



RESEARCH BRIEF

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Biofuels Can Have a Win-win Outcome that Improves Smallholder Productivity and Increases Household Welfare

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DRB 13-02, MARCH 19, 2014

Rising prices of fossil fuels, together with apprehension about the environmental harm created by them, have resulted in increasing efforts to search for alternative energy sources such as biofuels. Biofuels production is still a debatable issue regarding the opportunities it creates and the challenges it poses. Its proponents see it as an alternative energy source that substitutes renewable and relatively clean energy for conventional energy sources. Sceptics, however, consider it a threat to the poor. Some even take it further and perceive it as a crime against humanity to raise crops for fuel instead of food. It is crucial for low-income, food-deficit countries such as Ethiopia to investigate the distributional and food security questions raised by such investments. Will such biofuel investments be pro-poor or will they lower the income of vulnerable people or groups? Which group in Ethiopia, if any, will be affected negatively due to increasing biofuel investments in the country? Will such investments undermine the country's food production or food security? Findings in Ethiopia suggest that biofuels investments can have a "win-win" outcome that can improve smallholder productivity, food security, and household welfare.

This paper tries to see whether there are positive or negative impacts on smallholder farmers and people living in rural areas as more agricultural land is used for biofuel production. The paper captures the impact of biofuels investments by agro-ecology zones, using data from 15 biofuels firms and two NGOs that are involved in biofuels production, namely, REST in Tigray and ORDA in the Amhara region. It was found that the spillover effects of certain biofuels can increase the production of food cereals (with the effect being variable across regions) without increasing cereal prices. These spillover effects include cash that can be invested in economic opportunities, and new technologies to improve food crop production.

Key Points

- The effect of biofuels investments on cash crops is found to be either neutral or mild and positive.
- Biofuels expansion complements the growth of the agriculture sector, with important linkages to other sectors.
- Urban households are better able than rural households to exploit opportunities created by biofuels investments.
- Increased biofuels production can increase production of both food cereals and cash crops in Ethiopia. However, the effects vary by region.

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Biofuels development in Ethiopia is unique in that it is characterized by a diversity of biofuels crops (jatropha, castor bean, sugarcane, and palm oil, including indigenous trees) and use of byproducts such as molasses for ethanol production. Considering this diversity of biofuel options for Ethiopia, this study takes seven biofuels scenarios for analysis, namely, sugarcane, jatropha, castor bean, palm oil, jatropha with improved productivity of the smallholder crop sector, and castor bean with spillover effects of biofuel technology on smallholder crop agriculture.

According to the results, smallholders in regions where biofuels crops are located can benefit from biofuels expansion in different ways, including wage employment, technology transfer such as improved farm practices, and infrastructure. In particular, the jatropha and castor bean scenarios that involved spillover effects positively affected household welfare and cereal production, with the effect being variable across regions.

In general, the urban households are better able than rural households to exploit opportunities created by biofuels investments. In terms of sectors of the economy, production of cereals (food) benefited most, especially in zones where biofuels investment is located. The effect of biofuels investments on cash crops also turns out to be either neutral or mild and positive. However, the effect of biofuels investment on livestock is found to be neutral or negative.

Conclusions

Contrary to the notion that increased biofuels production will undermine the food security of developing countries, the study results show that it can increase production of both food cereals and cash crops in Ethiopia. However, the effects vary by region. Also, to be successful from a poverty reduction perspective, biofuels investments must be made on land that is not currently being used for food production. Transfer of technology know-how from biofuels firms to farmers is also required. An important implication is that, to maximize the benefits of biofuel investment, it is important to expand infrastructure, which in turn will help to expand and attract biofuels investments in areas that are not already occupied by smallholders.

ABOUT THIS BRIEF

This brief is based on "The Distributive Effect and Food Security Implications of Biofuel Investment in Ethiopia: A CGE Analysis," Z. Gebreegziabher, A. Mekonnen, T. Ferede, F. Guta, J. Levin, G. Köhlin, T. Alemu, and L. Bohlin, January 2013, EfD Discussion Paper 13-02. (The DRB series of research briefs is associated with the EfD Discussion Paper Series.)

FURTHER READING

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