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# The Impacts of Large Scale Use of Biofuels on Food, Agriculture, and Trade

One of the targets of the United Nation's Millennium Development Goals is to cut in half, between 1990 and 2015, the proportion of people who suffer from hunger. Progress toward achieving that target has been slow. If food availability or the ability to purchase food further declines, there could be large social costs at the global scale.

Research on the implications of widespread biofuel use on food, agriculture and trade is still in its early stages. The following issues are still largely unresolved and require further research.

## 1. Could the use of biofuels exacerbate world hunger and malnutrition?

Food security exists when all people at all times have physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life. Thus, food security is a function of available food supply, incomes (access) to purchase food, and the nutritional quality of available food. The price of food cuts two ways in this equation: higher food prices could increase farmers' net incomes, but also would hinder the ability of net food consumers to afford sufficient nutrition.

Over the past year, the increased demand biofuels production has placed on corn has resulted in a near doubling of the price of corn. The prices of other agricultural commodities have begun to rise as well as farmers substitute corn for relatively less profitable crops like soy and wheat, and as livestock producers switch away from corn-based feeds.

Half of the people in the world face severe resource constraints that limit their ability to adapt to higher food prices. Fifteen percent of the world population lives on less than $1/day and 50% of the world population lives on less than $2/day; many are spending over 80% of their income on food and still going hungry. Further, a diminished supply of food crops could result in a decrease in U.S. Food Aid shipments, which currently provide up to 20% of the coarse grain supply to some countries that not only suffer high malnutrition rates, but also rely on corn as a primary source of nourishment.

## 2. Could developing countries benefit from an increased demand for biofuels?

**Poor farmers could benefit**. The social welfare effects of a large-scale conversion to the use of biofuels likely will vary across and within countries; a complex set of interactions will determine winners and losers. While the landless poor – net food consumers – are likely to be hurt by higher food prices, many poor farmers stand to benefit if trade barriers are reduced. For example, farmers in Mexico, currently unable to compete with the U.S. in maize production, likely will be able to produce corn profitably given higher corn prices. In China, where many of the poor are landowners, much of the country likely will benefit from higher commodity prices.

**Would all farmers fare equally?:** Benefits could vary depending on a farmer's ability to scale production (net food producers could benefit the most), whether crops are rainfed or irrigated (farmers who do not rely on irrigation will not compete for water resources); whether a farmer produces crops or livestock (livestock producers could suffer from higher feed prices);

and what type of crop or livestock the farmer produces (poultry and swine producers could see a rise in feed prices), among other factors.

**The demand for biofuels could potentially be leveraged as a mechanism for development.** Countries in which small-scale farmers are able to process and refine biofuels themselves could see benefits in terms of economic growth, energy self sufficiency, and a healthier trade balance. At the same time, focusing on fuel crops to the neglect of food staples could aggravate existing hunger problems.

## Recommendations for Further Research

The following issues should be investigated further:

- **Minimization of distortionary trade policies.** The World Trade Organization should mandate a removal of current trade barriers on ethanol and other biofuels in order to level the playing field among producing countries. The degree of trade liberalization will significantly affect potential price increases, patterns of cropland expansion, and income opportunities for farmers. For example, if the U.S. removed its ethanol tariff, then Brazil could expand production and send more ethanol to the U.S., lowering the price of ethanol for consumers and increasing income opportunities for Brazilian farmers.
- **Enhancement of the capacity of developing countries to harness biofuels technologies to their advantage.** One example is to transfer to developing countries research and technology that would facilitate the development of small-scale biofuel production facilities in rural communities. Western biofuel technologies, suited to large-scale industrial agriculture, cannot easily be adapted to small-scale farming.

## Other key questions include:

- Which food crops will be most affected by the development of biofuels; and how will the large-scale use of biofuels influence both trade in, and the international commodity prices of, these crops?
- How will commodity price changes impact poor consumers and hunger globally?
- How might biofuels-induced changes in food availability within countries like China and the U.S. be propagated globally? What will be the effect on patterns of trade? Particularly, what will happen to overall levels of food security in those poor countries, such as Sub-Saharan Africa, that are currently net importers?

## Further Reading

J. Von Braun, R. K. Pachuri, "The Promises and Challenges of Biofuels for the Poor in Developing Countries" International Food Policy Research Institute, Washington, D.C. (2006)

The Council for Agricultural Science and Technology (CAST). Convergence of Agriculture and Energy: Implications for Research and Policy. CAST Commentary QTA 2006-3. CAST, Ames, Iowa; http://www.cast-science.org.

United Nations Conference on Trade and Development (UNCTAD). *The Emerging Biofuels Market: Regulatory, Trade and Development Implications.* United Nations, New York and Geneva, 2006.