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Boden- und Wasserrecht in Shigar, Baltistan: Autochthone Institutionen der Ressourcennutzung in Zentralen Karakorum

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Books

Isle of Fire: The Political Ecology of Landscape Burning in Madagascar

By Christian A. Kull. Chicago: University of Chicago Press, 2004. xiv + 322 pp. US$25.00. ISBN 0-226-46140-8.

Madagascar—the name of this tropical island in the Indian Ocean is intrinsically linked to the country's fame of being one of the most valued hotspots for biodiversity, but also to its more tragic reputation of being one of the poorest countries in the world. Madagascar's struggle to overcome the increasingly accentuated dilemma between socioeconomic development and conservation is most prominently exemplified by an omnipresent and controversial phenomenon: the continuous burning of vegetation by peasants across the island, from the extensive grasslands and pastures in the western highlands to the remaining forests and fallow lands on the eastern escarpment.

Christian Kull devotes his book to the so-called "fire problem" of Madagascar, which in reality is a century-long conflict over appropriate resource use between local farmers and external stakeholders. This view counters a well-established conviction that fires are ruining the island's natural heritage and preventing efficient use of natural resources, and that something must be done to stop the burning. This conviction, which the author calls the "antifire received wisdom," permeates almost all discussions of Madagascar as part of a larger discourse of environmental degradation. Given the serious impasse created by such perspectives with regard to harmonizing (local) livelihood needs and (external) conservation interests, Madagascar's fire problem was ripe for such a political-ecological analysis.

In the first part of the book, the author lays out the fire problem, documents the theoretical and empirical bases of his work and introduces the reader to Madagascar. Having presented the chosen perspective of political ecology, he proceeds to outline the historical dimension of the topic. The dispute about fire is not a new problem but rather a century-old struggle among different interest groups over access and characterization of resources, and the politics of conflict between them. Subsequently, Kull develops an elegant framework to analyze fire in Madagascar, which distinguishes causes or goals of fire from the effects of burning, and looks at contextual factors that mediate their relation.

The analytic framework sets the stage for the second part of the book, which looks at how fire fits into land users' livelihood strategies around the island. Based on his own fieldwork and a thorough analysis of existing research, Kull examines 8 case studies, enabling him to develop a profound understanding of 3 distinct contexts: the agropastoral logic of fire in a grassland environment; the use and consequences of fire in the *tapia* woodlands; and the role of fire in a slash-and-burn context on a forest frontier of the eastern escarpment. It is a meticulous account of farmers' realities skillfully triangulated by ecological and socioeconomic research perspectives. Three important qualities make this an outstanding section of the book. First, the empirical basis acquired through exhaustive fieldwork and the authors' competence as a precise observer. Second, the in-depth analysis and compilation of existing studies, which offers at the same time an excellent state of research on environment and development in Madagascar. Third, the analytical focus on distinct *contexts* of fire use, which allows the author to balance the account of inherent complexity and a meaningful generalization of main comparable characteristics.

The third and final part of the book focuses on the historical and current politics of fire. The author demonstrates the mechanisms by which the state criminalized fire, and how the peasants resisted this criminalization. By taking advantage of the state's distended nature and of strategic village solidarity, and by harnessing fire's own ambiguities, the peasants have succeeded in defending their livelihoods and meeting their landscape management goals. Kull chronicles the pattern of criminalization and resistance through the history of Malagasy fire politics, revealing distinct historical periods in response to political, economic, and ideological changes. Finally, he critically reviews the most recent attempts to break the impasse between farmers and state over fire through community-based natural resource management. He assesses an imbalanced delegation of rights and duties in relation to the use of fire rooted in the ever-persisting antifire received wisdom. He notes that it is based in Western, urban culture, rooted in the ideas and institutions of natural sciences and biodiversity conservation, and fuelled by the economic interests of powerful international donors.

Such indications nourish the curiosity of the reader to extend the political ecological analysis beyond the duality of peasants versus state actors, namely to explore the role of conservation and development agencies, donors and scientists in shaping and influencing what is the Malagasy state today. A more explicit attribution of responsibilities to the latter actors in supporting unavoidable tradeoffs between development and environment objectives would have benefited the rather pragmatic conclusions, where Kull proposes elements of a contextually differentiated fire policy.

I highly recommend this book, not only to readers interested in fire as a resource management tool, but also to a broader public interested in scientific knowledge production that

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aims at innovative strategies allowing for integration of socioeconomic development and conservation objectives. In this respect, the book implicitly contains the following important elements, which may be promising aspects to be taken up in future by human geography in particular, and sustainable-development-oriented science in general.

First, the study is clearly motivated by a socially perceived problem and not by a scientific agenda. This determines the selection of a wide range of useful and relevant analytical tools leading to a truly interdisciplinary investigation. The fruitful mutual enrichment of diverging approaches is clearly demonstrated, and we observe that an artificial differentiation between fundamental and applied research is unfounded. Second, the author explicitly addresses the normative dimension inherent in questions related to sustainable natural resource management. By taking an ethical position close to peasants' livelihood needs, he does not obscure the analysis but rather increases transparency. Third, the study is guided by an approach that attributes different case studies to comparable contexts which are characterized by common ecological, socioeconomic, and political factors. On the one hand, this makes it possible to point out the high diversity of human–environment interactions without overwhelming readers with the complexity of each case study. On the other hand, it enables a meaningful generalization of insights and avoids oversimplification.

I am convinced that the production of such contextual knowledge represents a promising way to further enhance the relevance of sustainability-oriented research for informed decision-making.

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Boden- und Wasserrecht in Shigar, Baltistan: Autochthone Institutionen der Ressourcennutzung in Zentralen Karakorum

By Matthias Schmidt. Bonner Geographische Abhandlungen, Vol 112. Geographisches Institut der Universität Bonn. Sankt Augustin: Asgard-Verlag, 2004. xiii + 314 pp. €25.00. ISBN 3-537-87662-9.

This is the first publication dealing comprehensively with the human geography, economy, and irrigated agriculture of a cluster of settlements in the Shigar valley of Baltistan, located in Pakistan to the south of the Xinjiang Autonomous Region of the People's Republic of China.

The publication is rich in statistical data on the region (32 tables), monochrome photography (16 photographs), and useful graphics (40 models, architectural drawings, and maps); 6 color maps inserted at the end of the book show the painstaking rigor with which the author has presented numeric and spatial data on land use, ownership, and irrigation systems. The author has copied, digitized, and geo-referenced the data recorded in available land revenue records and maps. A good example of the latter has been reproduced (p 309, Photograph 6). Official land use categories are presented (pp 116–117) separate from indigenous land use terminology (pp 134–135), with no attempt to critique the functionality of official categories, which are identical to those used throughout Pakistan. The 9-page glossary of local terms (pp 296–304) is a valuable resource for future field workers and researchers in the area, despite the occasionally erroneous segregated etymological markers between Urdu, Persian, Arabic, and Balti.

Pastoral economy descriptions and livestock data show how every available resource is traditionally maximized and how a sophisticated cross-breeding between yaks and oxen yields different hybrids suited to diverse altitudes and ecological zones (p 84, Table 5). Anecdotal data on milk yields (p 98) exist, though the economics of meat, bone, hide, and other livestock products would have been helpful. Agricultural data clearly trace the evolution from subsistence agriculture to a cash economy with a cultivation shift to (seed) potatoes, portending a future monocrop culture (p 163). A concomitant transformation of tenancy relations is adequately described (pp 160–162).

The ethnographic, historical, and religious treatment (pp 58–67) is at best rudimentary. The author incautiously uses loaded terms like "feudal" and "mediaeval" (p 67), while taking indirect cognizance of the amorphous nature of Balti kinship (p 60), which anthropologists would have immediately identified as a non-segmentary "Eskimo" system. The treatment of religious belongingness exhibits gaps that could have been bridged by a reading of Shahzad Bashir's important work (Bashir 2003).

The data contained in the book provide a strong argument for the importance of demography in social theory and a fresh discussion of its implications; the opening quote from John Biddulph's seminal work from the 19th century, "…the increasing population is overflowing its limits" (p 1), holds as true today as it did more than a 100 years ago. However, the author's theoretical points of departure (pp 1–11) remain anchored in the empiricism symptomatic of most studies in anthropogeography and move little beyond issues of resource use (for similar arguments, see Solot 1987).

There is a need for rationalizing units used in the book—local weights and measures should be consistently expressed in metric units (p 165). As this book consti-

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tutes a valuable reference work, the need for an index is sorely felt, while footnotes would have saved more time in the reading than the endnotes of every chapter. However, this book breaks new ground in combining available data with fieldwork to reconstruct a segment of land use, irrigation practices, pastoralism, and livestock rearing in the eastern part of the Northern Areas of Pakistan. In particular, detailed descriptive and numeric data on irrigation systems of Baltistan appear for the first time in print. This is the most comprehensive current work on the subject and an invaluable sourcebook for any researcher working on the Northern Areas of Pakistan. An English translation would certainly prove indispensable for any social scientist or development planner working in Baltistan, Ladakh, or Yarqand.

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Global Change and Mountain Regions: An Overview of Current Knowledge

Edited by Uli M. Huber, Harald K.M. Bugmann, and Mel A. Reasoner. Dordrecht, The Netherlands: Springer, 2005. vii + 650 pp. €150.00, US$199.00.
ISBN 1-4020-3507-1.

The challenge of global climate change is engaging scientists across a wide range of disciplines and has become an important issue for politicians and environmental agencies around the world. Modeling scenarios predict not only a range of temperature increases, but also critical changes in precipitation, over the next century. Regional variations in these climatic parameters will be of great significance, particularly in the mountains, which are well known to be sensitive, fragile environments. The impact of these climatic changes will be compounded by population growth, both within and beyond the mountains, leading to increased demand for basic resources, especially land and water.

External system changes, associated with tectonic and climatic events, are rapidly felt in the mountains where thresholds allow rapid reactions, generating responses from geomorphological and ecological systems which can have direct impacts on mountain livelihoods. In mountains, such physical changes are often catastrophic, as the equilibrium conditions between different parts of the system trigger positive feedback loops creating further instability. However, such conditions must be regarded as a normal part of mountain dynamics, reflecting how interactions of climatic and tectonic processes in areas with high relief and available energy promote geomorphic and ecological changes. It is the question how the operation of this system will be affected by climate change that is a current challenge to science.

The International Year of Mountains (IYM) in 2002 did an outstanding job of increasing public awareness of mountains across a range of issues, from the dependence of over half of the world's population on mountain water resources to future sustainability of mountain environments and indigenous peoples. This has been developed in the introductory paper of this book, which sets the scene by reporting on key issues in mountain research developed within the IYM framework and how this has successfully driven subsequent multidisciplinary research. Much of this was motivated by a demand for data on mountain environments by policy-makers. This has led to the establishment of global interdisciplinary structures which have strengthened partnership opportunities, as exemplified by the Mountain Research Initiative (MRI), organized around 4 core activities (Becker and Bugmann 2001):

- Long-term monitoring and analysis of environmental change
- Integrated model-based studies in different mountain regions
- Process studies along altitudinal gradients and catchments
- Sustainable land use and natural resource management

All of these are key components in this book, which provides an excellent synthesis of major issues associated with environmental change in mountains. It is one of the first major outputs associated with the MRI and the GLOCHAMORE (GLObal CHAnge in MOuntain REgions) project funded by the European Commission's Sixth Framework Programme (Price 2006). It forms volume 23 of Springer's series on Advances in Global Change Research, and includes 63 papers stretching over 650 pages. The large number of papers precludes detailed description, and this review will therefore only briefly mention specific sections. The book is divided into 5 sections exploring key themes and developing MRI core activities: palaeoenvironmental changes (15 papers), cryospheric changes (9 papers), hydrological changes (10 papers), ecological changes (15 papers), and human dimensions (12 papers). The papers in each section are summarized at its beginning. Some papers are devoted to synthesis of specific issues, whilst others report developments in specific areas, particularly with new data from high-resolution records or increased monitoring of current processes. The final paper by the editors and eminent colleagues is an excellent synthesis of this great amount of information and identifies

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future research directions. For readers in a hurry, I recommend going straight to this paper which summarizes the main themes in more detail than this review.

It is reassuring to find that many of the general points and issues that I have identified are picked up in this final paper—for example, the need for integrated science and social science projects that involve stakeholders and policy-makers, and the importance of mountain regions and highland–lowland interactions in providing resources and services. The increasing threats to mountain systems from both natural drivers of change and globalization mean that the future will be a challenge—hence the importance of proxy records of past environmental change to allow an assessment of present trends and development of scenarios for the future. Changes to the cryosphere illustrate the future as one where glaciers will disappear from many mountain areas within the next few decades (Thompson et al 2006). Models are important in establishing where temperature change is going to be maximized; but so too is an increase in monitoring networks to assess the complex responses to this change.

The role of mountains as "water towers" is expanded, given that water stress is going to increase considerably as climate change impacts particularly arid and semi-arid areas where most water comes from the relatively more humid mountains (Viviroli et al 2003). The impact on ecosystems will be direct—not only as species move "upwards and polewards," but also through an overall decline in landscape stability. The papers in this book clearly show the complexity of dealing with ecosystems over a wide range of spatial and temporal scales; this can be solved by a "landscape-ecological view of entire mountain ranges" rather than numerous small-scale studies. Integration of biodiversity and land use is important, bringing in the human dimension. This firmly directs attention to the 720 million people who inhabit mountain regions and will be exposed to increased risk and vulnerability resulting from global change, particularly with respect to agriculture, since many are subsistence farmers.

This book is an essential collection of papers on important mountain-directed themes. Climate change has started—it is not a possibility, but reality. Mountains, because of their sensitivity to forcing mechanisms and vertical range, will be among the first environments to react to this change, whether relating to glacier disappearance or to plant migration. As this book clearly demonstrates, the challenge to understand this will require scientific cooperation not only between different disciplines but also involving technology and social science. Global initiatives, such as the MRI, have a central role to play in directing research programs that will inform policy-makers about global change that will impact the entire Earth. The editors and contributors are to be congratulated on the production of this timely book which will be a key text in tackling the challenges posed by climate change.

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Páramos de Costa Rica

Edited by Maarten Kappelle and Sally P. Horn. Santo Domingo de Heredia, Costa Rica: INBio Press, 2005. 768pp. US$25.00. ISBN 9968-927-09-0.

Biome and border identities have always been important considerations for the development of geography, especially regarding the use of applied research for biodiversity conservation. Nowhere is this more apparent than in books that are considered to represent the "state of the knowledge," some of which are recognized as "vade mecums," as guides for future work in ecosystems conservation. When a team of 2 editors compiles a vast amount of information in expert contributions in order to address the daunting challenge of producing a scientific reference work for use in the highland areas of developing countries, the result can be a beacon for fostering mountain geography.

This is the case of Kappelle and Horn's book. Those reading scientific literature in Spanish will consider this book a "bible" with regard to the study of Costa Rican highland environments. Robert Hofstede, author of *Páramos of the World* and current IUCN regional representative for South America, asserts that this new contribution "deserves praise not only for compiling up-to-date existing information but also for including new information, previously unpublished or limited to a restricted readership, about the Costa Rican highlands"—which cover about 1% of the national territory. He echoes other "paramologists" of South America when he expresses a healthy professional jealousy that "a country with only 15,000 hectares of *páramo* has achieved such an important volume including geological, geographical and biological information," and also

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states that this publishing effort is commendable and worth emulating in the Andean countries and in other comparable ecosystems of the world.

Thanks to the financial aid of the Foundation for Tropical Research of the Netherlands, The Nature Conservancy, and the universities of Utrecht, Amsterdam, and Tennessee (Knoxville), the volume represents an important international effort catalyzed in Costa Rica by the National Institute of Biodiversity (INBio) and the Ministry of Environment and Energy (MINAE). There are contributions from both local and foreign scientists and practitioners, including some world authorities in the study of their botanical or zoological subjects. The editors, despite having their origins in the Netherlands and the USA, consider themselves as "Ticos" (Costa Ricans) at heart. Although they were attracted to the mountains because of their interest in tropical ecology, their joint edition is an achievement of holistic thinking in favor of the mountain environments of Costa Rica. They met there serendipitously in the late 1980s, and the outcomes of this encounter have matured over the years. After many workshops, international conferences, congresses, journal articles, and books on cloud forests and fire ecology, it has resulted in a co-edited book of titanic proportions.

The book comprises 37 chapters written by 63 contributors; Kappelle and Horn authored or coauthored 16 chapters. As an overview volume, the book is organized in 7 parts: (1) general aspects of the *páramos*; (2) physical aspects; (3) paleoecological and biogeographical aspects; (4) biodiversity aspects: fungi and plants; (5) biodiversity aspects: animals; (6) biodiversity aspects: ecosystems; and (7) aspects of conservation and sustainable development. The book also includes the Paipa Declaration from the first World Páramos Congress (2002) and the list of publications of Adelaida Chaverri Polini (1947–2003), to whom this book is rightfully dedicated. A portrait of this pioneer of Costa Rican *páramo* research on the summit of Cerro Chirripó opens a rich collection of photographs, diagrams and illustrations that conclude with 18 pages of full colored photographs of the most significant landscapes.

The editors are quick to point out the need for more research to understand the dynamics of Central America's highland grasslands and to guide efforts towards the protection of this small but significant portion of Costa Rica's ecosystems. However, as a highland grassland biome, the *páramo* extends southward to the Huancabamba depression in northern Peru, where it takes the form of a drier tussock grass community, the *jalca*; and on towards the Central Andes of Bolivia, Chile, and Argentina, where aridity has led to the development of yet a different grassland known as *puna*. The book makes a strong case for reconsidering the character of the landscape, hinting at heavy human influence, particularly as fire frequency and intensity are seen as management tools in what some consider "cultural landscapes." I was glad to read many chapters that included pyrophytic species as *páramo* indicators and others known to be serotonic as components of Costa Rican highland florulas, evidencing their human dimension. The chapter on bird fauna helps to demonstrate that most animals are also likely inhabitants of the cloud forests—which certainly constitute potential vegetation at these elevations—and that most are ubiquitous in human-dominated landscapes.

While I did not find a clear answer to the old debate over forests and prairies on tropical mountains, it is clear that all considerations of biodiversity conservation are linked to the presence of humans, who are one of the main factors determining the actual vegetation. For instance, the important landscape history of fire dynamics observed in the Cerro Chirripó leaves one wondering if the few surviving indigenous groups, such as the Bribri and the Cabecar, modify landscapes through their highland–lowland interactions, or if the many colonist groups who set up camp there and opened up forests for cultivation and herding are to blame for the current landscape configuration and species composition.

With this book, most mountain geography colleagues will be confident to revisit the biogeography of neotropical highlands and remap the *páramo* to include the highlands of Costa Rica, Panama, Venezuela, and Colombia; the *jalca* to include the highlands of Ecuador and northern Peru; and the *puna* to include the highlands of Southern Peru, Bolivia, Northern and Central Chile, and Northwest Argentina—although in Tucumán, Argentina, the name *páramo* is still fondly used by highlanders.

Whether the term *páramo* is used to refer to the climatic conditions of cold, misty, thin air, or to the actual ecosystem, this book represents the state of the art in conventional scientific knowledge of Costa Rica's mountains. It would have been fine to include a chapter relating to agricultural landscapes or to ethnobiological, traditional knowledge of the very few remaining indigenous groups living in the isolated Talamanca range, reportedly the northernmost limit of the *páramo*—despite Kappelle's assertion that its northern limit should rather be Irazu and Turrialba near the capital city of San José. It would also have been good to include a chapter on land use change based on repeat photography to ascertain the biodiversity risk potential and factual land use change, as there is new evidence that current forest cover has increased in comparison with fig-

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ures from the past few decades. The book contains a good description of protected areas, especially national parks, but there is a dearth of information regarding other management options, such as private reserves, ecotourism enterprises, or drinking water capture and hydroelectric power generation, for example in the Río Macho and Tapantí, which has been pointed out elsewhere as a prime *páramo* for environmental services. Costa Rica has recently declared a new national park (Los Quetzales) which includes an important remnant of *páramos*. I still wonder if the namesake of this new park is appropriate for emphasizing the need to protect tropical montane cloud forests that are converted into *páramos*, to be used either as pastures or as rangelands, in the process now known as "paramization" or "tropical highland savannization."

This is a truly masterful bibliographic work, which brings the editors as well as their topic to the forefront of tropical mountain geographical research. I am particularly glad that the book has appeared in Spanish, thereby ending a long period of unavailability of this type of state-of-the-art literature to local scientists, professionals, and students, who certainly need to be exposed directly to the challenge of designing the future of Costa Rica's *páramos*. It is refreshing to witness how two doctoral students who became fascinated with the country have now given back to the Ticos, in their own language, a highly valuable scientific treatise on *páramos*, making it an indispensable reference for future montological research and application. Pura vida—this book is scientific advancement with a purpose!

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The Community Forests of Mexico: Managing for Sustainable Landscapes

Edited by David B. Bray, Leticia Merino-Pérez and Deborah Barry. Austin, TX: University of Texas Press, 2005. US$40.00. ISBN 0-292-70637-5.

Community forestry is very much the fashion in forest policy and discourse. The majority of countries in Asia, Africa, and Latin America now have policies that refer to community ownership or user rights, and arrangements for co-management. The experiences of some of these countries—India and Nepal in particular—have been analyzed in immense detail, and with a strong focus on social and institutional aspects. This volume does something few others have done: it focuses on the experiences of one country, in the round. Chapters contribute analyses of history and policy, social processes, ecology and land use change, and economics. It is the outcome of a project comprising a series of studies of these aspects in Mexico, and hence has a natural integrity resulting from the contributors' mutual purpose and history of working together.

The multifaceted analysis, and the ways in which the Mexican experience is set in the global context in the introductory and concluding chapters, are the strengths of this book. The Mexican situation is in many ways unique. It has its roots in the land reforms of the early 20th century, resulting in a situation where 80% of the forests are owned by communities. Mexico's particular achievement is in the commercial production of timber within the context of community forestry, through community forest enterprises (CFEs), which form a focus of many chapters. This is an area skirted around cautiously by governments and development agencies in other countries. Too often, community forestry is synonymous with the desire to achieve reforestation on the cheap, or to pacify rural disquiet. By contrast, the authors term this commercial success "community forestry in the strong sense."

The book is a solid tour of the issues. Authorship ranges from academic to NGO, and with good representation from Mexican writers. The dry style of parts bears further examination: there is good coverage of the political background and the introductory analysis is astute—it is not enough to demonstrate current financial success but, in addition, evidence is needed of ecological sustainability.

A very welcome section addresses the neglected question of the impact of community forestry on forest ecology, although I would have liked to see more on the connection between this and community management. While it is acknowledged that communities are not experts in all aspects of forestry, sustainability relies on good use of rigorous monitoring by the managers themselves—in this case the community. As these chapters make clear, not enough is known about how the valued species regenerate, even by scientists. If community forestry is to be sustainable, it must be adaptive—and that requires that the managers (in this case, the communities) understand and respond to changes in their forests. The need for such expertise is documented in a case study of the *ejidos* in Quintana Roo, where communities were faced with economic crisis unless they improved their inventory methods (Lawrence and Sánchez 1996). Without such procedures, it is not clear that "community forestry in the strong sense" equates to sustainability in the strong (ie ecological) sense.

For the political economist and historian, there is a mass of fascinating detail, covering a range of scales and time periods. Forest owners and users have organized and reorgan-

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ized; matters are not as straightforward as the simple model of *ejido* ownership and management would indicate. For example, Rodolfo López-Arzola describes the exploitation and protest of the Oaxaca indigenous communities, followed by their unionization and the business lessons learnt, particularly through the 1980s. Peter Wilshusen focuses on the state of Quintana Roo and the very recent changes within the *ejidos* themselves, as distrust and financial incentives led to subdivision into work groups. The approach of the book is more social than cultural; description in detail does not often include the voices of the community members or an understanding of how they might make sense of their experiences. One of the most important comments in the book is by Peter Taylor, noting that "successful" CFEs are so, probably, because the economic unit (the cooperative, or *ejido*) overlaps with the social unit, and therefore members have a strong incentive and context in which to make their relationships work.

If the book is strong on the Mexican situation, it is initially a little hazy at times on the wider global context. For example, Arnold's review of community forestry (1998) is taken as a "recent" summary of the field. However, amends are made in the final section. The chapter by Klooster and Ambinakudige is outstanding as a contribution that makes sense of a sprawling literature on community forestry around the world. The book ends on a strong note, with David Bray's chapter pulling together the story that emerges from previous chapters, and summarizing the lessons from Mexico. Clearly, community forestry *can* be economically viable, and policies *can* help to make that happen. To some extent, this experience must be dependent on ecological and social context—which species are in the forest, and how people interact with each other. The experience of Mexican CFEs is encouraging, and similar studies elsewhere are now greatly needed to understand the extent to which that experience is replicable or applicable elsewhere.

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Ecological Responses to the 1980 Eruption of Mount St Helens

Edited by Virginia H. Dale, Frederick J. Swanson, and Charles M. Crisafulli. Berlin and Heidelberg, Germany: Springer, 2005. xx + 342 pp. €29.95, US$39.95. ISBN 0-387-23850-6.

The eruption of Mount St Helens on 18 May 1980 transformed more than 600 km^2 of green coniferous forests and clear cold lakes and streams of the Cascade Mountains to a gray ash- and pumice-covered landscape. Although other volcanic eruptions have had more important ecological and human consequences, the 1980 eruption of Mount St Helens and the ensuing ecological responses are the most thoroughly studied in the world. This may be explained by the close proximity of the volcano to major metropolitan areas, allowing scientists to perform reconnaissance trips and establish permanent plots within a few days of the eruption.

This book synthesizes the ecological research that has been conducted in the 25 years since the eruption by hundreds of scientists, students, and technicians. The fields of research are very broad, ranging from geology to plant and animal ecology of both terrestrial and aquatic systems. The 20 chapters, in 5 sections, provide detailed results of experiments and observations of 25 years of evolution of the physical environment (Section 1, Chapters 1–3), plant communities (Section 2, Chapters 4–8), animal communities (Section 3, Chapters 9–14), and ecosystem processes (Section 4, Chapters 15–18). The last section (Chapters 18–20) highlights 11 important lessons learned from these 25 years of research experience.

Following an introduction, the first section provides information on the pre-eruption physical and ecological conditions and the main physical and environmental events from March 1980 to late 2004. The chapter on the pre-eruption conditions is very useful for non-specialists, although the information provided is certainly too general for specialists. In particular, the climatic presentation of the area is rather simple, with no emphasis on spatial variability and an increasing rain shadow to the east of the volcano. The following chapter precisely defines 6 zones of decreasing disturbance intensity with increasing distance from the volcano: (i) the Pyroclastic Flow Zone, (ii) the Debris Avalanche Zone, (iii) the Mudflow Zone, (iv) the Blowdown Zone, (v) the Scorched Zone, (vi) the Tephra Fall zone. These zones are used by all specialists as a basis for designing their experiments or observations.

Chapters 4 to 6 present the results of long-term experiments conducted on the survival and establishment of plant communities in the Tephra Fall, Debris-Avalanche and Mudflow zones, respectively. In the less impacted Tephra Fall Zone, the authors emphasize the roles of species traits and snow cover at the time of the eruption whereas, in the

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2 latter highly disturbed zones, the authors underline the importance of the dispersal filter to understand community succession, as well as the occurrence of subsequent disturbances. In Chapter 7, focusing on early vegetation development in several highly disturbed zones, the authors recognize the importance of chance events and highlight the unpredictability of the course of succession at these early stages. The last chapter of this second section, a remote sensing approach to the whole area, emphasizes the importance of either environmental factors or of the distance to surviving individuals, depending on the severity of the disturbance.

Chapters 9 and 10 focus on arthropod communities, Chapter 11 on herbivory on prairie lupine (an important colonizer of the highly disturbed zones), Chapters 12 and 13 on aquatic animals (fish and amphibians, respectively) and Chapter 14 on small mammals. In general, the authors emphasize the importance of life-history traits for species survival and the surprisingly rapid colonization of animal communities—particularly aquatic organisms—as compared to plant communities. For example, 20 years after the eruption, fish assemblages were almost similar to those commonly occurring in other parts of the Cascades.

The fourth section deals with ecosystem processes and, in particular, mycorrhizae (Chapter 15), patterns of decomposition (Chapter 16), legume effects (Chapter 17), and response and recovery of lakes. Mycorrhizal responses in terrestrial ecosystems and microbial responses in lakes appeared to be extremely fast with a recovery of almost all ecosystem characteristics in most lakes by 1986, although geothermal activities impede a return to the initial conditions. A decomposition study of rodent carcasses elegantly demonstrates that decomposition was inversely correlated to disturbance intensity, although the authors emphasize that a confounding effect of elevation is likely, because the most disturbed sites occur at a much higher elevation than the least disturbed ones. In contrast to the conclusions of the other sections, chance and dispersal effects do not seem to affect ecosystem processes which are more directly driven by site quality and thus disturbance intensity.

In the last section, after a chapter focusing on ecological perspectives on management of the Mount St Helens landscape, the authors emphasize the difficulty of integrating all the information provided from these 25 years of research. They agree on the absence of a unified theory from which to evaluate the ecological responses to the 1980 eruption, preferring to summarize the story of the aftermath of the eruption of Mount St Helens in terms of 11 lessons provided by this research. Key among these are the importance of the biotic and abiotic legacies which acted as nuclei for species recolonization, the rapidity of some ecological responses, and their high variability and spatial heterogeneity. Another important conclusion of the authors concerns the unpredictability and complexity of successional processes: "All described processes of successional theory have been shown to occur on Mount St Helens and sometimes concomitantly at one location, which underscores the limits of any one existing mechanistic model to explain succession." In summary, this book offers an unprecedented look at the complex interactions of biological and physical systems in response to a major volcanic disturbance.

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Kulturlandschaft oder Wildnis in den Alpen? Fallstudien im Val Grande-Nationalpark und im Stronatal (Piemont/Italien)

By Franz Höchtl, Susanne Lehringer, and Werner Konold. Berne, Switzerland: Haupt, 2005. 629 pp. CHF58.00. ISBN 3-258-06927-1.

Should Alpine cultural landscapes, created and maintained over centuries by mountain dwellers, be preserved, or should nature be allowed to reclaim these areas as wilderness? This topical question, currently debated by decision makers across the whole European Alpine region, is the subject of in-depth discussion in the book under review. The authors have succeeded in drawing a very detailed picture of the current situation in the southern European Alps, as well as providing practical suggestions and recommendations for the area's future management.

The book derives from a research project supported by the Bristol Foundation, Zurich, and implemented by the Institute for Landscape Management in Freiburg, Germany. It comprises the results of 2 PhD theses by 2 of its 3 authors (Susanne Lehringer: *Consequences of Depopulation and Abandonment on an Alpine Landscape and its Population—A Case Study of Strona Valley in the Piedmont (Italy)*; Franz Höchtl: *Landscape Development and "Wilderness" in the Val Grande National Park*), as well as 6 master's theses. The research project was supervised by Prof. Werner Konold, the first author of this book, who is an expert on the history and ecology of cultural landscapes and their elements. The main goal of the project was to analyze "the effects of progressive land use abandonment on alpine landscapes, its inhabitants and users" in the Italian Piedmont.

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The authors chose a transdisciplinary approach, combining methods of historical landscape analysis, vegetation analysis, and empirical social research. The book is structured into 3 parts, the first describing the geography, history, culture, and ecology of the study area; the second offering a detailed description of the methodological approaches and the results of the research project; and the third presenting the discussion of the results, followed by conclusions and suggestions for the future management of the study areas.

The research project focuses on 2 study areas in the Italian Piedmont Alps near the Swiss border: the upper Strona valley and the village of Premosello Chiovenda. The study areas share historical, landscape, and social backgrounds. Both are characterized by a long history of depopulation and land use abandonment, a widespread phenomenon in the Piedmont Alps. However, the 2 areas also differ in important ways. Premosello Chiovenda is populated throughout the year and is situated inside a protected area—the Val Grande National Park, which is advertised as Italy's "largest wilderness area." For this reason, its population hardly engages in agricultural activities. In contrast, parts of the upper Strona valley are populated only during the summer months due to a lack of functioning infrastructure and maintenance. There are no protected sites in the Strona valley, and large areas above Campello Monti are still used as mountain pastures.

The study results show that reforestation in both areas has already reached an advanced stage. In the Strona valley, for example, the area covered by forests has increased by 74% over the past 60 years. Today, only 9% of the total area is still used for pasture, and hardly any agricultural activities are carried out around the villages. Agriculture is mainly practiced as a pastime or to generate part-time income. Many paths are no longer maintained and have become overgrown. Interviews and questionnaires show that in both study areas, local residents perceive and regret these latest developments, whereas the opinions expressed by tourists and visitors are ambivalent—while they appreciated the cultural history and diversity of the area, they were also enthusiastic about the region's tranquility and wilderness.

The authors conclude that future strategies in the study areas need to be tailored to the local situation, and that the local population must be closely involved and participate in decision-making processes. The decision on whether to conserve a cultural landscape or to abandon the area and let it naturally convert into "wilderness" depends on very specific regional and local circumstances. Solutions must therefore be sought in participatory processes. According to the authors, wilderness areas as they exist in the USA, where the term was originally coined, are not compatible with the cultural heritage of Europe's Alpine regions; the establishment of such an area in the study area is therefore not desirable.

This book is very up-to-date and approaches a phenomenon that affects the entire Alpine area. It offers a great amount of detailed information on the history, culture, and vegetation of the area. Even though its findings might not be easily transferred to other Alpine regions without making adaptations, the book still provides valuable information for decision-makers facing similar problems. The authors' successful combination of qualitative and quantitative research methods supports the book's high quality standard and density of information, as well as its integrity. The text is illustrated with many figures, maps, and pictures that make it appealing to read and foster a better understanding of the contents. Despite its size, this book is highly recommended not only for decision-makers or experts dealing with similar questions, but also for a broader public interested in sustainable mountain development and in the history, culture, and ecology of the Piedmont area. The authors succeed in involving their readers and making them curious to visit the area. It is regrettable that no English translation is available.

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