Moreover, most areas in urgent need of restoration lack "climax" forests. Given the importance of understanding successional pathways to establish goals and guidelines for restoration plantings, it is unfortunate that Elliot and co-authors continue to use "climax" forest conditions as the reference point for measuring restoration success. Studies of natural regeneration and restoration plantings should be conducted in parallel whenever possible to maximize understanding of local ecological processes, tree species characteristics, requirements of local fauna and flora, and obstacles to regeneration at different spatial scales. Ultimately, an understanding of successional pathways and their local variations is required to restore tropical forest ecosystems, protect biodiversity, and promote livelihoods or rural populations at large, landscape scales.

Although local stakeholders are frequently discussed in Restoring Tropical Forests, they are primarily viewed as "resources" for restoration projects (Chapter 8). Yet, local communities are the main beneficiaries of forest restoration projects and their active participation should be sought during all stages of project development, including decisions regarding restoration approaches and goals, selection of species, and long-term monitoring. The well-being of local community members is directly impacted by the success or failure of restoration projects. Restoration practitioners should be viewed as "resources" to help local communities design projects that suit their needs and values well into the future.

Aside from these issues, Stephen Elliott and his many collaborators should be commended on providing an essential step-by-step guide to how to restore many functions of tropical forests using native species plantings. In addition to illustrating the many steps needed to initiate this long-term process, their book provides new hope for the future of many tropical regions.

References

Chazdon, R.L. 2014. *Second Growth: The Promise of Tropical Forest Regeneration in an Age of Deforestation.* Chicago, IL: University of Chicago Press.

Goosem, S. and N.I.J. Tucker. 1995. *Repairing the Rainforest: Theory and Practice of Rainforest Re-establishment in North Queensland's Wet Tropics*. Cairns, Australia: Wet Tropics Management Authority.

Holl, K.D. 2012. Restoration of tropical forests. Pages 103–114 in J. Van Andel and J. Aronson, (eds). *Restoration Ecology: The New Frontier*. Hoboken, NJ: John Wiley & Sons.

Holl, K.D. and T.M. Aide. 2011. When and where to actively restore ecosystems? *Forest Ecology and Management* 261:1558–1563.

Lamb, D. 2011. *Regreening the Bare Hills: Tropical Forest Restoration in the Asia-Pacific Region*. New York, NY: Springer.

Menz, M.H.M., K.W. Dixon and R.J. Hobbs. 2013. Hurdles and opportunities for landscape-scale restoration. *Science* 339:526–527.

Robin Chazdon (robin.chazdon@uconn.edu) is a professor of Ecology at the University of Connecticut. She has researched tropical forest ecology and succession for over 30 years. She is the director of PARTNERS (People and Reforestation in the Tropics: a Network for Education, Research, and Synthesis), an international and interdisciplinary Research Coordination Network and the Executive Director of the Association for Tropical Biology and Conservation.

Ecosystem Services in Agricultural and Urban Landscapes

Stephen Wratten, Harpinder Sandhu, Ross Cullen and Robert Costanza (eds). 2013. Hoboken, NJ: Wiley-Blackwell. $92.95 hardcover, &74.99 e-book. ISBN: 978-1-118-50624-0. 224 pages.

In their book *Ecosystem Services in Agricultural and Urban Landscape*s, the editors highlight "the current global challenge to halt ecosystem degradation and (provide) updated knowledge of two crucial systems—agriculture and urban areas" (p. 195). This timely effort builds on Robert Constanza's and Gretchen Daily's pivotal work on the quantification of ecosystems services (ES), or the benefits derived from ecosystems, and applies the concept of ES to farmland and cities, the largest users of ecosystems and their benefits. The book is intended to increase the understanding of the role of ES in these areas for a range of users: from undergraduate and graduate students; economists; agriculturalists; ecologists; local and regional planners; and government personnel. Ultimately, the intention of the book is to develop concepts, policies, and methods for evaluating ES in these areas. The volume of contributed chapters is divided in four parts: an introduction, which sets the scene in terms of the ecological and economic implications of ES; a series of case studies drawing from differently managed systems; a series of case studies that explore ES at various spatial scales; and finally an exploration of ecological systems design and management towards the delivery of ES.

In the introductory section (Chapters 1–3), the contributors introduce the concept of ecosystems services, provide the range of different ES. Overall, the section does a sufficient job connecting the ecological processes and functions that support different ecosystem services, and in chapter 3 connects these different ES with economic implications through a brief description of different valuation methods. At times the introduction section reads inconsistently when defining key terms related to ecosystem services. For example, chapters 1 and 2 broadly organize ES into four categories: supporting, provisioning, regulating, and cultural services, while chapter 3 focuses on market/non-market

and direct use and indirect use values, without synchronizing the key concepts in the section. Although this has tremendous value for a general overview of different ways of evaluating and defining ecosystems services, it would be even more useful if a common language is drawn and agreed upon by the different users of the term.

The second section (Chapters 4–6), readers are presented with case-studies of the application of the concepts of ecosystems services in agriculture and urban areas. Contributors used current examples of viticulture, aquaculture, and urban landscapes to apply the concepts in the introductory section. In chapter 4, the authors describe ecosystem services in the form of conservation biological control to help improve pest management in viticulture. Chapter 5 applies the same theory to aquaculture, but in largely hypothetical scenarios, and also introduces the environmental and social tradeoffs of sustained aquaculture production. Chapter 6 provides an application of ES to urban ecosystems in Germany, describing differing types of urban vegetation and the main ecosystem services derived from them. Although the case studies seem to be of tremendous value since they provide a very robust collection of references for those looking for other studies in similar fields, they fail to make the connection between the ecosystems services and the valuation methods presented in the first part of the book.

That said, for readers looking how to measure and monitoring ES at multiple scales, section 3 does provide some framework of actual examples of field-scale assessment of ES on urbanized areas and farmland using remote sensing (chapter 8) and scenario building (chapter 9). This section builds on other published work, and successfully makes the bridge between the measurement of ecological processes and the estimate of the economic benefits derived from such. For example, in chapter 9, the authors provide a summary of mean economic value of ecosystem services in organic and conventional agriculture fields in New Zealand, and include models that estimate significant differences between the two modes of agriculture in terms of the economic values of some ES. They find that organic farms have double the non-market values of ES than conventional fields, a finding which may serve as a platform for debating merits to transitioning to more sustainable agricultural practice.

The last section (Chapters 9–11) uses a holistic approach to implement ecosystem services with multiple stake holders across a range of disciplines. This culmination does an effective job tying ecosystems services to multiple actors in different settings. Governmental and local agencies might take notice of this section as it effectively provides informed heuristics on how to fully engage the multiple actors who are crucial in planning for the sustainable future of agroecosystems and cities. Any momentum toward this future will depend upon "coordinated scientific and social action, integrated across multiple scales, sectors, and systems" (p. 154), and as such the tools and models provided in this section might serve as a crucial starting point for readers interested in this outcome.

As a group comprised of mostly graduate students (first four authors listed) who read this book as part of a biological problems class (moderated by the last author), we brought to this review a broad understanding of ES and an open mind toward new examples and literature. This book sparked interesting interdisciplinary discussion about the application of ES to different systems including our own, and we agreed that it provided an interesting framework on which to build our own research. However, we felt that it left us wanting a deeper analysis of ES, including more global examples (as opposed to various hypothetical examples) of the actual employment of tools and methods in ES estimation and valuation. We also felt that the book was somewhat repetitive, and lacked the depth to serve as a guide to advanced graduate students or early career professionals interested in delving into studies of ecosystem services in urban and agroecological settings. However, we agreed that this would be an excellent resource for an introductory level course for undergraduates, or a supplemental text that might be supported with other theoretical and applied works in ES, many which referenced in this text. This book would also be a useful resource for those that may not be versed in ecological theory or interdisciplinary analyses, but are interested in the sustainable management of urban or agroecosystems.

Jose Escamilla, Savannah Rugg, John Brush, Jorge Cantu, and Alex Racelis. JE, SR, JB, and JC are graduate students in the Department of Biology at the University of Texas Pan-American in Edinburg, TX. They are conducting graduate research looking at the impact of invasive species, agroecosystem design, urban development, and urban landscaping (respectively) on various ecosystem services. AR is an assistant professor in the same department.