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ILLUSTRATED ATLAS OF THE HIMALAYA

DAVID ZURICK AND JULSUN PACHECO

REVIEWED BY JOHN METZ

This large format book is a comprehensive survey of the physical and social characteristics of the Himalaya with strikingly beautiful maps and photos and smooth, informative prose. It combines the significant cartographic talents of Julsun Pacheco with the wide-ranging travels and research of David Zurick to produce a book that follows upon but expands the territory covered by Toni Hagan in his *Nepal: A Himalayan Kingdom*, written 45 years earlier. The book's only problem is that by appealing both to the scholar and to the sophisticated lay Himalayan aficionado, and it sometimes leaves both groups only partially satisfied.

The book has five major sections of approximately equal length: The Regional Setting; The Natural Environment; Society; Resources and Conservation; and Exploration and Travel. It also, of course, has lists of its Maps and of its Tables and Charts at the beginning and, at the end, the sources of the illustrations, a bibliography, and indices of the subjects, place names (especially thorough), and maps covered. (Tom suggests deleting the italics stuff.)

The authors limit the coverage to the Himalaya in its more restricted meaning, i.e., the arc of mountains south of the Tibetan Plateau between the Indus and Tsangpo/Brahmaputra rivers, leaving out discussions of the Hindu Kush and Karakoran in the west and the Naga Hills and Hengduan Range in the east. They divide the Himalaya into three subsections, the Western Himalaya (Kashmir/Jammu, Himachal Pradesh, Uttaranchal), Nepal (including Darjeeling and Sikkim), and the Eastern Himalaya (Bhutan and Arunachal Pradesh).

I very much like the layout of the pages in the book, which display and integrate the maps, tables, and photos in an effective and pleasing way. I also

want to praise Zurick's photos which capture and revealingly portray the landscape and people in almost archetypical ways. Moreover, the text is written in a similarly pleasing way.

However, I found myself, manifesting the curse of the scholar, repeatedly looking for but not finding within the book proper the sources of the diagrams, tables, maps, and text. The sources of the illustrations (maps, diagrams, etc.) are referenced in a table at the end of the book, which is fine and even allows for a more detailed explanation than could be presented at the bottom of each illustration. There is also a general bibliography, but I wanted to know where to find more on some specific parts of the text. A separate bibliographical essay discussing the sources would have been a way to keep the text free of the clutter of references, but of providing more detail on the sources of the information presented.

The first section of the book, the Regional Setting, provides a fine overview of the three major parts of the Himalaya and discusses the various subdivisions of each. Pacheco has beautiful, three dimensional maps of the entire Himalaya (over two13 inch wide pages) and for each of the three subdivisions. He also has detailed maps of the major cities: for Srinagar, Kathmandu, and Pokhara there are both street maps and 3-D maps of their topographic settings, while for Thimbu, the Paro Valley, Bumthang, Gangtok, Simla, Dehra Dun, Nepalganj, and Biratnagar there are line maps of street and road patterns. This section also includes statistical "Fact File" tables for Jammu and Kashmir, Himachal, Uttaranchal, Nepal, Sikkim, Bhutan, and Arunachal. These tables include: area, population, population density, GNP/capita, infant mortality, and other useful information that allow succinct overviews and quick comparisons between the subdivisions.

Illustrated Atlas of the Himalaya

David Zurick and
Julsen Pacheco

Kentucky: University
of Kentucky Press,
2006 University of
Kentucky Press. Pp.vii-
xv + 211

The second section, the Natural Environment, is the least satisfying part of the Atlas. The section focuses on geology and climate and then uses these to assess natural hazards. The mapping of data and discussion of Natural Hazards is enlightening. I find the geological discussions, however, overly technical and hard to follow. Most elements of an adequate explanation are present, but need just a little more detail and explanation to allow the reader to understand how the processes and features described fit together to create the landscape.

I would like to have seen a more explicit discussion of the general topography, similar to Hagan's discussion of the Nepalese cross-section of the Tarai, the Siwaliks, the Mahabharat, the Hills, the high Himalaya, the suture zone valleys, and the mountainous edge of the Tibetan Plateau. There is a similar cross-section described on page 39 of the Atlas, but it is part of only one paragraph, which does not highlight its importance. Nor is it used subsequently as a heuristic device to make clear how the geology relates to and explains the topography. This cross section is typical of Nepal, so some discussion of how other parts of the Himalaya, like western India, differ from this simple model would then be possible and informative.

I would also like a bit more on the geological processes that create this pattern. The discussion and maps of plate tectonics (not "continental drift") are fine, but there should be more on how the colliding plates produce the folding and faulting that creates the topography, including an explanation of overthrust faults, the major thrust faults in the Himalaya, and the nappes they have produced. We also need a few sentences explaining the formation of sedimentary, igneous, and metamorphic rocks and the how collision of India with Asia has created, transformed, and lifted the existing rocks. Most of the discussion is present, but it just needs a bit of additional information here and some adjusting there to allow the reader to more fully understand the discussions and geological formations included in the maps. Finally, some of the map legends need more information: for instance, the Nepal geological map includes units labeled "granite" and "crystalline," but granite is crystalline, so I surmise the "crystalline" unit refers to metamorphic rocks, though which ones is not clear.

The discussions of climate also need refining. Much more is occurring than surface heating and cooling creating pressure difference on the northern and southern sides of the Himalaya. The monsoon circulation needs to be related more closely to the general circulation of the atmosphere, especially the advance and withdrawal of the Inter-tropical Convergence Zone (ITCZ) over the Indian subcontinent. That movement is tied to the location and movement of the mid-latitude westerlies and the migrating mid-latitude cyclones that track beneath them. The Tibetan Plateau presents a barrier to the westerlies such that they flow either to its south during the northern hemisphere's winter and spring months

or to its north during summer months and early fall. The ITCZ advances as the westerlies jump to the north. During the winter and spring, the mid-latitude cyclones deliver moisture to the mountains and northern plains, but, after traveling over Turkey, Iran, Afghanistan, and adjacent Central Asia, they have little moisture within the lowest 5000 m, so only the highest peaks receive the precipitation that produces their glaciers. However, as these storms approach the eastern side of the Himalayan arc, they are able to pull moisture from the Bay of Bengal, producing significant low elevation precipitation from central Nepal through Assam during the March to June pre-monsoon.

The third part of the book, Society, does a good job mapping and describing the ethnic and religious diversity; population, migration, and urbanization patterns; early trade routes and current transportation and communication systems; human development levels, as measured by statistics of poverty, employment, education level and access, health status and access; and contemporary governance/ human rights conditions. The text, tables, graphics, and photos are presented objectively and imply, without explicitly emphasizing, the desperate condition of the majority of the people living in these mountains. This steep environment makes easy access to the outside impossible and provides few highly productive agricultural sites, so food shortages are widespread. Moreover, being the periphery of what had, until the last decade, been itself a periphery of world development means that outside investment is limited. Unfortunately, the fine maps of social characteristics are sometimes incomplete across the region because the three states that control the mountains collect information in incompatible ways and/or the widespread civil unrest has prevented governments from collecting or promulgating information. The book does fail to emphasize the highly uneven patterns of wealth and power that underlie the revolts and civil wars that bedevil the mountains. In general, the authors take objective, non-judgmental positions, and thereby avoid the controversies that could lead them to being considered partisan and unworthy of future access to these areas. Overall, there is a wealth of highly useful and interesting information.

Resources and Conservation, the fourth part of the Atlas, summarizes and maps agricultural, forest, water, mineral, and wildlife resources of the mountains. The section on agricultural is, appropriately, about one third of the chapter. Available data on the following is compiled and mapped (and sometimes presented in tables) by district: land use, soils, cropping patterns, population per hectare in 1960-1980; land clearing for agriculture for periods 1890-1950 and 1950-1990; Nepal's areas of irrigated and rainfed fields, plus their sum, the total area cultivated; percentages of Nepal's districts in grassland and chemical fertilizer use in Nepal by district.

The discussion of forests emphasizes their importance to subsistence systems and their loss to conversion and degradation. One map shows the areas in forest, areas converted

from forest to other land uses, areas converted from other land uses to forest, and non-forest land. Another map shows the area of forest per capita in Nepal's districts. One pair of maps shows the population density by district in 1970 and in 1990, implying that demand for forest products is overwhelming supply. Another map pair presents the rates of forest change by district in the historical period (1890-1050) and in the contemporary times (1950-1990). The text discusses the varying historical and contemporary uses of the forests across the mountains, from the subsistence uses and commercial logging of India's western forests in colonial and recent times, to the primarily subsistence uses in Nepal's hills and commercial and/or agricultural clearing of its Tarai, to Bhutan's relatively large forest estate, to the shifting cultivation practices of India's northeast. They approvingly consider the recent policies to engage local communities in forest management, but the authors maintain the usual concern that use patterns are depleting forests.

Mineral resources are briefly reviewed, but water resources receive considerable attention, noting the increasingly severe competition for water from drinking water, hydroelectricity generation, and irrigation projects. Nepal doubled its area of irrigated agriculture from 1984 to 1998, but Kathmandu's water supply is increasingly inadequate and polluted. The existing and potential hydroelectric projects are mapped and discussed: export of hydroelectricity has begun in India, but the potential remains great but unrealized for the entire region, though climate change and seismic instability remain challenges.

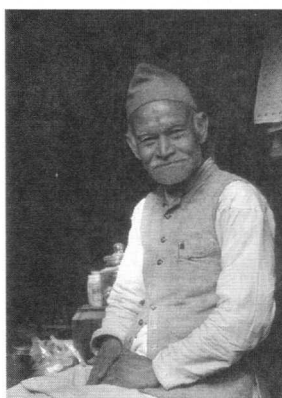
The section on Wildlife includes region-wide information in maps and text as well as detailed information on Nepal and Bhutan's protected areas. The tremendous biological diversity that the mountains' environmental diversity fostered is under threat from human expansion. In Assam and the eastern Himalayas comprehensive surveys of biodiversity have still not been completed. To preserve this extraordinary heritage, large areas have been reserved under various levels of protec-

tion – 18% of Nepalese and 20% of Bhutanese territory is under formal protection, but enforcement of use restrictions vary and are practically non-existent in many remote areas. The authors cite Nepal's Annapurna Conservation Area as a model because it has incorporated local people in the planning and implementation of the reserve.

The last part of the Atlas, Exploration and Travel, maps and describes travel patterns of Hindu and Buddhist pilgrims, non-western travelers and explorers, western and especially British explorers, mountain climbers, and finally tourist trekkers. A wealth of information and detail on all of these groups summarizes how visitors and outsiders have come to learn about the region. I found all these descriptions and the maps of the routes of the various travelers trips fascinating, especially the travels of the Jesuits in the 16th and 17th centuries, of the British explorers and their Indian "pandit" agents in the 19th and early 20th centuries. There are beautiful maps of the first mountain climber conquests of the tall peaks. The final section of this chapter describes and maps the major trekking routes of contemporary tourists: the Annapurna circuit, Khumbu, and Zaskar/Ladakh. In addition, treks in Himachal Pradesh and Uttaranchal are discussed in the text. Sikkim, Bhutan, and Arunachal Pradesh remain largely outside the trekkers options.

Conclusion. Overall, the Atlas is a significant synthesis and beautiful presentation of a great deal of information on the Himalaya. Bridging the usual gap between the Indian and non-Indian parts of the mountains, it is the first integrated atlas of the region. It has outstanding maps and photos and is written in pleasing prose. It is sufficiently attractive to be a coffee table book, but has the academic rigor to be a research reference.

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David Zurick's photographs from the *Atlas*