At the roots of urban disasters: Planning and uneven geographies of risk in Kolkata, India

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ABSTRACT

Cities in India are increasingly at risk from natural hazards and the effects of climate change. In Kolkata, urban development on the low-lying periphery has produced uneven geographies of risk, with well-protected suburban settlements surrounded by overcrowded slums with poor infrastructure and a lack of basic services. This article connects proximate conditions of vulnerability in peri-urban Kolkata to their root causes based on a mixed-method case study of the satellite township Salt Lake. I locate roots of risk in four trends in the political economy of urban development—the commodification of hazardous land, inadequate provision of affordable housing and amenities, exclusion of the poor, and interdependence of spatially separated groups. Together these trends constitute a key social dynamic that is shaping development and risk in peri-urban Kolkata, the desire of urban elites to live separately from the poor while depending on their labor. I conclude with a discussion of how these trends are shaping disaster geographies elsewhere in Kolkata and urban India and argue that we must go beyond proximate understandings of urban disaster risk if we are to address its production and proliferation.

On September 6, 2012, the skies opened up over Kolkata, India. The monsoon showers were brief but intense: in just a few hours, more than four inches (100 mm) of rain fell on the city. In Salt Lake, a new town suburb on the city's eastern fringe, the rainfall caused minor flooding at several key intersections, inconveniencing motorists and snarling rush-hour traffic. Office workers from the nearby technology park shielded their heads with folded newspapers and hoped to catch an open seat on the next rickshaw or bus. An entrepreneurial hawker sold cheap plastic umbrellas at double the normal price. The rainfall was heavy but unremarkable, a typical monsoon downpour. The flow of everyday life in Salt Lake continued largely uninterrupted.

Less than a kilometer away, the Kestopur slum was submerged. The rainfall overwhelmed the settlement's few functioning drains and, within a matter of a few hours, water rose to knee height and above. The settlement's main paved street was impassable, and soon traffic was at a standstill. Off the main road, on the dirt and stone footpaths that crisscross the settlement, the water flowed freely. The shacks and shanties lining the footpaths were flooded, with water coming up from the ground and through the *katcha* (built from temporary materials) roofs and walls. Weary residents moved their possessions onto high shelves to protect them from the water. Cycle rickshaw drivers attempted to navigate through the flooded streets, while children splashed in the murky water. The pit latrines and open drains that serve as the settlement's rudimentary sewer system overflowed, depositing raw sewage into the streets. The makeshift electrical lines that deliver electricity to many of the households hung dangerously close to the water. The flooding was heavy but unremarkable, a typical monsoon downpour.

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Salt Lake and Kestopur represent two important trends in the Global South. The first is the rapid growth of cities, much of it occurring in so-called slums (e.g., Davis, 2006; legates & Hudalah, 2014).[1] The second is the increasing costs from natural hazards and the effects of global climate change (International Federation of Red Cross and Red Crescent Societies, 2010; Revi et al., 2014; United Nations International Strategy for Disaster Reduction, 2011). These trends are interrelated; cities tend to be built in hazardous geographies (De Sherbinin, Schiller, & Pulsipher, 2007) and urban growth has led to millions of people living in high-risk areas, often without adequate infrastructure, housing, and services that mitigate the harmful effects of environmental hazards (Braun & Aßheuer, 2011; Pelling, 2003; Pelling & Wisner, 2012). The policy literature on disaster risk reduction and climate adaptation now routinely refers to urbanization and attendant spatial expansion as one of the key drivers increasing environmental risk, particularly in Asia, Africa, and Latin America (e.g., Kha, Bloch, & Lamond, 2012). International institutions acknowledge that the terrain of urban risk is highly uneven, with vulnerability concentrated in low-income and marginalized communities and risk indices routinely use slums as a metric for vulnerability (Revi et al., 2014; Sherly, Karmaskar, Parthasarathy, Chan, & Rau, 2015; World Bank, 2011).

Though our understanding of the conditions of vulnerability at the place and time of urban disasters has improved, there is a recognized need for research that broadens our understanding of disaster risk toward root causes (Oliver-Smith, Alcantara-Ayala, Burton, & Lavell, 2016; Wisner, Blaikie, Cannon, & Davis, 2003). *Risk*, the possibility of adverse effects resulting from a population's exposure to environmental hazards (Cardona et al., 2012), accumulates through a variety of dynamic and long-term processes grounded in the broader political economy and ecology of places (Adger, 2006). Disaster researchers from human and political ecology have long understood root causes as the interrelated set of processes and institutions that help determine who and where the vulnerable are, the nature of their vulnerability, what hazards they are exposed to, and the resources they have available to mitigate risk or adapt to changing conditions (e.g., Hewitt, 1983; Lewis, 1999; Mustafa, 1998; O'Keefe, Westgate, & Wisner, 1976; Peet & Watts, 1996).

The international policy literature on urban disasters frequently cites the *speed* of urban growth as a cause of risk, a narrative where the pace of urbanization is outstripping the capacity or competence of governance institutions, leading to unplanned settlements on hazardous land. Yet, Pelling (2012) reminds us that population growth and hazards do not, in and of themselves, generate risk. Geographies of risk are constructed by the competing claims over the resources, broadly conceived, that structure economic relationships, govern spatial development, and assign rights to various actors. A root-cause approach broadens our analysis beyond the seeming failure of urban governance and toward an understanding of how, and where, power is being exercised, to whose benefit, and how it leads to urban development where risk is unequally distributed (Mustafa, 2002). Doing so also makes visible the connections between disaster risk and everyday urban inequalities (Murray, 2009; Satterthwaite, 2003).

Root-cause analyses are rare in disaster plans and other official analyses of risk, which tend to focus on hazard exposure and proximate conditions of vulnerability. Root causes are often quite distant, spatially and temporally, from the vulnerabilities seen at the time and place of disasters, requiring contextual and sociohistorical knowledge not easily gleaned from usual sources of bureaucratic knowledge. Root causes also resist quantification and indexing, an increasingly popular policy tool for understanding risk. Analysis of root causes also reveals drivers of vulnerability that are linked to unequal distributions of resources and differential access to power and rights, inequalities that are often produced by the same governance institutions tasked with disaster risk reduction and mitigation and whose leadership and constituencies may have significant stake in maintaining the status quo or furthering inequality (Lewis & Kelman, 2012; Watson, 2009). Thus, many official analyses tend toward more proximate, visible, accessible, and palatable explanations of risk and disasters.

Limiting our study of risk in such ways is problematic for the goals of long-term disaster resilience and urban climate adaptation, however. The roots of urban risk are found in the political economy of places and logics of city development and transformation, which find expression in the

everyday values and practices of urban governance institutions like planning (Pelling, 2007). Though a focus on proximate conditions may help us to understand risk in a particular time and place, it is a less effective lens for understanding the processes and actors that help produce unequal risk geographies, yielding only a "partial understanding of causation and culpability" for disasters (Murray, 2009, p. 168) and a myopic understanding of how contemporary practices of urban development will shape future geographies of risk.

The goal of this article is to trace the proximate conditions of risk in peri-urban Kolkata to their root causes and, in doing so, provide a broader lens for understanding the emerging patterns of risk in Indian cities. The study centers on Salt Lake and its nearby slums and relies on a mix of contemporary and historic data collected during 15 months of fieldwork from 2010 to 2013. The data include three dozen interviews with public officials, planning professionals, residents, and civil society organizations; a review of historical and contemporary planning and development documents; and two surveys of low-income households. My analysis does not center on any particular disaster event. Instead, it starts from an empirical observation that environmental hazards have an unequal impact on Salt Lake and its attendant slums (Rumbach, 2014) and seeks to understand the past and ongoing urban development processes by which those risk geographies were created and are maintained. I pay particular attention to how the institution of planning—as a practice, set of policy documents, and language of spatial governance—is employed and contested.

I locate the roots of risk in four trends in the political economy of development of Salt Lake and its environs. First, low-lying land on the periphery of Kolkata that was once considered unsuitable for development is now a valuable commodity for urban expansion. Peripheral land development began in earnest in the post-independence period when Salt Lake was built and has accelerated in the period of economic liberalization, increasing population exposure to environmental hazards. Second, though Salt Lake was envisioned as an inclusive community that would be home to lower and middle-class Bengalis, it developed as an exclusive suburb without housing or amenities for the poor. Third, and related to the second, Salt Lake's ongoing development has brought with it norms and aesthetic values that reflect the preferences of the globalizing middle-class and elite, which influence official decisions about which uses of urban space are desirable and legitimate. Here I draw on recent work by scholars of Indian cities who argue that "unplanned" and "informal" are flexible categories used to govern space to the advantage of urban elites (e.g., Bhan, 2009; Ghertner, 2015; Roy, 2003). The practical result has been campaigns to push shanties, hawking, and other visible signs of poverty beyond the borders of the township and into nearby slums where residents cannot command equivalent infrastructure or services necessary to mitigate risk. Finally, despite growing spatial separation between Salt Lake and its low-income workforce, I find that the communities are economically interdependent. The nature of work and spatial geography of settlement for the urban poor, tied to the service and labor needs of Salt Lake, make those communities particularly vulnerable to environmental hazards. Together these trends constitute a key social dynamic that is shaping development and geographies of risk in Salt Lake and nearby communities, the desire of urban elites to separate themselves socially and spatially from the poor while remaining dependent on their labor.

After a brief introduction to the environmental context in Kolkata, I describe each of these trends in detail. I conclude with a discussion of how the roots of risk in Salt Lake help to understand broader patterns of environmental inequality in Indian cities.

A city at risk

By almost any measure, Kolkata is one of the world's most environmentally at-risk cities. The Kolkata metropolitan area, which includes the core city of Kolkata and its nearby suburbs, is regularly exposed to natural hazards including heavy rains and tropical cyclones (World Bank, 2010b). Due to its flat topography, low relief, and inadequate drainage infrastructure, many parts of Kolkata routinely flood during the monsoon season (World Bank, 2010a). More infrequent and severe floods cost lives, cause widespread damage, and affect basic services (Sarkar, 2000). In 2007,

for instance, heavy rains and flooding killed at least 11 people, disrupted water supplies, and caused a sewage overflow that led to outbreaks of enteric disease (Majumdar, 2007). In 1978, the heaviest recorded rain in 100 years led to catastrophic flooding and thousands of deaths (Rumbach, 2014). Over 100,000 households, many living in slums, were displaced when sewage- and effluent-laced waters inundated their homes ("Ailing in the City," 1978; "A Hell on Earth," 1978).

Flood events like in 1978 and 2007 will become more frequent and severe as a result of global climate change (World Bank, 2013). Kolkata routinely ranks at the top of international lists of cities at highest risk from future climate conditions (e.g., Asian Development Bank, 2015; Stutz, 2012; World Bank, 2014). An analysis by Dasgupta, Gosain, Rao, Roy, and Sarraf (2013) found that in 2050, a rainfall event like in 1978 would flood 33% of the city's land area, directly affecting 3.5 million people. Tropical storms will become more frequent and intense, and rising sea levels in the Bay of Bengal will elevate storm surges. Nicholls et al. (2008) found that by 2070, $1 trillion in city assets will be at risk from climate-induced storms and flooding.

These impacts will be most severe for populations living on the eastern edges of the city, where much of the growth over the past few decades has occurred. Until the mid-20th century, Kolkata grew along the natural levee of the Hooghly, a linear urbanized sprawl stretching more than 37 miles from north to south but rarely more than 4 miles in width (M. Chatterjee, 1990). Beyond the high ground of the river, the land gently declines toward a hinterland of marshes, jungles, and tidal lakes that act as floodplains for the region. The floodplains are now primary sites for Kolkata's urban expansion and are central to the city's future disaster landscape. Salt Lake was among the first large-scale developments in the region and was a precursor to dozens of projects now underway.

"The clean sheet": Planning Salt Lake

In 1948, Dr. Bidhan Chandra Roy became chief minister of West Bengal. He inherited a capital city in crisis; the British partition of Bengal had led to millions of refugees crossing the border from newly created East Pakistan, many of whom took refuge in Kolkata. The sudden influx of refugees coincided with an acute housing shortage and aging public infrastructure, producing a public health crisis. With the river to the west and land along the levee largely developed, city officials looked east.[2] Inspired by a visit to The Netherlands in 1949, Dr. Roy proposed that Kolkata should build a new township called Salt Lake on land recovered from the wetlands east of downtown (Government of West Bengal, 1981). Roy imagined the township would be a "wonderland," a self-contained cynosure of multistoried housing, parks, markets, and businesses and all of the amenities necessary for economic and social self-sufficiency. He instructed Dobrivoje Toskovic, the young planner hired to design the township, that it should house 400,000 lower and middle-class citizens, a model development with "all the amenities and facilities of a modern, planned town" (H. Chattopadhyaya, 1990, p. 11). His vision was consistent with other planned city extensions in the post-independence era, which aimed to achieve inclusive and integrated growth by mixing households from different socioeconomic groups (Vidyarthi, 2015).

Toskovic set out to create a "humane and healthy environment," which would operate "just like a garden city" (D. Toskovic, personal communication, March 9, 2010). He was guided by the work of modernist architects and planners like Le Corbusier and Lucio Costa; his chief inspirations for Salt Lake were the planned communities of Chandigarh (India), Brasilia (Brazil), and Rawalpindi (Pakistan). He saw the Salt Lake project as an opportunity for Kolkata to begin anew, to abandon the disorder of the old city and embrace the amenities that a planned community could offer. "Today = Anarchy," he wrote in his notes.

> The road is choked with traffic. The servants' quarters are now shops which encroach on the pavement. The house becomes a block of flats. Each part has developed separately producing chaos. (Toskovic, 2009, p. 19)

The solution was to start over using a "clean sheet" away from the "entanglement" of the old city (see Figure 1).
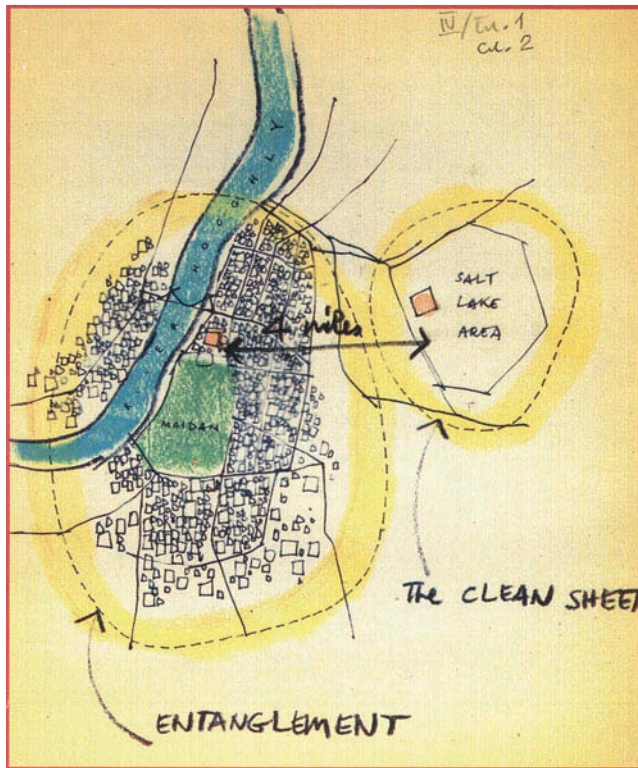
Figure 1. "The clean sheet." © Dobrivoje Toskovic. Reproduced by permission of Dobrivoje Toskovic. Permission to reuse must be obtained from the rightsholder.

Writing about master planning in Brasilia, Holston (1989) observed: "To be different, an imagined utopia must negate the prevailing order" (p. 79). As the master plans for Brasilia attempted to dehistoricize the city from Brazil, so did Toskovic's plans for Salt Lake attempt to negate the history of the larger metropolis in which it would be embedded. His thinking reflected that of Prime Minister Jawaharlal Nehru, who saw the growth of Indian cities as anarchic, unbefitting a new and modernizing nation (Kalia, 2006). Vidyarthi (2015) describes new towns and city extensions like Salt Lake as emblematic of the state's use of power and expertise to translate Nehru's vision for a modern, secular and casteless society through orderly development.

The modernist vision for urban growth was most practical on undeveloped land, tabulae rasae typically found on the periphery of existing cities. For Salt Lake, the state assembled approximately four square miles of low-lying or persistently flooded land in the northern wetlands for reclamation (Chatterjea, 1990). It was elevated using hundreds of millions of tons of silt dredged from the Hooghly River, unlocking vast development potential in the region and signaling an important shift away from the logics that had kept Kolkata's urban footprint contained to higher ground near the river. Reclamation began in 1962 and the first home was occupied in 1970 (Chatterjea, 1990; H. Chattopadhyay, 1990). The population grew from 10,000 in 1981 to approximately 276,000 in 2011. By 2030, it will likely reach 500,000 (Bidhannagar Municipal Corporation [BMC], 2007; Kolkata Municipal Development Authority, 2005).

From the perspective of hazard exposure, Salt Lake is typical of many new towns and suburbs meant to relieve population pressure on growing cities (Kennedy & Sood, 2016). With the most environmentally desirable land developed, cities are expanding onto floodplains, unstable hillsides, and other hazardous geographies previously considered unsuitable. Considered in isolation, Salt

Lake has exposed a substantial number of people and assets to potential losses. More broadly, planned developments like Salt Lake establish a trajectory of growth for the larger city; the massive investments in infrastructure needed to build such settlements make further development more feasible and cost effective, and past experience shows that once such investments are made, it is nearly impossible to change the direction of urban growth (Olshansky, 2009).

Salt Lake has invested in infrastructure to reduce the impacts of environmental hazards, including stormwater drainage, graded streets, and green spaces for water retention and absorption. These investments have been largely successful, at least for the residents living within the boundaries of the planned township, where the risks from monsoon flooding and other hazards are substantially reduced. These infrastructural systems do not extend to the nearby slums, however, where much of the local workforce lives.

Exclusion: Toward a "healthy atmosphere" free from poverty

Today Salt Lake is a wealthy suburb, a departure from Dr. Roy's original vision. Stately homes and gated properties face well-maintained streets, leading to small pocket parks and centralized markets. The sidewalks and streets are largely free of the types of small-scale hawking and food vendors found throughout the rest of Kolkata. Though Dr. Roy's vision for Salt Lake was emblematic of the Nehruvian socialism that guided many city plans in post-independence India, the township's growth began in earnest in the late 1980s and 1990s as the political economy of urban development was changing. The evolution of Salt Lake from an imagined self-contained and inclusive community to an exclusive one can best be understood through two interrelated trends. The first has been an evolving rhetoric about Salt Lake that increasingly imagines the township as an "exclusive" and "healthy" environment, allusions to a community free from the visible markers of poverty common to the larger city. This rhetoric emanates from Salt Lake's residents and government officials and is embodied in development plans and the township's promotional literature. The second trend, a practical consequence of the first, has been ongoing efforts to evict unplanned uses.

The move toward exclusivity began during the planning process.[3] Surprisingly, Toskovic's plans for Salt Lake did not provide land or housing for the poor, instead focusing on the needs of middle- and upper income households. When I asked Toskovic why he deviated from Dr. Roy's initial visions, he equivocated; low-income housing "depend[ed] on the Government decision to find an adequate area where this kind of construction is adequate to paying capacity of these people" (personal communication, March 10, 2010). Rabial Mallick, a long-time advocate for worker rights in the Salt Lake area, provided a different explanation. For city officials working with Toskovic on the Salt Lake plans, there was "widespread concern" that "housing poor people [in the township] would depress real-estate prices in the vicinity," making the township a less attractive site for outside investment and for relocation by wealthier households (Rabial Mallick, personal communication, November 14, 2009).

Salt Lake was further oriented toward wealthier and well-connected households as the township developed. In Toskovic's original master plan, the ratio of land allocated for middle-class, multi-family apartment buildings and high-income, single-family structures was approximately 70:30. Today the ratio is nearly reversed, with the majority of plots containing detached houses rather than multifamily units or apartment blocks (Saha, 2008). Though the processes by which landowners were able to change the land use designation of their plots are murky, the evidence points to political patronage and dubious leaseholder transactions (e.g., "The Salt Lake Fiddle," 2010). In the 1980s, then–Chief Minister of West Bengal Jyoti Basu moved his personal residence to the township and, soon after, many high-ranking government officials followed. According to long-time residents I interviewed, Basu and ruling party officials used state-owned land in the township as a type of political currency, distributing plots as rewards for patronage or to encourage loyalty. Once an individual became a leaseholder in the township, he was only legally able to transfer the control of his plot land to his offspring, to prevent land speculation and price escalations. Again, residents told

me that this law was easily flouted. When a lease is taken over by an individual who is not related to the original owner, explained a neighborhood association leader, they "still always [had] the appropriate documents" (interview, April 9, 2010). By his account and others, falsified documents were readily available through the municipal and state government for well-resourced households. The illegal transfer of leases accelerated after real estate sector reforms in the 1990s, as Salt Lake became a primary site for residential and commercial real estate speculation and investment.

The notion of exclusivity also became common in the rhetoric of the local government, the BMC, established in 1992. In its promotional literature, the BMC (2007) advertises itself as a prestigious address:

> Being a planned city, Bidhannagar offers many facilities usually not available in many of the other older Indian cities. It has clean and well-maintained roads and sanitation, tree-clad boulevards, relatively pollution free environment, its own swimming pool … the Bidhannagar Municipality has carved out a distinguished position in the Municipal Map of the state of West Bengal. … Unique and exclusive as it is, this Municipality has become a model to follow in the eyes of others. (p. 3)

Over time, Salt Lake has sought the types of businesses and amenities associated with other world-class suburbs, residential enclaves, and high-tech developments that cater to households with "global lifestyles" (P. S. Bose, 2015, p. 52). The City Centre mall, constructed at the heart of the township, offers luxury retail, grocery stores, and a multiscreen cinema. In recent years, five-star hotel brands and nationally recognized hospitals have opened properties there. Sector V, the final phase of Salt Lake that opened in the mid-1990s, was planned as an information technology hub to attract multinational firms.

To protect this image, the Salt Lake government goes to great lengths to distinguish the planned township from Dattabad, a large slum within its borders:

> The planned township enjoys an organized growth due to zoning of land-use whereas the added areas are sprawled with unorganized growth. The slums of Dattabad on the fringe of the planned township along the E. M. Bye Pass are diametrically opposed to the planned township, densely populated with deplorable living condition. (BMC, 2007, p. 12)

The Dattabad settlement predates Salt Lake itself, and Toskovic's master plan calls for it to be redeveloped as part of the township. According to interviews with six long-time residents of Dattabad, the slum was originally home to refugees fleeing post-independence violence in East Pakistan and was later used to relocate fishing and agricultural families displaced by the Salt Lake project. Dattabad then grew to house daily laborers needed to construct infrastructure for the township. When the time came for the community's redevelopment, residents successfully resisted eviction based on promises from their initial resettlement and through strategic alliances with local political parties.

Despite its long history and central importance to the township's development, Salt Lake officials describe Dattabad as a blight on the township. In its official planning documents, the municipality argues: "Without proper planning of the settlement of Dattabad, the planned township of Bidhannagar Municipal area remains in an unfinished & unorganized state" (BMC 2007, p. 27). Following several small-scale evictions of households on the perimeter of Dattabad, Nandagopal Bhattacherjee, chairman-in-council of the BMC, argued that the shanties were "disfiguring the township with filth and an unhealthy sub-human lifestyle that is inappropriate for its citizenry" (Biswas, 2009, p. 5).

Salt Lake officials' understanding of Dattabad as something different and separate, despite its location within the political and historical boundaries of the township, is partly rooted in the physical master planning tradition, where the success or failure of planning is affixed within the spatial boundaries of formal developments themselves and not to the broader urban system in which they are embedded. When I asked Toskovic about the larger environmental and social critiques of the project, he suggested a different standard by which to judge his work: "The main question is: are people living in Salt Lake satisfied or not?" He felt that the city had developed the way he imagined:

"It has grown into a lovely garden city, just as I had planned." I asked him whether he had visited Dattabad during his most recent tour of the city; he had not, because it was "not part of the Salt Lake township" (D. Toskovic, personal communication, March 18, 2010). An architect-cum-planner in the Department of Urban Development in Salt Lake similarly had a difficult time understanding my questions about differences in infrastructure across the municipality, because I was referring to the Salt Lake township and its added area of Dattabad simultaneously. "Salt Lake is planned, finished," he said. "Flooding is not a concern because Bidhannagar was built with sufficient drainage facilities" (P. Sen, personal communication, January 6, 2010). When I pointed out that the Dattabad area had very poor drainage, he was visibly annoyed. "Dattabad is an unplanned area," he argued. "We cannot be held accountable for what we did not do."

The tendency of planners, leaders, and residents of Salt Lake to imagine Bidhannagar as a unique and exclusive community has practical consequences, including ongoing campaigns by the BMC to rid the planned township of the slums, shanties, and street vendors that contradict the township's aesthetic and functional notions of what constitutes a modern and planned city. In 2007, the BMC carried out a "mini-operation Sunshine" to demolish slums and evict hawkers and vendors from public spaces, justifying their actions based on the illegality of such activities and the nuisance they posed to Salt Lake residents. The nickname of the operation harkened back to a 1996 operation by the government of West Bengal to make Kolkata "a safe investment destination" by demolishing road-side stalls and removing hawkers from sidewalks and other public spaces (Bandyopadhyay, 2009, p. 118). Roy (2010) argues that the state government initiated Operation Sunshine to gain support from urban middle classes and to "recuperate a city of air and light, governed by values of hygiene, order, and beauty" (p. 95), which similarly motivated the BMC a decade later.

The narrative of slums and hawkers as unclean, ugly, and not properly belonging—what Ghertner (2012, p. 1162) terms "nuisance talk"—has been central to rationalizations for demolitions and evictions in Salt Lake. Again in 2007, the BMC demolished more than 2,000 shanties that had been built on the side of the Krishnapur (Kestopur) canal, displacing more than 8,000 people (Chakraborty, 2007). "The place is a den of criminals," complained a local resident, referring to the shanties ("Robbery at SA 150," 2007, p. 1). In a later exchange with the *Salt Lake Telegraph*, a resident of EE block voiced typical concerns about living in proximity to the slums: "It's time we take our morning walks in clean air and our children grew up without hearing the slang that is freely used by slum dwellers. I came to Salt Lake and purchased a flat in this township for the reason that my children grow up in a healthy atmosphere" (Biswas, 2009, p. 5). In 2009, another 200 shanties were destroyed in Sector V, the information technology hub in the township. The eviction was carried out as part of a routine beautification drive. "The shanties clash with the image of a tech township, so we decided to do away with them," said Subrata Sen, the vice chairman of the Nabadiganta Industrial Township Authority, housed in the BMC offices ("Eviction in Sector V," 2007, p. 3).

The notion of *planned* has also been important to official justifications of evictions. After street clearances in 2007, a staff member at the Urban Development Department argued that "hawkers interfere with the planned nature of the township" (Chakraborty, 2008, p. 3). In 2009, the municipality set out to destroy several bamboo bridges stretching from Salt Lake to nearby slums and neighborhoods. Rickshaw pullers, porters, and other wage laborers who use bicycles and carts for transport prefer these informal bridges because, unlike the permanent ones, they do not require climbing stairs. Commenting on the removal of the bridges, BMC Chairman Biswajiban Majumdar stated simply that "Salt Lake is a planned city and we cannot allow such illegal bridges here" (Chakraborty, 2009). Majumdar spoke similarly about the removal of several small pockets of slum housing from vacant lots in Salt Lake in 2009: "There is no scope for shanties and slums in Salt Lake," said the BMC chairman (Biswas, 2009, p. 5).

Though the language of exclusion in Salt Lake commonly refers to the unplanned nature of undesirable uses, officials and residents ignore that the many planned parts of Salt Lake are themselves unplanned, informal, or illegal. As described earlier, many of the township's plots were

murkily converted from higher density uses to lower ones, in direct violation of the original master plan. Further, plots originally intended for civic amenities and green spaces have been illegally transferred to well-connected individuals and commercial developers. There has also been the widespread and illicit transfer of residential leasehold rights. In 2012, municipal authorities estimate that 35% of residential plots in the township had been illegally sold or transferred since their original allotment. The practice was so widespread that the state government, with support from the BMC, legalized the process and will now retroactively regularize illegally transferred leaseholds (Chakraborti, 2012). Many commercial buildings also violate building norms and approved plans. For example, neighbors of the AMP Vaisaakkhi mall were alarmed when the planned 8-story building grew to 13 stories, an illegal construction that was also retroactively sanctioned (Ray, 2012).

Recent work on the nature of informality in Indian cities helps explain the seemingly contradictory stances of public officials toward unplanned uses. Annanya Roy (2003, 2005, 2011b) argues that the key axis of inequality in southern cities is not between the formal and informal but within informal production of space itself. Middle-class and elite forms of informality—like the single-family house in Salt Lake occupying a roomy plot intended for an apartment building—are as illegal as the slum or roadside stall. Yet, such informality is "rarely criminalized or targeted by the state" (Roy, 2003, p. xxi), making informality itself a flexible concept and an expression of class and political power. Bhan (2009, 2013) uses legitimate to describe the types of settlements that are protected from arbitrary eviction. In some instances, settlements draw their legitimacy from the law itself, but for others de facto security is extended through routine practices of urban development.

This differentiated treatment of informality and illegality and "selective stigmatization" of the poor is important for understanding both the ongoing development of Salt Lake as an exclusive suburb and the uneven production of disaster risk there (Roy, 2005, p. 158). The illegal conversion of land and transfer of leaseholds no doubt contributed to rapidly escalating housing costs in the township, in direct violation of the township's intended purpose and master plan. The ex post facto formalization of those transactions has further accelerated price increases, deepening inequalities. The township's expulsion of unplanned uses does not reflect an urban governance regime consistently rooted in law and formality but one that uses the language and legal authority of planning to preference uses that meet the functional needs and aesthetic values of wealthier residents and businesses. Middle-class and elite informalities can demand infrastructure, services, and legal recognition, whereas subaltern informality typically cannot, at least to any comparable degree, leaving the latter more acutely vulnerable to environmental hazards within the same geographic landscape.

Today, the drive toward exclusivity in Salt Lake is an ongoing, uneven, and incomplete process. There are still some small pockets of slum housing within the planned parts of the township, though their numbers get smaller as vacant plots are developed and small-scale evictions are carried out. After several high-profile pushes to evict street hawkers, the municipality has relented in some areas, especially in commercial areas like Sector V where office workers rely on the convenience and affordability of roadside stalls. The Dattabad slum has proved especially resilient, despite being located on a large tract of prime land within the boundaries of the Salt Lake municipality. Households have, by and large, resisted eviction and the community has been successful in leveraging slum upgrading schemes and advocating for basic infrastructural improvements. A recent conflict between several hundred households there and the East–West metropolitan rail project highlights the power of poor households to resist development agendas within urban spaces through strategic political alliances and allegiances, what Benjamin (2008) describes as "occupancy urbanism" (p. 719). The new rail line—the first major expansion of the city subway system in 40 years and a key infrastructure for the state's vision of a modern and global Kolkata—was designed to pass through Dattabad, requiring the eviction of several hundred families squatting on state-owned land. With support from local party officials from the Trinamool Congress, the families refused to vacate their homes and participate in official surveys, a necessary bureaucratic step in the relocation process (Mandal, 2013; Mandal & Roy, 2015). Though the households did eventually relocate, they delayed the $1.35 billion project by multiple years and received significant compensation. Dattabad is

evidence of the capacity of some poor communities, even in the context of exclusionary master plans and globally oriented development, to resist and subvert such agendas, contesting elite visions of urban spaces and creating hybrids of imagined and idealized cities.

Economic interdependence

Even as Salt Lake officials and residents have worked to expel slums and hawkers from the planned parts of the township, there has been no corresponding drop in demand for the labor and services provided by the urban poor. In fact, a dizzying array of low-wage workers keeps Salt Lake functioning on a daily basis. Maids, household servants, vendors, construction workers, tea sellers, taxi drivers, office assistants, rickshaw pullers, and many others serve the needs of township residents and businesses. To better understand this workforce, I administered a short survey focusing on work, transportation, and housing to 598 individuals working low-wage jobs in Salt Lake. The respondents represented 44 different occupations in eight general categories, predominantly in food and beverage (33.3%), domestic service (30.6%), other services (9.4%), and construction and building (7.4%). The respondents were low income, earning between 1,500 ($33) and 4,000 ($89) rupees (Rs) per month with a median income of Rs 2,600 ($57). When asked about their living arrangements, 9% (54) were maid servants, drivers, or *chowkidars* (watchmen) who lived on the premises of their employers. Two percent (12) were *dhobis* (washermen) or chai/food stall workers who lived in their stalls or stands. Of the remaining respondents (531), 94.4% (501) reported living in a slum. Less than 6% of respondents reported living in formal housing outside of their employer's home.

Based on these results, I selected five representative slums near Salt Lake where the low-wage workers reported living and conducted a survey with 414 purposely sampled households. The survey results describe the nature of work for households living in slums near Salt Lake and the economic relationships between the township and those communities. Of those respondents who were employed, the majority (527 or 57.8%) worked in casual, unskilled occupations like household domestic work or rickshaw pulling. More than 20% (186) were self-employed, most commonly as hawkers, buyers, and food/beverage vendors. Another 13.3% (121) had regular employment as unskilled workers, most frequently in construction, small-scale manufacturing, or municipal employment. Just 1.4% (13) of all respondents were regular, skilled employees. When asked where they earned their living, the majority of respondents reported that they are part of the Salt Lake labor market. More than half, or 51.6% (468), worked exclusively in Salt Lake and another 16.2% earned at least part of their income in the township. One hundred and thirteen respondents (12.5%) earned their livelihoods inside the slum itself. Less than 20% (179) earned an income outside of the slum but not at all in Salt Lake (Rumbach, 2014).

These results are evidence of two underlying relationships between Salt Lake and nearby slums. First, there is an economic interdependence. The vast majority of low-wage workers in Salt Lake earn their livelihoods in essential services and trades, performing the basic metabolic functions that are instrumental to the daily life in the township. Second, the township and slums are co-located. Proximity to livelihood opportunities is a crucial factor determining the location of informal housing (UN-Habitat, 2003). The type of work that predominates the economy of Salt Lake's slums tends to pay low wages, requires long hours, and offers few days off. In our survey of low-wage workers in the township, for instance, 96% (574) reported working 7 days a week. The nature of the employment produces a pattern of settlement where workers are able to quickly transport themselves to livelihood opportunities while maintaining their familial, religious, and community obligations. Not surprisingly, the majority of our respondents to our survey lived within 30 minutes of their work and used inexpensive modes of transportation, most commonly walking and bicycling.

These relationships have significant consequences for disaster risk. Salt Lake's low-wage workforce has settled on flood-prone land near the township, the predictable result of an urban development process that simultaneously requires their labor but seeks to exclude them. Urban elites in Salt Lake have paradoxically sought to create spatial and social distance between themselves and the poor, while simultaneously depending on a system of labor and economic exchange that requires the poor to

remain close by. The nature of work for households living in the slums—spatially dependent jobs that are predominantly low wage and without formal protection by the state—makes them economically vulnerable to disasters, compounded by the lack of infrastructure and basic services, insecurity of tenure, and overcrowding that is characteristic of their communities.

Discussion and conclusion: The roots of urban risk in globalizing India

An analysis of disaster risk in the Salt Lake reveals that the proximate conditions of vulnerability—a well-protected and wealthy suburb surrounded by at-risk slums—is not the product of any particular moment in the political economy of development there but a palimpsest of past and ongoing urban agendas, contestations, and economic dependencies (Anjaria & MacFarlane, 2011). Examining the roots of risk in Salt Lake allows us to understand the present condition of flooding there as well as future landscapes of risk on the eastern edge of Kolkata, where the "march of the megacity" continues largely unabated (Banerjee, 2012, p. 93). Salt Lake is not a perfect analog to the many large-scale and globally oriented developments emerging on the fringes of the larger city but a precedent to them (Roy, 2010). The urban elite's simultaneous distancing from, and dependency on, the poor is a social dynamic we see at work elsewhere on the city's periphery. In this concluding section I discuss how the four trends in the political economy of development I have identified as root causes of risk in Salt Lake—the commodification of hazardous land, inadequate provision of affordable housing and amenities, interdependence of spatially separated groups, and exclusion of the poor—shape disaster geographies in eastern Kolkata and in urban India generally.

After decades of a moribund economy and stagnant growth, Kolkata has begun to reemerge on the global economic stage. Chief Minister Mamata Banerjee swept into office in 2011 promising to make Kolkata "like London," a clean and beautiful city that would stimulate private investment and drive state economic growth (R. Bose, 2011). Economic liberalization and new forms of land speculation and real estate investment have transformed the urban periphery, from once rural areas to burgeoning enclaves of globalized urban development centered on information technology and housing and amenities targeted toward elites with global lifestyles and tastes. New Town Rajarhat, a high-tech suburb under construction just northeast of Salt Lake, is intended to house over 1 million people. Dozens of developments, large and small, are occurring along the eastern metropolitan bypass, a north–south highway that marks the increasingly urbanized border between the city and its low-lying hinterlands. The commodification of land by the real estate developers and land syndicates, working in concert with financial institutions and a supportive state government, requires that it be transformed to habitable spaces for urban growth (Banerjee, 2012). As the city marches east, wetlands, fishing ponds, and other features of the floodplain are being filled in, paved over, and otherwise consumed, even in the legally designated and protected region known as the East Kolkata Wetlands (Banerjee, 2012; P. S. Bose, 2015). Political support for the transformation of the city at its edges—and the considerable economic benefits generated—vastly outweighs warnings from environmentalists about the value of such land for hazard mitigation and other critical ecosystem services (Ghosh, 2005). At times and in important ways, land commodification has been challenged, resisted, and undermined, often by the rural poor who live and work in the places considered as an untapped resource by economic elites (e.g., Roy, 2011a; Shatkin, 2011). Nevertheless, the direction of urban growth in Kolkata is decidedly east, a trajectory of development onto hazardous land initiated in large measure by the Salt Lake project.

The story of the commodification of hazardous land is a familiar one throughout urban India. Skyrocketing land values have created entirely new spaces for growth and contestation in cities, particularly on the periphery where developers seek tabulae rasae for large-scale and globally oriented urban development projects (Weinstein, 2014). After the devastating floods in Chennai in 2015, for instance, researchers calculated that nearly 20% of the nearby floodplain areas had been developed in recent decades for uses that included transportation infrastructure, an information technology corridor, engineering colleges, special economic zones, and gated communities (Aithal &

Ramachandra, 2016; Jayaraman, 2015). Amita Baviskar (2011) describes the commodification of the Yamuna riverbank in East Delhi for elite developments like the Commonwealth Games athletes village, despite protests from environmental nongovernmental organizations about the critical importance of that land for flood conveyance.

Growth and development on hazardous land in Indian cities is occurring alongside a massive shortfall in the formal production and provision of affordable housing and associated amenities (Sengupta, 2013). Accounting for population growth and the deterioration of existing stocks, Kolkata needs nearly 70,000 new units of housing per year, only a fraction of which is actually being produced (Kolkata Municipal Development Authority, 2005). With economic liberalization, the state and city governments have scaled back their involvement in producing public sector affordable housing, instead emphasizing the involvement of the private sector, encouraging foreign direct investment in real estate, and pursuing public–private partnerships for large-scale projects (Sengupta, 2007; Sengupta & Tipple, 2007; Sud, 2014). The vast majority of new units that are being built by the private sector cater to higher income groups, however (P. S. Bose, 2013; Sengupta, 2007). Nationwide, Tiwari and Hingorani (2014) estimate that the housing shortage is in excess of 26.5 million units, nearly all (26.1 million) for lower income groups. In that context, city expansion onto hazardous land virtually necessitates the formation and growth of slums as a vital source of affordable housing for the working poor.

Economic liberalization and attendant real estate sector reforms have also changed the character of urban development in Indian cities, as civic authorities and private sector actors attempt to capitalize on the building boom and attract private and international capital by promoting their cities as global and world-class (Baviskar, 2006; Searle, 2014; Shatkin & Vidyarthi, 2014). Though the citywide pursuit of a world-class city in places like Delhi and Mumbai has faltered, elite visions of urban change continue apace in exclusive suburbs, residential enclaves, private communities, and high-tech satellite cities (Roy & Ong, 2011). S. Chattopadhyay (2010) argues that these "bourgeois utopias" (p. 6) are coming to define the contemporary era of urbanism across India and much of the Global South (see also Bhattacharya & Sanyal, 2011; Wang, Kudu, & Chen, 2011). Like contemporary Salt Lake, bourgeois utopias are largely built on a shared vision of what constitutes a modern, functional, and aesthetically pleasing city, which gets translated into plans, policies, and everyday practices of urban development (Anjaria, 2006; Baviskar, 2004; Ghertner, 2015). Scholars of the Indian city have used a variety of terms to describe the deeply unequal patterns of urban growth emerging in the context of neoliberal reforms: malevolent urbanism (McFarlane, 2012), bypass urbanism (Bhattacharya & Sanyal, 2011), and enclave urbanism (Sharma, 2010), to name a few. Though their contexts and logics vary, these cases point to urban governance regimes that deliver the lion's share of infrastructure, services, and legitimacy to the upper classes, creating a patchwork of urban spaces with unequal access to the resources necessary to mitigate disaster and climate change risk.

This is not to say that the Indian city was ever equitable. Zérah (2008), for instance, examines the history of service provision in Mumbai and finds long-standing distortions toward ruling elites. What is unique about the current era of urbanization, besides its scale, is the growing separation between economic groups. Partha Chatterjee (2004) points to efforts to rid streets and public spaces of squatters and encroachers, the suburbanization of the middle class, and the proliferation of protected spaces for "elite consumption, elite lifestyles, and elite culture" as evidence that Indian cities are "becoming bourgeois at last" (pp. 131–132) changes he locates in the advancement of the idea of the postindustrial city that began to circulate in India after economic liberalization. In Kolkata, he notes that state-supported reforms to the urban economy toward technology and services have led to the reconstitution of urban spaces to fit the mold of the globalized metropolis (P. Chatterjee, 2004). The poor certainly have an established place within the city; as Chakravorty (2005) notes, the leftist governments have not carried out the large-scale slum demolitions and evictions that have occurred in other large cities, and spatial boundaries between groups are not as hardened. On a smaller scale and within the circumscribed spaces for globalized development, however, we see the pursuit of the bourgeois city, in plans and the everyday practices of urban governance. In Salt Lake, the permanent presence of the poor—made visible

by slum housing, hawking, and other encroachments onto public space—violates the aesthetic and functional norms the township is reaching toward and is thus being expelled, at least beyond eyeshot and earshot. Yet, the township depends on the poor, undermining efforts to create spatial distance and leading to a patchwork of formal and informal, legitimate and illegitimate spaces within the larger urban fabric. We should expect to see similar patterns of spatially separated, uneven, but interdependent settlements emerge on the periphery of Kolkata and other Indian cities, as world-class developments are planned and built on increasingly hazardous land and without provision for the necessary poor.

The Salt Lake case is instructive for planners and policymakers concerned with building disaster- and climate-resilient cities. It argues for a critical view of disaster risk that extends beyond the proximate drivers of vulnerability the seeming failure of planning and toward questions of how, and by what logics, urban space is planned, developed, and governed. The patterns of vulnerability we see in Salt Lake are not easily undone. Though in situ work to mitigate risk in slums is essential to the safety and well-being of residents, it is also important that we understand and acknowledge more fundamental relationships between elite-driven urban development and uneven geographies of risk, if we are ever to address their continued production and proliferation.

Notes

1. In this article I use the term *slum* to describe diverse urban communities characterized by inadequate access to infrastructure and basic services, poor-quality housing, high population densities, and/or insecure residential status (India Census 2011; UN-Habitat 2003). The word itself is deeply problematic (Gilbert, 2007), but other terms (i.e., informal settlement, squatter settlement) are inadequate for describing the range of settlement types considered slums in cities like Kolkata.
2. Dr. Roy had advocated for the development of the planned town of Kalyani in the early 1950s, located 30 miles north of Kolkata. The town was unsuccessful at attracting residents, however, due to its long distance from the urban core.
3. Dr. Roy died in 1962 and did not oversee Salt Lake's planning or development.

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