

Utilización y conservación de los ecosistemas terrestres de México, pasado, presente y futuro. Antony Challenger with the collaboration of Javier Caballero. Comisión para el Conocimiento y Uso de la Biodiversidad; Instituto de Biología, Universidad Nacional Autónoma de México; Agrupación Sierra Madre, S.C. 1998. 847 pp., maps, diags., photos, refs., and index. Paper. ISBN 970-9000-02-0.

In the preface of this book Antony Challenger explains how he set out to write this enormous tome. As he describes it, only someone young (he was 26), enthusiastic, and inexperienced would have accepted the challenge to write a single book that was both sufficiently detailed and broad enough in scope to serve as a basic text on conservation in Mexico. It took him seven years and 847 pages. The result is an extensive and invaluable overview of the political and cultural ecology of biodiversity in Mexico.

The book consists of an introduction, a four-chapter section on the history of human uses of ecosystems, six chapters covering the biogeography, ecology, and human uses of the main terrestrial ecosystem types, and a conclusion addressing sustainable development in Mexico.

In the introductory chapter, Challenger explains the importance of biodiversity, summarizes the threats to biodiversity in Mexico, and describes how indigenous and traditional farmers continue to make important contributions to Mexican biodiversity through ongoing processes of domestication and adaptation of existing crop varieties to differing ecosystems and human needs. Specific topics include species relationships, co-evolution, natural selection and the major activities threatening biodiversity in Mexico. In contrast to the destruction of Mexican ecosystems under modern production techniques, indigenous agricultural activities enhance biodiversity through ongoing processes of domestication and diversified production systems maintaining a heterogenous landscape.

Chapter Two covers "primary production and the conservation of natural resources" from the Pleistocene to the Spanish Conquest, including the origins of agriculture in Mexico, and the agricultural basis of several pre-Columbian civilizations in Mexico. Chapters 3, 4 and 5 address the Colonial period, independence, the Porfirian dictatorship, and modern Mexico from 1910 to 1994. Each of these chapters concludes with a map of Mexico illustrating the general distribution of agricultural, grazing, forestry, mining, and industrial activities and the ever-growing extent of alterations to natural ecosystems.

These chapters take a cultural ecology perspective in which society and nature are interwoven. For example, the culture of the Maya encompasses their agricultural systems and settlement patterns, and these have repercussions on vegetation and wildlife. In the same way, environmental change affects society and a number of theories for the collapse of Mesoamerican cultures hinge on environmental change. In his discussion of the conquest, Challenger describes a process of cultural *and* ecological transformation in Mexico following the introduction of new species, including human pathogens like small pox and scarlet fever. In the chapter covering modern Mexican history, Challenger addresses the environmental implications of topics such as land reforms, import substitution industrialization,

tropical colonization and the promotion of cattle ranching, agricultural policies, the debt crisis, and finally neoliberalism.

Historically and currently, Mexican development strategies are unsustainable. Furthermore, they are actively destroying the bases from which Mexico could construct a sustainable development alternative. One of the greatest tragedies of the Spanish Conquest and colonization, for example, was the loss of indigenous technical knowledge, agricultural techniques, and perhaps crop varieties. These disappeared with the drastic re-organization of production around European plants and animals, mining, and export crops like dyes and sugar, and the collapse of indigenous populations. Currently, the North American Free Trade Agreement continues the process by pitting Mexico's small-scale indigenous maize farmers against enormous and heavily subsidized agro-industries in the United States and Canada.

After setting out the human history of land use in the first 250 pages of the book, Challenger is ready to describe the current situation of primary production and conservation and vegetation types. Chapters 6 through 11 focus on specific ecological zones. Topics include the sources of various taxa, profile drawings of different forest types, and descriptions of the main ecological processes shaping these ecosystems, such as forest succession. Challenger provides long lists of current and suggested protected areas in each of the five major ecosystems. Most importantly, each chapter describes indigenous and modern systems of management in each ecosystem type.

The final chapter reiterates the value of indigenous technical knowledge and traditional environmental management systems. In contrast to green revolution agricultural techniques that homogenize the environment, rely on unsustainable chemical and fossil fuel energy inputs, deplete soil and water, poison people and face real risk of collapse, traditional agricultural systems maintain environmental heterogeneity and often have proven sustainability. Ethnoecology, therefore, has an important role to play in the search for sustainable environmental management.

Challenger argues that sustainable development in Mexico requires the conservation and intensification of traditional farming systems, including serious efforts to rehabilitate soils and forests. This, in turn, requires a radically different development strategy, one based on food self-sufficiency, not the current "market logic" of importing grains. Sustainable development requires a paradigm shift, *a la* Kuhn. A drastic change in thinking should accompany a global redefinition of development leading to semi-autonomous national economies trading as equal partners. In Mexico, sustainable development would also require land reform, especially directed against cattle ranches in tropical zones.

In his final paragraph, Challenger writes that the biggest challenge is not how to manage natural resources, but rather how to manage ourselves. This is the weakest aspect of the book. The power relations behind the market structures and government policies he criticizes remain opaque. In a brief section on plantation subsidies, for example, Challenger does not address the issue of how these subsidies disproportionately benefit transnational integrated pulp and paper companies and fail to reach the small-farmer actors he expects to use them to restore de-

graded environments. Similarly, he is very optimistic about the ability of biotechnology to play a role in improved traditional systems, without considering the goals of the actors behind most biotechnology research.

In another example of the book's relative weakness on social issues, Challenger calls for the establishment of more parks and the funds to delineate and patrol them as part of a broader process of ecological zoning and land use planning. The United States park system remains a model suitable for emulation (p. 785). He does not address the state of conservation within existing Mexican parks, nor the compelling and difficult issues of social justice, cross boundary, and other people management issues in Mexico's parks, many of which are inhabited and nearly all of which are heavily used.

Conversely, though, the description of Mexico's ecosystems, their natural histories, human impacts, and indigenous production strategies comprise the strength of the book. Challenger demonstrates the value of ethnoecology for sustainable development, clarifies the cultural and ecological destructiveness of past and present development policies, and identifies potential techniques for better management.

Unfortunately, the book's size and organization dilute these compelling messages. The book would have benefited from better editing. The conclusion, for example, contains sections on human impacts on ecosystems and potential areas for parks that should have been included in the respective ecosystem chapters where there is similar material. The conclusion also contains lengthy discussions of ecotechniques like agroforestry, organic agriculture, and organic coffee, but these too should have been contained in the ecosystem chapters with similar material. Similarly, a few tables could have replaced pages of description of protected areas throughout.

Even with such editing, the book should be printed in two or more volumes. Incredibly, this 850-page book is published in a single paperback volume. This is a book that needs to be in every Mexican college library and accessible to every organization addressing conservation and development issues in Mexico. Unfortunately, even moderately-used copies will rapidly fall apart; my copy already has a cracked spine. It is too bad the book is not itself more sustainable.

Despite the length, a thorough index and a detailed table of contents make the material accessible. Challenger maintains an author-date citation style throughout with references following each chapter, and this guarantees the utility of the book as an obligatory desk reference for all Latin Americanists with interests in the intersections between biodiversity, people, politics, and history. We are fortunate Challenger took on a Herculean task, and executed it so well.

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