitive on the global market. On subject of balance between agricultural and energy policies, the FAO has taken a position of moderation toward biofuels and insists on the maintenance of a balance between food sovereignty and energy security³.

The case of Mexico illustrates the crisis around corn, which constitutes a staple food. The rise of the corn prices is linked to the growing demand for this crop for the production of ethanol intended for the US market. As a result, *tortilla* prices saw a 100% increase in only one week⁴.

Environmental and social criteria for sustainable development of biofuels

Awareness is growing at a global level in relation to the potential negative effects caused by the production of biofuels. The response to these concerns focuses on the definition of sustainability criteria and the development of a biofuel certification mechanism. Initiatives have been launched for the development of standards for ensuring the sustainable development of biofuels. The major frameworks for dialogue are currently the *Roundtable on Sustainable Biofuels*⁵, and the *Roundtable on Sustainable Palm Oil*⁶. Several questions can already be raised, particularly with regard to the implementation of these standards process in terms of both applying and measuring them.

The feasibility of this standardization for developing countries draws into question the low capacities of producers, food security, lands use rights, farmer's rights, and also the safeguarding of staple crops and family farms.

Another question would be the degree of involvement and influence of developing countries, particularly African countries, within these dialogues. Are these countries closely involved with the various standardization initiatives on an international scale? Are they ensuring that their priorities, specific contexts, and needs for poverty reduction are taken into account?

The challenge for the development of biofuels is to avoid falling into the international trade model of fossil fuels, which has not benefited African countries, even those that are oil producers.

Biofuels for Africa: An illusion or a sustainable option to reduce energy vulnerability and alleviate poverty

Africa has experienced several attempts at the development of biofuels. The initiatives in Mali date back to the 1940s, specifically for the conversion of jatropha. Nevertheless, these attempts remained limited to very small scale usage in the context of improving rural access to basic energy services. Currently, we are witnessing a growing interest across the continent. Mauritius constitutes an example of leadership in the field of bio-energy production with 40% of its energy needs ensured through cogeneration using bagasse coming from the commercial production of cane sugar. Mauritius is also aiming to develop the processing of sugarcane for ethanol production.

Other countries have already developed national strategies, including Mali, with clearly defined objectives, Senegal with a national program, and several countries in southern Africa (South Africa, Zimbabwe, and Zambia). One wonders whether these strategies are based on reliable data (in terms of both agronomy and energy), and if they are in line with agricultural and environmental policies?

Can Africa ensure its energy security through biofuels without first ensuring its food security, its environment and its biodiversity? With the implementation of international standards on biofuels, will African countries, which seem tempted by the potential of being players in a new international market, be in conformity with the standards of sustainable cultivation and production? Beyond the formulation of biofuels strategies, will African countries be in a position to achieve their aims and be competitive on the international market?

The oil crises of the 1970s stimulated the same passion for renewable energy (solar and wind, in particular). It should be noted that more than two decades later, Africa has not managed to leverage these sources for energy security, poverty reduction or sustainable development. Isn't this illusion, previously evidenced around renewable energy technologies such as these, likely to reproduce itself around biofuels?

There is a sense of urgent and immediate need in Africa to carry out an in-depth reflection in the biofuel sector, which is still not fully understood. Furthermore, the large-scale development of biofuels should take place within a framework of appropriate overall energy planning. Biofuels must be considered within an overall energy "mix" which should also integrate other forms of clean alternative energies. Beyond the diversification of energy sources, Energy Efficiency should also be a strategic priority both for production and of consumption systems.

Careful attention must be paid to biofuels whose large-scale development involves numerous actors. A national multi-stakeholders dialogue and a harmonization of energy, agricultural, environmental and social policies should be assured in order to maintain a balance between food security, energy, and the right to the sustainable social development.

Priority should also be given to the strengthening of local production in order to satisfy national needs and to provide benefits at the local level. International trade could be considered but only as a secondary option.



3 *Biofuels – Some Myths and Misconceptions*, NFU, June 2007

4 J. Burnstein et M. P. Rocha – *South Bulletin*, n° 143, 15 Avril 2007

5 *Roundtable on Sustainable Biofuels*, an Initiative of the Ecole Polytechnique de Lausanne, Energy Center, 2007

6 *Multi-stakeholder platform with secretariat in Malaysia*