

# Preface

Food and nutritional insecurity have been major issues in sub-Saharan Africa (SSA) since the 1970s. One in four inhabitants of SSA (240 million) is vulnerable to food insecurity, and 79 million of them are also undernourished. The proportion of undernourishment has decreased from 33 % in 1990–1992 to 23 % in 2014–2016. While crop yields and agricultural production have marked an upward trend in some countries, major challenges lie ahead. Population of 800 million in 2000 and 962.3 million in 2015 is projected to be 1.1 billion by 2020, 1.8 by 2050, and 2.3 billion by 2100 and stabilized at ~2.1 billion in 2150. Hot spots of hunger and malnutrition of SSA are Sahel, from Senegal to Chad, and the Horn of Africa. Food and nutritional insecurity are aggravated by civil strife, political instability, soil degradation, and harsh and uncertain climate. The GDP of SSA at the current market prices is \$1729 trillion, and GNI is \$1638 trillion by the Atlas method. The life expectancy at birth is 58 years, and the primary education completion rate (for both sexes) is 69 %. In 2014, 37 % of the population lived in urban centers, and per capita CO<sub>2</sub> emission is 0.8 Mg per year compared with the world average of 4 Mg CO<sub>2</sub> per year.

Despite numerous debates about sustainability, there is a strong need of critically re-examining the basic concept and taking a multi-dimensional approach with specific attention to environmental, economic, soil, and institutional sustainability. The involvement of private sector, providing a credit system and market-driven programs, is critical to the success. In addition to sustainability, there is also a strong need to consider other concepts, such as resilience and stewardship.

There is a strong link between hunger, poverty, and substance agriculture. The poverty rate (population living on less than \$1.25 per day) has decreased from 57 % in 1990 to 41 % in 2015, but the challenge remains to be effectively addressed through improvements in agriculture. While the proportion has decreased, the number of poor, hungry, and malnourished population has increased in absolute terms between 1990 and 2016. For example, the number of undernourished people has increased by 44 million since 1990.

Environmental sustainability is intricately linked with agricultural sustainability through deforestation, soil degradation, water contamination and eutrophication,

decline in biodiversity, and the increase in emission of greenhouse gases, soot, dust, and other air pollutants. The problem of water scarcity may be exacerbated with the projected climate change and the related uncertainty. Clean potable water is neither available nor easily accessible to a large segment of both rural and urban population. Women, young girls, and boys have to walk long distances or join long queues waiting for the community water taps to open. Providing improved sanitation facilities to rural and slum dweller urban population is a high priority.

Economy of SSA grew at an impressive rate of 4.5 % during 2015. However, agricultural productivity has stagnated in several regions closely linked to low agricultural productivity, and land and environmental degradation pose strong risks to political instability and domestic insecurity. Thus, improving agricultural productivity as an engine of economic development remains to be a high priority. Growth in agricultural sector, through judicious management of soil and water resources, is also important to achieve the Sustainable Development Goals (SDGs) of the United Nations.

That said, it is important to note that several regions of SSA have registered impressively positive trends in economic growth, agricultural production, poverty alleviation, primary education, and availability/access to basic amenities of life. The momentum generated thus far must be sustained in all relevant sectors including the environment, economic, institutional, and social and political arenas. Yet, sustaining the momentum will become more difficult in the future as population grows, climate warms, water resources dwindle and pollute, soils erode and become salinized, pests and pathogens become more pervasive, and weather patterns change and become uncertain. Sustainability will become a bigger challenge than ever before.

Thus, an international conference was organized at the Sokoine University of Agriculture, Morogoro, Tanzania, from June 1, 2015, to June 6, 2015. Major objectives of the conference were to deliberate the importance of sustainability in the context of environmental, economic, institutional, political, and soil issues to advancing SDGs, improving nature conservancy, and restoring land and water resources.

This 35-chapter volume represents core of several oral and poster presentations made at the conference. In addition to the Introduction and Conclusion chapters, the book is divided into 8 sections, namely (1) Environmental Sustainability, (2) Economic Sustainability, (3) Institutional Sustainability, (4) Social and Political Sustainability, (5) Technological Innovations, (6) Landscape Restoration and Management, (7) Integration with the Private Sector, and (8) Challenges to Implementations of SDGs of the U.N.

The conference was attended by more than 100 participants from SSA countries as well as the USA, Norway, and Italy. It was organized by a Steering Committee with representatives from SUA, the Ohio State University, and the Norwegian University of Animal and Life Sciences, and Food and Agriculture Organization (FAO) of the U.N. The conference was funded by NORAD, USAID, and SUA. Primary funding for the conference was channeled through several programs at SUA, namely the USAID-funded International Agricultural Research Initiative

(iAGRI), the Climate Change Impacts, Adaptation and Mitigation (CCIAM) project, and the Enhancing Pro-poor Innovations in Natural Resources and Agricultural Value-Chains (EPINAV) project. In addition, the conference benefitted from contributions from Africa Rising, the International Food Policy Research Institute (IFPRI), the World Agroforestry Center (ICRAF), and the Carbon Management and Sequestration Center (C-MASC).

The editors thank all authors for their outstanding contributions to this volume. Thanks are also due to staff at Springer for their timely efforts in publishing this volume. Our special thanks are due to Laura Alexander (iAGRI), Laura Hughes (C-MASC), Anthony Sangeda (iAGRI), and Ambonisye (iAGRI).

Columbus, OH, USA

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March 2016

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Climate Change and Multi-Dimensional Sustainability in  
African Agriculture

Climate Change and Sustainability in Agriculture

Lal, R.; Kraybill, D.; Hansen, D.O.; Singh, B.R.; Mosogoya,  
T.; Eik, L.O. (Eds.)

2016, XXIV, 717 p. 165 illus., 144 illus. in color.,

Hardcover

ISBN: 978-3-319-41236-8