

# Food and Water Security under Global Change: Developing Adaptive Capacity with a Focus on Rural Africa

International Food Policy Research Institute (IFPRI)

<b>Country/Region:</b>	Ethiopia and South Africa, Sub-Saharan Africa-wide Components
<b>German participation:</b>	University of Hamburg
<b>Leading scientists:</b>	Dr. Claudia Ringler
<b>Duration:</b>	February 2005 – January 2009

## Initial situation

Over the coming decades, global change will affect food and water security and the livelihoods of poor farmers, herders, and fishermen and women in significant, but also highly uncertain ways. Long-term changes in climate will disproportionately affect regions in tropical zones, countries where a majority of the population is employed in agriculture, where rainfed agriculture is the predominant agricultural production method, and poor countries with few financial resources to counter the adverse impacts of climate change. Thus, poor farmers and livestock herders in Sub-Saharan Africa will likely bear the brunt of adverse impacts from climate change. Thus, adaptation to changes in external conditions is needed to reduce vulnerability, take advantage of opportunities, and cope with adverse consequences. Promoting adaptation among vulnerable populations and systems requires a comprehensive assessment of global changes, their risks, and the constraints households face.

## Approach of the project

Responses to climate change need to encompass several levels, including crop and farm-level adaptations, national-level agricultural and supporting policies and investments, and both regional and global policies and investments. Potential strategies include infrastructure investment, water allocation reform, land-use policy, and food trade.

To identify both short- and long-term adaptation measures that

reduce the impacts of global change on vulnerable communities, IFPRI is working



with local partners and stakeholders to characterize vulnerability through focus group interviews and comprehensive household surveys.

Through workshops, partners develop scenarios and likely outcomes for vulnerable countries, identifying potential adaptive strategies and response options, and their limitations. The alternative scenarios are then analyzed using an integrated modeling framework (based on IFPRI's IMPACT-WATER) together with models from University of Hamburg's GTAP-Water model to assess the effectiveness and relative costs and benefits

of response options and adaptation strategies. From there, general adaptation strategies and policies for global and regional levels can be developed, with detailed policy reform options for countries and regions. IFPRI is also helping to enhance international and national adaptive capacity through training and by facilitating exchanges among researchers to share insights and experiences in global change research. The research results developed will provide policymakers and stakeholders in these countries with tools to better understand, analyze, and inform policy decisions for adaptation to climate change.

### Major results achieved

Research to date assessed vulnerability of Ethiopian regional states to climate change; vulnerability to climate-related shocks of farm households in the Limpopo Basin of South Africa; and determinants of adaptive capacity in several countries of Southern Africa. Climate change impacts on crops were estimated for both South Africa and Ethiopia. Several stakeholder workshops identified the nature of vulnerability, constraints to adaptation, and alternative strategies to alleviate these constraints at workshops in South Africa and Ethiopia. A series of adaptation strategies developed through workshops and stakeholder forums is currently being modeled to analyze impacts on food security and investment needs.

### Expected impact

These research outputs are providing policymakers and stakeholders in Ethiopia and South Africa with tools to better understand and analyze the consequences of



global change and to form policy decisions that facilitate adaptation. Ultimately, the least affluent stakeholders in the two study sites are expected to benefit most from the results and insights gained. Results will also be useful for other areas in Africa and elsewhere that will face similar challenges.

### Collaborating institutions:

Center for Environmental Economics and Policy in Africa; Ethiopian Development Research Institute; Ethiopian Economics Association.

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