

## **Biofuels in rural communities. Possible effects on livelihoods and food security.**

***A possibility for some – and a risk for most.*** <sup>i</sup>

An introductory note by Nordeco. Denmark

### **First principles -What is biofuel (1<sup>st</sup> generation?)**

The scientific principle behind biofuels is the carbon cycle:

As they grow, plants absorb carbon dioxide (CO<sub>2</sub>).

The carbon (C) builds tissues and feeds the plant while the oxygen (O<sub>2</sub>) is released.

When plant material is burned the carbon re-combines with oxygen.

The resulting carbon dioxide is released back into the atmosphere. The contribution of biomass to the greenhouse effect is therefore less than for traditional fossil fuels, which in a sense are biofuels, stored from past times.

When the plant-derived (bio)fuel is burned in an engine, the CO<sub>2</sub> released is offset by the amount of the gas absorbed by the plants when they grew.

It is, in principle, approximately carbon neutral; though the energy needed to plant, tend, harvest, process and transport the finished product can make the equation less favourable.

Production of crops for biofuels currently focuses on items such as corn or sugarcane, which are normal agricultural crops. Corn is even a staple crop for millions. Hence, the fast emerging biofuel market impacts 'normal' agricultural markets. Biofuel may also be derived from woody crops, but this seems to be only just emerging from the experimental stage <sup>ii</sup>. Only later (if a few years) will production of biofuels from a broader range of plants and their parts (including residues) become possible, when the so-called 2<sup>nd</sup> generation biofuel production moves from experimental to industrial scale.

### **Why all the hype about biofuels, now?**

Biofuels currently are in vogue because they

1. are seen (by some) as alternatives to fossil fuel use
2. provide an new market for farmers' groups and agricultural whole-sellers, notably in developed and middle-income countries
3. their existence may allow additional flexibility in the oil and gas markets and this flexibility is asked for by some key players.

### **Any problems?**

As biofuels are mainly produced from normal agricultural crops, they distort the markets for these crops, leading to *increased prices*, which in the case of corn directly diminish the food security (food access and availability) of millions of city-dwellers in

poor countries all over the world. A recent FAO report <sup>iii</sup> sums up: 'Structural changes in agriculture, specifically for increased feedstock for biofuel production, will keep agriculture prices at historic high levels for the next decade, says the report. These higher commodity prices will raise costs for developing countries that import food as well as the urban poor'.

Biofuel plantations (such as palm oil or sugarcane) in some cases have been planted in previously forested areas, which make the climate (and biodiversity and ecosystems services) effects negative.

In some cases, these plantations are on land previously used (and owned) by rural communities, which then lose a direct asset, to the detriment of their food security (availability and utilisation – as some nutritious foods disappear with the forest).<sup>iv</sup>

### **Can biofuels enhance food security, for some?**

Some communities may have;

- excess, unused and non-forested land
- excess labour
- clear negotiating power towards the buyers of the biofuel material, who will be powerful city people or even multinational companies

Under these conditions, the production of biofuels to the market *may* become an additional source of income, at least for a period.

If the community has mechanisms for equitable sharing, the income may benefit the overall food security.

We are here talking about STRONG communities, already well organised.

Governments may help create conditions where this potential may be exploited. This is detailed in a recent FAO meeting.<sup>v</sup>

### **The market; is probably short-lived, transitory and unstable**

The market for 1<sup>st</sup> generation is (outside Brazil and a few other countries) a very new and emerging one. It may collapse again soon, as threats to this market are numerous

- the climate benefits are dubious in most cases, which may take away one main incentive for the use of 1<sup>st</sup> generation biofuels
- other negative effects, such as those on food security, gives bad publicity, negatively impacting the market
- the competing markets for fuels are fairly unpredictable
- some countries (like the US) pay heavy subsidies to 'biofuel crops' thus distorting the market
- more clever ways of producing biofuels (2<sup>nd</sup>. generation, biochar <sup>vi</sup>) are fast emerging and will most likely quickly replace the 1<sup>st</sup> generation methods

### **What to do?**

For rural communities, this question calls for organizing themselves in order to grasp the opportunities and prepare for future developments – just like the issue of general livelihoods improvements does.

For NGO's (national and international) there is a call for advocacy support to communities especially on the land and food security issue, also as it relates to biofuels and advocacy interventions at national and international levels. The latter should influence policies and regulations (which may be emerging<sup>vii</sup>, for biofuel production and certification).<sup>viii</sup>

The communities, their organisations, government institutions and civic society may also be well advised to look into emerging opportunities within 2<sup>nd</sup> generation biofuel markets. They may be more relevant to exploit for improving food security of rural people. Still, this is not a given outcome. Even 2<sup>nd</sup> generation fuels can be derived from crops or grown on land taken from poor communities. Like 1<sup>st</sup> generation biofuels, they may serve to improve livelihoods/food security mainly if;

- they are derived from food crop *residues*
- these residues can be replaced in the ecosystem (e.g. straw previously used for compost replaced by green manure or other)
- the markets are regulated to include certification (social and environmental).

In general, rural communities are best advised to

- organise themselves, to increase bargaining power, improve NRM- and other skills and strengthen mutual help mechanisms and solidarity
- increasingly apply principles of sustainable agriculture, which will 1) increase and stabilise yields, 2) improve water capacity of the soils, reducing the risk for climate extremes, 3) increase organic matter contents in the soils<sup>ix</sup>, which may itself be sold as Carbon (not yet very price-attractive, but this may come)

*Comments or suggestions are most welcome and may be sent to*  
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i Now (August 2007) there is a book on the subject: BIOFUELS FOR TRANSPORT: Global Potential and Implications for Sustainable Energy and Agriculture – Worldwatch Institute

ii An example from Sweden, where ethanol will be derived from wood residues (in Swedish): <http://www.nyteknik.se/art/51501>

iii To be found at: <http://topics.developmentgateway.org/foodsecurity>

iv A journalist recently summed up some main problems in this article: [http://www.atimes.com/atimes/Global\\_Economy/IH01Dj01.html](http://www.atimes.com/atimes/Global_Economy/IH01Dj01.html)

v Meeting in April 2007: <http://www.fao.org/newsroom/en/news/2007/1000540/index.html>

vi More about this promising technology may be read at: [http://www.css.cornell.edu/faculty/lehmann/biochar/Biochar\\_home.htm](http://www.css.cornell.edu/faculty/lehmann/biochar/Biochar_home.htm)

vii EU is declaring interest in promoting sustainability in regulations of the global biofuel market:  
<http://business.guardian.co.uk/story/0,,2119897,00.html>

viii A southern African study at [www.wahenga.net](http://www.wahenga.net) gives recommendations for actions to ensure biofuel production may benefit and not harm the poor. [http://www.wahenga.net/index.php/rhvp\\_publications/wahenga\\_briefs](http://www.wahenga.net/index.php/rhvp_publications/wahenga_briefs)

ix The main documentation may be found in the paper by Pretty et al., 'Resource-Conserving Agriculture Increases Yields in Developing Countries', at: <http://pubs.acs.org/cgi-bin/abstract.cgi/esthag/2006/40/i04/abs/es051670d.html>