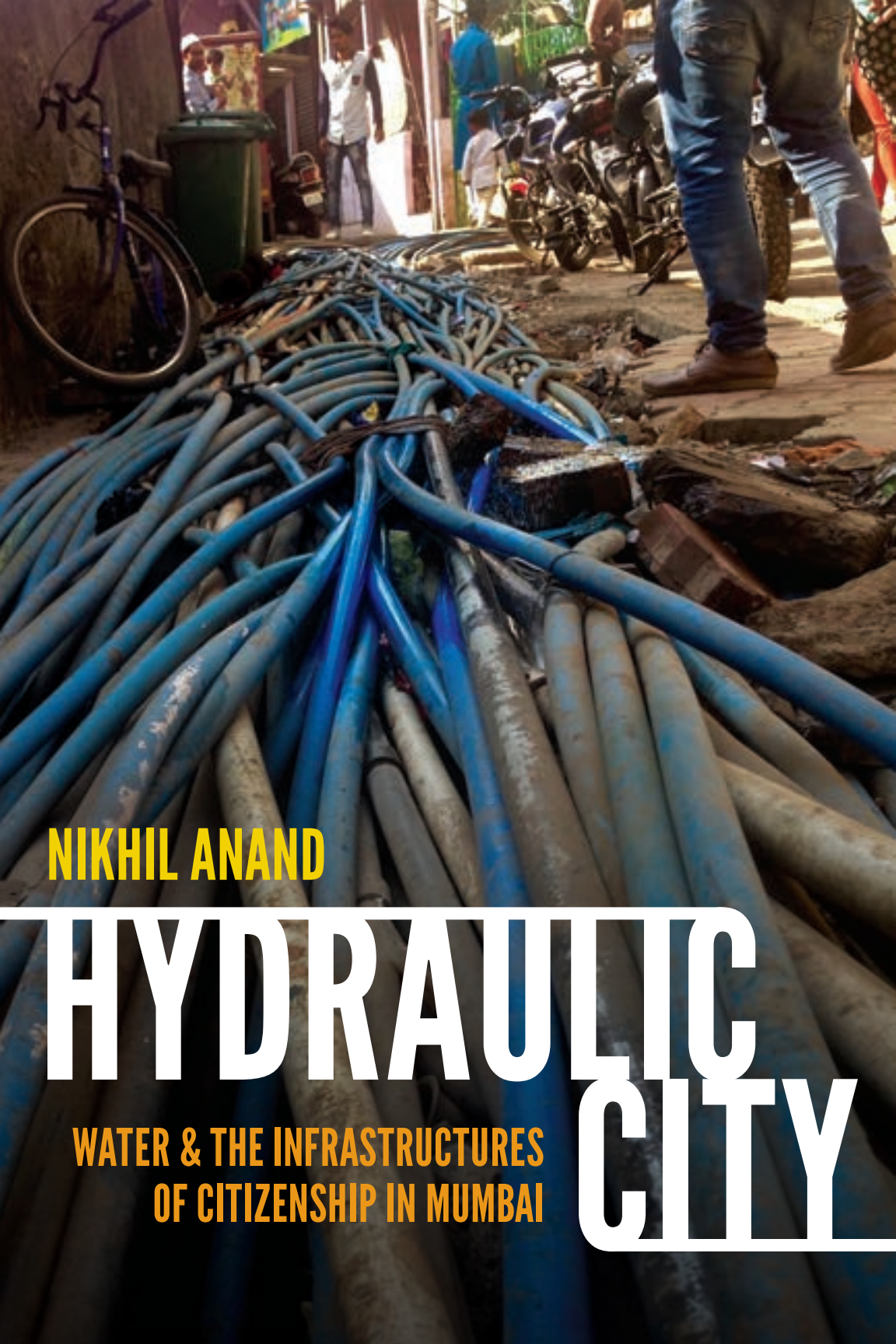

NIKHIL ANAND

HYDRAULIC CITY

WATER & THE INFRASTRUCTURES OF CITIZENSHIP IN MUMBAI

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Water and the Infrastructures of Citizenship in Mumbai

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Preface: Water Stories

Rain, floods, rivers, pipes, tides, and springs. Water is moving and is moved. Humans have experienced water as the giver of life and death. They have imagined it as three atoms or one of four elements, springing from the head of the divine, or floating under his son's feet. Human histories can be characterized by the search for and control of water. Wells, canals, aqueducts, lakes. Cities and civilizations have withered in its absence; others have risen through their control of the oceans. The social life of water has a deep, complex, and remarkable history that quickly traverses social, natural, and political boundaries.[1]

This book addresses the way water is made and managed by cities in a period of dramatic environmental change. In particular, it explores the everyday uncertainty with which water is accessed by those living on the margins of the state *and* the market in Mumbai, India. As states increasingly seek to distribute things through market mechanisms, this research asks why water continues to be demanded as a public good, *particularly* by settlers (also called slum dwellers) who are marginalized by public institutions.[2] The city and its citizens are made and unmade by the everyday practices around water provisioning—practices that are as much about slaking thirst as they are about making durable forms of belonging in the city. Yet this is only one of many stories about this city of water. The city, surrounded by the sea, irrigated by a river-sewer, and annually flooded by the monsoons, is soaked in water stories. They constantly disrupt the stories and arguments I tell in this book.

In a wonderful essay about the power and promise of stories, K. Sivaramakrishnan and Arun Agrawal (2003) point out that stories have multiple vocalities and multiple sites of production. Unlike discourses, stories are particularly attendant to the diverse locations at which human agency is thwarted or dreams are partially realized. Stories are unstable. Stories are the stuff with which cities are made (Calvino 1972). They present other ways for the world to be known. Unfortunately, while Mumbai is filled with stories of

water, many of these stories are now submerged in a new wave of crisis narratives about water, its politics, and its urban state. As policy experts proclaim a future of water wars, scientists warn of imminent changes to our climate, and government officials, politicians, and researchers proclaim new emergencies around the state of cities; these emergency narratives often work to subdue and suppress the multivalence of water and its storytellers in the city.[3] They obscure how, for many residents of large cities, the uncertainties around critical resource provision are already an ongoing, almost mundane feature of everyday life.[4]

The telling of stories is always a political act. Ethnographers have been famously uneasy with the ways in which our stories silence others. In recent years, however, infrastructures of the Internet, of mobile phones and mobile audio and video technologies, have changed the landscape of possibility for those long silenced by the political economy of writing. If writing has never been too far from projects to administer structural violence on the poor, as Akhil Gupta (2012) has poignantly argued, part of the excitement around new communications technologies has to do with the way in which they have reinvigorated popular oral and visual circuits of storytelling. They also promise to democratize the ways in which stories are told, circulate, and, as such, affect political structures (Appadurai 2006).[5] They permit the ethnographer an opportunity to have the stories we tell through ethnography destabilized by other storytelling projects, entangled as they often are with our own.[6]

In a modest and somewhat accidental effort, I worked with youth in two community organizations, Akansha Sewa Sangh and Agaz, and an artist organization, CAMP, to produce *Ek Dozen Paani* (One Dozen Waters), a series of twelve short films about water in the city while conducting fieldwork in 2007–8. I had been hosting weekend seminars on the city and citizenship for members of the two youth groups in the settlement where I worked, using water as a heuristic to do so. Through our conversations in these meetings, I was struck by the profound memories and experiences my volunteers-friends-students had around water. To them, water was neither dull nor merely politics. Instead, it animated their social memories of settlement, environment, and the city. Together, we agreed to archive these memories through a collaborative video documentary project. Members of our small collective shot video and contributed their footage into a shared archive. A series of ten storytellers then composed and assembled a montage of audio and video footage to tell their own stories, narrated through the relationships between water and its infrastructures. The films are freely available online and lie alongside the stories I tell in this book. In addition, some of these stories are

featured in the book as interludes. Like the other interludes in the book, they sit with and sometimes interrupt life that I describe in these pages. Water, like many other things we pretend to know and control, leaks from and undermines the stories we tell. It saturates, soaks, and erodes the stability of the world we know.

Supriya Polmuri's film in the collection, *The Question* (*Prashna*), is one example that demonstrates not only the power of stories but also the phenomenal power of water to order and render human life precarious and possible. The film begins with Polmuri looking out a window into the relentless monsoon rain. As she does so, she remembers how this cyclical, temporary, and yet prolific storm is so essential for the possibility of human life. She narrates an Akbar Birbal story.

As parables circulating through oral traditions, Akbar Birbal stories have long been told to children on the Indian subcontinent. These stories would always teach children to be thoughtful and a little irreverent in the world. Here, Polmuri draws on one Akbar Birbal story to remind us that while the world has long been ruled by great powers, they too are ultimately dependent on water to survive.

> Akbar asked his brother-in-law, "Tell me, what will remain in this world if we take away the ten *nakshatra*[7] of the monsoon?" The brother-in-law said, "I am not a little child to be asking me such questions. Naturally, seventeen constellations will remain." Akbar said, "That is incorrect." Akbar then asked Birbal the same question. Birbal answered: "Zero." Everybody in the *darbar* started whispering, "How can it be zero? . . ." Birbal said, "If the rain's constellations go away, what will remain in the world? If it does not rain, how will the crops ripen? Human life itself depends on water. If the rain's constellations are taken away, all life forms will disappear." (Supriya Polmuri 2008)

In telling this story, Supriya describes how Akbar, one of India's most powerful rulers, was nonetheless aware of water's necessity to the earth and to life. By telling the story with *nakshatra*—lunar constellations that are used to compose the calendar year—the story illuminates how water does not "just" make life possible. It also marks time and gives life meaning.

Yet even as we recollect water's powers, engineering projects to control water frequently presume we can rule over it and make its flows predictable, continuous, and ordered. Of course, as stories in this book demonstrate, pretenses of human control are routinely swept away in times of drought and deluge, or when the technologies of concrete and steel yield to water's steady,

patient pressure. Nevertheless, hydraulic projects continue to reanimate the city in an always incomplete effort to make environments predictable and reliable. As we enter times beyond the grasp of human history, we now need to confront the very real possibility that modernist modes of hydraulic government may no longer be sufficient for stabilizing our worlds.[8]

Indeed, in his life, Akbar would realize that despite ruling over much of the Indian subcontinent, he could not control its waters as effectively. In the late sixteenth century, Akbar decided to move his capital from Agra to Fatehpur Sikri so that he could live closer to the Sufi saint Salim Chisti. The capital city, specially constructed for the purpose, took fifteen years to build. Constructed out of red sandstone, its royal durbars, large columns, and impressive gates together are believed to compose one of the finest examples of Mughal architecture. Yet just fourteen years after it was completed, this fine city had to be abandoned when its nearby lakes suddenly dried up. Salman Rushdie recounts the event in his novel *The Enchantress of Florence*:

> The destruction of Fatehpur Sikri had begun. . . . Slowly, moment by moment, retreating at a man's walking pace, the water was receding. [The emperor] sent for the city's leading engineers but they were at a loss to explain the phenomenon. . . . Without the lake the citizens who could not afford Kashmiri ice would have nothing to drink, nothing to wash or cook with, and their children would soon die. . . . Without the lake the city was a parched and shriveled husk. The water continued to drain away. The death of the lake was the death of Sikri as well.
>
> *Without water we are nothing. Even an emperor, denied water, would swiftly turn to dust. Water is the real monarch and we are all its slaves.*
>
> "Evacuate the city," the emperor Akbar commanded. (Rushdie 2008, 344–45)

Acknowledgments

This research on Mumbai's water took me home to a world I did not know. Like many in Mumbai, I had for a long time lived in the city without needing to be conscious of the tremendous work of its social and material infrastructures. Through fieldwork, I learned of the extraordinary quotidian labor of employees of the city's hydraulic engineering department and those that live in the city's auto-constructed settlements, just to make water appear every day in city taps. And so it is with this more mundane book. Its appearance as a discrete thing conceals the generosity and work that has been invested in it by many others, just to make it appear in the world.

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INTRODUCTION. Water Works

Every day, engineers working in Mumbai's Hydraulic Engineering Department source and distribute 3.4 billion liters of water through over three thousand miles of pipe to the city's residents and businesses. Residents receive this water for a few hours a day, according to a schedule made by engineers and planners. Working between the ward and zonal offices, engineers decide when, and for how long, each of the city's 110 hydraulic zones gets water. The schedule is then operationalized by a small army of *chaviwallas* (key people), who ride in municipal vans on crowded city roads to turn eight hundred valves on and off with a series of specialized cranks and levers (known as keys). As they turn valves at the rate of one for every minute of the day, their rather mundane work produces dynamic and temporary pulses of water pressure in city pipes that hydrate the lives of over thirteen million residents. Their work, together with the five hundred water engineers and seven thousand laborers of the Hydraulic Engineering Department, is absolutely necessary to produce a vital matter of city life: water.[1]

Yet, despite all of this phenomenal labor and engineering, the hydraulic city is leaking profusely. During the hours of water supply, some pressured water hydrates the lives of known publics. The rest silently seeps out of pipes to unknown (human and nonhuman) others. As a result, the water infrastructure is full of contests and controversies. Residents are always shouting, complaining and protesting for more water.[2] When groups protest in their offices or on the streets, engineers sometimes respond by trying to rearrange the water pressures and the hours of supply. They try to give more water to protesting publics by providing them water for "more time." However,

FIGURE 1. Chaviwallas turning a valve on city streets. All photos are by the author unless otherwise credited.

because the amount of water the city gets every day is finite and materialized by valve operations, to give one hydraulic zone more water is also to give another zone less.

Residents, meanwhile, are not always content with waiting for the city to act. They often work with plumbers to redirect pipes without the permissions of the water department. As they do so, the city's water flows become difficult to control and know through centralized technologies. Instead, as water is constantly being redirected between and within city wards, that a neighborhood or a household has water in the present does not necessarily mean that it will continue to have water in the future.

Less than half a mile from a valve that chaviwallas turn on the evening shift, Alka tai, a longtime resident of Jogeshwari, Mumbai, told me about her daily work of water collection.[3] Despite the chaviwallas' routines, some residents of Meghwadi—the settlement in which she lived—no longer received water with sufficient pressure. Established over thirty years prior, Meghwadi was now categorized by the state as a "recognized slum." As such, its resi-

dents, unlike those of more recent settlements, were eligible for municipal services such as electricity, water, and garbage collection. Yet, in my previous meetings at the community center, Alka tai had been very vocal about the water problems in the settlement, and particularly in her home. "Water comes out of the pipe like a child's piss," one of her neighbors told me, gesturing with her little finger to indicate the fickleness and inadequacy of the service. The water department's impotency, she seemed to suggest, required many residents to spend their time laboring for water.

To see what she and her neighbors were experiencing firsthand, Alka tai invited me to her home. We stepped out of the community center, which sat on the main road, and walked into the settlement. With neatly painted brick walls, grilled windows, and electricity, Meghwadi's houses looked quite solid and reliable. They were arranged neatly on a grid. Children played in the alleys, skipping deftly away from those returning from work at the end of the day. Potted plants lined the alley. The neighborhood's "beautification" was a poignant reminder not only of the settlers' achievements but also of their aspirations for urban environments.[4]

As we walked through the paved alleys and right by open wells of Alka tai's neighborhood, we stopped a few doors just before her home, by a tap near a small provision store. She turned it on to show me that indeed there was water—that it was the area's scheduled water time.

Alkai tai's home was just around the corner. It was larger than I expected, with a staircase leading to an upper floor. Downstairs, the tiled front room was separated from the kitchen by a fading curtain. Its walls were painted bright pink. Her house had water infrastructure built into its design. Both her kitchen and bathroom had concealed plumbing, taps, and drainage. To my surprise, I also saw an overhead water storage tank sitting above the washing room. The water infrastructure in Alka tai's home looked a lot like the one I grew up with, twenty kilometers away in the high-rises of a neighborhood in central Mumbai.

Yet, for Alka tai, the overhead tank was no longer of much use. Her family had installed the tank when there was good water pressure. Now, there was so little water pressure that she could barely fill the small drums and buckets that packed the washing area. It was one thing to have water infrastructure, I thought to myself, and quite another to have water at home. Alka tai explained to me that her water problems did not have to do with a lack of water in her pipes. "There is water!" she insisted. To demonstrate this, she began sucking water out of the pipe in the washing room—a human pump. In a few seconds, the fickle water began flowing, hesitant at first, and then consistently,

quietly. "See," she said, "whenever I want water I have to do this." I marveled at the mundane yet physical way in which she needed to use her own labor to physically draw water out of municipal pipes. Sympathetic toward her water difficulties, I wondered where her problem was located. Was it because the valves of the water department were not sufficiently turned? Or might the problem be nearer her home, in the piped network of her neighborhood? Where the blockage was physically located would determine whether the responsibility for its repair was a private or public matter.[5]

It was only after she demonstrated her difficulties that Alka tai welcomed me as a guest in her home and offered to make me a cup of chai. As I sat down to wait in the living room, I was surrounded by four children doing their homework. They, in turn, were surrounded by their schoolbooks, neatly encased in laminated, brown paper covers. One of them had an assignment in English. A few minutes later, Alka tai brought me some peanut *chikki* and tea and sat down to chat. "*Sab kuch hai*," she said. "We have everything." Her husband had a stable job with the railways, her kids were being educated in English at private schools, and she spent her afternoons working with her women's savings group. Indeed, her home and her household infrastructure had all the marks of upward mobility. "*Sab kuch hai, par paani nahi hai*," she continued. "If we don't have water, what is the use of all this?" She gestured around her home, at the painted walls, the electrified ceiling, and the books of her children.

Perhaps because it was still early in my fieldwork, my evening in Alka tai's home was formative to the questions that frame this book. I had not expected her home to be so ordinary—that it would have painted walls, tiled floors, internal plumbing, and be full of children going to private school.[6] As I sat in her home, waiting for tea, I was compelled to reconsider many preconceived ideas that I had about life in the "slums," having grown up next to them in Mumbai, and having read about them as a graduate student in California. Through these memories and texts, I had learned a fair amount about slums as "informal" and marked by different kinds of absence—the absence of planning, formal civil associations, concrete houses, laws, and city infrastructure.[7] I had learned that slums were popularly imagined to be structures built without the permissions, recognitions, and licenses of the state, on property that belonged to someone else. In the documents of the state, "slums" are not marked by their legality but instead signify places of nuisance, dangers to public health, and also potential sites for the extension of urban services.[8] Several Bollywood films depict slums as places filled with rural immigrants, criminals, or enterprising heroes.[9] And finally, a range of popular texts on

slums in the Global South have recently described them simultaneously as places of sparse living conditions and places of potentiality and revolutionary action.[10]

Alka tai's home, meanwhile, did not have a place in these accounts, saturated as they are with structural accounts of precarity, displacement, and absence. Nor did her home fit neatly into sensationalist and entrepreneurial renditions of slum life. As I sat under a fan in her spotless, electrified, *pucca* home, in a paved, clean neighborhood, sipping tea and looking at her derelict water network, I confronted the very *ordinary* ways in which her family had, within a generation, cemented their lives in the city despite tremendous odds, even as she struggled to access water. If her home seemed exceptional it was not because it was marked by the qualities carried by the word *slum*. What seemed remarkable instead was that Alka tai had inhabited her home without the permission of the state and had, within a generation, improved it substantively. Her household was now seen by the state as one that *could* receive state services.

Accordingly, in this book I try to avoid using the terms *slum* and *slum dweller*. As many have by now pointed out, these terms carry images and ideas (of danger, vice, disorder, and filth) that did not characterize my experience in homes like Alka tai's.[11] Instead, I use the terms *settlement* and *settler* to identify the ways in which residents built and inhabited particular kinds of homes prior to formal state recognition. While these terms also have their troubling histories,[12] they better describe the material and political processes by which homes like Alka tai's have been built and claimed in the city. Where I do occasionally use the term *slum* or *slum dweller* it is to reference the state categories through which settlements are known.

How did Alka tai's family make life in the city possible? Her house and neighborhood were well connected to many urban services—electricity, schools, water, and hospitals. That fact that her children went to private school revealed not only the state of public education in the city but also her family's ability to transcend it and realize their aspirations for children who spoke English. Later in our conversations, she spoke about the ways in which her *mahila mandal* (women's organization) helped others access health services in hospitals or gain school admissions. She was able to ensure that her garbage was regularly collected, that she could live in material and social comfort. Nevertheless, despite her work, and the work of the city's water department, she had water problems that made daily life rather difficult. As she went on to describe the graduated and discretionary means by which she accessed city services, I noted that her access to urban services—water,

housing, food, electricity–did not come as an indivisible package of rights, borne out of her formal legal status, nor was she outside these infrastructural regimes. Instead, they were discretely entailed and materialized through diverse recognitions of technology, law, and state practice in the city.

This book follows the iterative, discreet, and incremental ways in which marginal groups establish their lives in the city by attending to the fickle flow of water through municipal pipes. Noting the ordinary and extraordinary work that it takes to make water flow from rain-fed dams to the homes of the city's marginalized residents, I focus on how cities, citizens, and their political authorities are mediated and made through the everyday government of hydraulic infrastructure. This infrastructure is a living, breathing, leaking assemblage of more-than-human relations.[13] It is composed as much of steel and cement as "nature," laws, social histories, and political practices. The surfeit materialities and socialities that have accreted around modern water distribution infrastructures in the city not only assist in but also perforate, interrupt, and sit alongside powerful efforts to constitute liberal cities and subjects in Mumbai.

In making this argument I draw on the work of postcolonial historian Dipesh Chakrabarty, who has urged an attention to the way that the multiple "politics of human belonging and diversity" at times assist and (at other times) interrupt the performances of capitalism.[14] These forms of social and natural belonging—"History 2s," as Chakrabarty calls them—are neither external to nor are they subsumed by capitalism (Chakrabarty 2000, 66). They "live in intimate and plural relation to capital, from opposition to neutrality" (66). By designating several possible "History 2s" in this way, Chakrabarty seeks to draw attention to multiplicities of life worlds that persistently have ambivalent relations with capital formation.[15] While capitalism is powerful, it is also a contingent process full of instabilities, improvisations, and unanticipated articulations (see Mitchell 2002; Tsing 2015).[16]

In this book I draw on Chakrabarty's argument to theorize the social life of infrastructure in Indian cities. In demonstrating how Mumbai's hydraulic infrastructure is powerful, and yet is full of leaks and always falling apart, I suggest that infrastructure is a social-material assemblage that not only constitutes the form and performance of the liberal (and neoliberal) city but also frequently punctures its performances. Infrastructure entangles liberal rule in lifeworlds that its administrators have long sought to transform and transcend.

Historians and geographers of the liberal city have traced its formation to the rise and administration of sanitary infrastructures in Europe in the

late eighteenth and early nineteenth centuries.[17] As proponents of liberal rule rose to prominence during this period, they sought to give liberalism form by "freeing" political subjects and objects from the "primitive" entanglements of social and political life. It is difficult to overemphasize the role of infrastructure in this project. The infrastructures that were rapidly produced, extended, and renovated in this time—roads, sanitary infrastructures, and marketplaces—were not only productive of liberal expertise but also enabled a series of constitutive divisions necessary for the operation of liberal rationalities in everyday life.[18] These included the separation of the technical domain from the political, the material and natural from the social, and the private from the public. Promising to enable states to rationally govern subjects from a distance (see Foucault 1988), infrastructures have since been key sites for the administration of life.[19] Through their extension, management, and repair, infrastructures make life and liberal rule possible.[20]

Nevertheless, the promises of liberalism (and for that matter, neoliberalism)—of the free, continuous flows of people, ideas, and things—have long been elusive particularly (but not just) in the postcolonial city.[21] In Mumbai, liberal rule has been troubled by colonial histories, fickle natures, and restive publics. Colonial histories of limited liberal government, a technopolitical regime that is beholden to regular annual rainfall in a distant (but relatively small) watershed, and present neoliberal modes of governing infrastructures have instead constituted the city's infrastructures as unstable forms that continuously leak, break down, *and* operate as background in everyday life. While infrastructures occasionally produce and enable the movement of some political subjects or things, they also continue to stall, stick, and bind projects of liberal and neoliberal reform in the city. In these pages, I focus on the excesses of Mumbai's hydraulic infrastructure to demonstrate how its materialities, histories, and socialities have ambivalent relations with the production of liberal rule. I argue that water infrastructures are generative of a multiple, entangled, nonconstitutive outside to the form and performance of the liberal city.

Following this larger argument, I make three subsidiary arguments that pertain to how the hydraulic city and its citizens are made. First, hydraulic citizenship (or substantive membership in the city's water distribution regime) is not a singular, historical event in the linear time of liberal polities. Instead, it is an incremental, intermittent, and reversible process that is composed of multiple temporalities. Second, as citizens are formed through the historic, political, and material relations they make with water pipes, these relations constantly have political effects that exceed human intentionality, thought,

and action. As such, we need to more carefully account for the material politics of infrastructure in readings of postcolonial history and theorizations of government. Finally, I draw attention to excesses of Mumbai's water infrastructure—the leaks of water and authority—because such forms of wasted authority and uncontrolled flow are why water systems remain public. Despite being marginalized through these infrastructures, settlers desire public infrastructures precisely because "bloated" public systems provide many more points of access through which settlers can incrementally and tenuously establish reliable homes in the city. In the following sections, I work through each of these arguments in more detail.

Hydraulic Citizenship

Over the last two decades, anthropologists have demonstrated how citizenship is not simply a formal category of membership that guarantees its bearer equal membership in a national polity.[22] Citizenship is a flexible and contingent form of political subjectification that emerges through iterative (and constitutive) performances between the state and its subjects (Ong 1996). It is claimed through formal practices of voting, everyday performances of social belonging, and also through demands for the resources of states—water services, schools, and health care.[23] While formal citizenship promises equality among citizens, the distribution of substantive civil, political, socioeconomic, and cultural rights among citizens has long been unequal (Holston and Appadurai 1996; see also Holston 2008). Anthropologists have shown how social and cultural difference have often been the grounds for both the denial and the accommodation of citizenship claims, as marginalized groups—immigrants, minorities, indigenous groups, and the poor—are often seen and treated as second-class citizens by their nation-states.[24] The graduated forms of membership and belonging that ensue demonstrate how citizenship can be inclusive, yet also dramatically unequal (Holston 2008).

In this book, I draw on this work on citizenship to explore how the materiality of the socionatural world matters to citizenship forms. By attending to the iterative relations between Mumbai's residents, and their relations to pipes and municipal engineers, I argue that hydraulic citizenship—the ability of residents to be recognized by city agencies through legitimate water services—is an intermittent, partial, and multiply constituted social and material process. Hydraulic citizenship is not a linear process that is realized through the accreted recognitions of city laws, documents, and policies, or the outcome of political protest or social recognition. Hydraulic citizenship

is a cyclical, iterative process that is highly dependent on social histories, political technologies, *and* the material-semiotic infrastructures of water distribution in the city.

Residents in Mumbai are only too aware of the ways that the promises of citizenship are only fitfully delivered, even to those who have all the necessary documents that establish their claims to the city. For instance, Alka tai's story made clear that her everyday experiences of the entitlements of her citizenship were only tenuously related to her formal status as an Indian citizen or her governmental status as being eligible for water services. While she was a formal citizen—for instance, she was recognized as a voting citizen by both the federal and municipal governments—she received only *some* of the promises and guarantees of this citizenship.

Residents of the city are discretely hailed by different city agencies in the provisioning of their daily needs. While different state services are related to each other, they do not "arrive" at residents' homes consistently, or together, when they are "recognized" as urban citizens.[25] Alka tai recognized her cyclical and patchy experiences of substantive citizenship when she gestured to the anachronistic state of her water network together with her family's other tangible accomplishments. She and her family now lived in a house that, while unauthorized, was recognized by the city administration to be fit and deserving of its governmental services—garbage collection, electricity, water. Her house was protected from the arbitrary demolition exercises of the state. Accordingly, her family had invested in internal plumbing and overhead storage tanks. This infrastructure and its commitments (hardware, pipes, finance) suggest that she felt reasonably stable in her home and that she had received high-pressure water from the city. As such, she was not just a formal citizen—with the papers and pipes marking the ways in which her home was recognized by the state. The infrastructures of her home also indexed the ways in which she was seen and treated as a substantive citizen by the city's electricity utility, education department, health services, and the water department.

Yet these achievements were belied by the difficulties she had recently begun to face. When I visited Alka tai, she no longer received water with a pressure she had come to expect.[26] Instead, she was compelled to draw the state and its water into her home using her own bodily labor, by sucking water out of the pipes.

The nonlinear relation between her past connections, everyday experiences with other public infrastructures, and expectations for the future—here instantiated by a fickle water line—illuminates how hydraulic citizenship in

the city, like other forms of belonging, is not an event that is turned on and off like a switch, nor is it secured with the recognitions of land tenure or other papers and policies of urban belonging.[27] Instead, hydraulic citizenship emerges through diverse articulations between the technologies of politics (enabled by laws, plans, politicians, patrons, and social workers) and the politics of technology (enabled by the peculiar and situated forms of plumbing, pipes, and pumps). It depends on the fickle and changing flows of water, the social relations through which everyday political claims are recognized, and the materials that enable residents to connect to and receive reliable water from the urban government. It takes a significant amount of work to become *and remain* a hydraulic citizen. As settlers and other residents constantly evaluate and respond to the dynamic flow of water pressure in the city, their water connections not only form and constitute their social and political urban communities but also elucidate and differentiate the ways in which residents are able to claim and live in them.[28]

How did Alka tai once get reliable water with so much pressure that she could fill an overhead tank? And why could she no longer do so? When Alka tai gestured to her water infrastructure as she spoke, she suggested that the likelihood of her being counted once again among the city's hydraulic citizens related to not only to the conditions of her belonging to the city's polity but also to the material conditions of the water infrastructure. These conditions depended on the life of the installed pipes, as well as daily maintenance work of city engineers, chaviwallas, and the various political and technical intermediaries (councilors and plumbers) that connected her home to the city's public system. To reliably retrieve water through her pipes again, she was now required to do vital maintenance work in order to restore her claims to water pressure from the city's water department.[29]

The Matter of Government

In Mumbai, and indeed in many other cities, residents understand that their access to water services is both productive and reflective of their relationship to state institutions.[30] Water services, as such, not only describe the substantive ways in which residents are seen and treated as deserving subjects of state authority, of ways they are seen by the state (Scott 1998). Water services also are means through which subjects "see the state" (Corbridge et al. 2005). The pipes and pressures of the water network are a key site through which the legitimacy of state officials and their institutions is evaluated and claimed by residents of the hydraulic city.

In recent years, scholars have drawn on Michel Foucault's formulation of biopolitics to theorize the entailments, limits, and possibilities of modern, liberal forms of government that emerged through Europe's relations with its colonies in the late eighteenth century.[31] Biopolitics is understood as a modality of rule that works through the administration of goods and resources (like water) that people need to live. It "refers to a taken-for-granted (though not necessarily very well conceptualized) fact: that all modern governments are concerned with managing the biological, social, and economic life of their subjects" (Collier 2011, 17). Indeed, as thousands of miles of water pipes connect the legal regimes and political resources of the municipal state to the intimate habits of life in Mumbai's households—quenching thirst, cooking food, and washing bodies—the everyday management of these infrastructures is a political technology constantly bringing states, cities, and subjects into being (see Barry 2001, 2013).

Nevertheless, if Foucauldian scholarship has drawn attention to how human imaginaries, social categories, and politics have been embedded in technologies, less clear is the manner in which the peculiar materialities of technologies matter to the form and formation of government.[32] That is to say, if different technologies—of water, health, or energy—are extended by a governmental regime, do they produce different kinds of subjects, or do they each have similar effects? For instance, is a hydraulic citizen the same as an electric (or energetic) citizen? Does the hydraulic state produce the same forms of political subjectivity as the electric (or energetic) state?[33]

There has been an active and long-standing debate in science and technology studies (STS) as to whether and how artifacts and objects may "have" a politics (see Star 1999; Winner 1999; Woolgar and Cooper 1999). In this book I demonstrate how the materials and technologies of water infrastructures are not politically neutral, subject to the powerful political rationalities of government officials or World Bank reform projects. Nor do different modernist infrastructures in the city produce similar kinds of political subjectivity. Water, electric, cellular, and media infrastructures emerge from, produce, and permit different (but related) forms of political subjectivity in the city.[34] Mobilized by both their semiotics and their material affordances, these infrastructures call out and enable forms of everyday management that are reducible neither to the political rationalities of administrators or politicians nor to the material technologies that engineers mobilize in the city. Instead, they are unsteady accretions of different and dispersed social and material relations.[35] They are brought into being out of a multiplicity of historical forms and technopolitical relations that, while bound together, seldom

fully cohere. Slowly formed over time, infrastructures are made by and constitutive of diverse political rationalities, past and present. Finally, infrastructures are not smooth surfaces that perform as planned; instead, they are flaky, falling-apart forms that constantly call out for projects of management, maintenance, and repair that challenge projects of human knowledge and control.

This is why pipes connecting Alka tai's home to the state's large reservoirs and dams acted in ways that often confused her, plumbers, and the city's water engineers alike. The "eventful" politics of pipes, storage reservoirs, and valves—formed through relations between humans and nonhumans—all too frequently leaked through and permeated projects to govern this vital resource (see Braun and Whatmore 2011). At times, these political effects participate in or challenge projects of government. At others, they lay beyond systems of human thought, control, and action, constantly troubling the form and formation of life in the city.

In returning our attentions to the vitality and activity of the material worlds we live with, this book does not suggest that our political structures are determined and regulated by material conditions.[36] Instead, as already assembled infrastructures constantly break down, they reveal how our material, imaginative, discursive, and legal worlds are held together through unstable relations that rapidly and frequently transcend those of politics and technology, of the human and nonhuman, of nature, matter, and ideology. As infrastructures need to be maintained and renewed, they are constantly open to forming and reforming new kinds of cities and citizens.

For example, Alka tai's home made abundantly clear that her water problems were not only the effect of physical arrangements—the hardware of the network. Indeed, the thin pipes she was permitted to use were more fragile and liable to blockage. Yet these pipes were not just described by the diameters of steel, or the various qualities of steel pipe that are more or less liable to rust and rupture. Here water problems were also constituted through "soft" systems—legal regimes that deny water to recent settlers, department policies that permit settlers like Alka tai water lines no larger than a half inch in diameter, the plans of water distribution that direct lower-pressure water to her neighborhood, and the diffuse and decentralized everyday practices of residents, plumbers, and chaviwallas who live in the city. As such, the hydraulic system that emerges here is not a centralized formation of power and knowledge—the hydraulic state—that Karl Wittfogel imagined half a century ago.[37] Instead, the network that emerges here is controlled by a variety of residents, engineers, and administrators that move water in the city. It

is an infrastructure that leaks almost as much water as it delivers according to plan. Residents and governmental experts do not rule over Mumbai's water infrastructures. Instead they are made to live through its fickle and multiple leaks and breakdowns in an environment of social, political, and material uncertainty.[38]

Therefore, in describing Mumbai's water network, I theorize infrastructure not as a fixed set of material *things* that are functioning in the background until they break down in visible ways.[39] Infrastructures are neither ontologically prior to politics nor are they merely effects of social organization. Infrastructures are flaky accretions of sociomaterial *processes* that are brought into being through relations *with* human bodies, discourses, and other things (sewage, soil, water, filtration plants). They are processes always in formation and, as Alka tai found, always coming apart.

Thinking about Mumbai's water infrastructures as a process, one that is and yet is always becoming (see Biehl and Locke 2010), allows us to recognize the ways in which it structures the present and yet is also contingent on the imaginations and labor performed in a technological and political moment.[40] As such, infrastructures accrete different temporalities.[41] As new technologies, socialities, and politics are always emergent, they sometimes bring into being new infrastructures, whose moralities are appended onto already existing infrastructures. When new reform regimes are grafted onto already existing gatherings of steel, water, engineering, and politics, the resulting forms sometimes evade the structures and regimes of government (see Collier 2011). By drawing attention to the intransigence of water pipes and the ways in which their pressures, leakages, and weight matter, I show how, despite a deep history of state control, by no means has water been successfully encompassed by technopolitics. As water leaks, despite efforts to conserve it for human use, its materiality is not only constitutive of the political field but also always exceeds it, destabilizing its different regimes with a significant degree of uncertainty.

Postcolonial Infrastructure

Research on water infrastructures, energy networks, housing, and roads has demonstrated how political subjectivities and authorities are made through projects to manage infrastructure, the connections and disconnections they enable, and the ways in which they materialize and rescale geographies.[42] In his generative review of the literature, Brian Larkin has pointed out that "infrastructures are matter that enable the movement of other matter. . . . They

are things and also the relation between things" (2013, 329). They are political structures and cultural forms that have, for some time, been associated as symbols, promises, and vectors of modernity. In both social theory and political life, infrastructures have served as temporal markers for what distinguishes the developed from the developing world, a telos upon which the wealth of nations and the modern time of their cultures have been mapped and assessed.[43]

Infrastructures and technologies have long circulated around the world as political technologies to govern populations. Since it was first installed in 1860, Mumbai's water system is, in many ways, as old, complex, and extensive as those in several other global cities, including New York, Paris, and London. Built in the same era as the large public hydraulic works in these other cities, colonial Mumbai's modern water infrastructure was formed in close conversation with experts, engineers, and bureaucrats in Europe. As in those cities, Mumbai's water projects too were formed amid conversations around urban modernity and liberalism.[44]

Nevertheless, because infrastructural forms also depend on the political and social milieu in which they are assembled (Hughes 1983), it is significant that the city's hydraulic infrastructure was first established and extended during its time as a colonial city. If hydraulic engineers shared the technologies and arts of constructing a modern system between London and Mumbai, their expertise was subject to restrictions in the colony. Colonial administrators in Mumbai were subject to particularly rigid fiscal constraints because their supervisors in London questioned whether the city and its subjects were deserving of the fiscal investments entailed by a modern water system (see Dossal 1991, 2010). When the provincial government finally received permission to build and finance Mumbai's water infrastructure, it was first extended to secure the needs of the city's military cantonment and its wealthy native merchant communities.

Therefore, if production of a water system was inextricably tied to the making of a liberal citizen and a circulating public in London or Manchester (see Joyce 2003), the production of a water system in colonial Mumbai was designed to discriminate between those who were deserving of membership in the colonial city and those for whom the promises of liberal citizenship were deferred or denied.[45] As such, in Mumbai (and indeed in many other postcolonial cities), splintered urban forms are not merely an effect of neoliberal restructuring. Mumbai's water system has been splintered and technopolitical from its earliest days as a colonial city.[46] As such, the, installation of the water system in colonial Bombay served at once to institute the

colonial state as the leading patron of water delivery in the city, shift the costs of this delivery onto residents, and, by doing so, establish a biopolitical system of *limited* liberal governance in an emerging center of empire.

There is little record of the colonial or the early postcolonial government extending water services to those who lived in the city's auto-constructed settlements.[47] While water services would eventually be extended to those living in the working-class housing blocks of the city, this was done slowly and incrementally. To this day, these social differences are reproduced by the accreted laws, policies, and techniques that govern water in the postcolonial city. For instance, the historic alignment of water mains continues to favor the wealthier upper classes that live in the southern parts of the city, as do different kinds of laws that continue to tie water access to property claims. Nevertheless, the political forms of government have also changed over the last seventy years. Today, the laws and practices of differentiation and marginalization are constantly contested by settlers and other marginalized residents who mobilize both technical expertise and the political claims of citizenship, kinship, and clientship to demand a more inclusive regime of government in the city.

That many of those living in settlements have historically *not* been considered substantive citizens of government poses a problem for scholars of global cities, who sometimes assume the ubiquity of the liberal subject in their critiques of neoliberalism and citizenship.[48] Owing to the political histories of the postcolonial city, liberal citizenship has not been the dominant political location from which subjects make political claims.

In fact, settlers work hard to mobilize water connections precisely *because* these are also helpful in establishing their citizenship in the city. Legal water connections deliver more than water in Mumbai. The bills and pipes that legal connections also deliver are critical in demonstrating to other branches of city government that their subjects are good, recognized citizens. Thus, to be seen as deserving urban citizens in the country's most capitalist city, settlers meticulously mobilize the correct languages, papers, materials, and practices that document their presence in the city, so that they may get a legal water connection.[49] They mobilize various governmental and political practices—crossing the boundaries between liberalism and illiberalism, patronage and citizenship—to establish both access to water and, with it, documentary evidence that they "belong" to the city.[50]

In paying close attention to these kinds of political practices, Partha Chatterjee has suggested that the space of negotiation for marginalized groups takes place not through the procedures of civil society but through those of

political society. Marginalized populations, Chatterjee argues, "make their claims on government, and in turn are governed, not within the framework of stable constitutionally defined rights and laws, but rather through temporary, contextual and unstable arrangements arrived at through direct political negotiations. . . . All of this makes the claims of people in political society a matter of constant political negotiation and the results are never secure or permanent. Their entitlements, even when recognized, *never quite become rights*" (2008, 57–58; emphasis added).

Chatterjee's framing of political society describes a powerful way to examine how settlers have improved their homes and their infrastructure in Mumbai—through relationships with policemen, municipal officers, and political leaders (see chapter 2). Yet settlers do not only mobilize the claims and demands of political society as subjects of humanitarian care in Mumbai. They are recognized as formal citizens through temporary yet critical civil rituals such as elections, public consultations, or human rights training programs (chapter 4). They also work hard to be counted, recognized, measured, and mapped in government surveys as legitimate citizens. With these compromised and multiple techniques, settlers in Mumbai have effected a critical shift in the terms and means of belonging to the urban polity over the last three decades, where their politics of life are *sometimes* framed in terms of a politics of rights. Like many other more privileged residents of the city, their political practices—of claiming rights and favors—emerge from the political situation formed by their relations with friends, families, and other infrastructures of life, including the water network.[51]

Thus, the social histories of Alka tai's neighborhood are full of different stories of protest marches to the offices of the water department, and of petitions and special requests made at the offices of city councilors. Residents animatedly describe how they control their water system despite the lethargy of state officials. Their stories are also populated by prosaic and tedious application forms, proofs of address, and plumber work orders. Residents care for these papers actively, and through them claim and call out for the programs and protections of government, performing what anthropologist Arjun Appadurai has called "governmentality from below" (2002, 35; see also Zeiderman 2013). Accordingly, these improvement projects are not only extended "down" to the settlements from the offices of the city municipal corporation. Settlers also often tugged, pulled, and vociferously demanded these connections to their homes.

In Mumbai, wealthy and poor residents alike do not get individual household connections, but share their water connections with their neighbors. As

such, the water department generates and holds together social collectives that mediate relations between the state and individual households.[52] For instance, for Alka tai to get a water connection in accordance with the municipal rules, her household was required to form a cooperative society with ten other neighboring households and apply as a group for a single shared "standpost" connection at the water office. Since obtaining this connection, Alka tai and other "members" have made their own investments in the network and designed the water infrastructures from the city water main to their homes.

Because her water pipes were shared with her neighbors, Alka tai also shared with them her water problems as well as her strategies for managing them.[53] As soon as we finished our tea, she took me to a neighbor's house. Like Alka tai's husband, Jadhav was gainfully employed. He ran a lathe above his home and was busy doing small machining works on contract. Like Alka tai, he too complained of an unreliable supply. Hearing us discussing water outside his home, another neighbor who worked in the postal service came out to talk with us. Yes, water was a problem, he said, but it was not something to fuss about. His friend had commissioned a city councilor's plumber to clean the pipes. He would take 1,000 rupees (US$20) from each household to do the work and guaranteed success. Instead of doing this *kit-pit* (complaining) with a useless researcher, perhaps they could try him? The suggestion sounded good to both Alka tai and her neighbor. The amount of money did not seem to bother them too much, and they agreed to call the plumber to see if he could fix the errant pipes.

Public Reforms

In much of the development literature, the crumbling, visible, decrepit water infrastructures that Alka tai lived with are suggested to be emblematic of cities in the Global South. Against the normative expectations of infrastructure's invisibility, the hypervisibility of infrastructure in cities of the Global South is often taken—by scholars and administrators alike—as evidence of pathological breakdown, of "not-quite" modernity.[54] In recent years, however, a series of infrastructural disasters and mundane infrastructural disrepair in the Global North has challenged our imagined geographies of breakdown, abandonment, and infrastructural development. As stories of infrastructural breakdown increasingly permeate newspapers and research projects in the United States, the production of smooth and spectacular infrastructures has been taken up most actively in developing countries like Brazil, India, and

China as evidence of their global ambitions.[55] It is through the active production and extension of hypermodern infrastructures that countries like India and China seek to join the "developed" world.

In this landscape, the Jawaharlal Nehru National Urban Renewal Mission (NURM), launched over a decade ago, was India's most significant urban intervention in the country's history. The NURM was directed at the production and extension of infrastructures in its cities.[56] Through this program, over US$11 billion was been allocated to improve urban infrastructure and restructure municipal government in sixty-seven Indian cities. Yet, unlike previous moments in which infrastructure was planned, financed, and constructed by state agencies, the NURM follows the neoliberal turn in development planning, in both form and content. When allocating funding to (primarily large) cities, the Ministry of Urban Development reviewed not only the funding proposal (made by cities for infrastructure projects) but also the extent to which the city requesting funds fulfilled its reform commitments (see Kundu 2014; Kundu and Samanta 2011). Had the city formulated a development plan? Did it follow its stated timeline for the implementation of urban reforms? The content of the specific reforms required was substantive and wide ranging. The NURM required cities to reform their property tax structures and systems of accounting. It recommended that cities abolish their rent control and urban land ceiling laws, toward the creation of liberal property markets. The policy reforms recommended also included full cost recovery of urban services, encouraging public–private partnerships for the delivery of urban services, and, somewhat paradoxically, ensuring the tenurial security of all residents "at affordable prices."

Yet, even as the federal government sought to introduce funding incentives to compel municipal authorities to encourage the privatization of different infrastructures (roads, electricity networks, etc.), water networks in India, like those in other parts of the world, have consistently troubled privatization. In contemporary India, while the state has declared its commitment to neoliberal policies and operationalized its commitments through programs like the NURM, water projects continue to be managed by public institutions. How might we understand the persistence of public water programs in a state that constantly proposes and avows the principles of neoliberal government? What makes water particularly resistant to commodification? By situating this research amid a water privatization project in Mumbai, the pages of this book begin to answer these questions.

In part because of its deep history as a state-saturated water supply system, projects to directly privatize water distribution in Mumbai were not

proposed until relatively recently. In 2004 the Public Private Infrastructure Advisory Facility (PPIAF), a World Bank program, worked with the Ministry of Urban Development in Delhi to fund a study toward recommending and overseeing structural reforms necessary to "improve" Mumbai's water supply in K-East ward, one of the largest wards in the city. Still recovering from the very public opposition and subsequent collapse of World Bank–supported water privatization projects in Delhi and Bangalore, both the World Bank and their consultants repeatedly tried to assure people that the Water Distribution Improvement Project (WDIP) was just a "study" focused on improvement and *not* a privatization project. Nevertheless, critics of the project pointed to drafts of bid documents and a "transition team" formulated *prior* to the study to argue that it was only a legitimizing exercise for an already determined process of privatization.

Expecting protests and opposition to the plan, I arrived at Mumbai's water system particularly because I was interested in learning how and why the project to privatize urban water distribution would run into trouble in subsequent years. It was a stimulating time to be doing fieldwork. Stories of water often feature in the city's newspapers. Yet the considerable talk and controversy around the privatization project allowed for even more exciting headlines about the city's pipes and distribution regimes. Between 2006 and 2009, activists, water department engineers, and NGOs in Mumbai organized a moderately effective opposition to the WDIP by arguing that water was a human right and not a commodity. Their claims were countered by the World Bank consultants proposing reforms, who pointed to the fact that the poor are already paying with their time for water of poor quality in the public system, and that they would likely be willing to pay more for better service.

Yet such a framing of the difference between public and private systems was neither theoretically productive nor useful to residents like Alka tai.[57] Settlers are disadvantaged through *both* private and public management of city infrastructures. On the one hand, purchasing water as a private commodity is prohibitively expensive. On the other hand, state agencies, particularly in urban areas, often do not consider the poor as equal citizens. Therefore, settlers in Mumbai tend to cope with water scarcity by making multiple sets of claims. To access water, they engage not only with formal states and markets but also with a wide range of political and sometimes illegal social arrangements that include kin, local politicians, municipal plumbers, and social workers. These everyday practices of accessing water suggest we need to rethink the perils and potential of both rights and commodities for marginalized subjects living in the city.

In this book I argue that settlers demand public water systems not because public systems deliver reliable supplies to all. Settlers desire public systems because, relative to private infrastructures, these "bloated," "inefficient" public systems are known systems that offer many more points of access (officials, politicians, social workers, and leaky pipes) through which settlers can be connected to the hydraulic city. Settlers also desire water through the public system because its documents (printed on government stationary) allow them to claim and access *other* public urban services and substances of citizenship—like housing, health, and education. Because public water infrastructures are constituted by city engineers, councilors, plumbers, and pipes, residents have learned the diverse social and political ways they may pressure these actors to make water flow to them, even when the rules, laws, and policies of the city preclude their access (Anand 2011). In short, relative to private systems, public systems are known systems that are more accommodating of vital forms of leakage that nourish those marginalized by states and markets in the city. Public infrastructures are more amenable to hidden, partly known, materialized arrangements through which millions of residents access water and live in the city.

Settlers in Mumbai recognize, and recognize very well, that the laws and norms of states are made by those more powerful. While conducting fieldwork, residents of Jogeshwari incessantly pointed out how water distribution was consistently unequal, favoring the wealthier populations living in the southern reaches of the city. They recognized that city officials were more beholden to the needs of wealthier residents in South Mumbai. They were aware that their complaints would only seldom be attended to if made through the "proper" channels. Accordingly, they often sought to make their claims on the city's water through infrapolitics—unobtrusive, invisible, and often illicit kinds of connections, often made with sympathetic officials, to the city's network (Scott 1990).[58]

After all, it was because she had seen me as a potential fixer of her trenchant water pipe that Alka tai invited me to her home to see her water network. She was hoping that I would be a known social relation who might help her solve her water difficulties or, at the very least, diagnose her water problem.[59] Recognizing different markers of my class (like those of NGO workers who frequented the area), Alka tai was not incorrect in making this assumption. Indeed, the impatience of her second neighbor in talking with us stemmed from the same recognition. Living in Meghwadi for as long as he did, he was familiar with both the intentions and effectiveness of those who descend on "slums" to save them. He was also aware of a more quotidian,

more situated way in which their water problem could be solved—by talking with local experts who knew others who would help pressure the water pipe again. He successfully urged his neighbors to hire a plumber to clean, maintain, and reinstall their water pipe. When a plumber finally worked on the problem, he cleaned and fixed the pipe, all without the knowledge or the intervention of the city's water department.

THE CHAPTERS OF THIS book are full of mundane stories of social and material connection that describe the hidden and yet tremendously vital ways in which Mumbai's residents (and particularly its settlers) have been able to establish their lives in the city. This is not to say that settlement is an easy or a durable process, nor is it to say that infrapolitics is always effective. As researchers of South Asian cities have recently shown, marginalized residents are confronting a revanchist urban administration that has worked with powerful real estate developers to intensely remake cities to serve the needs of the "world class."[60] I do not intend to underplay these processes, which have been dramatically remaking the neighborhoods of Jogeshwari as well, sometimes violently.[61] Yet even as these exclusionary processes are ongoing, we know less about how and why the processes of gentrification and displacement have consistently been troubled and slowed.[62] Connections—here made through and with attempts to secure access to water—demonstrate how residents are able to live in the city despite the predations of states and markets.

This book is based on ethnographic fieldwork conducted over eight years, most of it performed in eighteen uninterrupted months between 2007 and 2009. During this time, I followed the work of water department engineers as they moved water through the city, and that of settlers in the settlements of Jogeshwari who mobilized pipes, plumbers, and politicians to access it. Living in one of Jogeshwari's settlements for nine months, I learned how my neighbors responded to these difficulties and worked to restore reliable connections to their homes. I also interviewed vital intermediaries in this hydraulic system—city councilors, plumbers, and social workers—and explored how they traversed the boundaries of the law to produce their authority in the settlements. Together with my research assistant, I carefully perused between six and eight newspapers (in English, Hindi, and Marathi) for twelve months, to attend to the ways in which the city's water crisis was being written about and read in the city. These news stories percolate the text of the book. By featuring these news stories within and between most chapters, I wish to demonstrate how the hydraulic city is constantly being

discursively constructed in the city's media (Gupta 1995). This way of knowing Mumbai's water has important political consequences in the city (see chapter 1).

As I was conducting fieldwork at the same time as the water privatization project was being actively explored in the same municipal ward, my fieldwork was enhanced and enriched with the work of several experts, officials, and activists (themselves often at odds with each other). I interviewed a range of planners, engineers, and technical experts charged with conducting a study of the ward and implementing a pilot water privatization project. They were generous (and always a little wary) to share their research, their documents, and their surveys with me. At the same time, I attended meetings with the Water Rights Campaign—a network of NGOs and community groups protesting privatization—sharing my readings of water privatization in other cities of the world. Finally, to understand how the reform efforts were situated in a national (and international) conversation around urban water reforms, I participated in national workshops on the topic that were organized for administrators and municipal water engineers from all over the country. These workshops were intended to teach municipal experts the arts of water reform, and how to manage pipes and publics during the transition period. Yet, for both attending urban engineers and me, the workshops also provided an opportunity to learn about attempts at water reforms in different parts of the country, and the difficulties that reform projects encountered.

While the book seeks to make a contribution to debates about neoliberalism, it is not centered and organized around the privatization initiative in Mumbai. In the book, and indeed in the city, privatization projects arrived both tenuous and late, as a contingent, compromised, and fitful effort to restructure the city's ongoing history of hydraulic settlement and government. I am interested in how hydraulic infrastructures structure, and are structured by, the diverse ways residents and experts imagine, live with, and manage water in the city (see Larkin 2015). Having been continuously constituted over the last 150 years, Mumbai's public water system is formed with the regular appearances of water stories in the city's news, the imbrication of ever-changing state policies, hydrology, technology, and a medley of different political and social relations that are enabled by the materiality of water and the politics of the democratic state. These relationships not only make a certain *kind* of water but also produce particular kinds of hydraulic subjects—those who are conscious and anxious of water's cyclical temporality—and their illiberal, modern, democratic, considerate, and coercive technopolitical experts: engineers and city councilors.

Finally, while I focus on the water that courses through the treatment plants and water pipes of the Mumbai water department, this is not the only kind of water in the city. Indeed, both researchers and residents of the swampy city are not allowed to forget that different waters are everywhere in Mumbai. Thousands of wells and many sinkholes perforate a city that is surrounded by the sea. Every year, the torrential monsoons, together with the flooded sea, inundate the city, halting the movement of things and people through it. The Mithi river-sewer travels the length of much of the city, before slowly pouring its mysterious liquid material into Mahim Bay. These different waters percolate through this book as interludes. As interludes, they sometimes mix with, sometimes disrupt, and at other times just lie alongside a tidier ethnographic story I tell about piped water supply in the chapters. The interludes remind us that stories of water scarcity and anxiety are just some of many liquid stories residents know and live with in this sodden city.[63]

Chapter 1 begins by showing how rainfall in an agrarian district one hundred kilometers from the city is made Mumbai's through labor, technology, and narratives of water scarcity. Drawing on scholarship in political ecology that has been especially attendant to the politics of environmental crisis, I show how the discursive rendering of water scarcity unmakes both rural and urban residents, and makes water generative of an anxious and xenophobic urban public.

In chapter 2, I engage the urban studies literature on capitalist transformation by showing the discretionary processes through which settlers have established themselves in Mumbai. To do so, I provide a brief history of a settlement in the neighborhood of Jogeshwari, examining how its residents have made critical improvements to their water infrastructure through a series of liberal and illiberal claims. Most residents are now able to apply for public water connections following incremental and graduated processes of state recognition. These processes of recognition, paradoxically, continue to require and proliferate illiberal technologies of government in the city.

Today, Jogeshwari's residents, like other residents in Mumbai, receive water on a water supply schedule, for a few hours every day. Chapter 3 is an ethnographic account of how water time punctuates the rhythms of social life in the household, figuring and producing gendered and classed subjects through it.

Chapter 4 draws on fieldwork in a community organization to focus attention on the unstable and unsteady ways in which settlers manage diverse regimes of subjectification and citizenship in the city. I focus on the dangerous situation that emerged when community groups in the area demanded water

as a right, while continuing to depend on "good relations" with the elected city councilor. When these diverse forms of subjectivity were revealed to the councilor at a water reform consultation, his response showed how political leaders exert sovereign and disciplinary power to rule their populations despite the power of elections and the promises they bring.

In recent years, consultants at the World Bank and India's Ministry of Urban Development have sought to restructure public distribution systems to provide not staggered but continuous (24/7) water supply to all urban residents. Yet efforts to make water available 24/7 have been strongly compromised by the prolific leakages of water from the city's underground network. Chapter 5 shows how, amid the heterogeneous physical and social demands of the network, engineers are unable to stop water from "leaking." These leakages not only nourish settlers but are also critical to the reproduction of the hydraulic state. As engineers struggle to address unknown quantities of physical and social leakage, staggered water supply becomes a critical way for engineers to reassert control over a public system.

Where the previous chapters show how settlers have made critical and incremental claims to the city's water network, chapter 6 explores how Muslim settlers in Premnagar have been rendered an abject population through the cultural rhetorics and practices of water engineers. The ability of Premnagar's residents to live in the city despite municipal abjection shows how Mumbai's water constantly and consistently escapes technocratic control. As Premnagar's settlers draw water from bore wells and other hidden sources, they mark a critical way in which water's leakages and subterranean flows permit abject hydraulic subjects to live in the city.

Amid spectacular infrastructural breakdowns in recent years, and their increasing regularity in times of climate change, the book concludes by drawing attention to the ordinary lives of crumbling infrastructures, and the processes and politics with which they are put together again. As scholars of anthropology, geography, politics, and science studies attend to the infrastructures that mediate relations between environments, engineered landscapes, and politics in the contemporary period, the book concludes with four provisional contributions to these literatures that emerge from a study of the social life of water in Mumbai.

Notes

PREFACE

1. As David Mosse points out, "the relationship between water and society is as complex an historical, sociological and regional problem as any that can be imagined. Any contribution can hardly fail to be humbled by the fundamental questions invoked and the weight of antecedent interdisciplinary scholarship" (2003, 1). In their review article, Ben Orlove and Steven Caton (2010) suggest that the generativity of social studies of water has to do with its ability to traverse (and therefore connect) our political, social, and biological lives.

2. Instead of using the now problematized terms of *slum* and *slumdweller* (see Desai 2003; Echanove and Srivastava 2009; Ghannam 2002); in this book I use the *settlement* and *settler* to identify particular *kinds* of urban objects (homes) and subjects (residents) that are made prior to state recognition. I elaborate my reasons for doing so in the introduction of this book.

3. Arjun Appadurai has argued that emergency narratives stifle thinking and, moreover, reproduce unequal power relations. In his study of housing activists in Mumbai, he demonstrates how they refute emergency modes of organizing and instead practice a "politics of patience" that allows different voices to be heard and gathered (2002, 30).

4. In a provocative special issue on urban resilience, Bruce Braun and Stephanie Wakefield (2014) have suggested that the environmental apocalypse is not in our imminent future. Instead, they suggest that for many people in the world it is already a present reality. We are already dwelling in it (see also Braun 2014).

5. Accordingly, several NGOs in Mumbai now host programs through which ordinary residents can research, document, and tell their stories in and of the city. Pukar, an NGO based in Mumbai, resources and supports the research interests of hundreds of youth every year. "Youth fellows" are given the tools to tell their stories, of love and work, of mills and caste, of ecologies and gender in the city. A cofounder of Pukar, Appadurai has recently argued that it is critical that such research be carried out and the opportunity to narrate the city not be the privilege of the specialist alone. Research needs to be "deparochialized," Appadurai argues, because it "is vital for the exercise of informed citizenship" (2006). A different NGO, Yuva, has focused more on the making of news. They produce *Hamari Awaaz*, a video news bulletin that is made by youth living in different settlements.

6. Drawing on the work of Marilyn Strathern (2004) and Ursula Le Guin (1996), Donna Haraway (2014) has encouraged us to populate and destabilize our stories and retell them as gatherings of experience. "It matters what stories tell stories," she suggests,

insisting that what is needed now are not heroic storytellers (or ethnographers) but an effort to apprehend the worlds we know unstably and collectively with others.

7. Loosely translated, the Nakshatra are the twenty-seven lunar mansions that have long been used by astronomers in India to measure the calendar year. The monsoon is marked by the time when one of ten Nakshatra are directly overhead.

8. Here I draw on Dipesh Chakrabarty's (2009) essay, "The Climate of History," which has insisted that climate change promises to forever alter humanist pretensions of discrete social and environmental domains, and as such collapse enlightenment distinctions between natural history and social history.

INTRODUCTION

1. I begin with an account of the numbers that compose Mumbai's water system consciously, because this is how the system is often represented by engineers to the city's journalists and researchers.

2. See Chakrabarty (2007) and Coelho (2006) for more about the politics of shouting in postcolonial India

3. *Tai* is a kinship term signifying big sister in Marathi. With the exception of the filmmaker residents that I worked with in Jogeshwari, I have given pseudonyms to those who are not public figures in order to protect their identity.

4. Through an account of river restoration in Nepal, Anne Rademacher (2011) shows how settler populations too have desires and aspirations for greening their urban environments. These aspirations complicate accounts that identify the greening of cities as a bourgeois project.

5. If the blockage (or leakage) was located on the household side of the meter, it would be Alka tai's family that would be responsible for repairs. On the other hand, if it was located prior to the meter, it would be the formal responsibility of the city government.

6. My interest in the ordinary here emerges not only with recognition of Alka tai's family's extraordinary accomplishments but also with the work of Asef Bayat (1997). Bayat has urged an attention to the everyday political praxis through which marginalized lives are rendered more stable, through a "quiet encroachment of the ordinary" (Bayat 1997, 61; see also Anjaria 2011; Ghannam 2002).

7. Scholars of informality working in Mumbai and South Asia more generally have made signal contributions by describing the everyday processes through which marginalized residents have established themselves in the city (see McFarlane 2008; Ananya Roy 2003; Ananya Roy and AlSayyad 2004). Newer work has extended the analytics of informality by demonstrating how it is not merely in the domain of the marginalized but also key to the work of bureaucrats, state officials, and real estate developers as well (Baviskar and Sundar 2008; Bear 2015; Ananya Roy 2005).

8. See Bjorkman (2015), Echanove and Srivastava (2009), Ghannam (2002), and Ghertner (2015) for nuanced readings on how the category of "slum" often erroneously conflates living conditions, legality, built form, and moral virtue into a single unit of "slum" housing deemed to be unsuitable for civil life.

9. See, for instance, Raj Kapoor's *Shree 420* (1955), Anurag Kashyap's *Black Friday* (2004), and Danny Boyle's *Slumdog Millionaire* (2009).

10. See, e.g., Suketu Mehta's *Maximum City* (2004), Mike Davis's *Planet of Slums* (2006), Robert Neuwirth's *Shadow Cities* (2006), and Katherine Boo's *Behind the Beautiful Forevers* (2012).

11. See Desai (2003), Echanove and Srivastava (2009), and Ghannam (2002).

12. I recognize the terms *settlers* and *settlement* have fraught histories, particularly because they are usually used to identify the unauthorized and often violent process of constructing colonial settlements in the settler societies of Israel, Australia, and the United States.

13. Bruce Braun (2005) asks why nonhuman natures remain static and passive in accounts of urban water. Arguing that the properties of water also influence urban politics, Braun suggests that human geographers pay closer attention to these "more-than-human" relations.

14. See also J. K. Gibson-Graham (1996), who has drawn attention to the gendered scripts through which capitalism is known. They urge that we do not take the narrative of capital as complete and totalizing. More recently, Anna Tsing (2015) suggests we see capitalism as "patchy" and always needing an outside to colonize.

15. Vinay Gidwani has made a powerful critique of Chakrabarty's argument here, suggesting that his dualist rendering of capitalist histories continues to locate Europe as the center from which capitalist projects emanate (Gidwani 2008).

16. Feminist geographers have pointed to the gendered metaphors through which capitalism has been narrated and urged that we refuse their power (see Gibson-Graham 1998; Hart 2002). For work arguing for an attention to the contingent expansion of capitalist life, see Mitchell (2002) and Tsing (2015).

17. See Gandy (2002), Hamlin (1998), and Joyce (2003).

18. See Mitchell (2002) and Mukerji (2010) for accounts of the rise of engineering in nineteenth-century Egypt and France, respectively.

19. Caroline Humphrey (2005) has urged us to recognize how ideology appears in and is produced by material structures. Here I draw attention to the ways in which infrastructures give material form to liberal ideologies, and might explain why infrastructures have returned as a key site of governmental action in these more neoliberal times. By governments around the world, infrastructures are seen to be a suitable site for state action, one that creates the grounds for, but does not intervene in, the workings of the market (see Collier 2011).

20. As such, infrastructures are also a key site for the administration of structural violence on variously disenfranchised groups (Rodgers and O'Neill 2012).

21. I suggest this may be the case not just in Mumbai but in many other postcolonial cities around the world.

22. As scholars of citizenship have noted, subjects—like the urban poor in Mumbai—might be formal citizens, entitled to the guarantees of citizenship, and still not receive its guarantees (Appadurai 2002; Holston and Appadurai 1996). On the other hand, subjects who are not formal citizens—such as illegal immigrants—might still receive the substantive distributions of citizenship (Holston 2008; Sassen 2003).

23. See Appadurai (2002), Clarke (2013), V. Das (2011), Holston (2008), Lazar (2013), Ong (1996, 2006), and Thomas (2011).

24. There is a rich literature in anthropology on the relation between national citizenship and cultural difference. See, for instance, Clarke (2013), Herzfeld (1992), Ong (1996), Rosaldo (1994), and Zérah and Landy (2013).

25. In this section, I am thinking of recognition as has been theorized by Elizabeth Povinelli (2002). As I describe in chapter 2, recognition is an ambivalent event, which calls on settlers to perform their subjectivity in particular ways so as to call on the state's care. On the other hand, once settlers are "seen by the state" as such, they are also liable to the exercise of its disciplinary apparatus.

26. See Ferguson (1999) for more on the nonlinear relations between political membership, time, and modernity.

27. Note that hydraulic infrastructures reveal and delineate different processes of urban citizenship relative to land- and property-based accounts. While the recognitions of property have long been central to establishing citizenship in the city (D. Harvey 2008; Holston 2008; Joyce 2003), including obtaining water services, an attention to the everyday life of water infrastructures reveals how the event of tenurial security is not sufficient to guarantee hydraulic citizenship in the city.

28. In their article "Beyond 'Culture,'" Akhil Gupta and James Ferguson (1992) argue against a reading of culture as being isomorphic with space, and instead urge an attention to how communities are constituted through meaningful inscriptions and interconnections made in space.

29. Julie Chu (2014) has urged an attention to the political work of disrepair (see also Graham and Thrift 2007).

30. South and Southeast Asian scholarship has been particularly attentive to the ways in which water infrastructures are generative of state institutions and political relations. See, e.g., Geertz (1972), Gilmartin (1994), Hardiman (1996, 2002), Lansing (1991), L. Mehta (2005), Mosse (2003), Schwenkel (2015), and Whitcombe (1972). In more recent years, urban political ecologists have shown how water networks are constitutive of the political field in the city (Carroll 2012; Gandy 2002, 2014; Kaika 2005; Kjellén 2006; Loftus 2012; Meehan 2014; Sultana and Loftus 2012; Swyngedouw 2004; Swyngedouw and Heynen 2013).

31. Foucault (2008) described the rise of biopolitical government in Europe (particularly France). Extending and complicating his account of Europe as the center of this form of rule, Ann Laura Stoler (1995) and Peter Redfield (2005) have since demonstrated how these techniques of government were first produced and improvised through relations with its colonial subjects.

32. While Foucault refers to technologies of power in his work, he was less lucid about how material technologies "make a difference" in his work (Bennett 2010). In part, this may be because, as Michael Behrent (2013) argues, Foucault's use of the term *technology* has had less to do with material technologies and more to do with signifying a particular art of managing populations and the self through instruments like the map, the census, and the survey. This is not to say that Foucault neglected the power of material objects in his work. He took care to remind his readers that material artifacts are "rigorously indivisible" from the ideas that form them, where neither the material nor the ideational is primary in the first instance (Foucault 1984, 253; see also Larkin 2008). Nevertheless, matter tends to remain passive in these accounts (Barad 2003; Lemke 2014). It often articulates with, but seldom objects to or remains outside of, the political formations from which it is sought to be drawn. See also Mitchell (2011).

33. See Boyer (2014, 2015) for the relation between energy and biopolitics.

34. See, for instance, Coleman (2014) and Degani (2013) for the kinds of political subjectivity and hopes for the future effected by electricity in India and Tanzania, respectively. On the other hand, see Larkin (2008) and Sundaram (2010) for an attention to how the media infrastructures that electricity enables produce different kinds of social and political forms of connection and circulation.

35. In theorizing infrastructure as accretion, I am mindful of the work of Franz Boas, who theorized culture as an accretion (Boas 1974), and also of more recent work by Donald Moore (2005), who urged an attention to historically "sedimented" social practices in Zimbabwe.

36. Sarah Whatmore (2006) reminds us that the recent turn to materiality is, in fact, a "materialist return." As I evoke hydraulic networks to theorize political and social forms of cities and citizenship, I am conscious of the past–present legacies of materialist scholarship, particularly in the field of environmental studies. Early explorations of nature–society relations have shown how political systems are made and consolidated by powerful groups controlling the resources of already existing landscapes.

37. Karl Wittfogel worked with mechanistic formulations of hydraulic systems to describe the formation of "hydraulic societies" (see also Strang 2016). In his landmark tome, *Oriental Despotism* (1957), Wittfogel theorized how these were ruled by authoritarian "despots" in the "Orient" through the management and control of irrigation structures—particularly large-scale irrigation and flood control projects. Wittfogel's rendering of social order (and also social others) borne out of controlling "nature" has been powerful and troubling, to scholars of both India and of environmental studies more generally. For instance, Janet Abu-Lughod (1991) has questioned whether the hydraulic systems he characterized in South India were either despotic or centralized. On the other hand, Donald Worster (1992) takes a different approach. In his work on California, there is nothing "oriental" about hydraulic societies. Either way, Wittfogel's work on hydraulic societies is troubling because it suggests that material conditions (of water scarcity or abundance) are what structure social order in the first instance (see also Geertz 1972). Here, I depart from Wittfogel to describe a different hydraulic regime, one that, while durable, has diverse locations of control, authority, and leakage.

38. The uncertainty I describe here is not just a material uncertainty of when water will "come" but also a political uncertainty of who is in control of water and its diverse kinds of pipes, valves, and politics. I suggest uncertainty to be an outcome of processes that are simultaneously material and political (cf. Thompson, Warburton, and Hatley 1986).

39. Noting the peculiar invisibilities of infrastructure, Susan Leigh Star (1999) famously noted how infrastructures are often invisible until they break down. It is when infrastructures break down, Star argues, that their tenuous relations become visible. Taking up her provocation, geographers have demonstrated how both breakdown and infrastructural visibility are ubiquitous and particularly noticeable in cities of the Global South (Graham 2010; Graham and Thrift 2007; McFarlane 2008), where multiple infrastructural regimes jostle for prominence (Furlong 2014). The tangle of electric and television cables, water pipes, drums, and buckets visibly materializes the contentious state of technology and authority in these cities. Yet while these infrastructures are indeed apparent, less clear is the relationship between visibility and breakdown in these locations. First, these knotty

visible assemblages are often, in fact, working in these locations. Second, as "concrete semiotic and aesthetic vehicles oriented to addressees" (Larkin 2013, 329), roads and energy infrastructures are often built to be especially spectacular—to demonstrate the power and technological prowess of nation-states, corporations, or other institutions to deliver the visions and appearances of modernity (P. Harvey and Knox 2015; Schwenkel 2015). What the hypervisibility of infrastructure in the South (and indeed in many other locations) reveals instead is the lack of any easy correspondence between visibility and breakdown.

40. Heidegger (1977) has reminded us that we are thrown into worlds that are not of our making, worlds that are already formed by technology. These silently, and often invisibly, produce the very conditions of possibility for corporeal, social, and institutional life.

41. See Limbert (2010) for an account of the temporalities of energy production. See McKay (2012) for a description of how subjects make claims to state resources using different temporal frames.

42. For research on water infrastructures, see Bjorkman (2015), Ranganathan (2014), and von Schnitzler (2013). Hannah Appel (2012a, 2012b), Andrew Barry (2013), Leo Coleman (2014), and Timothy Mitchell (2011) have generated critical insights through their work on energy infrastructures. For housing, see Fennell (2015) and Schwenkel (2013). Penelope Harvey and Hannah Knox (2015) and Jeremy Campbell (2012) have researched roads in Latin America. Through her research on the Nile and his research on the Panama Canal, Jessica Barnes (2014) and Ashley Carse (2012) have demonstrated how infrastructures produce disconnections and rescale geographies.

43. As theorists have pointed out, infrastructures have been used as a heuristic device (by social scientists and politicians alike) to measure and map the progress and development of nations (see Graham 2010; Gupta 2015).

44. See Dossal (2010), Gandy (2002), and Hamlin (1998).

45. Based on fieldwork with apartheid infrastructures in Johannesburg, Antina von Schnitzler (2013) has demonstrated how infrastructures separate, differentiate, and preclude the formation of publics as much as they connect them (see also Harvey and Knox 2015).

46. See Dossal (1991), Gandy (2014), and Zérah (2008).

47. There is, however, some research into how water connections were extended into the working-class *chawls* in the early twentieth century (Chandavarkar 2007; Hazareesingh 2000).

48. In critiquing neoliberalism, scholars sometimes presume that the postcolonial state has a history of durable public services that is only now being undone.

49. There is now a well-established literature that examines the relation between documents and citizenship. See Cody (2009), V. Das (2011), Gupta (2012), Hull (2012), McKay (2012), and Tarlo (2001).

50. See V. Das (2011), Hull (2012), and Tarlo (2001) for critical scholarship that attends to the relation between documents and citizenship.

51. I use Barry's (2013) theorization of the political situation to draw attention to the ways that the political terrain is made through a negotiation of invisible and visible relations. Amita Baviskar and Nandini Sundar (2008) critique Chatterjee's assertion that the subjects of political society use moral claims, social connections, and cash to demand en-

titlements. Instead, they argue that members of powerful and more marginalized groups *alike* deploy these relations in everyday life.

52. Work that assumes the liberal subject sometimes assumes the normativity of nuclear households as a unit of governmental intervention. Nevertheless, "the household" and the community do not exist a priori but are constantly being made through hydraulic and other infrastructures.

53. In her work on the privately owned public toilets in the Ghanian city of Temba, Brenda Chalfin has demonstrated how infrastructures are productive of publics—here a "commonwealth of waste" (2014, 2016; see also Marres 2012). Reminding us that these publics are dynamic formations that are being un/made by infrastructures everywhere, Catherine Fennell's (2015) study of public housing in Chicago develops a materialist conception of sympathy to theorize how public infrastructures are brought into being.

54. Here I use Homi Bhabha's (2012) framing of the "not quite" to describe how infrastructures in the Global South are seen through a neocolonial gaze (in the North and South alike) as outcomes of processes of mimicry, a mimicry that attempts to overcome yet only reinscribes national difference between nations deemed to be developed and developing. The visibility of infrastructures in the South has been a commonplace way to distinguish them from those in the North, where scholars in S&TS have argued that infrastructures are visible until they break down (see Star 1999; Star and Ruhleder 1996). I question the neat association between functionality and visibility by drawing attention to contested infrastructural practices in Mumbai (see also Barnes 2014; Carse 2014). In so doing, I follow scholars of Mumbai's infrastructures who have questioned the normative expectations of infrastructural invisibility implicit in earlier accounts, pointing to the ways in which colonial histories and postcolonial politics make infrastructures a highly visible mediation of technology and politics (see Bjorkman 2015; Gandy 2014; McFarlane 2008). Yet this is not to say that the invisibility of infrastructures in the Global North be taken as given. Historians of technology, working primarily on infrastructures in Europe and the United States, have shown how the invisibility of working infrastructures is a precarious achievement that needs extraordinary work (see Barry 2013; Coutard 1999; Hughes 1983; Starosielski 2015). For more on the relation between visibility, power, and infrastructure, see also Appadurai (2015), Finkelstein (2015), Gupta (2015), and Larkin (2013).

55. American newspapers now regularly report infrastructure breakdowns. See Belson (2008), Davison (2011), McGeehan, Buettner, and Chen (2014), Murley (2011), and Schaper (2014).

56. For more on the NURM, see Banerjee-Guha (2009), S. Benjamin (2008), and Ranganathan, Kamath, and Baindur (2009).

57. See Bakker (2007, 2010) for a lucid account of why this staged contest of public versus private systems is also theoretically insufficient.

58. Just as infrastructure—transport, banking, currency—underpins commerce, James Scott argues, "infrapolitics provides much of the cultural and structural underpinning of more visible political actions" (1990, 184; see also Hansen and Verkaaik 2009). While Scott foregrounds the social relations of infrapolitics, in this book I extend his formulation to also consider the politics of the hidden, underground materials of the city's water infrastructure. These connections are not only differentially visible and political, acted

upon by human agents. The city's water infrastructure is also a vital participant in its political life, often acting in ways outside or beyond those desired by its government.

59. See Elyachar (2010) for a similar account of how residents in Cairo seek to fix their water connections through such "phatic labor" (see also Simone 2006).

60. There is by now sufficient research documenting these important shifts in Indian cities. For more recent accounts, see Bjorkman (2015), Doshi (2012), Ghertner (2015), Goldman (2011), Harris (2013), and Ranganathan (2014).

61. I have focused on these processes elsewhere (see Anand 2006; Anand and Rademacher 2011).

62. Here, the works of Jonathan Shapiro Anjaria (2016), Solomon Benjamin (2008), and Liza Weinstein (2014) have been notable exceptions.

63. Tess Lea (2015) has cautioned against the coherent narratives of much ethnography when she warns that these deny the fragmented, multiple, and partial realities in which we live.

CHAPTER 1. Scare Cities

1. For an excellent political ethnography on the Shiv Sena, see Hansen (2001). See also Katzenstein, Mehta, and Thakkar (1997) for an account of the institutional histories that accounted for its rise in Mumbai.

2. While conducting fieldwork, I found engineers and politicians often making the city's problems visible through mystifying numbers (Prakash 2010) and ritual incantations bemoaning the absence of suitable, sufficient infrastructure (Appel 2012b).

3. Of course, this is not what the Shiv Sena is only known for in the city. It has one of the most organized women's wings that regularly sponsors welfare and social service events in the city, including programs to donate school uniforms, clothes, and so on (Bedi 2007, 2016; Roy 2009). It also sponsors a number of livelihood generation projects in the city (Solomon 2015).

4. Urban research based in cities of the Global South proliferated in the early 2000s. Much of this scholarship explored the makings of citizenship by attending to questions of land and housing (see Appadurai 2002; S. Benjamin 2008; Doshi 2012; Ghertner 2016, Holston 2008; Hull 2012; Meehan 2014; Tarlo 2000; Weinstein 2014; Zeiderman 2016). More recently, scholars began to explore questions of urban membership and citizenship through studies of water in the postcolonial city (see Bjorkman 2015; Coelho 2006; Kooy and Bakker 2008; Meehan 2014; Ranganathan 2014; von Schnitzler 2013).

5. For more on the productive life of scarcity, see also Alatout (2008), Bakker (2000), Birkenholtz (2009), Giglioli and Swyngedouw (2008), L. Mehta (2005), and United Nations Development Programme (2006).

6. Accordingly, Linton and Budds (2014) have urged us to see the water cycle as a "hydrosocial cycle."

7. I use the term *technopolitics* following Larkin (2013) and Mitchell (2002) to signal ways in which political relations are formed and reproduced through technological assemblages.

8. While historians have largely focused on colonial and postcolonial South Asia beyond its cities, careful accountings of Mumbai through the nineteenth and twentieth