Climate risk management in Africa: Learning from practice
The Climate and Society series is devoted to providing authoritative and accessible information on climate risk management research, practice, and policy in support of sustainable development.

The series is a program of the International Research Institute for Climate and Society (IRI). IRI aims to contribute to sustainable living and poverty reduction, through the integration of climate information into management strategies for climate-sensitive sectors such as agriculture, food security, water resources, and health. IRI is a member of The Earth Institute at Columbia University, New York.

The Climate and Society editorial team is always looking for new ideas for future issues in the series. Please contact us with any ideas or for further information:
Molly E. Hellmuth
Director, Climate and Society Publication Secretariat
The International Research Institute for Climate and Society (IRI)
The Earth Institute at Columbia University, Lamont Campus
61 Route 9W, Monell Building, Palisades, NY 10964-8000, USA
E-mail: hellmuth@iri.columbia.edu
Phone: +1 845-680-4463
Fax: +1 845-680-4866
http://iri.columbia.edu

This report was funded by the UK Department for International Development (DFID) and the US National Oceanic and Atmospheric Administration (NOAA), which provided its support under cooperative agreement NA050AR4311004.

DFID is leading the British government’s fight against world poverty. One in five people in the world today, over 1 billion people, live on less than US$1 a day. In an increasingly interdependent world, many problems – including conflict, crime, pollution, and diseases such as HIV and AIDS – are caused or aggravated by poverty. DFID supports long-term programs to help eliminate the underlying causes of poverty. DFID also responds to emergencies, both natural and man-made.

DFID, 1 Palace Street, London SW1E 5HE, UK; Tel: +44 (0)20-7023-0000; Fax: +44 (0)20-7023-0016; E-mail: enquiry@dfid.gov.uk; Website: www.dfid.gov.uk

NOAA is an agency within the US Department of Commerce whose mission is to understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet national economic, social and environmental needs. The agency is a leader in applied scientific research in climate, weather and water, ecosystems, and commerce and transportation, and provides environmental stewardship services and information products to assist society to understand the role of the oceans, coasts and atmosphere in the global ecosystem to make the best social and economic decisions.

NOAA Climate Program Office, 110 Wayne Av., Suite 1200, Silver Springs, MD 20874, USA; Tel: +1 301-427-2089; Website: www.noaa.gov

Disclaimer
Final responsibility for the views expressed in this report lies with the editorial team, which has distilled them from the material provided by the report’s many contributors. The views are not necessarily those of DFID or NOAA.
Front cover photo credits:
top section: D. Berehulak/Getty Images, bottom section: D. Telemans/Panos Pictures

Editing, design and layout: Green Ink, UK (www.greenink.co.uk)

Printing: Pragati Offset Pvt. Ltd, India (www.pragati.com)
Climate risk management in Africa: Learning from practice
Edited by
Molly E. Hellmuth, Anne Moorhead, Madeleine C. Thomson, and Jim Williams

Lead authors
Introduction: Molly E. Hellmuth, Anne Moorhead, and Jim Williams
Flood management in Mozambique: Filipe Lucio, Americo Muianga, and Mike Muller
Food security in Ethiopia: Teshome Erkineh
Malaria control in southern Africa: Stephen J. Connor, Joaquim Da Silva, and Samson Katikiti
Agriculture in Mali: Daouda Diarra and Pauline Dibi Kangah
Drought insurance in Malawi: Daniel Osgood and Duncan Warren
Lessons learned and next steps: Molly E. Hellmuth, Anne Moorhead, Madeleine C. Thomson, and Jim Williams

Contributing authors

Review team
Mac Callaway, Jenny Frankel-Reed, Graeme Hammer, Sarah Macfarlane, Laban Ogallo, Roland Schulze, and Philip Thornton

Copyright © International Research Institute for Climate and Society

First published 2007
All rights reserved. The publisher encourages fair use of this material provided proper citation is made. No reproduction, copy, or transmission of this report may be made without written permission of the publisher.

ISBN 978-0-9729252-3-5

Correct citation
The impact of climate change will fall disproportionately on the world’s poorest countries, many of them here in Africa. Poor people already live on the front lines of pollution, disaster, and the degradation of resources and land. For them, adaptation is a matter of sheer survival.

UN Secretary General Kofi Annan, addressing the 12th Conference of the Parties to the United Nations Framework Convention on Climate Change, 15 November 2006, Nairobi, Kenya.
Acknowledgments

Many people contributed to the preparation of this report. The core team, contributors, and reviewers are listed above. Editorial services were provided by Simon Chater and Anne Moorhead and design services by Christel Blank and Paul Philpot, all of Green Ink Ltd, UK. Additional design and editing services were provided by Rise Fullon and Francesco Fiondella, both of IRI.

The team would like to acknowledge the input of many stakeholders from national governments, universities, research institutes, development partners, the private sector, civil society, and non-government organizations, who were present at the workshop, Climate Information for Development Needs: An Action Plan for Africa, convened by the Global Climate Observing System (GCOS) and hosted by the United Nations Economic Commission for Africa (UNECA) at its headquarters in Addis Ababa in April 2006. These stakeholders voiced the demand for this report and participated actively in consultations on its various drafts. (The workshop report can be accessed at www.wmo.ch/web/gcos/gcoshome.html.)

Additional feedback from stakeholders was provided at the recent side-session, Climate for Development in Africa: Learning from Practice, sponsored by IRI, GCOS, UNECA, the African Development Bank, and the African Union at the 12th Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Nairobi in November 2006. At this side-session, the case studies were presented and an advanced draft of the report was made available for comment.

The team gratefully acknowledges the financial support of the UK Department for International Development (DFID) and the US National Oceanic and Atmospheric Administration (NOAA) in the preparation of this report.
As one of the most vulnerable regions in the world to the projected impacts of climate change, Africa faces many challenges at this critical juncture. Traditionally, national development plans, poverty reduction strategy papers, and sectoral strategies in climate-sensitive sectors have paid little, if any, attention to climate variability, and even less to climate change. Our ability to turn a threat into an opportunity hinges on actions taken today.

Africans have already begun to take some steps in their region. For example, the African Union Commission (AUC)-supported Environment Initiative of the New Partnership for Africa’s Development (NEPAD), and its related Action Plan, acknowledge the economic importance of climate variability and change by including a program area on combating climate change in Africa. In addition, the AUC-supported NEPAD Africa Regional Strategy for Disaster Risk Reduction recognizes the importance of coordination across agencies for proactive disaster prevention and response strategies.

The AUC, in partnership with the UN Economic Commission for Africa and African Development Bank, is supporting a major new initiative, ‘GCOS-Africa Climate for Development’, beginning in 2007. The program, part of the Global Climate Observing System, is designed to integrate climate information and services into development in support of Africa’s progress towards the Millennium Development Goals. A major objective is to mainstream climate information in national development programs, focusing initially on the most climate-sensitive sectors.

This inaugural report in the Climate and Society series is a key resource for climate-informed planning and practice in Africa – as it critically examines five experiences of ongoing climate risk management in the disaster risk reduction, health, agriculture, and food security sectors. The report provides a valuable opportunity to reflect on the positive lessons that can drawn from these experiences, as well as on the key knowledge, information, and capacity gaps we face in managing climate risk in Africa today.

Ahmadu Babagana
Director
Department of Rural Economy and Agriculture
African Union
Foreword
from the African Centre of Meteorological Applications for Development

It is a recognized fact that Africa, because of widespread poverty and consequential limited adaptation and coping capabilities, is one of the most vulnerable regions of the world to the current impacts of climate variability and the projected impacts of climate change. It is also a known fact that most of Africa’s disasters are caused at least in part by adverse weather. These disasters pose a serious threat to poverty reduction and sustainable development on the continent.

In 2004, the Heads of State and Government of the African Union reaffirmed their commitment to establishing and strengthening centres of excellence and networks dedicated to agricultural and environmental issues, and to establishing and enhancing regional early warning systems to combat natural disasters.

In 2005, the Gleneagles Plan of Action committed the G8 countries to support Africa’s efforts to establish or upgrade its climate observing systems, to fill meteorological data gaps, to expand its capacity for analyzing and interpreting such data, to develop decision support systems and tools for local, regional, and continental needs, and to strengthen the region’s existing climate institutions.

At the African Centre of Meteorological Application for Development (ACMAD), we recognize in our own mission statement that all these efforts must be made, with the goal of supporting sustainable development in line with national, regional, and continental strategies for poverty eradication, in the fields of agriculture, water resources, health, public safety, and renewable energy.

The innovative case studies presented here demonstrate that, used successfully, climate information can not only improve livelihoods and economies but even save lives. Together we can learn from these innovative practices, and in so doing help to create a better Africa.

Abdoulaye Kignaman-Soro
Director General
African Centre of Meteorological Applications for Development
# Contents

## Introduction

- Climate and development ................................................................. 1
- Climate variability and climate change ........................................... 4
- Climate information and climate science ....................................... 4
- Incorporating climate information into African development .......... 8
- Climate risk management ................................................................. 10

## The case studies

- Flood management in Mozambique ............................................... 15
- Food security in Ethiopia ................................................................. 31
- Malaria control in southern Africa ............................................... 45
- Agriculture in Mali ........................................................................... 59
- Drought insurance in Malawi ......................................................... 75

## Lessons learned and next steps

- The role of climate risk management in Africa ............................... 89
- Lessons from the case studies ......................................................... 89
- Recommendations ........................................................................... 95

## References

................................................................. 99

## Acronyms

................................................................. 103