



Soaring food prices and deforestation: could trade help mitigating negative effects of biofuels boom?



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1 Introduction

Driven by high governmental support, biofuel production has risen dramatically during recent years. Between 2001 and 2007 ethanol production has tripled and biodiesel production has grown almost ten fold.

- > Biofuels constitute a new market for crops which were already used for other purposes => *may threaten food security*
- > Biofuels create new incentives to extend the agricultural land to other land => *may lead to deforestation*

International trade in biofuels is at a early stage but there are very strong upward trends. However, there are important barriers for biofuels and biofuels feedstock trade.

- > Facilitating trade will lead to an efficient allocation of biofuels production in the lowest production costs areas
- > But trade can also put higher pressure on fragile environment => debate on the necessity of limiting biofuel imports according to sustainability criteria.

2 Methodology

Concept and structure of GLOBIOM are similar to the US Agricultural Sector and Mitigation of Greenhouse Gas (ASMGHG) model (Schneider, McCarl, and Schmid, 2007).

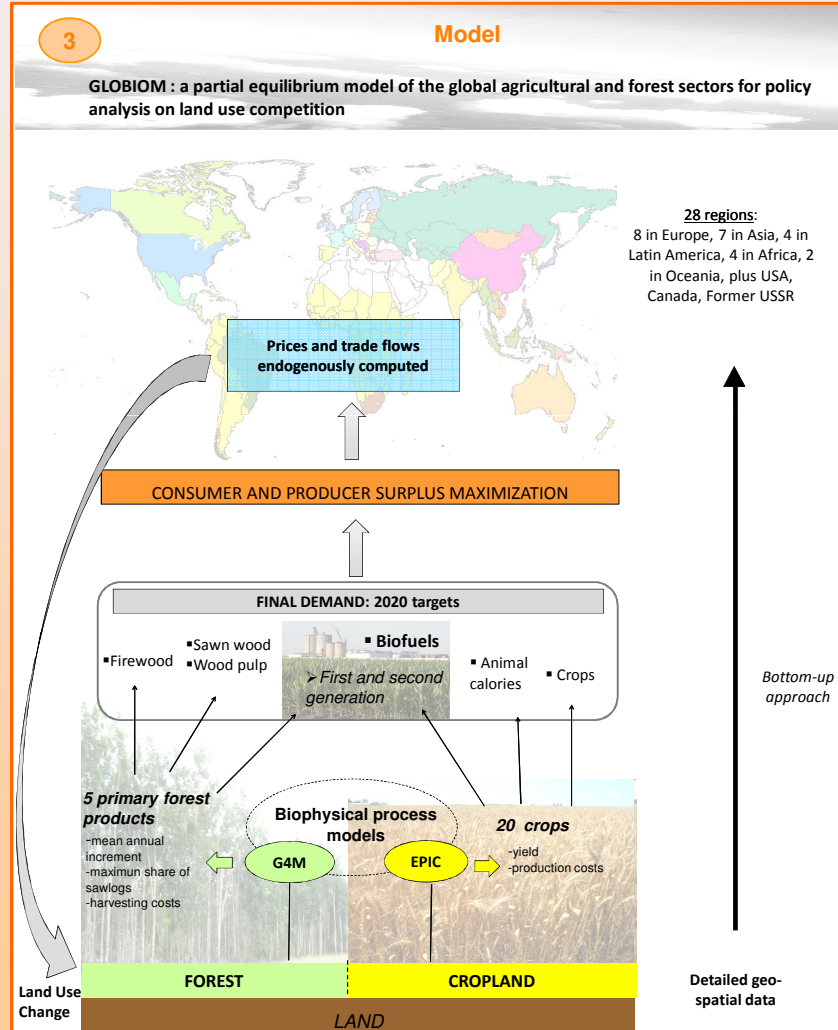
The global agricultural and forest market equilibrium is computed by choosing land use and processing activities to maximize the sum of producer and consumer surplus subject to resource, technology and policy constraints. Trade costs explain the differences in prices between regions and determine trade flows (spatial equilibrium model).

Land and its characteristics are the key elements of our modeling approach. A comprehensive geo-spatial database has been built (Skalsky et al., 2008) which contains data on:

- soil
- climate
- topography
- land cover
- crop management

Data were harmonized into several common spatial resolution layers including 5 and 30 arcmin as well as country layers.

Land is allocated among the different type of land-use according to its marginal profitability.



4 Scenarios and Results

SCENARIOS

1/ Deforestation is not limited
 A- Free trade in biofuels
 B- No trade in biofuels

2/ Deforestation is prevented
 A- Free trade in biofuels
 B- No trade in biofuels

RESULTS

DEFORESTATION: Million hectares of deforestation

FOOD SECURITY: Crop price index

Free trade mitigates the negative impacts of biofuels expansion. More than 10 million hectares of forest are lost when trade in bioenergy is not allowed. Avoiding deforestation reinforces the increase in crop prices but it is much lower when trade in bioenergy is free. That shows that indirect land use effects are large: if bioenergy must be produced in countries of consumption, food production must be reallocated in other areas => 15% increase in crop price index.

5 Future improvements

We are currently working on trade policies and more detailed transportation costs. That will lead to a better representation of trade in the model and will allow us to investigate more precisely the links between trade and land use change.

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