

Preface

This book reviews the linkages between climate change and agriculture in developing countries, including livestock farming and forestry, on the basis of work of the French Agricultural Research Centre for International Development (CIRAD) and the French Development Agency (AFD) and partners. We wish to show that we as researchers—and our partner farmers—have to modify many of our habits in response to climate change. The authors broaden the horizons for future scientific research while referring to the latest research on the issue. Our goal is also to help orient research towards addressing future knowledge production challenges. Notwithstanding this goal, the book targets researchers working on issues other than those addressed in different chapters, science and development officers in various agricultural and forestry sectors in developing countries, and also students and the informed public. Our hope is that the scientific content presented in this book will be readily understandable for all interested readers.

The analyses are focused on the climate change context, as outlined in documents of the IPCC¹ Fifth Assessment Report, which was published (in parts) between September 2013 and October 2014. IPCC was created to provide the world with a clear scientific view on the current state of knowledge on climate change and its potential environmental and socio-economic impacts on the basis of the latest scientific, technical and socio-economic literature. The published reports are focused on the physical science basis of climate change (Working Group I), impacts, adaptation and vulnerability (Working Group II) and mitigation of climate change (Working Group III).

The main concepts frequently mentioned in this book are defined below (from IPCC):

- Climate change: a change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer;

¹Intergovernmental Panel on Climate Change, <http://www.ipcc.ch/>.

- Risk: the potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values;
- Adaptation: the process of adjustment to actual or expected climate and its effects;
- Mitigation: a human intervention to reduce the sources or enhance the sinks of greenhouse gases;
- Resilience: the capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation.

The major climate change trends are covered in Chap. 1. The book is then structured in four main parts that link the common thread of issues explored. First, examples of responses to climate stress are presented, followed, in the second part, by examples of practices modified by climate change. The third part covers approaches for stimulating necessary change, while the book concludes in the last part with a critical review of the main current debates and their research implications. The broad scope of adaptation to climate change is thus covered mainly in the first part devoted to coping with stress. After outlining the risk concept, the stresses studied are successively heat, salinity, drought, pests and diseases. An analysis of cropping systems shows that yet unknown combinations of different stresses sometimes have to be taken into account. In the second part, which addresses the pursuit of novel practices and innovations, adaptation and mitigation share the stage—sometimes even in the same practice, such as agroforestry. This includes both experiments and farmers' innovations. In the third part, we seek ways to promote necessary changes. This includes services to provide, or tools required to induce, support and remunerate changes in practices, while also concerning public policies and regulations, including those related to agricultural product demand.

The themes selected are the subject of work carried out by CIRAD and AFD teams. They were selected for being crucial with regard to the climate change issue and when recent and original analyses were available. Some questions that do not meet these three criteria are not addressed in the book, for instance, bioenergy, forest climate policy or economic instruments for the mitigation of emissions. We focused on examples of technical options, along with political and economic instruments enabling trade-offs leading to these options or that could encourage consumers and farmers to make the proper choices.

The contributions presented in this book are undoubtedly just a mere drop in the ocean of issues at hand and for which farmers in developing countries will have to cope. We nevertheless hope they will provide fuel for these debates.



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