

Linking Human Health to Biological Diversity

Biodiversity and Human Health. Grifo, F., and J. Rosenthal (editors). 1997. Island Press, Washington, D.C. 356 pp. \$29.95. ISBN 1-55963-501-0.

The challenge facing professionals working in protected areas is to find ways of demonstrating that the conservation of biodiversity and its sustainable use have a fundamental relevance to the daily lives of people, including those who may never visit a protected area. There is a need to emphasize that protected areas contribute to the quality of life. *Biodiversity and Human Health* concludes that "More than any other biodiversity-related issue, public health concerns can help restore the need for sound management of the world's biological diversity as an important societal goal."

This pioneering book resulted from a 1995 conference with the same title, sponsored by the U.S. National Institutes of Health (NIH), the National Science Foundation (NSF), the Smithsonian Foundation, the National Association of Physicians for the Environment (NAPE), and the Pan American Health Organization (PAHO) and held at the Smithsonian Foundation. The conference was attended by 250 registrants from the fields of agriculture, biotechnology, chemistry, ecology, epidemiology, ethnobotany, immunology, law and systematics, as well as by physicians, policymakers, and citizens, to open a dialogue on the significance of biodiversity to human health.

The editors (respectively from the American Museum of Natural History and the Fogarty International Center of the National Institutes of Health) manage to achieve, with the other 26 contributors and the 20

pieces that make up the four parts of the book, their two aims: (1) to "offer examples of the kinds of cross-disciplinary research necessary to better understand and solve the biodiversity/human health crisis" and (2) to "educate and empower the public to both bring these issues to the attention of policymakers and consider the consequences of all their actions on our life-support system."

The book makes a clear link between some causes of biodiversity loss and its disastrous consequences to human health (Part I) and the pharmaceutical importance of biodiversity as a genetic bank for known and new drugs (Part II) in both a medical and an economic perspective. Part III focuses on the relationships between indigenous peoples and the diverse species for which they have been users and stewards, emphasizing that along with the biodiversity loss goes the loss among indigenous peoples of their cultural and scientific traditions. It also considers the compensation of local and indigenous peoples for their contribution to remedies and therapies as an incentive for conservation. The last part links conservation of biodiversity to sustainable development, arguing that "bioprospecting might offer compensation to source countries and serve as an incentive for biodiversity conservation" and exploring different possibilities for collaboration between the medical and the conservation communities.

Unfortunately, the book stresses what might be called the "disaster remedy approach": negative concepts, such as famines, scarcity, deforestation, and losses in biological and cultural diversities, are abundant. Despite the title, there is no actual reference

to health; on the contrary, the term health frequently implies numerous forms of diseases. The official definition of health, coined in 1948 by the World Health Organisation and officially accepted by some 185 countries—"health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity"—is neglected. Given this definition of health it would be both sensible and timely for professionals to shift the emphasis from a disaster remedy to a "well-being promotion" approach. Nevertheless, the examples used in the book, drawn from several developed and developing countries and illustrated with graphs, charts, tables, and schemes, make the reading informative and pleasant.

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Environmental Security

Ultimate Security: The Environmental Basis of Political Stability. Myers, N. 1996. Island Press, Washington, D.C. 308 pp. \$14.95. ISBN 1-55963-499-5.

Norman Myers argues that by protecting and effectively managing environmental resources early we can avoid social conflict later. The book is comprehensive, starting with a conceptual chapter, moving into case studies from seven regions, providing an extensive section on the

importance of our global interconnectedness, and then concluding with two additional conceptual chapters and some personal reflections. The basic argument is that social strife arises when environmental services are in short supply and that environmental degradation, coupled with population growth, is the primary reason for shortage. The writing style is narrative, occasionally anecdotal, and sometimes quite personal. The documentation is largely from news, secondary sources, and Myers' extensive international experience as a conservation consultant. The presentation is effective and provides a compelling argument uniting our desire to reduce social strife and to better manage the Earth.

With the words "security" and "political stability" prominent in the title, Myers is clearly writing for international policy experts and educated laypeople. The nine regional studies range from the importance of water management and allocation to peace in the Middle East, and by implication the importance of oil for the industrial world, to the role of soil management on the Indian subcontinent to sustaining food production and thereby political stability between opposing national interests. The case studies speak to the industrial world's interest in political stability more than its concern over human suffering. The chapters covering global issues, such as population growth, ozone-layer depletion and global warming, species loss, and environmental refugees, strive to build a new language of security to draw the thinking of conventional security analysts into the age of global human impacts. The stress on political stability is further made through Myers' personal anecdotes working with the international security community. To make the environment an issue of concern to this community, as well as to help those worried about the environment link their concern to political stability and security, is a significant accomplishment.

At the same time, I remain person-

ally a bit uncomfortable with Myers' barrage of arguments and their target. Although he emphasizes that great changes must be made in how we live in the industrial world and relate to the needs of people in the developing world, he directs his arguments through and to those embedded in the current structure. Although he frequently acknowledges the human suffering he has seen on his numerous travels, he appeals foremost to the utilitarians concerned with the gains of peace per buck spent. One contradiction is especially frustrating. Throughout the book, Myers provides evidence of how social conflict result in environmental degradation, acknowledging that the arrow of causation goes both ways. In short, not only does environmental deterioration results in social conflict, but social deterioration makes it very difficult to protect and manage land and wildlife. Myers documents the difficulties of protecting and managing the environment in the midst of food shortages resulting from the politics of inappropriate agricultural policies, during political turmoil driven by social inequities, and on the terrain of regional wars fueled, if not ignited, by ethnic divisions. Yet, even while acknowledging the complexities of development dynamics, he still emphasizes the first arrow, leaving readers with the impression that by protecting and managing the environment, such conflicts will be much reduced. The arrow of causation he emphasizes plays to the industrial world's desire to not have to play an interventionist role, whereas the causation running the other direction emphasizes how intervention now can also have environmental benefits for the future. The problem is much more systemic, with all of the moral and political contradictions of interconnectedness, than portrayed.

Ultimate Security gives us more reasons to be concerned about the environment. It challenges us to reason further on how we got on to and might step off of the consumption

and population growth treadmill. This book encourages us to find new grounds for global community so that sub-communities find peace. It should be an excellent reading to get undergraduate students in political science to connect their concerns to the environment and to get students in environmental studies and conservation biology to link their understanding to development and security. Still, I wish the final message was that environmental problems are social problems, not because they give us social problems, but because we cause environmental problems.

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Ethnobotany

Plants, People and Culture: The Science of Ethnobotany. Balick, M., and Cox, P. 1996. A Scientific American Library Book. W. H. Freeman. 256 pp. \$32.95. ISBN 0-7167-5061-9.

If you have any interest in plants or human culture, don't miss this little gem. A book with a title like *Plants, People and Culture*, directed to an educated but non-technical audience, should have some interesting information and perhaps some engaging stories, but I opened it without high expectations. After all, the popular press is not unkind to the field of ethnobotany. What would be different about this book?

It starts slowly in the first few pages, making the case that plants have played a key role in the development of human culture; this is obvious enough, given that we are omnivores and (at least recently) agriculturists. But Balick and Cox go on to develop the relationships between plants and people so wonderfully well, that delightful insights spring from the pages. I found myself captivated and, as if reading a good novel, reluctant to set the book down.

Plants, People and Culture is well presented, in a pleasing visual format. After the introductory chapter, the volume is organized simply and logically into five main chapters. "Plants That Heal" deals with medicinal plants, and is full of fine storytelling, including some of the authors' own experiences, as well as fascinating factual material. The next chapter ("From Hunting and Gathering to Haute Cuisine") is a selective account of how cultures use food plants, with some thought-provoking discussion of the relative stability of hunter-gatherer and agricultural societies. Then follows "Plants and Material Culture." Here the reader is guaranteed a few surprises about how plant products have influenced the development and the character of societies around the world. "Entering the Other World" with our author guides, we are next treated to a glimpse of how mind-altering drugs play a part in the fantasy world and the religious traditions of peoples who live much closer to the "forces of nature" than we do. One cannot help reflecting on the rise of drug use in western culture in this comparative context; as in so many other areas, our technical capacity to process materials increases both their effectiveness and the problems associated with their use. Finally, in "Biological Conservation and Ethnobotany," we find a thoughtful treatment of practical conservation issues. A feature of this chapter is a focus on reconciling indigenous and western views of what really matters and what should be done.

Why is *Plants, People and Culture* so effective and engaging? First, the authors not only know their subject intimately, but they live it as well. Their respect for indigenous knowledge has led them to engage with other cultures in the role of students as well as researchers. They genuinely share common interests with indigenous people, in plants and their practical uses. The excitement and enthusiasm they experience in the field shines through in the text, whether describing how a potential anti-HIV

drug was identified with the help of Samoan herbal healers, the construction of high-performance open-ocean sailing vessels using the almost-forgotten skills of South-Sea islanders, or a host of other fascinating examples.

Another strength of this user-friendly book is that the authors have struck a nice balance in deciding how much technical information to include. There is enough to satisfy the lay reader who is interested in some specifics on how ethnobotanists work with specimens, and how plant substances are identified, isolated and tested. The treatments of these topics are brief, informative and supported with illustrations.

A third strong point is that Balick and Cox focus on generating interest and understanding, rather than using their book as a platform for a particular conservation agenda. It is obvious enough that they care deeply about the threats to the diversity of plant resources and to the indigenous cultures that still carry so much knowledge about them. But they never browbeat us with bleak, oppressive predictions or implications of blame for the demise of those cultural systems that have more conscious ties to the diversity of plant life than ours. Their somewhat understated, gentle approach, in the face of such disturbing and potentially depressing trends is, in the end, perhaps the most compelling feature of the book. The appreciation of humanity that underlies their sensitive and informative treatment of indigenous cultures, extends to our "advanced" cultures as well. People anywhere will act according to what they need, want, and care about. Balick and Cox set out to give us reasons to value plants and indigenous knowledge and to enjoy learning about them. In the end, that is perhaps the most effective conservationist approach of all.

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Biodiversity and Protected Areas in South Asia

Banking on Biodiversity: Report on the Regional Consultation on Biodiversity Assessment in the Hindu Kush Himalayas. Shengji, P. (editor). 1996. International Centre for Integrated Mountain Development, Kathmandu, Nepal. 485 pp. ISBN 92-9115-564-0.

Understanding Biodiversity: Life, Sustainability and Equity. Kothari, A. 1997. Orient Longman, Hyderabad, India. 161 pp. Rs. 75.00. ISBN 81-250-0976-0.

People & Protected Areas: Towards Participatory Conservation in India. Kothari, A., N. Singh, and S. Suri (editors). 1996. Sage Publications, New Delhi, India. 291 pp. \$30.00. ISBN 0-8039-9333-1.

The South Asian region, comprising the Indian subcontinent and Sri Lanka, has a high concentration of biodiversity. The region includes three hotspots of biodiversity: the Himalayas, the Western Ghats, and the wet evergreen forests of Sri Lanka. Cultural and ethnic diversity is also high, with almost all the world's major religious groups existing side-by-side with scores, if not hundreds, of indigenous groups. As in other parts of the world, biodiversity is under assault from a wide variety of forces, including the burgeoning population of the region. How to conserve the rich biotic and cultural heritage of the region is the theme of these three books.

The Hindu Kush-Himalayan region extends from the arid mountains of Afghanistan in the west to the humid regions of northeast India, bordering China, Myanmar, and Thailand in the east. The topographic, geological, and climatic variability in the vast area has generated a wide range of habitats and ecosystems and a diverse biota. *Banking on Biodiversity* brings together for the first time the sparse and scattered infor-

mation about the biodiversity of the region and provides an overall view of key issues and challenges. There are overview chapters on Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan. These chapters summarize information about key ecosystems, overall levels of biodiversity, and endangered species and cover a wide range of issues such as biodiversity legislation, protected areas, and relevant agencies and institutions involved in the assessment and monitoring of biodiversity. Three additional chapters describe approaches to conservation in Pakistan, India, and Nepal. The information in the overview chapters is useful, but is largely derived from secondary sources, much of it easily available from the World Conservation Monitoring Center's country profiles. Only T.N. Khoshoo's chapter on the Indian Himalayas provides a panoramic, comprehensive view of the uniqueness and the importance of the region. Other chapters contain a number of inconsistencies, inaccurate data, and confusing statements. As an example, the chapter on Bangladesh states that approximately 16% of the country's area is occupied by forested lands and 6% is "tree stocked," but does not elaborate on the inconsistency between the two figures. Furthermore, in a region that has a high concentration of orchids, it is difficult to believe that of the 5700 species of flowering plants in the country, only 29 species are orchids (p. 61). Finally, inbreeding is confused with interbreeding (p. 63).

Opportunities to focus on key issues have been missed by most authors. For example, it might have been useful to discuss why conservation measures are not succeeding, how conservation strategies might be modified, and how the various countries in the region can initiate a coordinated plan. Again, Khoshoo is one of the few authors who describes how the benefits of biodiversity must be brought to meet the needs of the people. Elsewhere (*Asiaweek*: 21 February, 1997), Khoshoo has also ar-

gued that the nations of the region should cooperate on conservation of natural ecosystems and biodiversity. Moreover, he argues that the economic benefits from cooperation on ecosystem conservation may be equal to or greater than those derived from the political power gained from armed conflicts, which are so common within and among the countries of the region and have deleterious consequences on biodiversity. Overall, the value of this book lies in the provision of basic information about biodiversity and in highlighting the importance of this montane region in conservation of wild habitats and biota.

Understanding Biodiversity is a short book on various aspects of biodiversity conservation. Although the book is mainly about India, the issues discussed have relevance to other countries in the South Asia. Kothari, a familiar figure on the Indian conservation scene, begins with the definition and importance of biodiversity and then describes the historical and contemporary threats to biodiversity. Kothari's main concern, however, is equity in sharing the benefits of biodiversity. In the absence of equity, conflicts are inevitable and losses of biodiversity are to be expected. Conflicts in India initially occurred between the local communities, who had usufruct rights over forests and other biological resources, and the state, which increasingly expropriated ecosystem resources. The creation of protected areas has further intensified this conflict, and opportunities offered by biotechnology, the search for genes of known function, and medicinal products by big biotechnology and pharmaceutical companies have further enlarged the arena and scope of the conflict.

Kothari describes some mechanisms for regulating access to genetic resources and for equitable sharing of the benefits. In the final chapter of the book, the potential contributions of the Convention on Biological Diversity to resolve the contentious issues of access and benefit sharing are explored. A case is also made for a

public debate on various articles of the Convention.

Overall, the book is well researched and contains important messages. My only criticism is that a common thread linking various chapters is lacking. If there is a central point, it appears to be that conservation in a country such as India is not likely to succeed without wider participation of the population than at present. The manner in which such a participation may be achieved is the theme of the next book.

People and Protected Areas is based on the Workshop on the Joint Management of Protected Areas held in Delhi in September, 1994. Joint forest management in India was started more than two decades ago in the state of West Bengal with the aim of regenerating degraded forests; villagers were given rights to a part of the forest produce from regenerating forests in exchange for their involvement in protection of such forests. The success of the joint forest management program has led to calls for the extension of the concept to protected areas, as the biodiversity of these areas continues to erode for a wide variety of reasons. In the introductory section of the book, Kothari asks if joint management of protected areas is feasible. Section two explores the policy and legal framework for joint management, the institutional and procedural details are covered in section three, and concrete suggestions for joint management of specific areas are presented in section four. The final section of the book highlights joint management of protected areas in other parts of the world and the lessons India can draw from such experiences. Contributors to the book include a number of eminent social scientists, foresters, and ecologists who have either considerable practical experience in the management of protected areas or are very familiar with critical management issues. The authors underestimate the difficulties in the successful application of the concept of joint management to protected areas,

without basic information on the degree to which communities in and around protected areas rely on these areas, the magnitude of the resource base, and the extent to which the resources may be harvested without jeopardizing the integrity of the areas. Despite considerable rhetoric about the importance of involvement of people in management of protected areas, very basic information about resource use in protected areas of India is lacking. The book, however, should serve as a useful resource as India and other countries in the region make an effort to involve and elicit the support of local populations in maintaining the integrity of protected areas.

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Multi-Scale Social Dynamics: Local View of Deforestation

Culture and Global Change: Social Perceptions of Deforestation in the Lacandon Rain Forest in Mexico. Arispe, L., F. Paz, and M. Valázquez. 1996. University of Michigan Press, Ann Arbor, MI. 115 pp. \$19.95. ISBN 0-472-08348-1.

Throughout much of the developed world, tropical deforestation is perceived as a serious threat to global environmental quality. This concern has led to a reevaluation of international and national development policies that have contributed to or encouraged deforestation. Because most of the concern originates internationally, policy initiatives are often developed and imposed from afar but focus on the people who live closest to and depend the most on tropical forests. Consequently, the success and sustainability of conservation efforts seems to depend on the translation of distant concern into direct local changes in attitudes and behavior. The authors of *Culture and Global Change: Social Perceptions of De-*

forestation in the Lacandona Rain Forest in Mexico provide an insightful look at the perceptions of a diverse group of local people who live in and around a particular rain forest. This is one of the first interdisciplinary efforts to explore how local perceptions and attitudes toward natural resources are formed and should have broad application to anyone working on large-scale environmental problems where solutions tend to come from outside.

Arispe, Paz, and Valázquez open with an intriguing analysis of the social relationship between global and local entities, suggesting that, as has been found for many biological systems, examination of the relationship requires a consideration of the scale of processes occurring at each level. This global framework is included throughout the book, giving the results from this local study a much broader perspective. In addition, the book provides clues into how attitudes and perceptions are turned into action. In this case, actions that may have set the stage for a turning point in Mexican history. The authors note that their study was conducted as momentum was building in the region for the neo-Zapatista uprising, which occurred shortly after research for the book was completed.

The basis for the attitudes that shaped this uprising are presented in the second chapter, which provides an interesting historical overview of recent human occupation in the region especially related to how governmental policies have affected land-use patterns. This region, situated on the northern border between Guatemala and Mexico, has a history of human land-use dating back before the Mayan civilization. Their history traces changing land-use practices from a period of low impact communities of native peoples and Spanish settlers called *mestizos* through a series of modern governmental policy initiatives and reversals that increased forest utilization and population levels then tried to cope with resulting

problems. This complex historically-rooted tapestry of peoples and changing policies, provided the backdrop for the social perceptions that the authors attempt to sort out in the following chapters.

Members of seven local communities representing a cross-section of the people living in the vicinity of the rainforest were interviewed by an inter-disciplinary team representing social science, economics, anthropology, ecology, agronomy, and the humanities. Responses were divided by location and occupation (or income class). The respondents were questioned in four main areas: concepts of nature, changes to the natural environment, responsibility (for impacts) and vulnerability (to impacts), and deforestation. I found occasionally their conclusions were not well-supported because the analytical and statistical methods were not included in the book (the survey method was included in an appendix). This can probably be attributed to disciplinary differences but also indicates the flexibility needed and obstacles faced by interdisciplinary work. In general though, the in-depth interviews seemed to reveal, in an almost personal way, attitudes and perceptions toward some of the key areas shaping the interface between society and nature.

The core of the book summarizes and evaluates the responses in each category with insightful analysis and frequent quotations from the respondents. Chapter 3 focuses on locally held concepts of nature and how these relate to sustainability. These beliefs, both religious and nonreligious, form the basis for expectations in terms of what the forest provides and also the motivation to find solutions for problems in the forest. Chapter 4 covers perceptions on recent changes in natural environment of Lacandona Rain Forest, including an informative section on perceptions of the "world's greatest danger." Responses included deforestation, declines in animal populations, and rainfall (or drought) as

some of the main threats. Chapter 5 explored the question of blame by exploring responses to questions about responsibility and vulnerability. The Ministry for Agrarian Reform got most of the blame, whereas the peasants and "all of us" are the most vulnerable groups. When asked who should control the forest the respondents suggested peasants and government should be in charge, with international community being a distant third. Chapter 6 uses an interpretive anthropology to identify "discursive structures" on deforestation. The authors lay out a social map of discourses including five positions: dependent, independent, conservationist, "anti-farmer," and fatalistic. Their social map is put forth as ephemeral and shifting based on transactions between groups. So, although this map is changing, it provides insights into the political, social, and cultural basis for resolving environmental conservation conflicts. Sadly, nearly 50% of the respondents felt the forest will be destroyed in 20 years, and only 9% felt it will be saved. Understandably, there was wide variation between communities, explained by the authors on the basis of the social context of the different groups.

There were some omissions and areas where the book could have been strengthened. Given the global context of their work there was a missing respondent, the residents of Mexico City. This would have been an interesting linkage because the authors refer frequently to Mexico City media as a primary source of information for local residents and upon which they often base their perceptions. Also, I found it difficult on occasion to discern the differ-

ence between a number of groups that were not well defined: peasants, farmers, ejido farmers, Indians, and cattle ranchers. This didn't weaken the main thrust of the book but did make following the complex attitudes between community groups difficult. An additional frustration was the frequent use of an illiterate voice (missing prepositions and poor grammar) used in translated quotations of local people which was in stark contrast to the concise analysis presented by the authors and didn't match the level of their often detailed and sophisticated ideas. I'm sure there are disciplinary guidelines at work here but because these were translations and exact quotes were not possible, perhaps editorial input could have been exercised (adding prepositions and switching word order) without altering the content, thus raising the level of discourse presented by the local residents. Finally, a map would have been useful to provide a geographic context for the many place names used in the book.

The strengths of this book are precise analyses bolstered with actual statements from the local people caught in a difficult situation. We are challenged to evaluate the basis for their own opinions and those of others regarding global change. In addition, this study may offer lessons for environmentalists from the United States because the same local versus outsider dynamic characterizes the polarization and backlash resulting from many of our environmental conflicts, such as the Spotted Owl controversy. Connections with the neo-Zapatista uprising, which occurred following the research of this book, may help us understand how the frustration and discontent expressed

by locals can be translated into direct action either by force of arms or political organization. Although it may be a stretch to compare residents of the Lacandona Rain Forest to the loggers, miners, and farmers who make up the wise-use movement in the United States, this case study certainly lays out a groundwork for evaluating the impacts of conservation work on those most affected by changes in policy. Although concise and dense at points, the interpretive anthropology and cultural analyses are presented in a straightforward manner that is easy to follow and should provide plenty of food for thought to those concerned with international or domestic natural resources policy.

This book suggests that when solutions originate externally, as has been the case for international efforts to stop tropical deforestation, despite their good intentions these solutions may be making things worse. Although this may seem a paradox, these problems are real and although solutions must be carefully considered, choosing to do nothing is itself an action with perhaps dire consequences. Now conservation biologists, nongovernmental organizations, and governmental workers seeking to change local behaviors regarding resource use, informed by the tapestry presented here and aware of the importance of global-scale social dynamics, can use this book as a starting point for exploring new ways to design and implement policy.

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