

WATER DIPLOMACY

A NEGOTIATED APPROACH
TO MANAGING COMPLEX
WATER NETWORKS



SHAFIQL ISLAM
AND LAWRENCE E. SUSSKIND

THE RFF PRESS WATER POLICY SERIES

WATER DIPLOMACY

Water is the resource that will determine the wealth, welfare, and stability of many countries in the twenty-first century. This book offers a new approach to managing water that will overcome the conflicts that emerge when the interactions among natural, societal, and political forces are overlooked. At the heart of these conflicts are complex water networks. In managing them science alone is not sufficient, but neither is policy-making that doesn't take science into account. Solutions will only emerge if a negotiated or diplomatic approach—that blends science, policy, and politics—is used to manage water networks. The authors show how open and constantly changing water networks can be managed successfully using collaborative adaptive techniques to build informed agreements among disciplinary experts, water users with conflicting interests, and governmental bodies with countervailing claims. Shafiqul Islam is an engineer with over twenty-five years of practical experience in addressing water issues. Lawrence Susskind is founder of MIT's Environmental Policy and Planning Program and a leader of the Program on Negotiation at Harvard Law School. Together they have developed a text that is relevant for students and experienced professionals working in a variety of engineering, science, and applied social science fields. They show how new thinking about water conflict can replace the zero-sum battles that pit experts, politicians, and stakeholders against each other in counter-productive ways. Their volume not only presents the key elements of a theory of water diplomacy, it includes excerpts and commentary from more than two dozen seminal readings as well as practice exercises that challenge readers to apply what they have learned.

Shafiqul Islam is the first Bernard M. Gordon Senior Faculty Fellow in Engineering and Professor of Water Diplomacy at the Fletcher School of Law and Diplomacy at Tufts University. He is the Director of the Water Diplomacy Initiative. His research group—a diverse network of national and international partners—integrates theory and practice to create actionable water knowledge. He has published over 100 refereed journal and other publications.

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PREFACE

To address the emerging realities of our globalized world, we can no longer rely on the popular twentieth-century paradigm to which we have become so accustomed: scientists innovate; politicians make policy; and people respond, especially when they are unhappy. We offer a twenty-first-century approach to water management that acknowledges the complexity and uncertainty of natural and societal systems, accepts the increasing interconnectivity and consequences of important decisions, and rejects the unquestioned authority of hierarchical governance structures.

Our views have been shaped by a number of important books—*The Consolation of Philosophy* (Boethius, 525AD), *The Reflective Practitioner* (Schon, 1983), *Managing the Unknowable* (Stacey, 1992), *At Home in the Universe* (Kauffman, 1995), *The End of Certainty* (Prigogine, 1996), *The Science of the Artificial* (Simon, 1996), *The Third Side* (Ury, 1999), *The Black Swan* (Taleb, 2007), *Thinking in Systems* (Meadows, 2008), *Working Together* (Poteete, Janssen, and Ostrom, 2010), *Practical Wisdom* (Schwartz and Shapiro, 2010) and *Water Wisdom* (Tal and Rabbo, 2010).

Our approach to water diplomacy starts with a question: How can we ensure effective management of water as a common pool resource given that we can neither predict nor control many of the forces involved in its allocation and use? We think of diplomacy as the process of defining and resolving water issues at every level—from the design of a small-scale sanitation system in a village, to the development of a contested hydroelectric facility in one region of a country, to formal treaty negotiations among different nations.

Water problems are shaped by many natural, societal, and political interactions that create complex water networks. As population growth, economic development and climate change put increasing pressure on water resources, the management of these networks becomes increasingly important. Science cannot

provide all the answers. Policy-makers must take what scientists have to say into account, but beyond that, they also need to empower the relevant stakeholders to help formulate and implement solutions. To do this, we believe it will help to think of water as a flexible, even an expandable resource.

In our assessment, the most vexing water management problems are neither simple nor complicated. Simple problems are easily understood and manageable. Complicated problems, while not simple, involve interactions that are still knowable and predictable. Complex problems—and that is what most water management problems are—involve interactions that are both unknowable and unpredictable. Complex problems like these are not easily controlled. They involve too many variables, too many interactions and too much feedback.

For centuries we have taken nature apart and analyzed its components in ever-increasing detail. Now we realize that such “reductionism” can only provide limited insight. Water systems are more than the sum of their parts. “Systems engineering,” which water managers have relied on for years, does not work well when natural, societal, and political boundaries are mismatched and cause-effect relationships are ambiguous.

We view water networks as an interconnected set of nodes representing natural, societal, and political variables. The flow of information among these nodes is what enables them to evolve and adjust. Our challenge is how best to manage the flow of information to formulate and achieve desired outcomes. It is in this context that we propose a new Water Diplomacy Framework (WDF) rooted in ideas from complexity theory and non-zero-sum negotiation. Water users and managers can use this Framework to link scientific objectivity and contextual understanding.

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Shafik Islam
Larry Susskind
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LIST OF ACRONYMS

| | |
|---------------|---|
| ACF | Apalachicola-Chattahoochee-Flint |
| BATNA | Best Alternative to a Negotiated Agreement |
| CALFED | CALFED Bay-Delta Program (CA and Federal agreement) |
| CAM | Collaborative Adaptive Management |
| GWP | Global Water Program |
| IWRM | integrated water resources management |
| JFF | joint fact-finding |
| MRC | Mekong River Commission |
| PON | Program on Negotiation at Harvard Law School |
| RCN | research coordination network |
| USACE | U.S. Army Corps of Engineers |
| WDN | Water Diplomacy Network |
| WDF | Water Diplomacy Framework |
| WDW | Water Diplomacy Workshop |
| ZOPA | Zone of Possible Agreement |

1

A WATER MANAGEMENT FABLE FOR ALL TIME

(with Maia Majumder)

Once upon a time, many millennia ago, three hunter-gatherer tribes settled in different parts of a river water basin known as Indopotamia. People were few and resources were plenty. As the population grew, the tribes realized that they could no longer depend entirely on wild foods. Slowly, they learned to cultivate rice. The best land for agriculture, however, became increasingly scarce. Land was transformed into a symbol of power. To protect themselves, and to assert their authority, the tribes established geographic boundaries and organized governments. These eventually became the modern day states of Alpha, Beta, and Gamma.

Flash forward to the present. For centuries, there have been tensions among the three countries. Alpha is the largest of the three, and is economically and politically dominant. It has long monopolized access to the river, insisting that only after its water needs have been met will Beta and Gamma be allowed more water. Continued population growth and increasing crop productivity in Alpha, however, seem never to leave enough water for the smaller upstream countries. As it has continued to devote all of its resources to its own political and economic development, Alpha has earned a reputation as self-serving, cruel, and uncompromising.

Periodic droughts and forest fires plague Gamma. Lack of stored water undermines its ability to deal with these problems, and has slowed its economic development. Also, much of Gamma's groundwater is contaminated with arsenic, forcing it to rely almost entirely on the river for its drinking water. Beta, on the other hand, has lots of farmable land, but it does not have adequate labor supplies. In recent years, it has tried to shift to less labor-intensive energy-powered agriculture. This move has been difficult because Beta can't afford the required gasoline or coal. Unless Beta can import cheap labor or generate hydropower from the river, its crop development and economic growth will continue to suffer.

In desperation, Beta and Gamma have decided to join forces and build a dam. They are seeking funding from the Regional Lending Agency (RLA). They won't

2 A Water Management Fable for All Time

qualify for loans and grants, though, unless they can reach a water usage agreement with Alpha.

Alpha is quite unhappy about the idea of the dam. But because the RLA will only give money to countries that have good relations with their neighbors—and because Alpha wants money from the RLA for its own purposes—Alpha has signed a statement saying it supports the dam. Simultaneously, Alpha has threatened Beta and Gamma through indirect channels, indicating that it won't be able to control local insurgents who may destroy the dam if it is built. This action has only increased the strain on Alpha's already poor relationships with Beta and Gamma.

Alpha has reason for alarm. If the dam is built, it won't have the water it needs to grow enough rice—the staple food of its population and economy. This concern has become increasingly acute in recent decades, as glacial melting and associated sea-level rise have caused saltwater intrusion in the Indopotamia basin. As a result, Alpha's coastal rice paddies are too salty to produce rice. Alpha used to be able to grow whatever it needed. It didn't have to rely on any of its neighbors, so friendly relationships with Beta or Gamma were not important. With the loss of coastal farmland, Alpha now needs help.

Alpha has such strained relationships with Beta and Gamma that it cannot ask for assistance. Instead, over the past few decades, Alpha has pumped more and more water from the basin to expand rice production. Beta and Gamma have not had the economic or military clout to stop this.

Alpha uses the additional water to irrigate dry land in Mu, its most populous state. Mu sits north of the coast at a relatively high elevation. It is one of the few parts of the country that has not been affected by saltwater intrusion. Its soil, though dry, is nutritious and can be made fertile for rice growing. But, as Alpha's population has continued to expand, irrigation of Mu's rice paddies has required many millions of gallons of water every season. Over the past few decades, Alpha's active pumping has resulted in the draining of lakes, ponds and streams in Beta and Gamma.

The residents of Mu feel that they have been robbed of their rights by the central government of Alpha. Wages have been cut drastically to pay for the ever-increasing energy costs associated with the active pumping scheme. Residential areas have been cleared to create more farmland. The central government has made it clear to the citizens of Mu that their purpose is to feed the country.

One faction in Mu has had enough. It is planning a rebellion, intending to cut off the nation's rice supply. Plans are afoot for organized military resistance. Mu is on the border with Beta, and has opened covert lines of communication with Beta's national government. Mu has offered to trade subsidized labor for arms and military support.

During diplomatic discussions about the dam, the relationship between Beta and Mu was revealed. The discovery undermined trust between Beta and Gamma. Gamma worries that Alpha's attempts to settle its dispute with Mu will make Beta's need for additional workers clear. Gamma believes that when Alpha realizes this, it will offer Beta the subsidized labor it needs in exchange for discontinuing its support for the dam project. Because the RLA intends to split the money for the dam

between the two countries, Gamma won't be able to finish construction of the dam if Beta abandons the project.

Beta could, in fact, get by without the dam. It wants the dam primarily to support water-powered energy production as it attempts to convert its rice paddy fields to machine-operated farms. In the long term, these will be much more economically efficient. If, however, Beta can find additional workers whose wages are paid by Alpha, the conversion to energy-powered farming will not be necessary. By contrast, the only way for Gamma to deal with its recurring droughts, forest fires, and widespread dehydration is to increase its access to the river. Otherwise, Gamma will remain agriculturally and socioeconomically backward, falling further behind its neighbors.

In an ideal world, Alpha would allow Beta and Gamma to build the dam—free of insurgent attacks—in exchange for rice. This would allow Gamma to deal with dehydration, drought and wildfires. It would also allow Beta to pursue its conversion to machine-operated farming. By exporting rice to Alpha, Beta and Gamma would gain diplomatic clout, creating a stronger web of interdependencies among the three countries that would be more durable in the face of external adversity. Alpha's relationship with Mu, which would no longer be responsible for producing food for the entire country, could heal. Finally, with peace in the region, the RLA and other international players would be more inclined to increase their investments.

Is Alpha too proud to agree to this solution? Can Gamma trust Beta to follow through on the dam construction? Or, will Beta turn on Gamma if Alpha offers subsidized labor? Will Mu be able to reconcile with Alpha's central government, or will there be civil war?

The answers to these questions are contingent upon the three countries being able to turn an age-old conflict into a problem-solving opportunity.

Welcome to our world of water diplomacy!

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7 7. THE INDO-POTAMIA ROLE-PLAY SIMULATION (with Catherine M. Ashcraft)

implementation, which the COP will consider designing.