

A Look at the Future of Food Production

Food Security and Global Environmental Change. Ingram, J., P. Ericksen, and D. Liverman, editors. 2010. Earthscan, London, U.K. 352 pp. \$39.95 (paperback). ISBN 978-1-84971-128-9.

Livestock in a Changing Landscape. Volume 1. Drivers, Consequences, and Responses. Steinfeld, H., H. A. Mooney, F. Schneider, and L. E. Neville, editors. 2010. Island Press, Washington, D.C., U.S.A. 864 pp. \$95 (paperback). ISBN 978-159726-671-0.

Change is nothing new, particularly in the last two centuries. But our ability to detect and track the world changing is better than ever, so much so that change as the “new normal” has become cliché. And, although climate is only one driver of all this change, some conservation professionals give it disproportionate attention, generally at the expense of other forces such as economics, globalization, governance, and land use. We ignore these issues for understandable reasons: they are complex, tap foreign disciplines, and can pull us out of our comfort zone.

However, accepting complexity and leaving comfort zones are paramount for conservation to engage meaningfully with the global environmental changes ahead. Of the social, political, economic, and ecological processes that contribute to the complexity of global environmental change, land use is most the critical for conservation. Land use drives profound shifts in the energy, nutrient, and hydrological cycles (J. A. Foley et al. 2005. *Global consequences of land use. Science* 309: 570–574.), and most effects of climate change will affect biological diversity not by shifting bioclimatic envelopes, but through changes in land use. And few, if any, land uses are socially, economically, and biophysically more important than food production. Two new books, *Food Security and Global Environmental Change* and *Livestock in a Changing Landscape*, examine the future of food production.

The authors of both books present a holistic view, giving equal attention to changes in climate and land use and the process of globalization. This view is sufficient to pique a reader’s interest. But, for those who question the authors’ emphasis on food systems, a few facts and projections from the books are compelling: global meat production tripled in the last 30 years and will likely dou-

ble again in the next 20; demand for cereals will increase approximately 70% by 2050; livestock are maintained on roughly one-third of the Earth’s ice-free land; and livestock excreta contain more nutrients than all the inorganic fertilizers applied annually. Clearly, food systems are and will remain major features of the global environment and of land use at local and regional levels.

Food Security and Global Environmental Change provides an in-depth examination of food systems, and the authors’ detailed analyses yield important lessons about both understanding and managing food systems. For example, Ericksen et al. explore the ways food systems respond to globalization and sudden changes in economies and climate. The authors document how traditional social processes such as seed and harvest exchanges take place within and beyond villages and how these practices help smallholders reduce the risk of small-scale production and improve food security. Shifts from subsistence to cash crops and subsequent market failures can undermine these traditional social processes and compromise food security.

The editors and contributors offer a variety of analytical perspectives, which itself is valuable, and just as importantly, nearly all clearly lay out the links between food production, food policy, and applications of the research presented. Schilpzand et al. examine the expanding list of powerful “nonstate” actors in the governance of food systems or, more accurately, the governance of components of food systems because production and markets often operate at larger scales than governing bodies. Some conservation professionals will be interested in an extensive treatment of a familiar topic: vulnerability; but rather than applying the concept to species and extinction, the authors explore the vulnerability of social and economic systems surrounding food security. This is a germane topic because food systems, like ecological systems, are complex, have components that operate at multiple scales, and are managed with multiple objectives in mind.

The most important messages from the book, however, are that the world produces plenty of food and that distribution and access are often the crux of food security. Consequently, prices, market access, and transportation can all improve food security without changing land use. The book’s framing of food security also includes

“sufficient, safe, and nutritious” foods, which encompass the maintenance of ecosystem services and livelihoods that are dependent on natural resources.

Livestock in a Changing Landscape is more strongly focused on application of science than *Food Security and Global Environmental Change*, but it tells a similar story. Explorations of the nonfood uses of livestock—work, wealth storage, fertilizer, social currency, and hedges against environmental shocks—are presented throughout. These explorations are particularly salient because as the globalization of food drives production into more efficient food only systems, the ancillary nonfood benefits of traditional livestock production, such as providing economic diversification or serving as a social currency, will either be replaced or lost.

The authors provide a welcome and unvarnished view of traditional livestock systems. They recognize the risks of land degradation and acknowledge that intensification and commercialization are becoming part of smallholder systems. Instead of presenting traditional livestock management as a singular path to sustainability, the authors regard change as an opportunity to improve land management rather than as a threat to traditional systems. On-the-ground examples of the social and ecological linkages in livestock production illuminate how globalization and climate and land-use changes will affect these systems. One account highlights the parallels between cash crops integrated in a global market and large-scale and intensive livestock systems, with both providing fewer jobs and making it more difficult for small producers to use traditional practices, such as lending animals and sharing livestock products, to mitigate the risks from drought or disease. Readers wanting more in-depth case studies and local detail should explore this book’s second volume (P. Gerber, H. A. Mooney, J. Dijkman, S. Tarawali, and C. de Haan. 2010. *Livestock in a changing landscape. Volume 2. Experiences and regional perspectives*. Island Press, Washington, D.C.).

Despite their different perspectives, these books complement each other nicely. The editors and publishers deserve kudos for making the presentation of both books accessible to time-limited readers. Both summarize the main messages and conclusions from the chapters and book sections in concise and easily identified sections. Both could have gone further to get the message across quickly, however. With overwhelming volumes of material to read and many of us trying to read more broadly, a punch-line-first approach would have been welcome in both these important books.

A valuable thread running through both volumes is that a singular focus on economic metrics at the expense of others, particularly social and environmental, can lead to unintended consequences and illusory benefits. Clearly, we must add the lenses of social and environmental capital to our evaluation of food systems and development in general. As we work to alleviate poverty and promote sustainable land use, the perspectives and analytical tools from food-systems research can help determine whether “improved” livestock production or “revolutionized” agriculture will provide net benefits to the people adopting them.

As I write, another protracted drought is grinding the Horn of Africa. *Upheaval*—whether from globalization, land-use change, or environmental change—may better describe the next new normal for food systems. *Upheaval* means we have little choice but to leave our comfort zones. *Food Security and Global Environmental Change* and *Livestock in a Changing Landscape* offer tools for finding our way and powerful motivations for setting out.

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