

Tushaar Shah: Taming the Anarchy: Groundwater Governance in South Asia

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South Asian groundwater seems a narrow subject ill suited to an exploration of the socio-ecology of natural resource development and exploitation. Yet Tushaar Shah's new book *Taming the Anarchy* takes a historical perspective on water resources and agrarian production in an intriguing treatment of irrigation governance that has implications beyond South Asia or just groundwater. Shah's synthesis of irrigation technology as the means of agrarian livelihood, with social and political organization framing the evolving modes of production, offers new insights of interest to a broad *Human Ecology* readership.

Mounting pressure on resources, collusion among farmers and officials, agencies working at cross-purposes: all-out battle characterizes groundwater "anarchy" in South Asia. The contemporary era—from roughly the 1960s—is the latest phase in the long history of South Asian irrigation. This latest era is marked by an explosion in number, geographical extent, and importance to overall irrigation of private groundwater wells. Shah's extensive review of studies and statistics from India and Pakistan, and to a lesser degree from Nepal, Sri Lanka, and Bangladesh, constitute the supporting empirics. The state—ever a step behind the unfolding reality on the ground—ineffectively manages or even fully comprehends the groundwater revolution in South Asia. The implications *Taming the Anarchy* has for future decision-making center on the

elusive dynamic between policy and anarchy. Yet Shah only partially resolves this tension, leaving important questions open for further enquiry.

The typology of groundwater institutions (pp. 155ff) is normative but not ultimately reductionist to the South Asian context. Specific insights are drawn from broader international experience, including China, the United States, Mexico, Australia, Spain, the Middle East, and Sub-Saharan Africa. Missing entirely is a review of Soviet-era irrigation that informed the command-and-control model of public administration in India during the Green Revolution's privately financed groundwater explosion. Shah posits that the forms groundwater governance takes are produced by the interaction of users at multiple institutional scales with the physical resources they use or vie for. This analytical approach holds broad descriptive value but ineffectively accounts for the transformation among institutional forms. Innovation and evolution—what the final chapter's "thriving in anarchy" are all about—remain inadequately explained, partly by Shah's own admission.

The first of eight chapters, "The Hydraulic Past: Irrigation and State Formation" historically contextualizes the "era of atomistic irrigation" (p. 29), specifically in the Mughal and British colonial periods. A particularly helpful section relates the modern irrigation experience in South Asia to colonial and postcolonial experiments in irrigation from other regions: West Asia and North Africa, humid East and Southeast Asia, and Africa. Shah engages theoretically with Foucault and Wittfogel, among others, to understand the differential efficacy of "constructive imperialism" across time and space, as well as to broach the relation of hydraulic interventions to state formation. Data on irrigation types, area, and users reveal the increasingly important role of groundwater relative to surface water in the irrigation economies of South Asia.

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“Rise of the Colossus” evaluates theories that have attempted to explain, in causal terms, the groundwater revolution in South Asia and the North China Plain, which Shah suggests presents the most suitable analogy. Discounting technology, hydrogeology, state initiative, or rural electrification as determinative explanations of the timing and peculiarities of the groundwater revolution, Shah ultimately settles on neo-Boserupian interpretations of population pressure inducing land use efficiency to enhance investments. The proposition that pumps make possible individual “autonomous irrigation” for millions of smallholders, whereas flow irrigation compels either subjection to the state or cooperation with collective institutions further illustrates Shah’s political characterization of anarchy.

“The Future of Flow Irrigation” reviews the history and prospects of canal irrigation, which continues to preoccupy researchers of water management and history in South Asia. Shah effectively presents and dissects conditions required for successful flow irrigation: fewness of irrigators, homogeneity of crops, strong and legitimate oversight authority, and a limited choice set. Even if these conditions existed at one time, Shah argues they no longer correspond to the reality of South Asia today.

“Wells and Welfare” and “Diminishing Returns?” together evaluate the groundwater revolution’s effects on poverty and equity. Productivity, efficiency, and equity outcomes are contrasted with challenges to water resources sustainability and undermined collective or state governance. While dispelling doubt on the efficacy of the private pump boom in alleviating poverty and increasing food production, Shah urges careful consideration of future decision-making options, relying on his presentation of the progression of agricultural economies with a classic rise, peak, and fall pattern. Addressing South Asian conditions, indeed much of it highly specific to India, Shah begins at the mid-point in the book to address policy formulation.

“Aquifer and Institutions”, as we refer to above, is a crucial chapter in *Taming the Anarchy*. Framed in game-theoretic terms, five outcomes are categorized, ranging from unsustainable aquifer depletion to cooperative and sustainable use. Effective community-organized groundwater recharge projects in western India’s Saurashtra region are described in depth as an example of desirable cooperative gaming. The energy-groundwater nexus, in which subsidized power to irrigators exacerbates groundwater depletion at the same time that it secures constituencies for politicians, is problematized. Also discussed are “experiments in moral water economy” (pp. 180ff) and the tension between formal and popular understandings of hydrology. Understanding local institutions, social move-

ments (e.g., for water harvesting), and geographic context are critical for the design of effective public policy.

“Can the Anarchy be Tamed?” recalls John Kenneth Galbraith’s famous characterization of India as a “functional anarchy” with decision latitude vacillating really between tolerable and intolerable anarchy. This leads to a highly effective and passionate critique of water policy discussions and ‘expert’ advice thrust on South Asian decision-makers today, specifically embedded in integrated water resources management (IWRM) discourse and ‘best practices’. Shah argues that IWRM would entail abrupt disciplining a teeming mass of atomistic producers, using exogenous tools of entitlements, water rights, laws, permits and prices. Even if desirable as a route to ‘order’, the administrative and political transaction costs are simply insurmountable in South Asia today.

“Thriving in Anarchy” is Shah’s *realpolitik* prognosis for South Asia’s groundwater revolution. This is less *laissez-faire* than it is about strengthening nascent institutional arrangements by providing space for innovation and the evolution of irrigation socio-ecology. The state in the drama of groundwater governance is the *sutradhar*, the traditional Indian theatrical mediator between actors and audience. Accordingly, the policy framework Shah prefers is the “strategic indirect approach” that operates through the environment of conduct as opposed to manipulating individual behaviors. Practical policy directions are provided; instead of broad-brush attempts to overhaul the entire atomistic system, decision-makers must focus on specific challenges, e.g., the energy-groundwater nexus, collective groundwater recharge, effective conjunctive use of ground and surface water, and applying the best groundwater solutions to canal irrigation (through accessible water markets using individualized pipe delivery from main channels).

The concluding twelve “propositions” (pp. 239ff) are Shah’s rejoinder and gauntlet to researchers and policy-makers alike. The contributions *Taming the Anarchy* makes to irrigation governance globally are far-reaching. It should be a vital resource for academics, water policy planners, NGO activists, environmentalists, and concerned citizens. Shah’s prose is accessible yet does not sacrifice complexity for simplicity. Although the book presents South Asia in cohesive terms, it skims the surface of transboundary water governance tensions that are inherent in the region’s shared aquifers, upstream-downstream riparian interests, Kashmir’s hydro-politics, and India as the regional ‘hydro-hegemon’. Still, Shah very effectively assesses current challenges through scholarly analysis while framing substantive areas needing further enquiry.