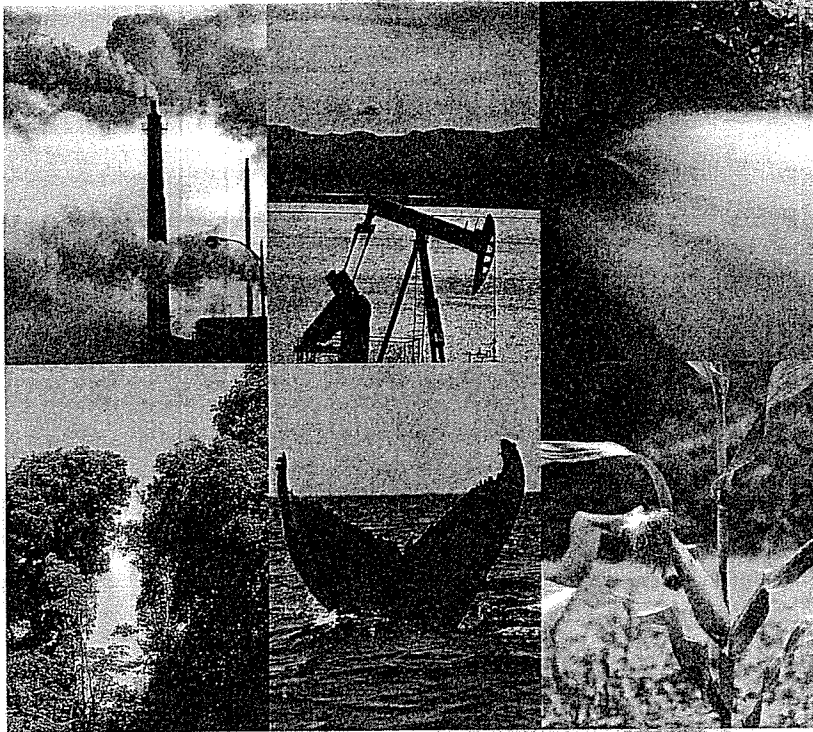


Environmental Issues in Latin America and the Caribbean

Edited by
Aldemaro Romero and Sarah E. West



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Aldemaro Romero
*Arkansas State University,
State University, AR, U.S.A.*

and

Sarah E. West
*Macalester College,
Saint Paul, MN, U.S.A.*

 Springer

Preface

We began this book with a simple goal— to assemble a collection of readings for an undergraduate interdisciplinary course taught by one of us (AR) at Macalester College. This course explored environmental problems and solutions in Latin America and the Caribbean using both natural science and social science methods. After a literature search failed to produce an anthology of interdisciplinary readings appropriate for the course, we set out to compile one.

We sought papers that dealt with the most salient environmental problems in the region, that were written by experts, and that were appropriate for undergraduate students. Most importantly, we sought papers that clearly demonstrate the contributions that experts from one discipline can make to analysis in another discipline. We sought papers that, for example, show how biological species assessments can be used to inform the politics of biodiversity conservation. We sought papers that show how economic analysis can be used to predict the likely effects of human behavior on ecosystems. We sought papers that pay close attention to how institutions, both national and international, affect the outcome of environmental initiatives.

To find essays that fit our needs, we sent out a world-wide call for papers, chose the most promising submissions, and subjected these submissions to peer review. The twelve approved essays represent the work of researchers from Latin America and the Caribbean, the United States, Canada, Europe, and Australia. All the authors have direct experience with Latin America and the Caribbean and the region's problems.

What distinguishes this book from others is its interdisciplinary nature. While each essay relies on a well-developed methodology from within one

discipline, the book is a collection of essays from both the natural and social sciences. These essays are written so that readers outside of the authors' disciplines can understand them and, more importantly, can see how their methods are relevant to their own research. A biology student can use this book to learn how to present technical data on the status of flora and fauna in Latin America and the Caribbean while also learning how the politics of international institutions affect species' survival. An economics student can learn about how to use biologists' research on the benefits for birds of shade-grown coffee to develop optimal coffee-pricing schemes.

This book is not technical. It is appropriate for students without extensive training; it could be used, for example, in a course that has an introductory social or natural science course as its only prerequisite. Professors in either of these fields should find this book a source of both case studies from within their discipline and outside material that complements it. Professors in interdisciplinary fields will find this book integrates disciplines while maintaining methodological rigor. Researchers and policymakers looking for an overview of the region's more pressing and intriguing environmental issues should also find this book of interest.

Mindful of the great diversity of environmental problems in the region, we have assembled essays that analyze a representative set of problems in depth rather than skim the majority of the region's environmental issues. While they do not cover every country in the region, the essays examine problems in the country for which many environmental studies have been published (Mexico) and in the most enigmatic one in the region (Cuba). The essays also sample a group of countries from South America, Central America, and the southeastern Caribbean. They consider problems at international, regional, national, and local levels and deal with environmental policy and practice now and in years past.

We organize the twelve essays according to theme and approach into five parts: Past and Present Conservation Challenges; National Policies, Local Communities, and Rural Development; Getting the Prices Right: Mechanisms for Protecting Public Goods; Public Participation and Environmental Justice; and The Effects of Development Policies on the Environment.

Chapters in Part 1 are case studies of resource exploitation and conservation written by biologists. They also demonstrate how politics and economics affect the likelihood of conservation initiatives' success.

In the first chapter, Romero and Creswell provide a detailed history of marine mammal exploitation in five contiguous countries of the southeastern Caribbean. To examine the evolution of exploitation practices, the authors use information from archaeological findings, archival material, and interviews with people who had direct experience with the fauna. Romero

and Creswell find that while Hispanic countries engaged essentially in dolphin fishing, those under British influence practiced mostly shore-whaling— despite the fact that all these countries share the same marine mammal fauna. And, while dolphins were captured by local fishers, shore-whaling was financed and operated by local elites who transferred technology and manpower from their agricultural business into the seasonal activity. The authors conclude that culture, economic forces, and social conditions, more than ecological conditions, determine the pattern of natural resource exploitation.

In Chapter 2, Rogers and her collaborators present a rich description of a unique conservation project involving the Monterey pine (*Pinus radiata*), a species whose natural populations are restricted to three along the central coast of California and two on the Mexican islands of Guadalupe and Cedros, off Baja California. This essay uses methods from conservation biology to describe the role of the pine in the islands' ecosystems. It also details how the United States, Mexico, and Australia cooperated in research, education, and fundraising to save the populations. Without the biological assessments that show the species' genetic uniqueness, those countries would not have lent their support. And without international coordination, the biologists could not have determined how to protect the valuable trees.

Chapter 3 examines the history of biodiversity conservation in Bolivia, one of the most biologically diverse countries in the world, with more than half of its territory in good or excellent conservation status. Ibis emphasizes poverty's competing effects on biodiversity. When the government had no funds with which to build access roads into forested areas, the country's poverty acted to preserve biodiversity. Once access roads were finally built, however, poverty in existing settlements pushed humans deeper into the forest. This chapter provides valuable lessons about how economic considerations affect conservation efforts in the poorest countries.

In Part 2, chapters demonstrate the role played by local agricultural and forest communities in the evolution of environmental policy and practice.

In Chapter 4, Kreitlow analyzes farm modernizing efforts implemented by the Mexican government in the Zacapoxtla region of the Northern Sierra. The author, a historian, uses fieldwork interviews, archival work, and technical reports written by agricultural technicians to explore the relationship between environmental and political change and the role that peasants play in that change. Beginning in the 1970s, the Mexican government attempted to introduce scientific technology such as hybrid seed, synthetic pesticides, and synthetic fertilizer, all standards in Green Revolution modernization programs. However, peasants rejected most of these proposed farm technologies, partly because the methods were environmentally and economically inappropriate. Kreitlow's chapter shows

how the environment conditioned the state project and therefore participated in political change.

In Chapter 5, Mitchell examines the intersection of forestry management, forest trade, and local democracy in Mexican communities. He traces the historical development of environmental policy and the Mexican forest industry that eventually led to community control of forest resources. Mitchell also discusses implications of the North American Free Trade Agreement (NAFTA) and the forest certification process on trade and local people. He conducts case studies to explore the hypothesis that local control and democracy are necessary for environmental sustainability, especially in forest-based communities of Mexico. He concludes that communal forestry management offers new hopes for environmental and democratic sustainability.

Part 3 makes a strong case for using economic incentives and regulations to protect the environment. The essays emphasize the role that institutions, international pressures, and conservation biology can play in effective implementation of policies that "get the prices right" by increasing the relative cost of behavior associated with environmental degradation.

Economists tout market-based incentives such as pollution taxes and tradable permits as the most cost effective methods for addressing a wide variety of environmental problems. In Chapter 6, West and Wolverton examine these incentives and their applicability to Latin America. They find that the institutions so necessary for successful implementation of these policies in the United States and Europe are weak or nonexistent in Latin America. They argue that since weak government agencies make enforcement difficult and costly, pollution control policies should attempt to minimize the need for large amounts of direct monitoring. In addition, they suggest that preference should be given to environmental policies that are revenue-increasing on net, so that weak institutions can become self-sustaining.

The parable of the tragedy of the commons tells us that resources held under open access conditions are prone to over-exploitation. One might therefore conclude that regulations should limit the amount of resource extracted. In Chapter 7, Potter explains while regulations to limit aggregate catch improve fisheries' use of resources, they also promote over-investment or a "race for fish." An optimal regulatory regime would therefore limit the investments and labor dedicated to harvesting, thereby increasing the costs of resource depletion borne by the fishery. Achievement of this objective in global forums is quite rare. Potter examines the reasons why the member-states of the Inter-American Tropical Tuna Commission have attempted this difficult task. The negotiation process and likely success of international

regulation of harvesting in the Eastern Tropical Pacific yellowfin fishery provide an example of effective management of global common property.

Market-based conservation strategies can encourage sustainable and environmentally-sensitive management practices in richly biodiverse areas. By paying a price premium, consumers provide a market signal that encourages producers to use less damaging management practices. However, as Dietsch explains in Chapter 8, without reliable certification programs, consumers cannot know whether the product they are buying was produced using environmentally-friendly techniques. Using methods from conservation biology and the example of benefits conveyed to birds by shade-grown coffee, he proposes a general approach for monitoring and evaluating certification programs. Dietsch's approach enables consumers to reliably distinguish environmentally-friendly products and to understand the effect their purchase has on tropical ecosystems.

Chapters in Part 4 examine how actors from within and outside Latin American governments have arisen to push for increased enforcement of environmental law.

Like many Latin American countries, Brazil has extensive and detailed environmental laws that are largely not enforced. In Chapter 9, McAllister describes and analyzes the involvement of the Brazilian Ministério Público in environmental protection. She uses legal analysis to explain the instruments that prosecutors use to defend environmental interests, describes and provides an explanation for the legal and institutional changes in the 1980s that allowed the Ministério Público to become a significant player, and assesses the effectiveness of prosecutorial enforcement of environmental laws. Her chapter provides an example of how a government entity can increase the enforcement of environmental law.

In Chapter 10, Pacheco-Vega examines how Mexican and international environmental non-governmental organizations (ENGOS) have exerted influence on the design and implementation of Mexican environmental policy. He uses an interdisciplinary framework to analyze how ENGOS successfully pressured the Mexican government to require polluters to report their toxic releases in the *Registro de Emisiones y Transferencia de Contaminantes*. This study shows how, by building coalitions and engaging in educational campaigns, ENGOS changed environmental laws in a country in which the state has traditionally dominated civil society.

The chapters in Part 5 examine the effects of economic development policies on the environment. Chapter 11 focuses on how increases in agricultural productivity have affected deforestation while Chapter 12 examines the effect of opening to international investment.

Recent literature on the causes of tropical deforestation indicates that, under certain circumstances, raising agricultural yields can accelerate

farmers and ranchers' encroachment on tree-covered land. The authors of Chapter 11, however, contend that the linkage between intensification and habitat conservation is generally positive. Southgate, Bravo, and Whitaker use economic methods to contrast the experiences of Chile and Ecuador during the 1980s and 1990s. They find that because of productivity improvements, agricultural land use in Chile fell. In contrast, in Ecuador, where productivity-enhancing investment was low, large tracts of forests have been converted into cropland and pasture.

In Chapter 12, Díaz-Briquets and Pérez-López examine the effect of Cuban development policy on the environment. In particular, they examine the effects of policies instituted in the 1990s, during what has been called a "special period in time of peace" (*periodo especial en tiempos de paz*), when a severe economic crisis was triggered by disruptions in imports of oil and other raw materials from socialist countries. It focuses on case studies of joint ventures in the tourism, nickel mining, and oil production sectors. Their central argument is that Cuba's socialist development model is responsible for widespread environmental degradation on the island, but to the extent that it has accelerated the growth of extractive industries, recent foreign direct investment from non-socialist countries has "compounded environmental stresses associated with socialist development."

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