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Adapting to the impacts of climate variability and change on agriculture

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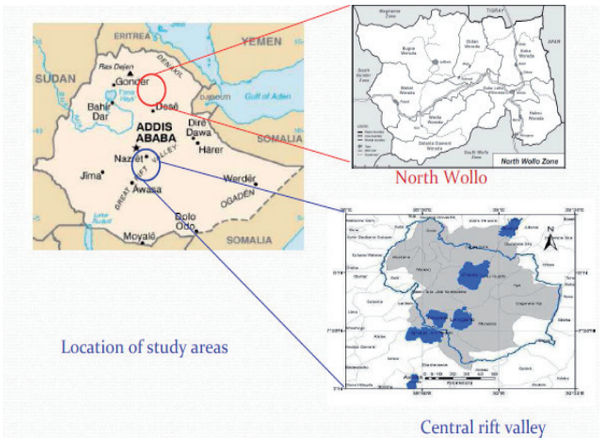
Background

Ethiopia is highly vulnerable to climate variability and change, due to its dependence on rainfed agriculture, low level of socio-economic development, and limited disaster management skills. Quantitative climate impact assessments on Ethiopian agriculture are scarce. This study is being conducted in two case studies, the Central Rift Valley and North Wollo (Figure 1), differing in environmental conditions, food security, poverty, and adaptive capacity.



Objectives

- To quantitatively assess the potential impacts of climate variability and anticipated climate change scenarios.
- To identify and evaluate existing adaptation and risk management strategies.
- To explore alternative future adaptation options that reduce vulnerability and enhance food security.

Research methodology

(i) Crop growth simulation models in combination with a GIS to assess potential impacts on crop production for different future climate change scenarios (Figure 2).

(ii) Field surveys and various expert knowledge systems to evaluate existing adaptation and risk management strategies, and to explore future adaptation options.

(iii) A bio-economic model to determine the degree to which multiple goals (production, income, environmental) can be realized at farm level.

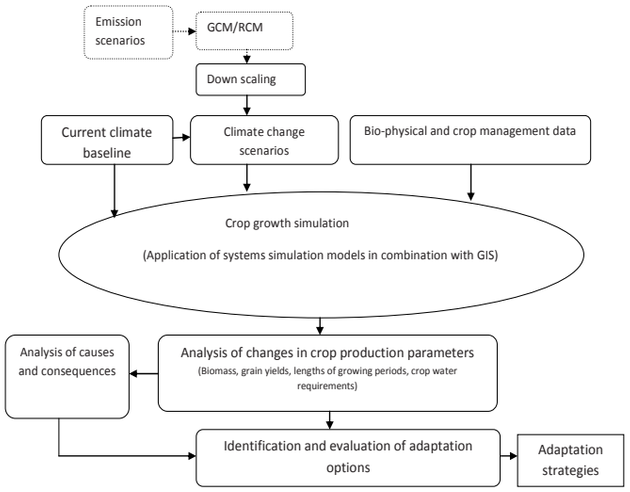


Figure 2. Analytical steps in assessing climate change impacts and adaptation options using crop growth simulation in combination with GIS

Preliminary result

Environmental degradation (land degradation, water scarcity) and lack of adequate climate risk management strategies are among the main causes for food insecurity in the Central Rift Valley and North Wollo. Apart from these results from a survey, the study is in the data acquisition stage.

Expected outputs

- Quantified information on impacts of current climate variability and potential anticipated climate change.
- Potential adaptation strategies/options that reduce vulnerability and enhance food security.
- Methodological frameworks and increased stakeholders awareness.

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