Towards a Living Income for Cocoa Farmers in Ghana: Income vs. Forest?

Ole Boysen, Joint Research Centre, European Commission, Seville, Spain and School of Agriculture and Food Science, University College Dublin, Ireland

Introduction

Cocoa, being Ghana's most valuable export commodity after gold and oil, is also the base of livelihood for 800,000 Ghanaian farmers. However, many of these farmers are very poor. This has a diverse set of reasons, including small farm areas, low yields, low input use and low investments. As these, in turn, are also a result of low incomes, these farmers are trapped in poverty. Cocoa farmer poverty is also seen as one of the causes of the continued clearance of tropical forest in Ghana. Lack of funds for inputs and investment required to maintain cocoa yields drives farmers to abandon old cocoa plots and to clear virgin forest areas which provide excellent soils for new cocoa plantations. The result is a continuous cycle of deforestation. Correspondingly, recent public discussion has emphasized higher incomes or a "living income" as a precondition for enabling farmers to engage in more sustainable practices and halt deforestation. A recent report by Mighty Earth states that Ghana lost about a third of its forests since the early 1990s and indicates that cocoa growing-linked deforestation in Ghana remains high, with a large share occurring in forest reserves.

Many commentators agree that higher farmgate prices are an essential ingredient to achieve a living income, alongside higher yields. On the other side, expectation of greater incomes also incentivises farmers to grow more cocoa, which can be done by increasing yields and/or acreage. Correspondingly, pressure on remaining tropical forests, known to provide the best soils for cocoa growing, would mount.

This highlights the interdependence of the two issues and that designing mitigation policies must consider both issues simultaneously. This study presents a first attempt to include a spatial representation of cocoa and forest land cover-change into an economic impact assessment model to facilitate such an analysis of policies to achieve a living income for cocoa farmers.

Methods and Data

The framework developed combines a Computable General Equilibrium (CGE) and a land-use model to facilitate the comprehensive analysis of the impacts of cocoa policies for the case of Ghana. The CGE model is suitable for simulating cocoa farm income-improving scenarios and to determine new market equilibria, including agricultural markets and the associated land market outcomes which indicate the change in land requirements for different uses. However,

the CGE model is not spatially explicit and cannot say anything about the geographic locations where land is used for what purpose. For this reason, a spatially explicit land-use model is linked in a second step which tracks the spatial allocation of land uses and land-use change including forests.

The CGE model adapted for this purpose is the recursive-dynamic DEMETRA model, a derivative of the STAGE CGE model suite. A particular strength of the model for the analysis of smallholder farms is the representation of non-separable household production and consumption through household activities. The Ghana CGE model is calibrated on a 2015 social accounting matrix (SAM) for Ghana which has been modified to distinguish households, factors and household production activities between rural and urban dwellers across 10 regions (20 households in total) and to disaggregate the cocoa processing sector from other food processing. All cocoa-related data has been updated to correctly represent the cocoa activities in 2015.

The spatial allocation of land use is determined by the LUISA4Africa model, an Africa version of the Europe-centred discrete land-use model LUISA (Land Use-based Integrated Sustainability Assessment). LUISA maximizes the utility of land cover in the form of net present values subject to constraints on land available and on land demanded for each potential use. The utility of land varies by location as described by land suitability maps. For this project, the model has been extended to explicitly include cocoa land in Ghana, considering it as perennial crop where yield changes with the age of the plantation according to estimated yield curves. The data base is complemented with current cocoa farm plantation location and cocoa land suitability maps.

Expected Results

While Ghana's cocoa sector receives high attention internationally and it is suggested that the price farmers receive for their cocoa beans needs to increase greatly to achieve a living income for cocoa farmers, the production-incentivising effects and the corresponding implications for forests have been largely neglected in quantitative assessments of the issue so far. This analysis allows the assessment of the implied trade-offs to identify policy options for achieving a living income for cocoa farmers while keeping potential negative effects on forests in check. The outcomes should be informative for all stakeholders involved in the current discussions around how to achieve a living income for cocoa farmers and the deforestation linked to cocoa in Ghana.