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"Global food security and food safety:
The role of universities"

Renewable Energy for Global Food Security

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Abstract

The production of renewable energy from agricultural resources competes with food production for land, water and soil nutrients. The increased demand for energy crops may increase land and other resources allocated to the production of energy crops at the expense of the production of food cereals. The change of balance trade of major crops due to expanded areas use for the production of energy crops may raise world market prices of staple food and therefore cause global food insecurity. Consequently, an assessment of the efficiency of bioenergy policies requires a comprehensive analysis of food cereals and biofuel feedstock markets. The aim of this paper is to develop a decision tool that enables decision makers to monitor the evolution of renewable energy from agricultural resources, to assess the impact on global food security and welfare and to implement proactive policies that comply with sustainable development goals. To this end, the Global Crop Market model, a two countries and two products partial equilibrium model, is built to analyse scenarios related to the evolution of renewable energy from agricultural resources in the European Union and to measure its incidence on food cereals market in the rest of the world. Depending on the values of supply and demand shifters of biofuel feedstock in the European Union and a range of policies, the results indicate significant food cereals price increases and welfare loss in both the European Union and the rest of the World. The increase in European demand for biofuel feedstock is to a substantial degree covered by additional imports. Indirect land use change and price mechanisms induce global food insecurity and greenhouse gas emissions. By contrast, some comparative statics analyses highlight that sound policies in the European Union increase the global welfare by €20.72 billion annually and Europe saves €55.57 billion annually. In nutshell, this paper demonstrates that the borderline between international and national is slowly, but surely disappearing in the today world. Renewable energy policies enacted in a large economy like the European Union cannot be sustainably promoted without accounting and monitoring their effects on global food security and welfare.

Keywords: Biofuel feedstock, food cereals, Global Crop Market model, global food security, land use change, price mechanisms

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