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10-2020

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Book Review: Blue Infrastructures: Natural History, Political Ecology and Urban Development in Kolkata

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A Book Review on

Blue Infrastructures: Natural History, Political Ecology and Urban Development in Kolkata

Jenia Mukherjee (Singapore: Springer), 2020, 263 pages, ISBN: 978–9811539503

What role does a river play in shaping urban justice and resilience? Jenia Mukherjee tackles this provocative question with an equally provocative answer: rivers are critical infrastructures with biophysical *and* social histories, both of which inform their physical condition and socio-ecological assets. In *Blue Infrastructures*, Mukherjee masterfully illuminates the intersection of materiality and history in the urban environment, exploring its implications for a just and resilient future city. Tracing the uses and evolution of Kolkata's "blue infrastructures"—rivers, wetlands, seas, etc.— from the colonial period to the present, Mukherjee's analysis addresses a pressing question in this era of the Urbanocene: *How can planners and policymakers justly conceptualize and build urban environmental resilience?*

A central contribution of this work is Mukherjee's expansion of the meaning of blue infrastructures, typically understood as biophysical, aquatic elements, and related ecosystem services. Much more than material, Mukherjee's blue infrastructures contain the histories, stories, and symbolism which (re)produce and are (re)produced by the biophysical, influencing resilience. Mukherjee rejects the conventional notion that resilience can be quantified or indexed based on the present, physical state of infrastructures. In a rebuke of reductionist methods, she demonstrates a novel way to study blue infrastructures, combining ethnographic methods with archival analysis. Her approach generates a rich account of environmental transformations, opportunities, and risks, manifested throughout the centuries in the city's many canals, sewers, rivers, and wetlands. Furthermore, her Historical Political Urban Ecology (HUPE) framework offers a practicable way to center justice in urban resilience planning, by challenging "mainstream histories." While Urban Political Ecology (UPE) tends to focus on the present, HUPE historicizes the urban environment, navigating through multiple time periods. According to Mukherjee, UPE overstates narratives of decline, whereas a HUPE approach elucidates both challenges and opportunities through the study of local environmental history. By confronting cyclical, systemic and historical patterns of marginalization, the modern city may avoid reproducing past injustices, and potentially attain a resilient future. Readers will journey through the messy, cross-temporal factors which make Kolkata's blue infrastructures what they are today, both problematic and hopeful. Each chapter flows as an accessible narrative, offering a uniquely nuanced view of a vast hydrological history.

Chapter 1 introduces readers to Kolkata, a city pressured by urbanization and climate change. Here, Mukherjee lays out a central argument: Kolkata can be resilient if blue infrastructures are optimized, but this requires an understanding of relevant historical and political factors. While making a case for the HUPE framework, she emphasizes the importance of narrative. Each city has

its own stories, some more dominant than others; they explain past environmental behaviors and current conditions, and open the door to a variety of futures. For example, the legend of Sagar, an old Bengali tale, ascribes agency and sacred status to the Ganges river, embedding it with cultural significance. In contrast, the river was portrayed by colonists as an object to be conquered and exploited, a powerful narrative with lasting material consequences.

What is nature, and who is it for? How do power, control, and hegemonic preferences shape the "natural" landscape and produce vulnerability? Chapter 2 describes the "swampy origins" of Kolkata, a complex "muddyscape" where land and water intermingle. This environment sustained generations of human life and culture, but has been erased through urbanization and conflicting goals. In chapter 3, colonists seek to tame the "wild" and "unhygienic" muddyscape, kicking off centuries of conversion, reclamation, gray infrastructural controls, and manipulation of Kolkata's blue infrastructures for profit.

How can discourse impact our understanding of blue infrastructures? In chapter 4, Mukherjee challenges reductionist binaries which misrepresent the complexity and heterogeneity of hydrological management. These include local-municipal, tamed-untamed, and nature-culture. Discrepancies in popular nomenclature also reveal something about dominant and subaltern histories. For example, "wetland" vs. "swamp" exposes a preference for acultural framing of natural resources, and an ignorance of the local histories embedded there. "East Kolkata Wetlands" vs. "wetlands to the east of Kolkata" portrays a resource both isolated from a connected whole, and intended for human consumption. Chapter 5 takes readers into the twenty-first century, explaining how choices which disrupted and degraded Kolkata's canals have reduced ecological function while increasing social vulnerability through displacement.

How have ideals of nature changed over time, and whose interests do they reflect? Chapters 6 and 7 describe Kolkata's embrace of a neoliberal economy, transition to a consumption based city, and recent preferences for sustainability, beautification, and ecological restoration. Market forces once responsible for ecological degradation, dispossession of peri-urban dwellers, and urban growth now tend toward "sustainable development." However, sustainability goals often reflect upper-class and global environmental priorities which exclude marginalized residents of Kolkata. Readers will be interested in how global South environmentalism compares to global North environmentalism, explored in chapter 8.

Chapter 9 resurrects a claim that Mukherjee makes early on: narratives which emphasize Kolkata's impending decline, proclaim ecological vulnerability, and decry degradation via urbanization are not the only possible reality. What if planners could take a more holistic view using HUPE, and optimize infrastructures through "upgradation?" Here, Mukherjee recommends intellectual exchange between scholars and practitioners toward this end. However, researcher-practitioner collaboration is a field replete with its own challenges and politics. These should be addressed if we are to understand the merits and potential of such an approach.

This work adds to scant literature on India's urban environmental history, and the HUPE framework offers a novel way to conceptualize resilience and ecosystem management. Individual chapters would make excellent reading assignments for courses in urban planning, water management, political ecology, environmental justice, and related fields. For scholars, this work provides a useful example of how historical and political analyses might be combined in any socio-ecological study. For practitioners, a strong case is made that natural resources (blue infrastructures and beyond) are inextricably connected to culture, politics, and history, and must be managed accordingly. Just and resilient urban futures call for holistic consideration of environmental transformations, opportunities, and risks played out across space, time, and culture. *Blue Infrastructures* is a compelling, informative contribution to this practice.

AUTHOR CONTRIBUTIONS

DH drafted the manuscript. MH added content and provided editing support throughout. Both authors contributed to the article and approved the submitted version.

ACKNOWLEDGMENTS