Troubled Waters

Climate Change, Hydropolitics, and Transboundary Resources

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Introduction

Global climate change presents the most significant of all the world's environmental challenges. Every country contributes to growing greenhouse gas emissions, and every country will bear the ecologic and socioeconomic consequences of worsening greenhouse warming. Climate is an elemental component of the natural environment within and against whose bounds human civilization has developed and prospered. Left unchecked, continuing global warming could cause worldwide social and environmental disruptions.

Climate change will particularly affect the world's shared freshwater resources. Shifting precipitation patterns and increased melting of mountain glaciers will disrupt the upstream sources that nourish river waters, upsetting the timing and quantity of downstream flows. Rising sea levels will exacerbate saltwater intrusion into many rivers' lower reaches. Stronger storm surges may inundate low-lying coastal deltas. Should climate change alter the amount or distribution of river resources, riparian states may suffer both chronic pressures, such as decreased freshwater availability, and acute crises, such as flooding or drought. Both types of threats can impair food production, endanger public health, stress established settlement patterns, and jeopardize livelihoods and social well-being.

Troubled Waters: Climate Change, Hydropolitics, and Transboundary Resources examines the environmental dangers and policy dilemmas confronting the sustainable management of shared water resources in a warming world. It presents analyses by regional experts as well as by Stimson staff. The content of this volume draws substantially on a two-day cross-regional workshop co-hosted by Stimson and The Energy and Resources Institute (TERI) in Delhi September 5–6, 2008. The workshop focused on the impacts of climate change on major transnational river basins and gathered experts from academia, think tanks, NGOs, public service, and the private sector. The basis of our analysis also includes interviews and literature from the field, as well as consultations with US experts.

In the collection's opening paper, Jayashree Vivekanandan and Sreeja Nair first set out the array of threats that greenhouse warming poses through shared water supplies and systems to human well-being, from compromising food security, to undermining development goals, to endangering public health, etc. They then sketch an analytical framework for understanding the complex web of resulting policy puzzles. Both global climate governance

and sustainable water management must grapple with pervasive mismatches between the national political level at which key decisions are made; the individual, societal, and economic levels where the actions generating environmental change occur; and the ecosystemic levels at which the environmental consequences unfold. Effectively addressing these challenges, they show, will require policymaking structures and processes that can successfully encompass multiple scales from the local to the global, while also navigating the disparate perspectives of diverse stakeholders situated at levels extending from households and communities to the national, regional, and international.

The volume is divided into two sections. In "Perspectives from the Regions," experts from South Asia, Southeast Asia, and the Middle East provide an introduction to the array of complex interlinkages characterizing climate change and water and explore some of the key issues in their respective regions.

South Asia presents a microcosm comprising nearly the entire range of environmental risks and policy problems arising at the intersection of global warming and water management. In his contribution, "South Asian Perspectives on Climate Change and Water Policy," Ashok Jaitly assesses the subcontinent's vulnerability to climate-induced strains on common freshwater supplies already stretched thin from the increasing demands imposed by population growth, expanding industrialization, and intensifying agriculture. On many fronts, he concludes, the region faces an incipient water crisis, posing challenges that its existing management systems—too often burdened by ineffective regulatory mechanisms and fragmented institutions—appear ill-prepared to surmount. Surveying the prospects for tensions over the region's transboundary waters to aggravate international conflicts, he urges the countries of South Asia to devote renewed efforts to dialogue, negotiation, and cooperative management of their shared resources.

Global warming will affect every country on Earth, but its risks will prove especially damaging to developing countries. Farming, fisheries, forestry, and other environmentally sensitive sectors represent significant portions of the economies of most developing nations, making them particularly vulnerable to climate impacts. In "Climate Insecurity in Southeast Asia: Designing Policies to Reduce Vulnerabilities," Khairulmaini Osman Salleh asks how the countries of the Association of Southeast Asian Nations can craft greenhouse policies to increase the resilience and reduce the exposure of the poor and marginalized among their populations. He calls on the nations of the region to incorporate climate change into the poverty line indexes that inform their development policies. Then, looking more closely at livelihood structures in three low-income groups—the urban poor, the highland communities of major river basins, and certain coastal areas—he maps a "geography of vulnerability" and discusses how current and potential climate change adaptation and capacity-building programs at these community levels should be integrated into national, regional, and international development policies.

In the section's final paper, Mohamed Abdel Raouf Abdel Hamid takes up the particular challenges that global warming poses to the Arab nations, focusing on the oil-rich but water-poor countries of the Persian Gulf. These states figure as the world's heaviest per capita emitters of greenhouse gases. At the same time, these desert states count among the most vulnerable countries to the effects of climate change. Indeed, so scarce already are freshwater supplies in the region that the six nations of the Gulf Cooperation Council depend on desalination plants for some two-thirds of their needs on average. Even so, each of these fossil fuel–producing countries remains acutely conscious that global efforts to curb carbon emissions strike at the historic engine of their economic prosperity. Raouf concludes that Arab awareness of the climate threat is growing among policymakers and publics alike. Yet governments have been slow to craft national action plans, and their international policy engagement is low. While the Arab nations have begun many promising initiatives, he argues, they must further develop measures and incentives to reduce their carbon profiles, promote clean energy technologies, and combat the adverse impacts of climate change.

In the volume's second section, "Interpreting the Trends," Stimson analysts pick up and expand on two cross-cutting issues—integrated water management and climate risks to environmental security—that run as recurring threads through the four regional contributions.

First, Kendra Patterson makes "A Case for Integrating Groundwater and Surface Water Management." These two sources of fresh water are typically treated as distinct supplies, studied and managed separately, often by separate authorities. Rivers, lakes, and other surface waters are considered renewable flows, part of dynamic hydrological cycles. Most groundwater represents finite stocks, confined in nonrenewable fossil reservoirs. Yet both surface and groundwater can straddle boundaries and, for shared rivers as for shared aquifers, withdrawals made by one user affect the water supply available to the others. Patterson takes lessons from the Ganges-Brahmaputra river system between India and Bangladesh, on the one hand, and the Nubian Sandstone Aquifer in North Africa, on the other, to argue that shared groundwater and shared surface water alike must be managed holistically if they are to be managed sustainably. In both cases, water managers must strive to incorporate and reconcile the demands of multiple users. By the same token, where demands can be met by drawing on both surface and groundwater, policymakers must integrate their handling of the two. Together, the resources comprise the total water available to their riparians. Where climate change or other pressures increase the stresses on one source of supply, so users will tend increasingly to exploit the other. If policymakers govern either resource in isolation, they risk mismanaging both.

In the concluding paper, David Michel evaluates whether climate change impacts on shared freshwater supplies could produce conflicts that might threaten global security. He

judges the outbreak of full-scale water wars unlikely. Historically, riparian states in transnational basins have deployed their diplomats and drawn up cooperative agreements to manage shared waters far more often than they have deployed armies and drawn their swords to settle disputes. But he cautions that open warfare between nations is not the only risk to peace and prosperity posed by greenhouse pressures on transboundary water resources. Droughts, floods, and frictions over shared rivers, he finds, are already fueling violent instability within states as well as between them. Rising climatic stresses on common waters will put new and perhaps unprecedented strains on cooperative governance institutions at the local, national, and international levels. He proposes a reexamination of the human security issues surrounding global warming and global water to illuminate where the potential flashpoints lie and guide decision makers in designing policies to head off or defuse the prospective tensions that could ignite future conflicts.

No one volume can supply a comprehensive view of such a complex and continually evolving subject. We have not attempted to produce such a book. Instead, adopting diverse, intersecting angles of approach, each author charts the regional and international terrain from a distinct vantage. Individually, their contributions insightfully explore salient aspects and suggest possible paths through the thickets of global climate governance and transboundary water policy. Together, their complementary and contrasting viewpoints vividly illuminate the contours of this difficult realm, providing the added depth and dimension afforded by the interplay of multiple perspectives.