



Tropentag, October 6-8, 2009, Hamburg

“Biophysical and Socio-economic Frame Conditions  
for the Sustainable Management  
of Natural Resources”

## Exploring Potential of Carbon Trading to Enhance Adaptive Capacity in Terms of Food Security in Sub-saharan Africa

KAROLIINA RIMHANEN, HELENA KAHILUOTO, REIMUND RÖTTER

*MTT Agrifood Research Finland, Plant Production Research, Finland*

### Abstract

Global change poses a threat especially to poor people whose livelihood depends directly on natural resources. Carbon and emission trading offers an opportunity to finance mitigation and adaptation to climate change and to conserve its natural resources. The value of the Clean Development Mechanism (CDM) involving carbon trading with developing countries more than doubled each year between 2005 and 2007. Still Sub-Saharan Africa (SSA) accounts only 1,4 % of all registered CDM projects. The share is nine-times smaller than SSA's global share of emissions. Consequently SSA has potential for greater incorporation in global market. The mitigation potential of Africa through agriculture is estimated 17 % and forestry 14 % of the global total. SSA has a high projected growth rate in agriculture-related emissions in the near future, due to growing wealth and rising demand for livestock products. Thus agriculture sector has a great potential for mitigation. The objectives of the present study are 1) to create an analytical framework to examine the impact of varied mitigation options utilised in carbon trading on food security and rural livelihoods, and 2) to apply the framework to assess the potential of the mitigation options in Ethiopian agriculture and land use for mitigation and food security. To achieve the objectives the baseline for the study is examined; current land-use practices, especially of smallholders, and problems related to them are analysed. Mitigation options that suit to local agricultural systems and enhance adaptive capacity in terms of food security are identified and their potential for mitigation and food security is assessed. Mitigation options considered include improved cropland and grazing land management, restoration of organic soils and degraded land, livestock management, manure management, bioenergy use, improved energy efficiency, agroforestry, afforestation and avoidance of deforestation. Options for mitigation are quantified based on available literature and data from on-going projects. Differences among the mitigation options in distribution of benefits are evaluated based on stakeholder interviews.

**Keywords:** Adaptation, food security, greenhouse gas, land management, mitigation, soil carbon