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Running dry?

Climate change in drylands and
how to cope with it

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Foreword

Dear reader,

The risks associated with climate change have been a topic of discussion since the Earth Summit in Rio de Janeiro in 1992. However, for the following 15 years, the climate and land community have largely ignored one another. Moreover, the issue of land degradation was not included in the Kyoto Protocol or other climate change negotiation fora.

However, the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), 2007, has brought about a rebound in mutual understanding. We have learned that climate change and land degradation are not only twin threats to sustainability of life on earth, but that they exacerbate one another.

Today, we know that the world's soils hold more carbon than the atmosphere and vegetation combined. Additionally, we know that land degradation is essentially symptomatic of soil carbon loss. Already, croplands, pastures, and forests in drylands are exposed to threats from climatic variability. Furthermore, we know that drylands account for the most vulnerable ecosystems to climate change. In the long run, climate change impacts, such as changes in temperature, shifts in growing seasons, storms, floods, droughts, and changed rainfall patterns, risk the livelihood of drylands populations. Therefore, adaptation to the adverse effects of climate change through sustainable land management is a crucial, though simultaneously challenging, task.

In order to make climate change endeavors more effective, we need a thorough understanding of how global and regional change are inter-related. We also need a more detailed account of the effects of climate change in drylands that are already underway. Finally, we need meaningful information on how sustainable land management in developing countries can contribute to the mitigation of climate change.

This publication provides a thorough overview and analysis of scientific results regarding climate change in drylands. This includes information on the inter-linkage between climate change and land degradation and the potential mitigation and adaptation measures. We hope the publication helps these crucial issues gain their rightful place within climate-change discussions.



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Introduction

Drylands cover more than one third of the world's terrestrial area. Land degradation in these regions is a driver of climate change. Conversely, dryland ecosystems and populations are among those most affected by the adverse effects of such change.

Recent international climate policy debate and negotiation processes have put the spotlight on the interplay between land use, climate change mitigation and adaptation. This has raised the profile of drylands. New analyses and research produced in preparation for the 2nd National Communications to the United Nations Framework Convention on Climate Change are giving an ever clearer picture of the country-level impacts of climate change. As yet, however, no comprehensive presentation of the linkages between land degradation in drylands and climate change – and of the solutions in the realm of sustainable land management – has been available.

This book is the first to give a full overview of the state of affairs and science in this complex issue area. The analyses are supplemented by case studies of experience gathered in German development cooperation. The publication does not, however, lay claim to being a blueprint for future policy.

It is organised in six thematic chapters. Chapter 2 sets out the contribution drylands make to climate change. In Chapter 3, the perspective is switched, with an overview of recent and projected climatic changes in dryland regions, followed up by a discussion in Chapter 4 of the impacts of global climate change in such regions. The next two chapters highlight a range of approaches towards tackling the challenges that ensue, in terms of mitigating climate change through sustainable land management and adapting to climate change impacts in drylands. Finally, Chapter 7 explores linkages between mitigation and adaptation.

This book will provide a compendium for all scientists, development practitioners and policymakers with an interest in the major global environmental challenges: desertification and land degradation, biodiversity loss and climate change.