EDRI
EfD
Environment for Development

RESEARCH BRIEF

While biofuels expansion can help improve economic growth, it can be harmful to the external sector

BY TADELE FEREDE, ZENEBE GEBREEGZIABHER, ALEMU MEKONNEN, FANTU GUTA, JÖRGEN LEVIN, AND GUNNAR KÖHLIN
DRB 13-08, MARCH 26, 2014

Biofuels have received a great deal of attention globally, and many countries have embarked on producing biofuels, given the volatility and the recent all-time high of world oil prices. Because Ethiopia has a tremendous potential for biofuel production, the Government of Ethiopia considers this an opportunity for enhancing food and energy security. In particular, development of biofuels has been considered key in terms of meeting the growing energy demand in the country and reducing the dependence on imported fossil fuel, which consumes close to 70% of export earnings. Therefore, it is imperative to investigate the growth and external sector effects of biofuels. This is especially important for a low-income, fuel-importing country such as Ethiopia, which has both a food deficit and a balance of payments deficit. This research investigates the economy-wide implications of the country's involvement in large-scale biofuels investments. The study involved collecting data from 15 biofuels firms and dynamically modelling the structure of the Ethiopian economy, including the biofuels sector, agriculture and other sectors of production, and import and export activities in the Ethiopian economy. Key questions include: will biofuels investment contribute toward economic growth? What are the likely effects of biofuel investment on the country's external sector?

Key Points

- A substantial increase in biofuels will have a negative impact on the external sector, especially on exports and imports.
- The impact of biofuel expansion on cash crops is limited, i.e., neither strongly negative nor strongly positive.
- Biofuel investment could possibly be one avenue to reducing poverty and enhancing growth; however, it requires policy attention, including R&D efforts and knowledge support to the biofuels industry.
- Appropriate institutional setups should be strengthened, particularly at the regional level.

In the modeling, the study focuses on the differential impacts of various biofuels production scenarios, including a baseline scenario that excludes investments in biofuels. These scenarios consider different feedstock, agro-ecological zones, and technological spillover effects. An economy-wide approach was used in the analysis.

The survey showed that there are complementary local innovations going on in the biofuels sector, including inventions and innovations in bio-diesel stoves, processors/distilleries, and biogas-driven vehicles. In general, biofuels expansion enhances total national output (GDP) and has implications for trade and foreign exchange availability if such expansion generates spillover effects, such as technology transfers or reinvestment of income

generated from biofuels activity in other agricultural activities. Without spillovers, however, the effect of biofuel expansion on economic growth is negligible. Among the biofuels crops, the scenarios for jatropha and castor bean are found to positively impact the economy if we assume that there are spillover effects. As for effects on different sectors of the economy, biofuels investment with technology transfer, such as improved farm management practices, complements the growth of the agriculture sector.

In a setting where a shortage of land and food security are major issues, cash crops will be the first to be replaced by alternative and competing crops such as biofuels crops. Even then, production of cash crops on a very small plot of land could increase due to improved farm management practices that are acquired from biofuels crop activities. The study suggests a small increase in cash crop production in some regions and scenarios. However, the impact of biofuels expansion on the external sector, especially on exports and imports, is negative as it affects both the real exchange rate and production of export commodities. This may be partly due to competition for land from biofuels crops production. Reduced production of traditional export commodities implies that less will be supplied to the export market, which worsens the net external balance. On the other hand, the country can substitute imported fuel with domestically produced biofuel, thereby saving foreign exchange.

Conclusions

Overall, the macroeconomic effects of biofuel investment, and the effects on different sectors of production, are mixed. Biofuel investment is growth-enhancing if such investment generates technology transfer. The impact on the external sector, especially on exports and imports, is negative. However, these results might change if we assume that previously unused land is used for biofuels. Hence, encouraging biofuels investments in a way that does not compete for land with traditional export crops would be essential to counteract the negative effects and realize benefits from biofuels expansion. Moreover, measures to address real exchange rate appreciation would also be important to counter the negative effects on the external sector. It was also found that the sector requires policy attention and could possibly be one avenue to reducing poverty and enhancing growth. However, it was also found that the sector suffers from lack of follow-up and appropriate institutional setup, particularly at the regional level.

ABOUT THIS BRIEF

This brief is based on “While biofuels expansion can help improve economic growth, it can be harmful to the external sector,” by Tadele Ferede, Zenebe Gebreegziabher, Alemu Mekonnen, Fantu Guta, Jörgen Levin, and Gunnar Köhlin, July 2013, EfD Discussion Paper 13-08. (The DRB series of research briefs is associated with the EfD Discussion Paper Series.)

FURTHER READING

Gebreegziabher, Zenebe, Alemu Mekonnen, Tadele Ferede, Fantu Guta, Jörgen Levin, Gunnar Köhlin, Tekie Alemu, and Lars Bohlin, 2013. “The Distributive Effect and Food Security Implications of Biofuels Investment in Ethiopia: A CGE Analysis,” EfD Discussion Paper 13-02.

MoME (Ministry of Mines and Energy). 2007. The Biofuel Development and Utilization Strategy of Ethiopia. MoME, Addis Ababa.

CONTACT

Zenebe Gebreegziabher (email) zenebeg2002@yahoo.com, (tel) + 251 914 70 01 95

Alemu Mekonnen (email) alemu_m2004@yahoo.com, (tel) +251 552 3564

RESEARCH BRIEF

While biofuels expansion can help improve economic growth, it can be harmful to the external sector

EfD Center in Ethiopia, www.efdinitiative.org/centers/ethiopia
eepfe-edir@ethionet.eth, Phone 251 11 552 3564 /550-6066. Fax 251 11 550-5588, Environmental Economics, Policy Forum for Ethiopia, (EEPFE), Ethiopian, Development Research Institute (EDRI). Blue Building, Near National Stadium, Office Numbers 401-409, fourth floor, P.O.Box 2479, Addis Ababa, Ethiopia

EfD, Environment for Development initiative, www.environmentfordevelopment.org
EfD Secretariat: info@efdinitiative.org, Phone: +46-31-786 2595, Fax +46-31-786 10 43, www.efdinitiative.org./efd-initiative/organisation/secretariat, Department of Economics, University of Gothenburg , PO Box 640, SE 405 30 Gothenburg, Sweden