Contents

Preface: Rainwater-Smart Agriculture in Arid and Semi-arid Areas . . . 1
Walter Leal Filho and Josep de Trincheria Gomez

Part I  General Approaches and Methods

Using Rainwater for Off-Season Small-Scale Irrigation in Arid and Semi-arid Areas of Sub-Saharan Africa: Key Working Principles and Best Practices ............................................. 9
Josep de Trincheria Gomez, Desalegn Dawit, Sebastiao Famba, Walter Leal Filho, Maimbo Malesu, Paula Viola Mussera, Stephen Ngigi, Celma Niquice, Rumbidzai Nyawasha, Alex Oduor, Nicholas Oguge, Francis Oremo, Belay Simane and Menas Wuta

Fostering Food Security and Climate Resilience Through Integrated Landscape Restoration Practices and Rainwater Harvesting/Management in Arid and Semi-arid Areas of Ethiopia ................. 37
Kifle Woldearegay, Lulseged Tamene, Kindu Mekonnen, Fred Kizito and Deborah Bossio

Towards Optimizing the Performance and Cost-Effectiveness of Farm Pond Technology for Small-Scale Irrigation in Semi-arid Farming Systems ........................................ 59
Stephen N. Ngigi

The Promise of Flood-Based Farming Systems in Arid and Semi-arid Areas ........................................ 77
Matthijs Kool, Frank van Steenbergen, Abraham Mehari Haile, Yasir Mohamed Abbas and Eysu Hagos
Adaptations in Water Harvesting Technologies for Enhancing Food Security and Livelihood: A Multi-country Study in Sub-Saharan Africa................................. 95
D. Snelder, F. Kahimba, O. Korodjouma, A. Abebe, E. Oughton, L. Bunc Clark and R. Lasage

Roads: Instruments for Rainwater Harvesting, Food Security and Climate Resilience in Arid and Semi-arid Areas ................. 121
Frank van Steenbergen, Kiﬂe Woldearegay, Marta Agujetas Perez, Kebede Manjur and Mohammed Abdullah Al-Abyadh

Part II Case Studies and Field Experiences

Fostering the Use of Rainwater for Off-Season Small-Scale Irrigation in Arid and Semi-arid Areas of Ethiopia ................ 147
Belay Simane, Taffa Tulu, Amare Lantideru and Desalegn Dawit

Fostering the Use of Rainwater for Off-Season Small-Scale Irrigation in Arid and Semi-arid Areas of Kenya ................. 159
Nicholas Oguge and Francis Oremo

Rainwater Harvesting Options to Support Off-Season Small-Scale Irrigation in Arid and Semi-arid Areas of Zimbabwe ............ 175
Menas Wuta, George Nyamadzawo, Blessing Nyamasoka, Rumbidzai Nyawasha, Grace Matayaya, Raymond Nazare, Simon Madyiwa and Jonathan Tsoka

Improving the Efficiency of Runoff Pond System for Supplementary Irrigation in Arid and Semi-arid Areas of Kenya ............. 199
Alex Raymonds Oduor and Maimbo Malesu Mabanga

Low-Tech Irrigation Strategies for Smallholder Vegetable Farmers in Kenya .................................................. 215
Silke Stöber, Caroline Moraza, Lucas Zahl and Esther Kagai

Rainwater Harvesting Irrigation—A Strategic Measure for Integrated Rural Development in the Dry Mountainous Areas of Gansu Province, China ......................... 235
Qiang Zhu and John Gould

Benefits and Challenges of Dugout Rainwater Harvesting Ponds in Tigray Region, Ethiopia .................................. 259
Gebremedhin Berhane

Innovative Rainwater Harvesting Technologies for Pastoralists in Arid and Semi-arid Areas: A Case Study in Oromiya Region, Ethiopia .................................. 281
Alemayehu Haddis
The ‘Majaluba’ Rice Production System: A Rainwater Harvesting ‘Bright Spot’ in Tanzania ........................................... 303
John Gowing, Lisa Bunclark, Henry Mahoo and Frederick Kahimba

Fostering the Adoption of In Situ Rainwater Harvesting for Food Security in Rwenzori Region, Uganda ..................... 323
James W. Kisekka, Nasser Kinaalwa, Evelyne Busingye and Maarten Onneweer

Management of Rainwater Resources for Rehabilitation of Degraded Lands in Arid and Semi-arid Region of Southern Pakistan .......... 343
Sahibzada Irfanullah Khan

Rainwater Management to Restore Ecosystems and Foster Food Production: A Case Study in the Semi-arid Region of Minas Gerais in Brazil ........................................... 359
Norma Angélica Hernández-Bernal

Lessons Learned in the Replication and Scaling-up of Rainwater Harvesting Technologies in Arid and Semi-arid Areas: A Case Study of Kilifi County, Kenya ........................................... 379
Charles Kipkorir Songok, Paul Kimeu, James Kamunge, Raphael Ngumbi, Lotome Chammah, Christine Adiema and Christine Omondi
Rainwater-Smart Agriculture in Arid and Semi-Arid Areas
Fostering the Use of Rainwater for Food Security,
Poverty Alleviation, Landscape Restoration and Climate
Resilience
Leal Filho, W.; de Trincheria Gomez, J. (Eds.)
2018, VII, 392 p. 168 illus., 158 illus. in color.,
Hardcover
ISBN: 978-3-319-66238-1