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Climate Change, Agriculture and Natural Resources

The Role of the Natural Resources Institute



How will a changing climate affect rural development?

Responding to climate change is one of the most urgent challenges facing humankind. The severest impacts are likely to be suffered by the poorest and most vulnerable in society who live in more fragile environments and have the least resources to adapt and recover. The majority of the world's absolute poor continue to live in rural areas and their livelihoods are heavily dependent upon agriculture and natural resources. There are thus serious implications for the food security, health and wellbeing of the rural poor, since it is projected that agriculture and natural resources will be severely affected by climatic change.

How will climate change affect agriculture?

In the longer term, mean temperature changes, increases in atmospheric CO₂ and mean precipitation changes will have a profound affect on agriculture. The time scale for this is subject to debate, but even in the shorter-term, climate change is affecting agriculture through increased frequency and severity of extreme events, such as droughts, floods and heat waves.

How can smallholders adapt to climate change?

There is great potential for smallholders in developing countries to adapt to climate change – much of which will comprise an intensification of their current adaptations to climate variability – through activities such as selection of appropriate crops and varieties, manipulation of planting times, micro-management of soil and water and livelihood diversification. However, this will crucially depend on the availability of appropriate technologies and institutional innovation systems and having the right supporting

policies and advice in place. The scale of projected climate changes and the challenges posed by existing climate variability to disadvantaged smallholders in low income countries is immense. There is thus an urgent need to understand these challenges better, to build adaptive capacity to respond, and to develop appropriate strategies which promote sustainable and equitable agricultural and rural adaptation.

How can NRI help?

NRI has been working to support rural development in developing countries for over 100 years, conducting inter-disciplinary research, consultancy and capacity building. NRI expertise in smallholder agriculture, natural resources management, economic development and rural livelihoods is highly relevant to the challenges posed by climate variability and change. Together with our partners, NRI will contribute to the search for effective mitigation and adaptation strategies.

Our key areas of intervention in climate change work are:

- identifying and assessing potential climate change impacts, especially the consequences for poor people's livelihoods;
- developing appropriate technical and institutional responses in collaboration with partners;
- analysing existing mitigation strategies and assisting in the development of equitable and sustainable future mitigation pathways;
- supporting southern voices in responses to climate change, particularly at the grassroots level.

Some examples of NRI work on climate change

• 4th IPCC Assessment Report

Professor John Morton, lead author on smallholder and subsistence agriculture to the Inter-governmental Panel on Climate Change (IPCC) 4th Assessment Report, Working Group II (Impacts, Adaptation and Vulnerability), chapter *Food, fibre and forest products*. The IPCC was recently awarded the Nobel Peace Prize for 2007, jointly with Al Gore, see www.nri.org/news/newslatest.htm#nobel

• Climate change impact on pests and disease vectors

Investigation of the possible effects of climate change on the biology of migrant pests, such as locusts and quelea birds, is relating projected scenarios to existing population models. In addition, work is being planned on the effects of climate change on the distribution and epidemiology of onchocerciasis (river blindness) throughout Africa.

• Agricultural adaptation in Tanzania and Malawi

Action research in Tanzania and Malawi to foster effective engagement amongst key stakeholders in the development of agricultural innovation systems which strengthen adaptation to climate change and variability. NRI is an important partner on this project led by the University of Dar es Salaam and funded jointly by the Department for International Development (DFID) and the International Development Research Centre (IDRC).

• Impact of climate change on land tenure

Assessment of the impact of climate change and variability on land tenure and identifying appropriate changes to policy and practice. The study is being conducted with the International Institute for Environment and Development (IIED) for the Food and Agriculture Organization of the United Nations (FAO).

• Climate change adaptation in drylands

Review on the implications of climate change for agrarian societies in drylands, covering conceptual frameworks, coping and adaptation strategies and public policy recommendations, in collaboration with IIED for the World Bank. Extensive work conducted on pastoralist livelihoods, drought mitigation, drought management and long-term policy, for DFID, the World Bank and major non-governmental organizations.

• Climate change and plant diseases

Study of the potential impacts of climate change on plant diseases in the UK and sub-Saharan Africa (UK Government Foresight Project), to inform the future scientific research agenda as well as public policy. The findings have been utilized by the cross-governmental research consortium exploring the effects of climate change on the spread of agricultural pathogens.

• Gender and climate change

Study of the potential gender implications of climate change in developing countries, focusing on: gender and agriculture, the gendered impacts of natural hazards and highlighting the need to mainstream gender in climate change adaptation. The study was DFID-funded and published in the Oxfam Journal *Gender and Development*.

• Sustainable use of biomass resources for energy

Research on the potential for expanding the use of wood and agricultural waste in energy production in South East Asia. This led to the development of a Biomass Energy toolbox which provides guidance on the policies and socio-economic and technical issues facing the development of the sector. Available online at: www.nri.org/biomass/homepage.htm.