

## Book Reviews: Climate Change and Agriculture in sub-Saharan Africa

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**Abdulai Jalloh, Gerald C. Nelson, Timothy S. Thomas, Robert Zougmore and Harold Roy-Macauley: West African Agriculture and Climate Change—A Comprehensive Analysis**

International Food Policy Research Institute, Washington, DC, USA, 2013, xxxiii + 408 pp. ISBN 978-0-89629-204-8 (Paperback)

**Sepo Hachigonta, Gerald C. Nelson, Timothy S. Thomas and Lindiwe Majele Sibanda: Southern African Agriculture and Climate Change—A Comprehensive Analysis**

International Food Policy Research Institute, Washington, DC, USA, 2013, xxx + 337 pp. ISBN 978-0-89629-208-6 (Paperback)

Both books are available as free downloads from the International Food Policy Research Institute (IFPRI) website at: <http://www.ifpri.org/publication/west-african-agriculture-and-climate-change>.

These volumes are primarily concerned with the potential impact of climate change on agriculture in West<sup>1</sup> and Southern<sup>2</sup> Africa, respectively, and how this may be minimized through careful planning based on accurate foresight analysis. A third volume, dealing with East Africa<sup>3</sup>, is due to be

<sup>1</sup> Benin, Burkina Faso, Côte d'Ivoire, Ghana, Guinea, Liberia, Niger, Nigeria, Senegal, Sierra Leone and Togo.

<sup>2</sup> Botswana, Lesotho, Malawi, Mozambique, South Africa, Swaziland, Zambia and Zimbabwe.

<sup>3</sup> Burundi, Democratic Republic of Congo, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, Sudan (analyses of the data were completed before South Sudan separated from Sudan), Tanzania and Uganda.

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Climate change, it may be argued, is the most significant threat to agriculture and, therefore, food security, worldwide. Drought, one of the most important consequences of climate change, already places severe constraints on agricultural productivity throughout Sub-Saharan Africa and in some countries of the region the effects have already reached crisis point, notably in the Horn of Africa, to be dealt with in the third volume. The greenhouse effect, it is predicted, will raise temperatures yet further and this, together with other factors, will lead to longer and even more severe periods of drought, imposing ever-increasing pressures on the already scarce supplies of that most precious of all commodities in the region, fresh water (see Grayson, 2013 for an excellent recent analysis of the global situation).

Sub-Saharan Africa as a whole is climatologically extremely diverse, however, and although drought is the most significant issue for many of its constituent nations, other predicted consequences of climate change are likely to be of overwhelming importance to the agricultural productivity of others, especially the likelihood of more extreme weather events in general, higher temperatures and increased variation in precipitation patterns in both wet and dry areas. All these, like drought, impact most severely on the poorest members of any society; in other words, those least able and least well equipped to adapt to them rapidly and effectively. The two books reviewed here, together with the as yet unpublished third volume, must therefore be seen as being of the very greatest relevance to all concerned with *both* food security and the alleviation of poverty south of the Sahara.

Given the current debates surrounding climate change issues, it is important to establish first the credentials of The International Food Policy Research Institute (IFPRI), the organization responsible for the volumes. The institute is a member of the CGIAR (formerly Consultative Group on International Agricultural Research) Consortium. It was established in 1975 to 'identify and analyze alternative national and international

strategies and policies for meeting the food needs of the developing world on a sustainable basis, with particular emphasis on low-income countries and on the poorer groups in those countries'. Although the research effort of IFPRI is focused on making a contribution to the reduction of hunger and malnutrition, the underlying analyses are wide ranging and extend far beyond the food sector. IFPRI's research programmes involve worldwide collaborations with governments and public and private institutions with a commitment to 'increasing food production and improving the equity of its distribution'.

The results of these research programmes are widely disseminated through a diversity of channels, including the publication of books and research monographs. To ensure the highest possible standards, all manuscripts are reviewed, before being released for publication, both internally, by the Institute's Publications Review Committee, and more importantly, externally, by appropriately qualified external peer reviewers. Such a rigorous process gives confidence in the objectivity and the validity of IFPRI's research programmes and the conclusions drawn from them.

Three years ago, IFPRI published *Food Security, Farming, and Climate Change to 2050: Scenarios, Results, Policy Options*, a research monograph by Gerald Nelson and a team of IFPRI researchers who together assessed quantitatively the challenges that climate change might bring to global sustainable food security (Nelson et al. 2010). Now, Nelson and three further groups of agriculturists and climate change researchers have built on this earlier, but necessarily wide-ranging volume, the three volumes discussed here that have Sub-Saharan Africa as their focus. The authors do not discuss in detail the scientific evidence for climate change nor, indeed, the strategies that may be required for its mitigation. Rather, they concentrate on the potential consequences of the predicted changes in climate in the region over the next 50 years on agriculture and, therefore, sustainable food security for Sub-Saharan Africa and the practical strategies that may be required to minimize their impact.

Agriculture is the principal source of employment for the c.290 million people living in the eleven countries that comprise West Africa and, it is suggested, accounts for thirty five percent of the region's gross domestic product. Southern Africa comprises ten countries and, in all, agriculture is the primary source of employment and therefore income for most of the rural populations of the region.

Climate change, the authors and editors argue cogently, is the major potential threat to this vital economic activity. This assertion is supported by detailed economic, agronomic, demographic and climatological analyses covering the period to 2050, all illustrated with a very large number of well researched tables, scenario maps, predictive models and figures. Together these constitute a unique source of accurate, up-to-date climate change information. A most valuable section in each of the books is devoted to detailed descriptions

and analyses of the methodology used in gathering the data and constructing the models, thereby allowing the reader to come to an informed conclusion about the likely reliability and accuracy of the scenarios predicted and the recommendations based on them.

Data concerning climate change and its consequences is continually being updated as new information becomes available from the many international research programmes and it would be desirable to continually update the electronic versions of the volumes available from the IFPRI website. A spokesperson for IFPRI has informed me, however, that the studies reported on are now complete and therefore cannot be updated on-line. However, the different data sets from the various providers, such as the World Bank's world Development Indicators, FAOSAT data and IFPRI's crop and IMPACT models (<http://www.ifpri.org/climatechange/casemaps.html>), are all updated by their source agencies from time to time and at least these updates should be available to the research community.

Having dealt with the potential consequences of climate change, the authors next deal with the foresight planning required to face up to them and minimize their impact. The West Africa book thus concludes with a series of clear recommendations for consideration by the regional economic body ECOWAS (Economic Community of West African States) and other national and international governments, research bodies and aid organizations concerning support for and co-ordination of: weather monitoring and data collection; targeted, collaborative research on climate change related to agriculture; the development of enhanced, integrated irrigation schemes; the conservation of natural resources; economic integration, particularly the need for the adoption of a common currency; and improvement of the international road network to encourage trade within the region. In making these recommendations the editors make a powerful plea for close collaboration between all West African nations in dealing with the challenges of climate change, for the actions of individual countries will inevitably have consequences for their neighbours.

The Southern Africa book, by contrast, draws separate conclusions and makes different recommendations for each of the individual countries of the region. However, an overview chapter summarizes the recommendations common to all: incorporation of adaptation to climate change in all long term planning and development programmes; irrigation development, targeting smallholders in the most vulnerable communities; capacity building in skills and tools for technical assessments, planning and policy development; awareness-raising regarding the potential impact of climate change in order to encourage support for action; the development and promotion of new drought- and heat-tolerant crop varieties and hardy livestock; the development of stronger links between research and extension organizations to

facilitate the timely transmission of information to farmers; and increasing the availability of weather and climate information. As for West Africa, collaboration, where possible, especially among neighbouring states, would be of great benefit.

Both books constitute an urgent call for concerted action, supported by hard and reliable evidence, thoroughly, constructively and reliably analyzed, within the region as a whole, as well as by the international community. These books are invaluable sources of information and ideas for politicians, policy makers, researchers, teachers and students concerned with climate change, agriculture, food security, poverty alleviation

and economic development in Africa. The first two volumes are enthusiastically welcomed and the third and final volume in the series is eagerly awaited.

## References

- Grayson, M. (2013). Agriculture and drought. *Nature (Nature Outlook)*, 501, S1–S19.
- Nelson, G., Rosegrant, M. W., Palazzo, A., Gray, I., Ingersoll, C., Robertson, R., et al. (2010). *Food security, farming and climate change to 2050: Scenarios, results, policy options*. Washington: International Food Policy Research Institute.