

## **Water Resource Management in Central Asia and Afghanistan: Current and Future Environmental and Water Issues. Edited by Zheenbek E. Kulenbekov and Baktyiar D. Asanov**

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Source: Mountain Research and Development, 42(3)

Published By: International Mountain Society

URL: <https://doi.org/10.1659/mrd.mm274>

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**Water Resource Management in Central Asia and Afghanistan: Current and Future Environmental and Water Issues. Edited by Zheenbek E. Kulenbekov and Baktyiar D. Asanov**

Cham, Switzerland: Springer, 2021. vii + 193 pp. Hardcover: US\$ 149.99, ISBN 978-3-030-68336-8. E-book: US\$ 109.00, ISBN 978-3-030-68337-5.

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As described in *Water Resource Management in Central Asia and Afghanistan*, the transboundary Amu Darya and Syr Darya rivers provide water and food security for more than 80 million people (p 4). Surprisingly little, however, is established in the academic literature on their dynamics and sensitivities to climate change and experiences of environmental degradation and land use change. To fill this gap, this book aggregates a multidisciplinary collection of papers, drawing on hydrology, glaciology, water chemistry, meteorology, and other fields. The resulting anthology provides rich regional context on current and future water issues, with an eye toward implementation of integrated water resource management, transboundary river management, sustainable development, and climate change adaptation. Read as a collection of conference papers, the work finds its strength in offering a cross-disciplinary and prefatory sampling of current and future water management issues facing Central Asia and Afghanistan.

The central aim of the book is to further knowledge of water issues, present and future, in the transboundary river basins of Central Asia and Afghanistan. The work's editors, Zheenbek E. Kulenbekov and Baktyiar D. Asanov, both professors at the American University of Central Asia, come to this work with backgrounds in hydrogeology and chemistry, respectively. They bring deep regional expertise to bear in this work, from careers performing environmental impact assessments and consultancies on water issues for national governments and international agencies. Their stated goal, more precisely, is to provide "a cross-sectoral, multi-scale assessment of development-directed investigations in the main rivers of wider Central Asia and Afghanistan." To support this point, the book chapters are organized thematically, drawing on studies from an array of authors, primarily local to the region, under each chapter. Themes include current water availability, climate change impacts, water risk analysis, environmental flows, and

remote sensing applications. Cross-cutting across the chapters is an understanding of the region as particularly sensitive to the impacts of climate change, explained as a product of its geographical diversity, glacierized headwaters, fragile transboundary river management regime, and high reliance on irrigated agriculture for regional food security. The range of material covered in the book draws on and contributes to literature on development in mountain regions by contextualizing water scarcity as a main limiting factor on regional socioeconomic development. Water modeling and monitoring are presented as key to improving water management and, in turn, development outcomes.

Structural choices in the chapter organization and brevity of the individual papers constrain the theoretical and methodological contributions of the book to the broader field of water resource management. These structural choices are visible in 3 key ways: the miscellaneous delineation of chapter topics, the uneven use of a scholarly apparatus, and omission of a synthetic orientation for the reader. The chapter topics are highly interconnected, and the delineation between them is not always clean. This makes it difficult to grasp the unique additional point that each chapter, and the broader field it stems from, adds towards the aim of the work. For example, the papers in the first chapter, which focuses on assessing water resource availability, closely fold in the impact of climate change and other human-driven activities, which is the topic of the second chapter, which likewise includes studies assessing water availability. The 2 papers in the following chapter on water risk, focusing on cotton agriculture in Uzbekistan and groundwater and flooding in northern Bishkek, could easily be folded into either of the preceding chapters because they likewise broadly explore issues that contribute to high risk of water scarcity under climate change. A few papers provide high-quality bibliographies, footnotes, and endnotes; however, these scholarly apparatuses are not offered across the body of work. Each individual paper takes its own approach to providing visual materials, and a select few incorporate figures, figure titles, maps, and site photographs. A regional map of the transboundary rivers of Central Asia and Afghanistan is omitted and would have offered a key resource to contextualize the individual basins studied and build an integrated understanding of the region.

Opening and closing remarks that synthesize this rich array of multidisciplinary information and more directly present the intended "cross-sectoral, multi-scale assessment" would have bolstered the work's ability to achieve its aims. A synthetic orientation would have added more weight and depth to the recommendations sprinkled through the work for a stronger commitment to transboundary management and scientific collaboration, evoked in papers 1, 5, and 6. The omission of a synthesis leaves the work as a repository of information rather than a weaving of argument for a shift in policy or scholarly thinking. The underlying reason for the lack of synthesis is suggested in chapter 14 about designing sustainable futures, which provides the only hint in the work

that the papers may originally have been prepared for a conference.

Because of these structural choices, the work offers readers a strong glimpse of different disciplinary dimensions of understanding in individual basins in the region but falls short of offering an integrated and comprehensive picture of water management challenges in Central Asia and Afghanistan. The authors' and editors' intended audience includes researchers, students, administrators, planners, and other stakeholders who work on rivers, irrigation, ecosystems, climate change, water risks, and remote sensing. The work is more readily digestible and useful to these audiences when understood as a collection of conference papers rather than a comprehensive assessment. In a region where baseline

monitoring and long-term data collection have been interrupted by political conflict and instability, particularly in the case of Afghanistan, this work offers an important contribution to the fields of mountain research and water management. The gravity of the water management challenges facing Central Asia and Afghanistan is clearly demonstrated and articulated throughout the work, and the broad call for new investment in data collection, monitoring, and policy development is evident. In summary, the ostensible format of *Water Resource Management in Central Asia and Afghanistan* as an anthology of conference papers positions each individual study as a cursory step to future work and in aggregate enriches our understanding of the unique set of water management challenges facing this key region.