

BOOK REVIEW

Blue Infrastructures: Natural History, Political Ecology and Urban Development in Kolkata, by Jenia Mukherjee. pp. 256 (Springer Nature, Singapore), ISBN 978-981-15-3950-3, Price: 5,007.00 (Paperback)

Urban communities around the globe are confronting with ever-expanding challenges. These challenges are being driven by, and exacerbated by, increments in urban population and environmental change. Urban areas grow perseveringly while fears of an unnatural weather change and ecological calamity loom ever more prominent, and the 'green' or 'sustainable city' is playing a significant role in planning and policy discourse to manage the emerging situations. In this context recently published book *Blue infrastructure: Natural History, Political Ecology and Urban Development in Kolkata*, by Jenia Mukherjee takes a 'longuedurée approach' to deal with catching the dynamicity of the delta through nuanced investigations of the steady exchange among land, water, and mud. It uncovers how this space could decide, and thus get dictated by, political power, finance, and social livelihoods across changing temporal directions and moving towards political-financial goals that convey long-term suggestions for sustainability. The author has used 'Historical Urban Political Ecology' (HUPE) as a perspective to contextualize the "urban nature" with special reference to Kolkata and beyond.

The Urban Political Ecology (UPE) perceives that the material conditions that encompass urban environments control, manipulate and serve the interests of the elite to the detriment of marginalised population. It gives a focal point through which to investigate the both – urban areas and things in urban areas. Therefore, urban political ecology gives an integrated and relational approach that unravels the interconnected monetary, political, social and biological cycles that together profoundly shape lopsided uneven landscape. The book broadly follows this thought and brings up an issue on 'urban nature' of Kolkata and its progressive turn of events.

From 'Blue Infrastructure to Disrupted Networks'

The book breaks down the trajectories of urban development of Kolkata into nine chapters. In the introductory chapter, the author brings up the issue about the pertinence of planning Kolkata's blue infrastructure and argues that the "blue infrastructures" of Kolkata offer the mind boggling story of co-development and co-functioning of hard, delicate, and ecological frameworks that advance broadly over time across tangled interactions among city, nature, and innovation. The second

chapter explores the 'imperial infiltration' in the delta and focuses on the foundation of Kolkata as site of trade for colonial power. In addition, it explains how the site offers ecological advantage to imperial forces to conquer the site over situation. The site was marked initially as 'unhygienic and wild' by the colonizer. Apart from the wide scope of environmental advantages that the site offered, the author also argued the site was relatively free from the official impedance which had tormented the colonial infiltrators at every other spot in Bengal.

After explaining the foundation of Kolkata, the author delves into the interventions of colonial power to the hydrology of delta. The colonial interventions came in the form of canals, and (salt water) lakes, artificial cuts and excavations, construction of pumping stations, lock gates, sluices, mortar sewers, and elaborate projects of drainage and reclamation of marshes. She argues that the whole framework had been developed as an incorporated device to deliver the colonial urbanization ventures. Networked infrastructures were structured and executed as significant routes of trade and urban utilities, meeting the expanding needs of the planned metropolis in the most cost-effective mode. Moreover it is highlighted that how selected site was slowly tamed, controlled and meddled with, keeping pace with the development of the universal laws of colonial hydraulics. This prompted the advancement of networked infrastructures in the form of an extensive (eastern) canal system in Kolkata. This canal system all the while also encouraged trade, transportation, and waste, sewerage, and sanitation.

To understand the untamed practices (Sewage treatment, fishing, dump yard, heavy metal removal, biodiversity, Fishing and flood control) within the networked infrastructure in Kolkata, the author focuses on East Kolkata Wetland (EKW), which is a significant part of the cities blue as well green infrastructure collectively; it can be called as 'turquoise infrastructure'¹ (Childers et al. 2015)² She highlights the ecosystem services created by these wetlands, which has an inferred 'subordination-domination framework' rooted in it; here, the wetlands are understood to be operating both as an output and an input, produced and required by the city. In addition, the author mentions that it is essential to recognize that EKW is "tightly bound to urban fabric and performance" and the working of both the city and its wetlands relies upon the mutually reinforcing sustainable flows between these two associated, interconnected, and embedded entities.

After exploring untamed practices and its contemporary challenges, author examines the disrupted networks (canals) in which she shows how navigable canal in the city turns into *nullahs* (a degraded canal) over the years. It was pointed out that after Independence, the canal

system of Kolkata gradually began to be used as sewage disposal sites and there is no recorded history that points out the specific time period when trades in the canal stopped functioning. In addition, it is noted that a significant reason behind the degradation and disruption of the canals is, "Heavy siltation and inadequate maintenance of the channel outfall structures resulting in a significant reduction in the hydraulic capacity of the sewerage system". This has resulted into the recurrence of flood in the city after moderate rainfall. The contemporary disturbance of the canal network is proceeded with tradition of the late colonial period, with the extra components of demographic pressure, nature of effluent, and development interventions (Construction of Metro Rail over the *Adi Ganga*) obtuse toward natural and social expenses.

Disruption in the cities' networked infrastructure has been incited by numerous things noted previously. Consumption of space in the form of townships has been highlighted in the sixth chapter of the book. Here, author sequentially shows the rise and advancement of projects in the eastern outskirts of Kolkata in the post-Independence period, concentrating on the four integrated township projects: Salt Lake, Baishnabghata-Patuli, East Calcutta Township, and New Town Rajarhat. Subsequently the local realities and global vision for city planning are discussed in the eighth chapter. Various official plans and global intervention through re-development project of canals has also been illustrated.

Beyond the idea of "bourgeoisie environmentalism"

The goal of planning history is to be critical about things that have not gone the manner in which they were proposed, making way for environmental protests, activism, and moving against 'statist development' objectives and planning agendas by non-state actors. With this argument, chapter eight subjectively dissects assortments of environmental activism across conflicting, negotiating, and mediating actors encompassing the protection and restoration of the *Adi Ganga* and the EKW. It entangles "middle class environmentalism" and political ecology perspective capturing multiple motives and intentions among various stakeholders ranging from heritage conservation priorities, to conservation of ecosystem resources for the sake of ecosystem services for both the city and its marginalized ecosystem-dependent communities. Moreover, through two contextual investigations, author argues, why and how it is critical to rise above the "bourgeoisie environmentalism" way to deal with incorporate assortments of urban environmentalism, molded by explicit political conjunctures specifically local settings.

The book certainly catches the intricacy of Kolkata's blue

infrastructure and its implication at large in the population. Be that as it may, there is some inadequacy in the book which has not been addressed adequately. First and foremost limitations are the deficiency of information with respect to the contemporary changes of land use in the city. Secondly, the book doesn't address the plight of the slum dwellers. Thirdly, the author singularly centres on disruption of blue infrastructure and its political ecology, however it doesn't enlighten the discussion about city as 'engine of economic growth'. More specifically in the post-liberalised world, policy makers conceded that a sustainable city has to be economically viable. But the book fails to point out any such path that addresses economic viability of the city. The next significant issue that the book does not throw any light is about the process of land acquisition. It talks about the development of four townships but very little focus has been given to the process of acquisition. Moreover, demographic and economic change in the city has not been discussed elaborately which was necessary to mention because author talks about the disruption of network at great length but mentions very little about city's economic change and influences of partition in the city. Lastly, when the author discusses the consumption of space in the form of townships through reclamation of wetland, she doesn't mention the role of partition and huge demographic pressure, faced by city immediately after Independence.

However, the book makes a great contribution in the field of urban environmental history and political ecology by shedding lights of the complexities in the urban development process and its evolution. It explores the conflicting rationalities, negotiation and middle-class sentiment on urban environment. Moreover it successfully establishes the fact that the flexibility of Kolkata must be sustained, tackled, and accumulated by improving on her ecological incentives by converging equations among multiple stakeholders beyond conflictual affiliations and positioning.

Footnotes

1. Urban wetlands are both green and blue infrastructure. When one combines green and blue, the result is the color turquoise.
2. Childers, D.L., Cadenasso, M.L., Grove, J.M., Marshall, V., McGrath, B., Pickett, S.T.A. (2015): *An Ecology for Cities: A Transformational Nexus of Design and Ecology to Advance Climate Change Resilience and Urban Sustainability, Sustainability.*

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