Robust adaptation strategies to climate change for Ethiopian agriculture – heterogeneity of farming households and the role of social networks

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Background

Climate-related events such as drought, excessive rainfall, high temperature, frost etc. affect specific crop yields negatively and to different degrees (Berger et al, 2017). This in turn affects food security of the farming populations. Farmers apply several and often different farmer-specific strategies to cope with and adapt to climate extremes. Successful strategies to cope with climatic change in agriculture may vary strongly given a large heterogeneity among farming households. Heterogeneity arises mainly from resource endowments and agro-ecological variations. Analyzing the adaptive capacity of these households and their coping mechanisms is important to design effective climate change adaptation policies.

Objective

Identify strategies for robust adaptation to climate variability and future climate change

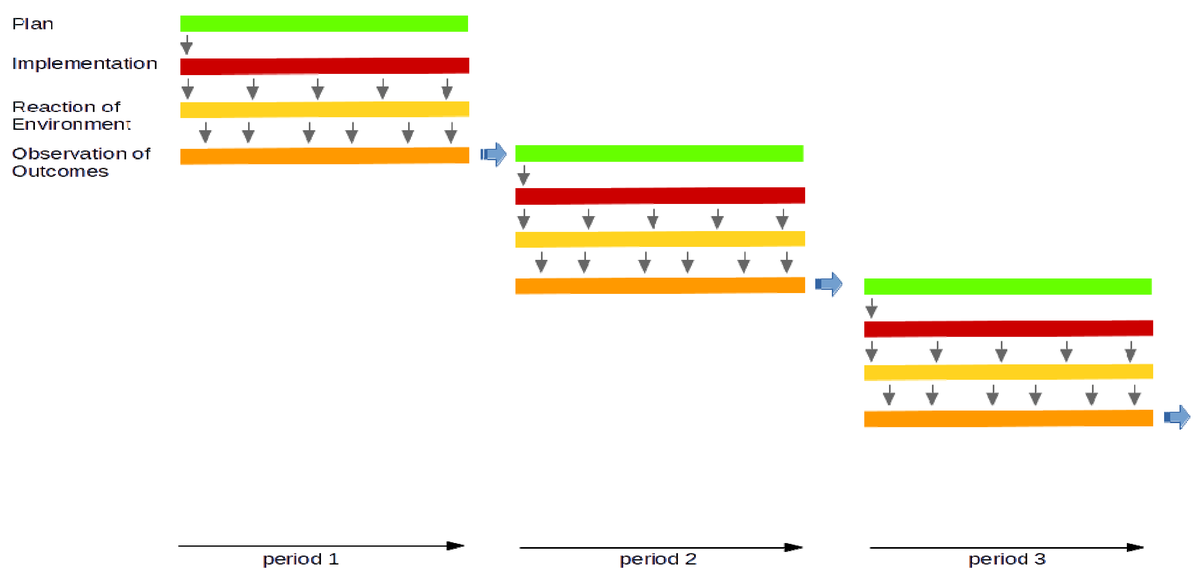
Research questions

- How vulnerable are Ethiopian farming households to impacts brought about by climate change?
- In how far do social interactions contribute to the adaptive capacity of households?
- Which strategies for adaptation to climate change impacts prove successful and robust to the uncertainty and increased weather variability associated to climate change?

Methodology

A Mathematical Programming Based Multi-Agent System (MPMAS) model will be employed to identify successful adaptation to climate shocks. The model allows for individual heterogeneity of modeled entities and explicit network interactions between individuals (Berger and Troost, 2014).

The MPMAS model will be used for ex-ante simulations of climate adaptation strategies for smallholder farmers. Farm agents are simulated recursively over years with varying climatic and economic conditions to ex-ante assess the robustness of strategies and their contribution to food security.



Recursive - dynamic simulations

Expected outputs

- ✓ Impact of climate change on agricultural production will be measured for Ethiopian farm households
- ✓ Successful adaptation options for different farm households will be identified
- ✓ The role of social interactions in adapting climate variability associated to climate change will be analyzed

References

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