

# **Water Resources Allocation and Agriculture: Transitioning from Open to Regulated Access**



# Water Resources Allocation and Agriculture: Transitioning from Open to Regulated Access

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Edited by

Josselin Rouillard, Christina Babbitt, Edward Challies  
and Jean-Daniel Rinaudo



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# Foreword

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The days of disparate water allocation arrangements and of free, unregulated access to groundwater are over. Past decades when water resources were appropriated by humans only with socioeconomic development goals in mind and when groundwater was available to any user with capacity to drill and pump, have led to significant water quantity and quality degradation in many locations around the world. This has had consequences not only on freshwater ecosystems, traditional water-dependent livelihoods, or spiritual water uses, but also on the viability of economic uses themselves. The increasing costs of ensuring good-quality drinkable water, and water tables plummeting to depths that make groundwater pumping uneconomical, are just two of many signals that things have to change in the water world. And such change has to be real.

This book is timely and appropriate since allocation is at the very heart of any water management system. If water allocation is not revisited and substantively revised to adjust to present goals and challenges, it is highly unlikely that the water management system will be able to reverse unsustainable trends. This book explores water allocation strategies covering a large array of water sources and also considers water users that for quite some time have rarely been incorporated into existing water allocation systems. It reflects on the theory of water allocation and presents a number of diverse actual experiences, thus constantly reminding the reader that in water allocation schemes the interaction between humans, nature and rules rarely – if ever – happens exactly as planned by the policymaker.

Over recent years we have seen several attempts by scholars from different disciplines to contribute to the challenges posed by water allocation. Among others, we have seen innovative institutional arrangements at various levels, including institutional frameworks for joint water management by user groups, moving to decentralized water management based on local allocation mechanisms rather than on central government-led ones. We have also seen the reconsideration and modification of indigenous water allocation arrangements to face emerging water problems and conflicts. Recent years have brought works highlighting the importance of environmental flows and the usefulness of looking at the water system as a pool of highly interconnected water resources—groundwater, surface water, reclaimed water, desalinated water. This book covers and illustrates both methodologically and empirically the role and usefulness of those approaches and several others, including economic instruments such as water pricing and quantity and quality regulations.

As water scarcity and deteriorated quality endanger sustainability of water resources and water-dependent ecosystems, a holistic approach, as advocated in the book, might be proven as the most adequate and effective way forward. Managing water in a scarcity context will necessitate the

combination of several approaches, the inclusion of several types of water, and the consideration of interests of and impacts on different types of sectors and users.

The larger and more complex the web of water users, the more urgent is the need to approach water allocation with sound, data-based science and with conflict-management techniques that can help stakeholders move from entrenched positions to options that can be agreeable by all. With the current advances in data collection methods and the still partially unexplored potential of Artificial Intelligence in water management, practitioners and stakeholders have an unprecedented opportunity to better understand natural and human systems and make truly informed decisions. With the current improved calculation and modeling capacity, policy interventions and interactions among water sectors and water users can be better understood by applying methods from disciplines such as Experimental Economics, Game Theory, Computable General Equilibrium models, and Hydro Economic modeling, to mention a few.

The cumulative knowledge contributed by science, however, does not produce by itself any durable change on the ground. The awareness of the need for both hard, data-based science, and soft, human-centered approaches, is key to learn from the various perspectives discussed in this book and to transition to a better and more sustainable allocation of scarce water.

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