

Growing biofuel and food production – Impossible combination?

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When starting to compare growing biofuel production impacts for growing agriculture and food production it is best to start with brief description of what biofuels are. Biofuels are fuels that are produced from natural ingredients, biomass and other nature-based materials that can be derived to ethanol and biodiesel. What then links them to agriculture is the fact that biofuels are widely produced by the plants that are also used for food (IEA: biofuels). In this blog text I'm trying to describe what the problem with biofuels and food production is and in the end I'll try to make some conclusions about the issue.

Biofuel production in the world has been increasing enormously in recent years. It has been estimated that production amounts has tripled from year 2000 to year 2007 and significant part of this growth is made by crops that are used also for food. For example in 2007 Brazil used 50 % of its sugar cane for biofuel and the EU used 68 % of its vegetable oil production for biofuels. This development is harmful for agriculture and environment and it leads to growing food prices, food crises and loss of natural habitats (Zhang et al. 2013).

The main reason for growing use of biofuels has been so called "environmental friendly" which is argued by the fact that biofuels are renewable energy sources and they don't cause CO₂ emissions. By these reasons many actors, including nature conservation organizations, mainly supported use of biofuels until 2007, when high food prices led to global food crisis. This crisis changed the common opinion of biofuels from positive to negative because people started to see that the land area used for biofuel production was out of food production. In addition scientists and nature conservation organizations noticed that biofuel production was actually harmful for environment, because new fields were cleared to rainforests and other natural habitats which led to big CO₂ emissions and to irrevocable natural disaster (Dauvergne & Neville 2010).

It has been estimated that nearly 60 % of humans in the world are malnourished and malnutrition is the most common reason for death nowadays (Pimentel et al. 2009). From these reasons and from the fact that the world's population is growing rapidly it is very important to find new ways to produce biofuels. David Tilman and others present in their article (Tilman et al. 2009) five alternative methods to make biofuels. The methods are perennial plants on degraded lands, crop residues, sustainably harvested wood/forest residues, double crops and wastes from municipal and industrialism. But these new methods are not enough, writers continue that "large reductions in fuel demand" and "large increases in both food and biomass productivity on existing farmland" are also needed. In the end of their article they write that biofuels should replace fossil fuels only when energy security, greenhouse-gas emissions, biodiversity and sustainability of food production are in order.

Jose Escobar and others are in their article (Escobar et al. 2009) in step with Tilman and others that new technologies are essential if biofuels will replace fossil fuels. They write that the present development is impossible if we want to calm the world's hunger down and that the biofuels will be just a partial solution for transportation. They hope that second and third generation biofuels will overtake the place from the present-days first generation biofuels and in the future biofuel production will be separated from food production. In the end they also state that it should remember to develop also other renewable energy sources, like wind, solar, geothermal and tidal energy.

European Union has decided in its directive that every member state has to promote its use of renewable energy in the transport sector to a 10% minimum in 2020. Union is informed about the issues that handle biofuels impacts on agriculture and for this reason directive encourages member states to develop new methods for biofuel production. Union also advises to use only biofuels that are produced sustainably and it requires that biofuels should emit 35% less greenhouse gases than fossil fuels (European Commission). In spite of these words well-known international organization Oxfam has rejected EU's biofuel targets. It says that the directive leads to land grabs in developing countries and it can raise the price of some foods significantly. Oxfam has also counted that already in 2008 the land area used for biofuel production to Europe could have fed 127 million people in one year (Oxfam international).

So in overall the question about biofuels and agriculture is very difficult and unsolved in many cases. Present first generation biofuels are leading us increasingly to worse hunger and they are also destroying our last undisturbed natural habitats. Development of second and third generation biofuels are underway but they are not yet ready to replace biofuels that are in use. Climate change is strengthening and in same time world's rulers are trying to reduce carbon dioxide emissions by replacing fossil fuels to biofuels and natural conservation organizations are fighting for to save last remaining rainforests.

In my opinion it would be better to concentrate primarily on developing other energy sources, like solar, instead of biofuels to replace fossil fuels on transportation. I validate my opinion to the fact that sun provides in one minute so much energy in the world that it supply the world's energy needs for one year. If we manage to develop battery technology, then we would make huge amounts of solar energy in world's sunny areas and transport it to other areas as

we now do with fossil fuels. In addition to solar energy there are also huge amounts of wind and tidal energy in world's coastlines. If we can exploit them, then we can save our important agricultural areas for food production and our last rain forests - without harmful carbon dioxide emissions. Harmfully this demands maybe even more developed technology, so in this situation it is better also to develop this second and third generation biofuels and try to find some sustainably solution which secure sufficient food production and nature conservation.

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