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Reviews of Web Sites, CD ROMs, Books

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Web Sites on SWC

The following Web sites are devoted to networks and projects concerned with soil and water conservation (SWC) worldwide; not all of them focus on mountain areas.

ICIMOD: Technologies for water conservation and development

www.icimod.org/sus_options/bp_water.htm
In its "Best practices and appropriate technologies" section, ICIMOD presents a variety of irrigation methods and describes their features and components as well as some of their advantages and disadvantages.

FAO land and water development division (AGL)

www.fao.org/ag/agl
This important searchable FAO site provides access to a wealth of information, databases, and tools developed by FAO and other projects and programs that focus on SWC. FAO publications and videos can be downloaded or ordered electronically. A list of separate portals facilitates the search for overviews on specific topics (eg, the portals on soil information: www.fao.org/ag/agl/agll/prtsoil.htm and conservation agriculture: www.fao.org/ag/agl/agll/prtcons.htm). The entire site is also accessible in French and Spanish.

UNEP: Success stories in land degradation–desertification control

www.unep.org/unep/envpolimp/techcoop/1.htm
For more than 20 years, UNEP has been actively involved in worldwide efforts to combat dryland degradation. UNEP has documented success stories of projects and community-based initiatives that have successfully addressed these problems. The web pages provide summaries of 18 award-winning success stories, some of them in mountainous or hilly areas.

WOCAT: World Overview of Conservation Approaches and Technologies

www.wocat.net
The Web site of the World Overview of Conservation Approaches and Technologies (WOCAT) described in the Development section of the present issue of *Mountain Research and Development*. WOCAT does not specifically focus on mountain areas but lists many examples from steep countryside. It also provides links to many partner institutions involved in SWC activities.

WASWC: World Association of Soil and Water Conservation

www.landhusbandry.cwc.net/abwaswc.htm
The World Association of Soil and Water Conservation (WASWC) is an international NGO of professionals and informed laypersons dedicated to promoting the sustained use of the earth's soil and water resources. WASWC provides a forum through which soil conservationists can be kept up to date on worldwide developments in their field, obtain information, and contact people working on similar problems. There is no particular focus on mountain regions.

GTZ: Development of mountainous regions

www.gtz.de/themen/index-en.asp
By accessing this list of themes, the user can find information on the GTZ's program for the development of mountainous regions, which it has elaborated on behalf of the German Federal Government. The GTZ or Deutsche Gesellschaft für Technische Zusammenarbeit is implementing a number of projects related to sustainable management of natural resources in mountain regions.

ASOCON: The Asia Soil Conservation Network for the Humid Tropics

www.asocon.org/main.htm
ASOCON is a network that assists member countries through a program of information exchange, regional workshops, expert consultations, and learning activities to enhance the skills and expertise of those responsible for the development and dissemination of SWC practices in small-scale farming, including indigenous practices.

Kilimanjaro Environmental Conservation Management Trust Fund

www.kilimanjarotrust.org
Mount Kilimanjaro is a Biosphere Reserve and a World Heritage Site. For generations, it has been a major source of drinking water, traditional smallholder irrigation, and power generation for the National Grid. Following serious environmental degradation, a Trust Fund was created, aiming to mobilize financial resources and channel them to communities with a view to financing community-driven activities geared toward combating environmental problems and hence improving people's lives.

Improving natural resource management and food security for rural households in the mountains of Yemen

www.capri.cgiar.org/projects/64.htm
The International Center for Agricultural Research in the Dry Areas (ICARDA) has launched a project to develop a decision-support tool, the aim of which is to enable policy makers to understand farmers' investment behavior and analyze the policy and institutional options that could assist in reversing terrace degradation. Indeed, rainfed agriculture in the mountainous areas of the Republic of Yemen was developed centuries ago, based on intricate systems of manmade terraces. In order to mitigate the threat

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posed to rural populations by the degradation of these terraces, the development of cost-effective SWC practices and productivity-enhancing technologies, as well as the identification of policy and institutional options that enable the adoption of these technologies and practices, is urgently needed.

The Vetiver Network

www.vetiver.org
This site provides abundant information on the use of vetiver as a soil and water conservation measure. The Vetiver network is a foundation with a mission for developing and disseminating information on the use of vetiver grass for SWC, land rehabilitation, embankment stabilization, disaster mitigation and pollution control. Examples available online illustrate the use of vetiver technology in many different (often mountainous) parts of the world. The site also has pages in French.

Mountain Technology

mountaintechnology.tripod.com/index.html
An interesting private attempt, based in Dehradun, India, to provide a platform through which individuals and institutions interested in mountain technologies can share information and knowledge. Several SWC technologies are listed but no examples or discussions are available yet. The authors of the site, who have received some support from the Society for Promotion of Wastelands Development, New Delhi, and ICIMOD, are encouraging users of the site to provide information.

Cover crops in hillside agriculture

www.idrc.ca/acb/showdetl.cfm?&DID=6&Product_ID=378&CATID=15
By Daniel Buckles, Bernard Triomphe, and Gustavo Sain; IDRC/CIMMYT 1998, ISBN 0-88936-841-4. This electronic book, available in English and Spanish from the IDRC Web site, provides a comprehensive evaluation of the use of velvetbean as a cover crop on the hillsides of northern Honduras. It sheds light on the opportunities and constraints presented by cover crops in the humid tropics and, perhaps most importantly, tells a story of successful farmer innovation. An abstract in French is also available.

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CD ROMs

WOCAT—World Overview of Conservation Approaches and Technologies

CD ROM Version 2.0. Runs with Windows 95 and MS Office 97. FAO Land and Water Digital Media Series 9. Published by FAO and WOCAT Network, 2000. Available free of charge.

WOCAT is a hands-on toolbox for conservationists. Its general aim is to provide a comprehensive framework, with methodologies and guidelines, for the description and evaluation of technologies, approaches, and strategies used for the conservation of soil and water resources. Over the past decade, the WOCAT methodologies have been well established and are applied globally in more than 35 countries. Over 125 conservation technologies and approaches have been documented in a public-domain database available on the Internet (www.wocat.net).

The WOCAT consortium has now published a completely revised version of its CD ROM. The CD ROM is a comprehensive guide to WOCAT. For new users, it includes an introductory slide presentation explaining the purposes and working principles of WOCAT and its methodologies. This is complemented by a video, presenting comments from members of the international WOCAT consortium and feedback from WOCAT users all over the world.

The core of the CD ROM is a selection of the fully searchable MS ACCESS-based databases of conservation approaches and technologies that have been compiled over the years. A standardized 2-page summary sheet can be printed out for each technology or approach documented. For an extended analysis, a query system enables complex database searches. This query system can be used, for example, to search for conservation technologies that are applied under certain environmental, economic, or land-use conditions. The system also provides information about the cost of the measures, their adoption or rejection by the local land users, and other socioeconomic aspects of soil and water conservation. Thus, experiences from other regions with similar framework conditions are easily accessible and comparable. This makes the database a valuable tool for conservation planners and extensionists. The CD ROM also contains an image database with photographs, sketches, and maps related to the technologies and approaches documented in the databases. These images help visualize and understand the different



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technologies and approaches documented in the databases.

WOCAT is a platform for exchange between conservationists. Its databases are "living," and they depend on the contributions from experts worldwide. The CD ROM therefore contains a list of people who have contributed to the databases and who may be contacted for advice and for further information. The CD ROM also includes all questionnaires and forms required to document and submit *new* information to the databases. However, it is not meant to be a "starter kit" for new and inexperienced users of WOCAT. The process of documentation, from the initial data collection in the field to the building of the database and a data-quality check, requires an initial training and guidance from experienced WOCAT users.

The CD ROM provides a basic understanding of the tools and methodologies used for the documentation of soil and water conservation. It also makes available an impressive sample of the presently existing database. The WOCAT CD ROM is a very valuable source of information for all those concerned with the conservation of soil and water resources. It is user friendly and will work on any standard desktop computer equipped with the WINDOWS 95 operating system and MS Office 97. It also contains a runtime version of MS ACCESS 97. The CD ROM is available free of charge from CDE WOCAT, Hallerstrasse 12, CH-3012 Berne, Switzerland, e-mail: wocat@giub.unibe.ch or from FAO, AGLL, Via delle Terme di Caracalla, 00100 Rome, Italy, e-mail: land-and-water@fao.org.

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Books

Agrarian Reform in Theory and Practice: A Study of the Lake Titicaca Region of Bolivia.

By Jane Benton. Aldershot, UK: Ashgate; 1999. x + 207 pp. £42.00. ISBN 1-85972-696-8.

In l953, Bolivia embarked on Latin America's second most profound agrarian revolution, which led to the liquidation of the hacienda system in the most populated western Andean region of the country and a radical redistribution of land, labor, suffrage, and educational rights to the Aymara and Quechua peoples. Jane Benton's *Agrarian Reform in Theory and Practice: A Study of the Lake Titicaca Region of Bolivia* is a useful, penetrating, and updated perspective on Bolivia's pathbreaking agrarian reform, as it revisits its impact at various intervals over the last half century.

For Benton, an agrarian reform worthy of its name represents not just new land rights, a redistribution of wealth, greater personal dignity, and new market opportunities but also access to the state's agricultural services, bringing increases in agricultural productivity and income for peasant farmers. This compact book gives special attention to the Lake Titicaca region and also in one chapter examines the more recent controversial land reform law known as the National Agrarian Reform Service Law (Ley INRA), passed in 1996 by the Bolivian congress. Benton's treatment of both these agrarian reforms offers a rigorous, insightful, and balanced interpretation of their many important and complex benefits as well as inherent limitations and contradictions for peasant and indigenous communities. Her geographer's eye for detail provides many keen observations of Andean physical landscapes to enrich the study.

The book is divided into 2 parts: the first 5 chapters remain more at the macro level and insert the agrarian reform story within Bolivia's wider sociopolitical context and the colonial and Republican historical process, eventually reaching the dramatic and far-reaching changes of 1953. This section includes an overview of some of the important literature on land reform experiences in Latin America and a historical analysis of Bolivia's land tenure changes and the struggles of the Aymara and Quechua peoples to oppose them. Episodes such as the "Law of Confiscation" of 1871, leading to the usurpation of altiplano indigenous lands on a grand scale by whites and mestizos, receive their due importance within this analysis. Her historical thread traces the social and political forces that hurled this nation-state into a full-blown social revolution led by the Movimiento Nacional Revolucionario and peasant-miner militias, which yielded one of Latin America's most sweeping agrarian reforms.

Benton weaves this political and social analysis of the 1953 agrarian reform upheavals together with a detailed picture of the legislation's key articles and land tenure categories and the respective roles of the implementing state institutions. Following this macrolevel sociopolitical treatment of the agrarian reform, she examines the country's second most important agrarian reform of the 20th century, the "Ley INRA," the effects of which have been more positive for Bolivia's indigenous peoples from the eastern lowlands, the indigenous peoples who had actually lost ground from the 1953 reform. She qualifies her assessment with the major caveat that many obstacles have blocked putting their collective rights gains into practice and, despite the promise of the new law, security of tenure cannot be guar-

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anteed, in part due to this enduring political and social power of a neolatifundista class dominating regional politics.

The remaining 6 chapters, constituting the second part of the book, concentrate on the Lake Titicaca region, especially the 2 communities of Chua Visalaya and Llamacachi, to explore questions about the reform's lasting impact on community development efforts and the quality of life for Aymara families. Benton's 1971 field work with hacienda "ex-colonos" and others provided the basis for a "before and after" examination of the reform by comparing the post-1953 situation to conditions of production, marketing, and human dignity and welfare under the hacienda system. However, several anomalies in the situation uncovered by her research give the analysis some ironic twists. The traditional hacienda in question failed to fit the classic profile of a socioeconomic institution that was technologically backward, as it deployed an array of improved seed, mechanical equipment, pedigree livestock, and modern management practices.

Also, only 1 of her 2 studied communities had been previously incorporated into the hacienda system. Llamacachi had always remained independent from the estate system under the juridical status of a "comunidad originaria." These 2 communities, with their distinctive historical experiences within the same basic locality, enabled Benton to set up an interesting comparative research design. She found that, during the post-reform period, Llamacachi had achieved community development success by promoting onions as a new commercial crop through the new marketing channels for peasant producers opened up by the reform changes, while Chua Visalaya demonstrated a sluggish response to the new marketing opportunities.

The agricultural extension and other service programs of the Interamerican Agricultural Services (IAS) (formerly a US government entity) delivered chemical fertilizers, improved potato seeds, pedigree sheep livestock, chemical insecticides, and pesticides to Aymara farmers in a timely fashion, which also tended to benefit Llamacachi rather than Chua Visalaya. Benton finds that the legacy of a paternalistic hacienda system may explain these differential responses to new economic opportunities. The impressive pride of the Llamacachi Aymara is illustrated by their unwillingness to allow their daughters to assume subordinate roles in domestic servant employment in the capital. Benton adds that, instead, these entrepreneurial women themselves were too busy "running their own businesses" to consider such low-status employment. The irony in this story is that the road to socioeconomic progress, rather than being paved with new land rights, resulted from collateral changes released in the countryside by the overall reform effort.

However, in the subsequent chapters, based on Benton's revisits to the 2 communities at different intervals over the 1980s and 1990s, this picture of agricultural modernization and material gain (eg, acquisition of various household consumer goods) by peasant families from the agrarian reform undergoes a reversal from anti-agricultural public policies (especially neoliberal ones) and other factors, sending the communities into ever increasing economic, social, and ecological stress. It is here that the issue of environmental sustainability—which had not been addressed in her agricultural modernization assessments in 1971—becomes central to tracing the 1953 agrarian reform's lasting legacy. Ongoing land fragmentation, labor shortages due to increased urban migration, overgrazing sheep, inappropriate tractor mechanization, changing land use patterns, and declining nutrition combine to signal an overall bleak future for lakeside farming.

This latter, more pessimistic depiction of the lakeside communities also appears to call into question—at least implicitly—several of the technologies behind the positive gains promoted by the IAS program prior to the decline of such services and the resultant community changes. Thus, Benton's positing of the sequence of socioeconomic change in the postreform period in the Lake Titicaca communities is one in which farming and related community life got considerably better before it became worse in its current precarious condition.

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Governing Irrigation Systems in Nepal. Institutions, Infrastructure, and Collective Action.

By Lam Wai Fung. ICS Press, Oakland, California, 1998. viii + 274 pp. US$24.95. ISBN 1-55815-505-8.

At the dawn of a century in which water will be one of the main issues involved in responding to the needs of an increasing population, Lam's book deals with important issues such as the factors influencing irrigation performance and collective action. Thus, even if the analysis is based on case studies from Nepal, the full implications of the book lie outside these geographical limits with regard to the methodological approach as well as political implications.

It is evident from the book's first line that Lam takes a position against the "conventional policy analyses (that) normally address irrigation governance and management in terms of the technical aspects in irrigation systems" (p 1),

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showing that the research was carried out at a time (fieldwork in 1992) when irrigation management transfer policies and collective action theories were in their early stages. The aim of this research is to advance arguments and demonstrations (using statistical tools) against the technical approach to irrigation management and to propose an institutional approach ("if institutions are a key to understanding irrigation performance," p 6).

Lam champions the idea, which is one of the book's strongest conclusions, that the performance of irrigation derives more from water management institutions than the degree of modernity and sophistication of the hydraulic infrastructure. Indeed, sophisticated engineering infrastructure such as permanent headworks tends to bring about lower levels of performance. By increasing the water diversion capability, such structures exacerbate the asymmetries between head enders and tail enders in terms of access to water; this also affects interest in collective action and unbalances the bargaining power of each group. The implication of such findings is huge for irrigation development projects and the apportionment of funds between the construction of the irrigation network on the one hand and organization and maintenance of the system on the other hand. Lam also suggests "a critical assessment of the local situation before an engineering infrastructure is constructed" (p 204) in order to know how farmers are able to organize themselves and then how sophisticated the infrastructure should be.

Moreover, Lam seeks to answer the question of how institutional arrangements affect the performance of irrigation systems in Nepal. The underlying problem is to understand how to improve the performance of the agency-managed irrigation systems (AMIS). Such systems, built and managed under the responsibility of the Department of Irrigation (DOI), generally meet with constraints in terms of technology, physical condition of the network, water delivery and agricultural productivity, especially compared with farmer-managed irrigation systems (FMIS). The author seeks to understand the factors that explain this difference in irrigation performance. Hence, his research fits into the stream of irrigation studies that attempt to learn lessons from the manner in which farmers manage FMIS, considering above all AMIS and FMIS as irrigation systems with common features.

To answer the aims of his study, Lam focuses on 2 directions that constitute the 2 parts of the book. The first (Chapters 2 and 3) deals with collective action and the influence of the type of governance on individuals' incentives. In this part, Lam gives a remarkable description of the functioning (and lack thereof) of the DOI and of the problem of corruption as a real system from which it is difficult to escape. He analyzes the points that make cooperation between the 2 "teams"—farmers and DOI officials—difficult in the management process, emphasizing that this should not be a reason for the privatization of the service.

The second part (Chapters 4–6) deals with a statistical analysis of 150 case studies from the database of the Nepal Irrigation Institutions and Systems (NIIS) project. The first step in this analysis (Chapter 4) is a definition of the concept of irrigation performance, based on 3 dimensions (physical condition of the infrastructure, water delivery, and agricultural productivity) whose variables are tested. In Chapter 5, using regression models, Lam analyzes the effect of various institutional, physical, and socioeconomic variables on irrigation performance. Some rival hypotheses that could explain the difference between AMIS and FMIS are tested in Chapter 6.

These 2 parts are introduced by a chapter that outlines the theoretical context and background, such as the logic on which collective action theory is based, a presentation of the characteristics of common-pool resources (nontrivial exclusion, substractibility, prisoners' dilemma game), and the notions of team production and coproduction.

The most important chapter for development and irrigation turnover process is the conclusion (Chapter 7), in which the results of the previous parts are used to make proposals for irrigation policies. Among these, and apart from what has come before, we notice the need for efforts to help farmers enhance their capability to work together and to avoid a dependence mentality rather than imposing rules on farmers (pp 192–193); a better distribution of irrigation tasks between farmers and officials, especially to avoid officials being involved in water allocation, as they do not have accurate information about its socioinstitutional aspects (p 200); the need for information and rules commonly accepted and negotiated instead of institutions as formal rules on paper (p 204); the need to take local institutions into account (p 204); and the need to give some autonomy to water-users' associations in order to avoid them being perceived as imposed by the government (p 208).

The book is notable for its honesty and clarity in the description of the scope of the study and in the presentation of results as well as for the caution taken in announcing conclusions based on these results. Unfortunately, there is no map to locate the sites or even the district names.

Some gaps must be recognized. First, there is very little information about the institutions themselves, how they are organized, how they work, how diverse they are, and whether there are any fundamental differences between those of FMIS and AMIS. There is a need for some anthropological analysis of these

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institutions in order to understand the various viewpoints that the author mentions ("from the farmers' perspective…") as well as analysis of the social dynamics that drive the institutions. Second, as with much research on collective action theory, historical aspects are neglected. When an attempt is made to integrate them, it is done awkwardly; for example, the ages of the various irrigation systems are supposed to relate to the historical evolution of the influence of factors analyzed without taking into account the development policies or other historical factors that might have influenced the management of the systems. Third, there is no reference (confirmation or invalidation) to the analysis of Yoder et al (1987), which states that, in the hills of Nepal, the degree of organization is higher when the main canal is long and requires a lot of maintenance work—the need for manpower for repairs explains the cooperation and the stronger organization. In the same way, the present research does not take a clear position regarding the theory that gives importance, in the explanation of collective action, to ecological data, risks, and difficulty with access to water.

The statistical approach also raises some questions. The problem it refers to is the definition and the measure of the efficiency of an institution. Lam defines irrigation performance in a convincing manner, but the measure of the efficiency and of the variables affecting performance is more subjective. Lam's interpretation seems consistent but sometimes falls victim to the figures and the meaning behind numbers and variables. For example, the dichotomy of Terai vs non-Terai irrigation systems with regard to the natural physical terrain could be discussed (river systems in the hills under natural conditions are closer to the Terai system than to the mountain system), and more accurate variables could be chosen to refer to ecological situations. Another example is that of water delivery, interpreted as concern with appropriation problems of water distribution and allocation (p 101)—and not with the physical problem of water delivery—which are a major difficulty in many AMIS. Figures are often perceived as more convincing and reassuring than qualitative arguments, even if they refer to vague categories (low, moderate, high).

Even if one does not completely agree with the approach proposed, the implications of this book for development policy are undeniable and the conclusions are important. I appreciate that the conclusion states the following fundamental points: "cooperation among individuals is not automatic" (p 187), "no recipe exists that will enable farmers to develop a reciprocity" (p 207) and "no recipe exists for the best configuration of institutional arrangement that fits all situations" (p 191). These conclusions remind us that managing water is an art involving both technical and social aspects, evolving within an historical and socioeconomic context that is different in each local situation.

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Growth, Poverty Alleviation and Sustainable Resource Management in the Mountain Areas of South Asia

By M. Banskota, T. S. Papola, and J. Richter, editors. Kathmandu, Nepal: ICIMOD; Feldafing, Germany: German Foundation for International Development; 2000. 590 pp. US$15 (developed countries, agencies), US$10 (developing countries). ISBN 3-934068-36-7.

This large compendium of "development" papers on the Hindu Kush–Himalayan region represents the proceedings of an international conference held from 31 January to 4 February 2000 in Kathmandu, Nepal. It was organized jointly by ICIMOD and its major sponsor, the German Foundation for International Development. There are 20 papers arranged in 5 parts: Part I—Perspectives and Issues (chapter 1); Part II—Overviews (chapters 2–8); Part III—Economic Opportunities and Options (chapters 9–13); Part IV—Land Systems and Natural Resource Management (chapters 14–17); and Part V—Access, Equity and Linkages (chapters 18–20).

As with most publications of this kind, there is a wide range in the quality of the individual chapters. Some are excellent, well-written scholarly contributions (especially those by Kreutzmann, Acharya, and Jodha, chapters 18–20). Some include valuable socioeconomic, demographic, and natural resource use data sets, and these alone make the acquisition of the book worthwhile. There are also some mundane, even trite, and parrot-style chapters and some banal country propaganda. This wide variation is not surprising when one considers that the contributors include recognized international scholars at one extreme and country-level bureaucrats at the other.

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The conference "was an attempt to take stock of the trends and experiences and to contribute toward formulation of appropriate strategies and policies for sustainable development in the mountain areas of the Hindu Kush–Himalayan region" (p 9). Because of the book's size and scope, only a few chapters have been selected for specific comment.

Chapter 1, Issues and options, provides a competent background, outlines the main issues, and serves as an executive summary with a list of 13 recommendations. Chapter 2, Searching for viable socio-economic and environmental options, is a lengthy (48 p) overview of the region. Although it contains some useful data and a series of 7 maps in color (several of limited value because of scale and thus illegible), it reads as an in-house ICIMOD report that we have read several times before over the last decade or so. Further, it is flawed by a confused account of the deforestation–downstream flooding and siltation debate.

In particular, the reference to Hofer and Messerli (1997) implies that these authors came to conclusions exactly the reverse of their actual findings! I think it is vital that this kind of misunderstanding be eliminated.

> A related concern was the downstream impacts of reckless deforestation in mountain areas. Bangladesh experienced unprecedented flooding in 1974 (Hofer and Messerli, 1997). As experts began to look for reasons, many found upstream damage in the Himalayas a plausible explanation (Hofer and Messerli, 1997). (p 88)

On the next page:

> Doubts developed when, in the late eighties, a research report revealed that, in downstream areas, there was already a significant stream load contributed by the river itself and not just from upstream areas (Bruijnzeel and Bremmer, 1989).

There is no space for examination of all the misinformation contained within these 2 quotations. However, because they lie close to one of the core areas of Himalayan environmental assessment and the development of appropriate policy responses, some remarks are in order.

First, Hofer and Messerli were referring to the floods of 1987 and 1988 and others, not just of 1974. Second, their work (a better reference would have been Hofer 1998) and the publications of other colleagues (Thompson et al 1986; Ives and Ives 1987; Griffin 1989; and others) had demonstrated the validity of Hamilton's (1987) somewhat light-hearted, albeit serious, remark—"it floods in Bangladesh when it rains in Bangladesh." Third, "doubts [had] developed" long before the publication of Bruijnzeel and Bremmer's 1989 review of existing papers rather than "research report." This kind of writing contributes little to the objectives of this conference and set of proceedings.

The remaining overviews of Part II (chapters 3–8) are "country reports." They should be read with the understanding that their authors were probably constrained to "political correctness," which itself raises a serious issue for an international publication. In view of this, I would rate chapter 3 as a courageous discussion of the disaster that almost overwhelmed the Chittagong Hill Tracts (CHT) and even Bangladesh itself. The 20 years of civil war represent a shameful illustration of misconduct and ethnic torment by the central government of the time, together with totally inappropriate conduct by foreign aid agencies. The account of the CHT successes of the last few years, leading toward progressive healing of the tragedy, is remarkable, especially in the light of the content of the following paper on Bhutan.

Chapter 4, purporting to illustrate the development experience of Bhutan, is little short of self-serving propaganda. "Gross National Happiness" (GNH) has been a convenient and, until recently, a highly effective watchword for His Majesty's Government of Bhutan's attempts to mislead outsiders concerning a government-sponsored tragedy that has at least reached the scale of the CHT disaster. In contrast to the situation in the CHT and the Shanti Bahini guerrillas, the refugees (about a quarter to a third of Bhutan's total population) have maintained a peaceful form of resistance; in effect, they have been completely passive victims. About 100,000 Bhutanese of Nepalese descent are surviving in refugee camps in eastern Nepal. The current Bhutan–Nepal efforts to verify the claims of the refugees to Bhutanese citizenship, and hence to possible repatriation, involve interviewing only 10 families per day. Because the Bhutan government authorities are insisting that no individual decisions will be made public until all 100,000 have been processed, even those interviewed in April 2001 face the prospect of having to wait 4 or 5 years before they learn of their status. In view of this, chapter 4, to my mind, constitutes another piece of misleading propaganda and cannot begin to provide adequate coverage of the Bhutan situation. It is unfortunate that ICIMOD and the German Foundation for International Development have allowed themselves to become conduits for such propaganda.

In conclusion, students of the Hindu Kush–Himalayan region will find this publication a valuable reference. Although it contains several excellent and important papers, much of it should be read, however, with a very critical mind.

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Contribution of Livestock to Mountain Livelihoods. Research and Development Issues

By Pradeep M. Tulachan, M. A. Mohamed Saleem, Juhani Maki-Hokkonen, and Tej Partap, editors. Kathmandu: International Centre for Integrated Mountain Development (ICIMOD); Beijing: Chinese Academy of Sciences, 2000. 319 pp. US$20.00 (developed countries), US$15.00 (developing countries), US$10.00 (ICIMOD member countries). ISBN/ISSN 92-9115-264-1.

Farming systems in the mountains and highlands of the world are generally mixed systems with livestock as one of the essential components. Mountain and highland communities depend on livestock production, which is the most neglected component of farming systems despite the fact that it is the backbone of land-based economies in mountain areas. Of late, livestock production has been accused of causing environmental degradation in mountain areas and sometimes contributing to the greenhouse effect, but these are mere allegations. Many mountain scholars, through their studies, have suggested that livestock production is environmentally friendly and contributes to the ecological integrity of farming systems, in addition to supplementing family incomes, generating employment, providing security to their owners, and being part of the people's cultural fabric.

Although the food security of communities in mountains and other harsh environments depends on livestock, this form of production is hardly ever a part of deliberations at international meetings and tends to be marginalized in development agendas. Amidst this grim reality, the *International Symposium on Livestock in Mountain/Highland Production Systems: Research and Development Challenges into the Next Millennium*—jointly organized by the International Centre for Integrated Mountain Development (ICIMOD), the Systemwide Livestock Programme of the Consultative Group on International Agricultural Research (CGIAR) convened by the International Livestock Research Institute (ILRI), the Food and Agriculture Organization (FAO), and the Centro Internacional de la Papa (International Potato Centre, CIP) in Pokhara, Nepal, from 7 December 1999 to 10 December 1999—gave a new lease of life to livestock and livestock-based economies. The book under review is the summary of this International Symposium.

The book is divided into 4 parts. Part I is the crux of the whole matter. The 4 editors, assisted by Beryl Rajbhandari, present an excellent overview of the research and development issues and challenges facing the livestock sector in the mountains and highlands of Asia, Africa, and South America. Institutional systems in these regions of the world can extract from the text everything that is indispensable for the development of livestock production and can thus greatly help improve the living standards of the communities inhabiting these regions. What is also remarkable about this overview is that livestock production has not been isolated from other components of mountain farming systems. It has been linked with everything else—natural resources, cultivation practices, cultural values, livelihood systems, etc—and the contribution of livestock production to the overall improvement of ecosystems has been highlighted. Part I ends with a box entitled "Pokhara Call for Action" that makes the matter still more interesting. An excerpt reads:

> Livestock are of particular importance in highland/mountain farming systems. They provide direct tangible benefits such as food, fiber, and draught power, as well as the indirect benefit of converting crop residues and other plant biomass into useable nutrients, the key to sustaining smallholder mixed farming systems. They also provide people with a secure form of investment, assets, and a protection against risk. In addition, livestock can enhance biodiversity across the landscape, and can help to balance social inequities, especially for women and the landless.

Part II of the book focuses on the diverse contributions of livestock to mountain livelihoods. Part III covers livestock production systems in the high-pressure areas of the Hindu Kush–Himalayas, the East African Highlands, and the Andean region. Part IV spells out concerns about livestock-based livelihoods and sustainability. In all,

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this wonderful book has 20 chapters. Almost every chapter presents the results of research, looks into constraints, highlights issues, describes general and specific contributions, proposes concrete suggestions, and elaborates on options.

The Pokhara Call for Action was the most significant outcome of the International Symposium. It recommends preparation of a global research and development agenda to improve livelihoods in livestock-dependent mountain and highland communities, incorporation of a livestock agenda in the framework of the International Year of Mountains in 2002, promotion of a higher priority in national and international development agendas for gender-balanced participation, empowerment, and property rights of livestock-dependent mountain and highland populations, and support for activities aiming to improve livelihoods in these eco-regions. If institutional systems abide by these recommendations and implement them with all sincerity, there is no doubt that the livestock sector will develop and consequently contribute to the welfare of the communities depending on it.

The book, in essence, presents the wonderful world of livestock. It is a rare and a landmark publication. The eminent livestock specialists and the livestock-sensitive authors of individual chapters—the participants in the Symposium—deserve all praise for weaving sustainable livelihoods around livestock. When one peeps into the amazing role of livestock in human development and welfare, one gets a feeling of attachment for them.

The book, however, gives no room for livestock rights and welfare. Human welfare cannot be one way. It should be complementary. Animal welfare should ultimately articulate into human welfare. It is high time the national and international organizations, scientists and groups of creative people developed a certain sensitivity toward livestock. Livestock welfare—an important ethical issue—should also have been recommended as part of the agenda for research and development activities.

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Virtual Rivers: Lessons from the Mountain Rivers of the Colorado Front Range

By Ellen E. Wohl. New Haven/London: Yale University Press; 2001. xi + 210 pp. 89 b/w + 29 law drawings. US$35.00, £27.50. ISBN 0-300-08484-6 (hardcover).

Researchers seeking a treatment of numerical simulation in fluvial geomorphology in *Virtual Rivers* will be disappointed and should search elsewhere. Other readers will be rewarded by a clear, succinct history of the headwater tributaries of the South Platte River draining the eastern slope of the Front Range of Colorado, USA. Ellen Wohl refers to these streams as "virtual" because, although they appear natural to the casual observer, they actually reflect a complex history of anthropic use, disturbance, and management. By this criterion, almost all streams and rivers at middle and low latitudes (and many at high latitudes) should be viewed as "virtual rivers." Those of Colorado are perhaps exemplary in this respect because major impacts of the last 200 years appear to have been replaced by "natural" conditions.

Wohl presents this history in a narrative of 4 chapters that emphasize the last 2 centuries of development in the Front Range. The introductory chapter covers a wide set of concerns and a long period of time (the Holocene) in a succinct fashion. It sets the scientific and historical context of the volume with brief descriptions of the scientific study of rivers, the human impacts on them, and the history of the Front Range streams before European colonization 200 years ago.

Starting in the early 19th century, beaver trapping on the Front Range streams involved the first major impact on their form and dynamics. This treatment is largely speculative and based on historical documentation, which is often only indirect and difficult to place on the ground. The difficulty of evaluating the effects of removing a key species, such as the beaver, from these fluvial systems is exacerbated by subsequent anthropic impacts that have been more direct and much greater in magnitude.

The following chapter treats the "arrival of civilization" to the Front Range streams and constitutes the bulk of the book. It traces the history of the channels from the discovery of mineral resources in the Front Range in 1859 to the end of the 20th century. The successive insults to the fluvial systems of the eastern Front Range have left us with streams that reflect the cumulative effects of these impacts. In sequence, these have involved major impacts from mining, when the streams were used in removing waste; timber harvest, when other streams were used to transport timber products in "tie drives"; and the development of water resources for irrigation and municipal supply, which has involved the abstraction of water from many streams and the augmentation of flows in others. All of these have had both direct and indirect effects on the channels of the Front Range, even where their influence is not clearly evident today. Finally, more recent impacts derived from communications, recreation, and residential use continue to influence the nature of these river systems. Clearly, with this history, there are no streams in

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the Front Range that have not been affected by this history of disturbance, a history that is likely to continue into the future.

This future is treated in the final chapter of the book, which suggests that the streams of the Front Range will continue to be used, managed, and appreciated for their virtual, if not truly natural, characteristics. If there is an optimistic message in this, it is that future insults are not likely to be so drastic and obvious as those of the past 200 years.

Virtual Rivers is an attractive volume and a good read. It will obviously appeal to those of us who live close to these rivers but also to anyone with a general interest in mountain streams and rivers. The book is well produced, with few errors that are not serious: some confusion over conversions between inches and millimeters (eg, pp 17 and 27); the common addition of an 'e' to Arapaho (pp 39 and 44); and the identification of the main river to which these streams are tributaries as the St (saint rather than south?) Platte (p 103). These typos will not confuse anyone and will certainly not detract from the value of a fine contribution to our appreciation of the Front Range streams and their environment.

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Turbulent Times and Enduring Peoples: Mountain Minorities in the Southeast Massif

By Jean Michaud and Jan Ovesen, editors. Richmond: Curzon; 2000. 255 pp. US$65.00, £45.00. ISBN 0-7007-1180-5.

Like so many edited volumes, *Turbulent Times and Enduring Peoples* has its origin in an academic conference, in this case the 1997 annual meeting of the Association for Southeast Asian Studies in the UK. A selection of these papers has been supplemented by about the same number of solicited papers to produce this volume. Its focus is ostensibly to present the highland societies of the mainland Southeast Asian massif within their historical context, "in order to illustrate how their development can be better understood when analyzed in a time frame, rather than being merely compared with technologically more advanced lowland societies." In this, the volume is only partly successful, and I suspect that this is because of its mixed parentage. It is quite a mixed bag.

About half of the 9 chapters are primarily historical. The others deal with more contemporary issues, such as the impacts of trekking, the staging of a local fair in a Yao village, economic changes in the Hmong communities in Thailand, and the impacts of sedentarization in the central highlands of Vietnam. In and of themselves, the chapters are mainly interesting, but a little more effort should have been made to draw out some of the main themes to emerge from the collection. The editors do provide an introduction to the volume, but it concentrates almost exclusively on presenting a human geography background to the region. Then it stops in a most abrupt manner, with no attempt to introduce the papers in the volume nor provide any conclusion. Having eschewed this opportunity for synthesis, the editors might have seen fit to provide a conclusion at the end of the book, but again there is nothing.

The geographical and ethnographical content is also a little unbalanced. Almost half the chapters deal with 1 ethnic group, the Hmong, and about half are based in Thailand, despite the fact that, as the editors point out, Thailand has fewer numbers of ethnic highlanders when compared with other countries. This reflects the relative research effort in Thailand compared with that in other countries and can be used to advantage if opportunities are taken to compare the Thai situation with that elsewhere. Again, this could have been taken up in a synthesizing concluding chapter.

The style and grammatical quality of the chapters also vary widely. Some chapters, understandably mostly by authors for whom English is not the first language, have numerous grammatical errors that should have been corrected during the editing process.

Despite this unevenness, the volume is not without interest. Clive Christie provides a clearly written account of the historical derivation of the Karen problem in Burma that contains little that is new but is a good encapsulation, perfect for student reading. Alison Lewis certainly added to my knowledge of the impact of the Western Protestant missionaries in Yunnan and Guizhou, and the well-organized review of Hmong migrations into Laos and Thailand in the early 20th century by Culas is also useful. The editors are to be congratulated in getting Peter Kunstadter to publish some of the empirical results of his large-scale surveys of changes in the Hmong village economy in northern Thailand. Bartsch provides a contemporary and useful village-level account of trekking impacts in a Karen village, emphasizing the important role that such tourism income now plays. Jonsson provides the most unorthodox and also one of the most interesting papers. He describes a New Year fair in a Yao village, its "Thai-ization," and what all this might mean. Yet, one sometimes has to wonder whether anthropologists can take things too seriously: on noting that during an evening dance by the Yao men, 3 of them were wearing women's trousers with their costume, Jonsson notes that "he did not see or hear any indication that this cross-dress-

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ing was a significant statement about gender."

As the editors point out, there is not a lot of literature that looks at the Southeast Asian massif as a unit. The contribution of this volume is therefore welcome, but with a little more effort its value could have been increased through greater efforts to synthesize the papers, make a little more sense of them for the reader, and perhaps place them a little more within the "turbulent times" referred to in the title.

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Forests in Sustainable Mountain Development: A State of Knowledge Report for 2000.

Edited by Martin F. Price and Nathalie Butt, IUFRO Research Series No. 5, CABI Publishing, Oxford and New York, 2000. xxxiii + 590 pp. UK£75.00, US$140.00. ISBN 0-85199-446-6.

Forests in Sustainable Mountain Development aims to be a comprehensive account of the present state of knowledge of the subject. It reviews the importance of mountain forests in terms of their production of wood, nontimber forest products, and services such as freshwater, tourism, and recreation. The book runs to almost 600 pages, but it makes no claim to be exhaustive in addressing the issues and questions it raises. For general background information on sustainable development in mountain regions, the reader is referred to *Mountains of the World: A Global Priority* (Messerli and Ives 1997).

Forests in Sustainable Mountain Development is the primary output of the Task Force on Forests in Sustainable Mountain Development established in 1996 by the International Union of Forestry Research Organizations (IUFRO). It includes contributions from well over 100 people, including forestry researchers and practitioners from international organizations, nongovernmental organizations (NGOs), and others.

Refreshingly in a world that increasingly defines well-being solely in terms of monetary income, the boot takes a very broad view of sustainable development, including not only its economic but also its environmental and sociocultural components. The inclusion of articles on sacred forests (P.S. Ramakrishnan), public perceptions and attitudes toward forests (W. Zimmermann and F. Schmithuesen), recreational use (various authors), and traditional knowledge versus Western environmental ethics (A.J. Thomson et al) gives an idea of the diversity of social issues addressed in the volume.

Most of the peculiarities of mountain forests are reviewed in one way or another, for example, regarding the following issues: climate (M. Beniston); biological diversity, endemism, and speciation (G. Grabherr); disturbance (D. Peterson et al); economics (H. M. Gregersen and W. Sekot); and silviculture (W. Schoenenberger). Other articles are less specific to the mountain context, but most of these are nevertheless useful because they summarize the broader state of the art regarding forest and forestry research and action. In this category, we find good contributions from G. Buttoud on multifunctionality, from O. Dubois on collaborative management institutions, from I. Kissling-Naef on the advantages of management under common property regimes, from F. Schmithuesen and W. Zimmermann on the role of forest and environmental legislation in sustainable land use practices, and from P. Branney and M. Hobley on participatory research, among others.

A review would not be worth the name if it did not have anything critical to say as well. As with any book of this scope, and with such a large number of contributors, there is some unevenness in the contributions. A few of them are overly theoretical. For example, Sarmiento's piece on forest restoration in the Andes does not address the implications of any of the major ongoing forest restoration initiatives in the region, some of which have done groundbreaking applied research, (eg, on local incentives for forest conservation). The case study on forests in the Usambara mountains of Tanzania by Kaoneka et al is another example.

The foreword gives rise to some confusion: why did the author (H. Mishra) choose Sweden, Finland, Japan, and Korea as beacon countries in a publication on mountain forests? True, forests provide an important contribution to these countries' economies in many different ways—but Finland is not really a mountain country (and some would argue that neither is Sweden). Quoting forest cover data as proof that these extremely different countries have successfully linked mountain forests to sustainable human development represents a worrying trend that focuses on forest quantity at the expense of quality. Especially in mountain forests, where multifunctionality is the name of the game, the quality of forest cover is all-important.

With regard to climate change, the CO_2 sinks question appears to get more attention than it deserves. No doubt mountain forests, which account for 28% of global forest cover, are important as carbon sinks. But with the impact of climate change on forest ecosystems starting to hit home, and with industrial emissions showing no sign of abating significantly, one could argue that adaptation is the key research and action theme of the future. Conserving natural forest cover across altitudinal gradients may well allow for migration of plant and animal species that might

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otherwise go extinct. As G. Grabherr notes in his contribution, mountains have provided stable areas in regions of ecological fluctuation, for example, by providing forest refugia when the lowlands became drier. In addition, as M. Alrich points out, the flora and fauna of tropical montain cloud forests are extremely sensitive to the impact of climate change, making them an ideal study object for people interested in measuring the impact of climate change.

One important research theme that is not addressed is how the political marginality of many upland communities reduces the scope of some of the key sustainable development tools highlighted in the book, such as economic valuation of environmental services and transfer payments to poor upland farmers for environmentally sound watershed management. It is no coincidence that one of the few fully operational transfer payment schemes for smallholders is in Costa Rica, the country with the least income inequity in Meso America. The actions that upland communities have carried through to deal with this marginality are an especially frutiful topic for reflection and action in this respect. Federations of forest user groups (FUGs) in Nepal and of *ejidos* in Mexico and Guatemala have become a political force in these countries, safeguarding legislative advances and creating an institutional interface that can help poor rural smallholders to benefit from subsidies and other government support measures they could never get access to by themselves.

Apart from these few minor points, this is an important volume that addresses most of the key problems facing mountain forests in a sound and engaging manner, with extensive references and a comprehensive index. The 10 sections of the book overlap somewhat, and many articles would fit under more than one section. But each section has a good, concise summary of the major issues covered in the initial overview articles, which makes the book as a whole much more accessible and valuable as reference material. This volume would be a worthwhile addition to the libraries of not only researchers but also forestry practitioners, with a shelf life of at least 10–15 years.

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Celebrating International Mountain & Ecotourism Year – 2002

Tourism Recreation Research

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Ecotourism and Sustainable Tourism in Mountain Regions:
Striving Towards Peak Performance

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In pursuit of Rio Conference Agenda 21 (Chapter 13), the UN General Assembly proclaimed 2002 as the International Year of Mountains (IYM) and urged the countries to manage their fragile ecosystems for sustainable development. Simultaneously 2002 was also declared International Year of Ecotourism (IYE). The Rio plus 10 Conference in Johannesburg (September 11-19, 2002) will evaluate the decade performance on the Agenda 21. As a follow up of this programme, TRR puts up this special theme issue to discover what efforts have been made to achieve measures of sustainability in different regions. Some of the highlights:

1. Minimal-impact guidelines for mountain ecotours (*Ralf Buckley*)
2. Accelerated tourism development and its impacts in Kullu-Manali, H.P., India (*James Gardner, John Sinclair, Fikret Berkes and R. B. Singh*)
3. Ecotourism in Gangotri region of the Garhwal Himalayas (*Gitanjali Chaturvedi*)
4. Is it Possible to Think of a Final Size for Tourist Mountain Centres in the North Patagonian Andes? (*Adriana Otero*).
5. An Examination of Environmental Attitudes Among Ecotourists: A Comparison of Three Case Studies (*A. Nowaczek and D.A. Fennell*)
6. Tourism in the Canadian Rockies (*Peter Williams*)

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