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Climate Variability and Change in Africa

Perspectives, Experiences
and Sustainability

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Foreword

I am pleased to write the foreword to this book, which covers the full breadth and width of the issue of addressing climate change and variability in Africa.

The authors have endeavoured to address the state-of-art in the modelling and understanding of climate change dynamics, which requires modelling and developing several tools to aid in the what-if-analysis of climate change, its impact, and the vulnerability and evaluation of adaptation measures/options. It is crucial that science is applied when addressing the challenges of creating a communication platform to advise policy makers in the area of climate change adaptation and institutional building.

I feel strongly that the book recognises the experience of project conceptualisation, planning and implementation. It includes a discussion of climate sensitivities and climate change mitigation measures alongside adaptation options using scientific and engineering knowledge infused with indigenous knowledge systems, which is both crucial and challenging.

This book was therefore conceived following consideration of the various challenges facing Africa in terms of the effects of climate change and variability, covering the following specific areas:

- Modelling and predicting climate change impacts
- Climate variability and predictability
- Understanding and predicting climate
- Regional downscaling and forecasting: uncertainty and verification
- Africa in a changing climate
- Adaptation strategies in the agricultural sector
- Adaptation strategies in the water sector

These issues were pooled to form the four major themes of the book:

- I. Climate variability and change
- II. Hydrology and water resources issues
- III. Agricultural issues
- IV. Policy and social issues

The focus areas of the book's 15 chapters in terms of the aforementioned topic areas are summarised in the table below.

In Part I of the book covering issues regarding climate variability and change, cases of climate change and its impact are presented in the following chapters:

1. Overview of Climate Variability and Change in Africa: Perspectives and Experiences
2. Change, Variability and Trend Analysis of Hydro-Climatic Time Series.
3. An Overview of Dynamical Downscaling of Global Reanalyses for Improved Climate Reconstruction Over Data-Sparse Regions
4. Evaluation of CMIP5 Climate Models for Precipitation Projections Over the Upper Blue Nile Basin

In Part II, covering hydrology and water resources issues, includes the following chapters:

5. Assessing Runoff Changes in Major Catchments in Swaziland Due to Climate Change
6. Impacts of Possible Climate Change and Variability on the Water Resources of Southern African: A Regional Modelling Approach
7. Framework of Best Practice for Climate Change Adaptation in Africa: The Water–Development Nexus
8. Groundwater Occurrence, Recharge and Productivity in Tertiary Volcanic Rocks of Ethiopia and Climate Change Implications
9. Relationships Among Surface Water Resources in the WR90, WR2005 and WR2012 Datasets of South Africa Using Mean Annual Runoff of Quaternary Catchments

Part III, focusing on agricultural issues, consists of the following chapters:

10. Integrated Assessment of Climate Change Impacts and Adaptation in Agriculture: The Case Study of the Wami River Sub-basin, Tanzania
11. Strengthening Horticultural Innovation Systems for Adaptation to Effects of Urbanisation and Climate Variability in Peri-Urban Areas
12. Evaluation of Different Tillage Systems for Improved Agricultural Production in Drought-Prone Areas of Malawi

Part IV, referring to social and political issues, involves the following chapters:

Chapter	Parts of Climate Change and Variability								Adaptation Strategies in the water sector
	Modelling and Predicting Climate Change Impacts	Climate Variability and Predictability	Understanding and Predicting Climate	Regional Downscaling and Forecasting: Uncertainty and Verification	Africa in a Changing Climate	Adaptation Strategies in the Agricultural Sector			
PART I									
Chapter 1	H	M	M	M	H	H	H	H	H
Chapter 4	M	H	H	H	M	M	L	L	L
Chapter 10	M	L	L	M	H	H	H	L	L
Chapter 11	M	L	L	M	H	H	H	L	L
PART II									
Chapter 3	M	L	L	M	M	M	L	L	H
Chapter 6	M	H	H	H	M	M	L	L	H
Chapter 7	H	H	H	H	M	M	L	L	L
Chapter 12	M	L	L	M	M	M	H	L	L
Chapter 13	M	H	H	H	M	M	L	L	L
PART III									
Chapter 2	M	L	L	M	H	H	H	L	L
Chapter 9	M	L	L	M	H	H	H	L	L
Chapter 8	M	H	H	H	M	M	L	L	H
PART IV									
Chapter 13	M	L	L	M	M	M	L	L	L
Chapter 14	M	L	L	L	M	M	M	M	H
Chapter 15	M	L	H	L	L	M	H	H	H

Note: H = High, M = Medium, L = Low

13. Africa in a Changing Climate: Redefining Africa's Agrarian Development Policies
14. Climate Change Adaptation Research and Policy for Agriculture in Southern Africa (CCARPASA)—Evidence from Rainfed Systems
15. Integrating Climate Change Adaptation and Mitigation into Sustainable Development Planning: The Policy Dimension

I have also noted that the book chapters and nexuses of climate change and variability are well correlated to illustrate the theory and practices of climate change and adaptation relevant to African conditions based on experiences of the authors who are domiciles in different parts of Africa.

This brings me to a concluding remark. In future, no single country will be able to address climate change alone and manage to develop adaptation and resilience in isolation. Climate change and adaptation systems do not follow political boundaries and a vast international pool of knowledge, technology and innovations will be required to achieve sustainable development and to realise the Sustainable Development Goals set forth by most countries in Africa—and the developing world in general.

I therefore welcome the book as a contribution to the ICSU Regional Office for Africa and its global environmental change program for ICSU being the initiator of this book, as well as an essential mobiliser of scientific research in the areas of climate change and variability, including adaptation issues in Africa.

Let me say finally: enjoy reading this book and contribute to the understanding of the impact of climate change on Africa's future.

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