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sustainable solutions for ending hunger and poverty

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PRESS RELEASE

**For Immediate
Release
13 November 2008**

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New study identifies farmers' options and obstacles to adapting to climate change

Johannesburg—The vast majority of African farmers interviewed for a recent climate change study perceived long-term changes in temperature or rainfall. Surprisingly, however, two-thirds of rural South African households in the Limpopo River Basin and more than a third of Ethiopian farmers did not make any adjustments to their farming practices in the face of global warming.

South African farmers identified lack of access to credit as the single biggest constraint to adapting to climate change, followed by lack of water, information, and market access, and insecure property rights. In Ethiopia, farmers identified lack of land as the major obstacle, followed closely by lack of information and credit. They also noted that lack of labor, inputs, and water, as well as poor soils, prevented them from adapting.

As part of the study on adaptation strategies and constraints, researchers surveyed nearly 800 farm households in the Limpopo Basin in South Africa and approximately 1,000 households in the Nile Basin in Ethiopia. The research project was conducted by the International Food Policy Research Institute (IFPRI), the Center for Environmental Economics and Policy in Africa, the Ethiopian Development Research Institute, the Ethiopian Economics Association, and the University of Hamburg, Germany. The study provides insights into the ability of poor farmers and livestock

herders—who will likely bear the brunt of climate change—to adapt to climate-related shocks, especially drought and long-term global warming.

The research shows that farmers who did adapt irrigated more, harvested water, planted different crops, changed planting dates, and practiced soil conservation measures, including the planting of trees. Farmers were more likely to adapt if they had access to credit and extension, owned private property, and had more farming experience or mixed crop and livestock farms.

“In the coming decades, climate change will significantly affect food and water security, particularly in rural areas of developing countries where agricultural production is the major source of income and employment,” said Dr Claudia Ringler, IFPRI senior research fellow and project leader. “Africa is particularly vulnerable because of its limited ability to adapt due to dependence on rainfed agriculture, low levels of human and physical capital, poor infrastructure, and already high temperatures,” she explained.

According to the study, the most vulnerable households in South Africa are relatively large, rely heavily on rainfed agriculture, have limited farming experience, and do not own livestock. Vulnerability also varies within and between provinces in the Limpopo River Basin, indicating the need for targeted, region-specific policy responses.

“By providing policymakers and other stakeholders with information about which households are most vulnerable to the effects of climate change, the obstacles that prevent successful adaptation, and the strategies and investments that promote it, we hope better policies can be implemented for the benefit of the poor,” said Ringler.

Increasing agricultural productivity by 25 percent, for example, would be much more effective in countering the negative consequences of climate change in Sub-Saharan Africa—such as declines in food production—than doubling irrigated areas. Using state-of-the-art computer modeling, the study projects that improving crop productivity would almost fully eliminate the expected increase in the number of malnourished children as a result of climate change. In addition,

it would not only counteract projected income losses due to climate change, but would actually increase overall Gross Domestic Product (GDP) in the region by U.S. \$25.7 billion.

Adaptation strategies, however, should go beyond improved water storage, additional irrigation, and new crop varieties to promote overall growth and development. The study also projects that additional investments of U.S. \$2 billion per year in agricultural research and development, rural roads, female secondary education, irrigation, and access to clean water could significantly reduce the adverse effects of climate change in Sub-Saharan Africa. Increasing these investments to \$5 billion per year could help reduce the number of malnourished children to one third of current levels over the next 50 years. In South Africa specifically, investments should focus on agricultural research and development, education, and access to clean water, and less on roads and expansion of irrigation.

“Investments and policies should target those groups who are most vulnerable to climate change, including small-scale, subsistence farmers, women and children, and the poor, marginalized, and less educated,” emphasized Ringler. “We also need to remember that adaptation can come at the expense of mitigation. Increased use of nitrogen fertilizer to improve food production, for example, also increases nitrous oxide emissions. To maximize benefits and reduce trade-offs, mitigation and adaptation strategies should be developed together. Although hard choices will have to be made, through careful planning and sound investments, Africa can ease the burden of climate change on poor rural households, and succeed in the fight against poverty, hunger, and malnutrition.”

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