Tropentag, September 16-18, 2015, Berlin, Germany

"Management of land use systems for enhanced food security: conflicts, controversies and resolutions"

Cost Benefit Analysis of Climate Change Adaptation Strategies on Soil and Water Conservation Methods in Northern Ghana

Baba Adam[1], Alexander Nimo Wiredu[2,1], Michael Kusi Appiah[3]

[1] *University of Hohenheim, Inst. of Agricultural Economics in the Tropics and Subtropics, Germany*
[2] *CSIR-Savanna Agricultural Research Institute, Socioeconomics, Ghana*
[3] *Zeppelin University, Leadership Excellence Institute Zeppelin — LEIZ, Institutional Economics & Wittenberg Center for Global Ethics, Germany*

Abstract

Climate change, characterised by rising temperature and rainfall variability, is already having significant effect on crop yields and livelihoods of farm households in the agricultural production systems of Ghana. The trend in climate change is likely to continue and the effect is expected to become more pronounce, making farmers in particular vulnerable and putting agriculture in Ghana as a whole at a greater risk. Several technologies and indigenous adaptation strategies exist to mitigate the effect of climate change and to ensure adequate food production. Despite their importance in preventing nutrient loss, retaining soil moisture, increasing crop yield, and providing additional income for farm households, adaptation is an investment and requires that actors make the best decisions. Literature on climate change adaptation, particularly in sub-Saharan Africa, deal with impacts, vulnerability, and constraints to adaptation but only little is known about the micro-level costs and benefits of adaptation strategies. This study will identify soil and water conservation (SWC) methods as climate change adaptation strategies used by farmers, and conducts economic analysis of the identified strategies using data from 100 systematically selected farm households in northern Ghana. Preliminary results show that farmers adapt to change in climate by using SWC methods such as compost, vetiver grass, mulching, stone bonding, terracing, cover cropping, manure application. To access the economic benefits of these methods, financial indicators such as benefit-cost ratio (BCR), net present value (NPV), internal rate of return (IRR), and sensitivity analysis will be estimated. Adaptation strategies that have high BCR and NPV are efficient adaptation strategy. The adaptation strategy with the highest IRR is most economical. The sensitivity analysis will identify the most resilient adaptation strategy in terms of shocks such as policy change and severe climate incidence.

Keywords: Adaptation, climate change, economic benefits, economic cost, food security, Ghana

Contact Address: Baba Adam, University of Hohenheim, Inst. of Agricultural Economics in the Tropics and Subtropics, Schwerzstrasse 2, 70599 Stuttgart, Germany, e-mail: baba.adam3@gmail.com