

## SHARING WATER: IRRIGATION AND WATER MANAGEMENT IN THE HINDUKUSH-KARAKORAM-HIMALAYA

HERMANN KREUTZMANN, ED.

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Water flows are connectors—of ecologies, of landscapes, of societies and their histories. In South and Central Asia, a great deal of the water that nourishes natural and social systems traces to the Hindukush-Karakoram-Himalaya arc—the arid and semi-arid mountain region that separates Inner Asian deserts and steppes from the plains of the subcontinent. Geographically, we may regard the Hindukush-Karakoram-Himalaya as a periphery, a hinterland, or a border zone. Indeed, its extreme conditions constitute an “upper limit of human habitation” (15). Yet hydrologic flows inextricably tie this inhospitable region to the past, present, and future of social and biological life throughout the subcontinent. Whether our focus is the extensive irrigation networks that enable agricultural activity in the plains, the vast existing hydropower systems that convert high-altitude water flows to electricity, or a modernization and development imaginary that seeks to maximize the power-producing potential of the region, ties back to both the biophysical and engineered landscapes of the Hindukush-Karakoram-Himalaya are inevitable. Indeed, the Hindukush-Karakoram-Himalaya arc constitutes a key regional source, not only of water, but of productive and symbolic power itself.

The importance of water has not gone unnoticed in Himalayan scholarship, but irrigated landscapes are conventionally studied in parts delineated by scholarly disciplines, rather than as systems understood through integrated approaches. This is due, in part, to the fact that the extreme complexity of most irrigation systems defies well-intentioned efforts to

understand their many facets. Of the accounts of irrigation networks that we have, a majority focus on water in the plains, and few engage higher altitude systems at the scale of the community. On both of these counts, *Sharing Water* makes a unique and important contribution to our understanding of Himalayan water—and, by extension, the interface of water and society throughout South Asia.

Edited by Hermann Kreutzmann, this volume directs our attention to arid and semi-arid mountain regions to examine irrigated agriculture at community scales at high altitudes. It is in this region that vast quantities of water are stored above the snow line, and it is from glacial melt that several major river systems, and the vast lowland irrigation networks they feed, originate. While manipulating the hydrology of this region is perhaps nothing new, a range of more contemporary developments—from postcolonial modernization projects to environmentalists’ campaigns against large dams—make understanding irrigation practices in the Hindukush-Karakoram-Himalaya important in particular, contemporary ways.

Consider, for instance, a point repeated in Kreutzmann’s introduction to the volume: since the early 1990s, when the United Nations Commission on Environment and Development coined the phrase in its Mountain Agenda, these mountain ranges have been referred to in development circles as the “water towers of Asia.” Indeed, Kreutzmann demonstrates the empirical basis for this label, showing the staggering increases in areas under irrigated land in the subcontinent since 1970 (24). These so-called water

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towers are also key sources of power generation, both realized and imagined. An extensive network of large dams, most constructed in the past forty years, are now emblematic of the high region that represents the development potential of lowland South Asia.

But in the contemporary moment, scale has emerged as a key site of contest. Demands for power continue to rise even as large-scale dam development has fallen under the critical purview of environmental and social activists who question their social, environmental, and financial costs. In general, smaller-scale irrigation and power projects are emerging as an alternative, and mainstream development policy has generally moved toward the devolution of water resource management from state bureaucracies to user groups, illustrated through such ideas as irrigation management transfer (IMT) and participatory irrigation management (PIM).

The studies compiled in *Sharing Water* serve development practitioners interested in turning over the management of complex irrigation systems directly to farmers by exploring how social systems adapt to harsh environments. But this is not strictly a "development" volume; its interdisciplinary and cross-cutting contributions offer important insights to contemporary scientific and social research on topics that range from the histories of community-scale irrigation networks, to their institutional and cultural aspects, and the overall dynamism of what may be conventionally referred to as "traditional management systems."

The unifying principle of the volume is one of region rather than theme or sector, and studies are presented from east to west: from Uzbekistan and Tajikistan, on to India and Pakistan, and then to Nepal and Bhutan. The volume opens with a chapter by Kreuzmann that reviews water resources in the region and presents a theoretical framework through which to approach integrated irrigation studies. The chapters to follow may be grouped into four areas: historical perspec-

tives on water management (Fourniau on Turkic and Tajik speaking regions in Central Asia and Vohra on Ladakh), case studies of community-scale irrigation systems (Stober on the Hindukush, Kreuzmann on Hunza, Labbal on Ladakh, Jest, Polge, and Pema on Dolpo, Fort on Mustang, A. and J. Sabatier on Nepal's Middle Hills), development-oriented papers (Khan and Hunzai, Manzardo), and the legal aspects of water management (Schmid, Jest).

Across the contributions, one finds a rich set of case studies that engage issues like the links between irrigation technologies and social organization, as in Fourniau's historical analysis of the differences between nomadic and sedentary water users. An historical perspective on water management and traditional law is offered by Vohra. Other papers examine the natural constraints presented by arid and otherwise harsh environments, exploring not only water scarcity, but also growing demand, conflicting interests, the physical obstacles of high altitude environments. Close attention is paid to local water rights regimes and their histories, toward complicating the notion that these regimes are stable and unchanging, and contributions by Schmid and Jest remind us that even in remote localities, the regulatory presence of the state is relevant to understanding these systems fully.

In general, this volume affords insights into irrigation systems as simultaneously social and ecological, and as both autonomous and inevitably connected beyond the locality. Attention to water flows as socio-natural regional connectors foregrounds the ecological costs and contests that accompany them. The volume clarifies the complexity, and sheer challenge, of water provision and allocation in the Hindukush-Karakoram-Himalaya.

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