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Summary:
Tanzania's biofuel feedstock production potential is closely linked to its food-producing potential, and is greatest for sugarcane in the southern region, whereas coastal regions have strong potential for cassava. Pro-environmental lobal energy policies which emphasize low-carbon targets are favourable for Tanzania through lowering maize prices and boosting ethanol and sugar export potential

Title:
Bioenergy and Tanzania's agricultural landscape: Interaction of global drivers and national policies

Problem and Objective:
The ability of Tanzania to meet national targets for bioenergy production are closely linked to its ability to produce food , and relies upon the same agricultural production base. The ultimate choice of feedstock will be driven by cost and productivity considerations, and the supply and demand dynamics at a national level are closely linked to world markets. In this study we see how this production potential is linked to global trends in food and energy prices and explore the implications of environmental policies as well as regional constraints to agricultural production potential.

Method:
In order to explore these questions, we constructed a country-level, multi-market model for Tanzania that can represent the supply and demand dynamics, with suitable disaggregation to the major administrative regions of Tanzania. This allows us to look at regional production potential in more detail than is possible in the standard aggregate national representation that most models have. We

link the projections of this national model to that of the IFPRI IMPACT model, which transmits the changes in global agricultural markets to the borders of Tanzania and provides an important connection with biofuel policies in OECD countries – like the US maize ethanol program – and how they affect the prices of crops that are important for Tanzania. At present, this model is partial-equilibrium in nature and does not model labor and other key factor markets, although these can be included in future extensions of the model.

Results:

The production potential for key bioenergy feedstock crops like sugarcane is higher in the southern regions of Tanzania, whereas that for cassava is highest in the coastal regions. Sorghum, which can be a potential feedstock (esp. for the sweet sorghum variety) remains highest in the central regions of Tanzania. Efforts at improving the productivity growth of these crops, through improved agricultural practices and technologies will boost not only the potential supply of bioenergy feedstock , but also overall food availability. Given the projected increases in sugar demand in the rest of Eastern and Southern Africa, there should be sufficient market potential for sugarcane, even if it is not converted to ethanol . If large OECD biofuel producers, like the US, were to focus on low-carbon fuel policies and reduce the use of maize ethanol, as a consequence – this would reduce the market pressures on maize, which would have a positive effect on Tanzania, while increasing the demand for lower-carbon biofuels like sugar-based ethanol. This would likely cause an increase in world sugar prices, as demand for sugar-based ethanol from Brazil increases, and increase the export potential for Tanzania in the sugar market. These could represent positive outcomes for Tanzania, and increase the incentives to invest in these sectors further.

Lessons learnt:

For practitioners:

Market potential is an important determinant of investment potential in new sectors like bioenergy – especially if domestic demand potential is limited. Export potential within the East Africa common market region will increase in importance as it expands to include South Sudan and potentially other regions in future.

For research:

More work needs to be done to understand sub-national supply & demand dynamics, especially for countries like Tanzania with heterogeneous agricultural landscapes. The implications of low-carbon fuel policies in OECD countries should be further explored, given the emphasis of this in the EU and growing interest in the US. Jatropha is still a poorly-understood feedstock, and its future potential remains uncertain. More research on alternative oil-based feedstocks needs to be done.

For policy implementation:

A successful bioenergy sector needs to achieve economies of scale in the production of high-productivity feedstocks in sufficient quantity. Otherwise costs become prohibitive for scaling-up. Given the bioenergy and food-production potential are so closely linked, pro-agricultural policies are essential in meeting these two goals.

Policy recommendations :

Given the close linkages between Tanzania's food sector and its potential for bioenergy production – national policy must remain pro-agricultural and support the development of a high-productivity sector that can produce in sufficient quantity to achieve cost-competitiveness – both in the domestic and international market. This general principle applies to both food and biofuel markets, and should be seen as complementary in terms of achieving their goals. This extends beyond just the productivity of the feedstock itself, but also the efficiency and functioning of the rest of the value chain. Important lessons from other countries suggests that the ability to lower the costs of production through achieving higher productivity and exploiting opportunities for vertical integration are important components to the success of any agribusiness venture. These principles apply to Tanzania, as well, which already has realized some competitiveness on export markets for some of its specialty agricultural products. If the market for sugar is viewed in this way, it might also achieve a level of productivity sufficient to meet the growing food demand for sugar within the East Africa region, as well as provide ethanol for beverage or fuel uses. As the recent switch in strategy by EcoEnergy suggests – perhaps a 'food-first' approach for Tanzania would be a more pragmatic way of achieving competitiveness in key agricultural sectors that can deliver products for multiple uses.

Further information available on www:

http://www.better-is.com/files/FS35_IFPRI_Activity_Report.pdf

Msangi (2012): Biofuels in Africa: http://ebooks.cambridge.org/chapter.jsf?bid=CBO9780511920899&cid=CBO9780511920899A024

Laborde 2012: http://www.ifpri.org/node/8439

Arndt 2010: http://www.wider.unu.edu/publications/working-papers/2010/en_GB/wp2010-110/

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Ewing (2009) (Abstract): http://www.sciencedirect.com/science/article/pii/S1462901108001123:

Participating institutions: International Food and Policy Research Institute (IFPRI), Institute for Environmental Economics and World Trade IUW, World Agroforestry Centre ICRAF, Wuppertal Institute for Climate, Environment and Energy, Leibniz-Centre for Agricultural Landscape Research (ZALF e.V.), Association for Strengthening Agricultural Research in Eastern and Central Africa. Associated partners: SOKOINE University of Agriculture, Ministry of Agriculture, Food security and Cooperatives Tanzania, Ministry of Energy and Minerals, Tanzania.

On behalf of Federal Ministry for Economic Cooperation and Development