Opportunities: Will the poor take advantage?

The growing potential of biofuels appears to create a substantial opportunity for the world's farmers. By increasing the demand for agricultural products, biofuel production could result in higher incomes for farmers. About 80 developing countries, for instance, grow and process sugarcane, a high-yielding crop in terms of photosynthesis efficiency that can also be used to produce ethanol. With international sugar prices moving generally downward until recently, partly owing to protectionist sugar policies in some OECD countries, sugarcane production for ethanol has become a more attractive option for developing-country farmers. Many developing countries already grow or could grow other potential energy crops such as maize, soybeans, rapeseed, and oil palm.

A modern biofuels industry could also provide developing-country farmers with a use for crop residues and marginal land. Emerging new second-generation technologies can convert cellulose from residues such as stalks and leaves into ethanol or electricity. While a much higher valuation of "residues" may in fact make "residues" history in agriculture, the soil fertility effects of that can be adverse. In some cases farmers can also grow energy crops on degraded or marginal land not suitable for food production. *Jatropha curcas*, for example, produces a seed that can be converted into non-polluting biodiesel. The crop is of special interest because it grows in infertile soil, even in drought conditions, and animals do not graze on it. The cost of producing biodiesel from Jatropha may be just US$0.43–US$0.54 per liter.

Because biofuel production is as labor intensive as agriculture, it could also generate additional employment in rural areas. The extent to which farmers will be able to realize the benefits described above depends on many conditions, including access to markets and access to technological innovation. In many low-income developing countries, farmers are unaware of the opportunities presented by biofuel production and thus risk missing out on the potential benefits. Other benefits, such as the ability to utilize residues and marginal lands depend on the advancement of the second-generation biofuel technologies. Public-private partnerships could help raise awareness of these opportunities among farmers in low-income countries and increase R&D investment in biofuel technologies.

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Challenges: Will the poor pay the price?

Besides large potential benefits, biofuels also pose challenges for the poor in developing countries. Like any innovation, increased production of energy crops has the potential to exacerbate socioeconomic inequalities by concentrating benefits on the well-off. It can lead to deforestation, a loss of biodiversity, and excessive use of fertilizers and pesticides, thereby degrading the land and water that poor people depend on. Policymakers must take care to ensure that biofuel production is managed and regulated in a way that avoids these pitfalls. These risks are speculative at present. With improved access to finance and sound policies for support of cooperation and for contract security, most innovations in agriculture can be scale neutral.

“The poor” are a diverse group, and expansion in biofuel production offers opportunities for some groups while it poses challenges for others. Applying the IFPRI IMPACT model for scenario analyses suggests that the projected increase in commodity prices, for example, would affect energy crop producers and energy crop buyers differently. Under the assumptions of an aggressive biofuel growth scenario significant price increases for some food crops could emerge in the long run (135 percent for cassava, 76 percent for oilseeds, and 41 percent for maize by 2020) unless new technologies are developed that increase efficiency and productivity in crop production and biofuel processing. Higher feedstock prices will benefit energy crop producers, but they would adversely affect poor consumers and food deficit farmers. A food-versus-fuel trade-off would result in cases where innovations and technology investments are largely absent and where trade and subsidies are flawed.

For countries with a limited natural resource base, biofuels could divert land and water away from the production of food and feed. Critics argue that crop production for biofuels compete with and drive out food production, thereby increasing food insecurity. Energy crop production, however, does not need to lead to increased food insecurity, for a couple of reasons. First, new ways of combining food production with energy production have been developed. Food crop residues like rice and wheat straw, maize husks, and sugarcane bagasse (a fibrous residue) can be converted into biogas, ethanol, and electricity. In other cases energy crops can be targeted to more marginal lands, while food crops can be grown on more favorable lands. In addition, farmers can rotate food and energy crops. Finally, research can—and must—help enhance overall crop productivity, and this is a prime task for the Consultative Group on International Agricultural Research (CGIAR).

Second, it is now well understood that food insecurity is a result not simply of a lack of food availability, but poverty. Food-insecure people do not have the income to buy the food that is available. If increased production of biofuels can raise the incomes of small farmers and rural laborers in developing countries, it may in fact improve food security. Still, risks for food security remain, particularly if the biofuel sector is not well managed and if oil price instabilities drive food price instability. Destabilizing oil price fluctuations that translate into food price fluctuations may actually be more worrisome than long-term price effects, as the poor have little capacity to adjust in the short run. Opening up trade opportunities for biofuels can dampen price fluctuations. Thus the effects of biofuel expansion on food security depend heavily on policies related to technology and trade. However, the risks of biofuels expansion for the hungry poor due to raising and more fluctuating food prices cannot be dealt with by energy, agriculture, and
trade policies only. Enhanced social protection policies, including targeted transfers for the poor are needed in the context of a new and more risky food price regime under the changing world food equation.

**Towards a pro-poor sustainable biofuel industry**

Policy-makers have recognized that the high demand for energy and the apparent enormous potential of biofuels do not guarantee positive impact on poor people and developing countries. Creating an industry that helps the neediest people improve their lives and livelihoods will require careful management at all levels. This management includes taking the necessary steps to develop a global market and trade regime with transparent standards for biofuels.

To develop a pro-poor sustainable biofuels sector that is sustainable and pro-poor, actors at the international, national, and local levels have crucial roles to play. International institutions must help transfer knowledge and technology for developing an efficient and sustainable biofuels industry to poor countries. The international community must also create a level playing field for trade in biofuels. By subsidizing their domestic agriculture and their biofuels industries, the OECD countries are raising the price of grains and feedstock in their own countries and are distorting the opportunities for biofuel production and trade in developing countries. At the national level, policymakers must take steps to create a well-functioning market for biofuels, to promote investment in associated areas like flexible-fuel vehicles and fueling stations, and to regulate land use in line with socioeconomic and environmental goals. They must also provide farmers who wish to grow energy crops with the same kinds of support needed for other forms of agriculture, such as research and extension services, credit, and infrastructure. Finally, local institutions must participate in designing and managing projects to develop biofuels so that poor people and small farmers can gain benefits as both biofuel producers and consumers.

With sound technology and trade policies, as well as social protection policies, win-win solutions—that is, positive outcomes for food security of the poor as well as for energy efficiency and security—are possible with biofuels in developing countries.