

# A Master Balancing Act

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PIPE POLITICS, CONTESTED WATERS: EMBEDDED INFRASTRUCTURES OF MILLENNIAL MUMBAI

By Lisa Björkman

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A multiplicity of sources—whether it be lived experience, popular discourse or scholarly work—seem to suggest a rather dim view about the state of urban planning in India's burgeoning cities. Lisa Björkman's book is a thoroughly researched and carefully crafted work that provides further evidence and perspective on this sorry state of affairs. The innovation of the book is the smart way through which it sets up and pursues the subject. Rather than provide an overall commentary on the state of urban planning and infrastructure, Björkman approaches the topic by focusing on just one aspect of the urban civic infrastructure—the complex infrastructural and informational network required to provide daily water to residents of a large and expanding city.

The city in question is Mumbai, where Björkman manages to combine detailed ethnographic work with a historical perspectives of the city's development planning to provide us with a fascinating account of the everyday struggles to provide water to the millions of taps in the city.<sup>1</sup> As she eloquently puts it in the Introduction:

In contemporary Mumbai water is made to flow by means of intimate forms of knowledge and ongoing interventions in the city's complex and dynamic social, political and hydraulic landscape. ... Mumbai's illegible and volatile hydrologies are lending infrastructures increasing political salience just as actual control over pipes and flows becomes contingent upon dispersed and intimate assemblages of knowledge, power, and material authority. 'Pipe politics' refers to the new arenas of contestation that Mumbai's water infrastructure animate. ... (p. 3)

At one level, the success of the book can be viewed in terms of its ability to make intelligible the above claim that, at first glance, might appear to be rather elaborate in its articulation of the complexities surrounding the daily water distribution network in Mumbai.

What is it that makes the exercise of supplying water to the city so challenging? The first and perhaps obvious guess would be to suggest a supply side story—there just isn't enough water available to meet the vast demands of the ever growing city. As it turns out, the obvious explanation in this case is not the correct one. Björkman suggests right at the beginning that the total amount of water available is by and large adequate to meet the city's needs. The challenge rather lies in the complex distributional network and it is this that over time has become unwieldy, complex and unpredictable.

The source of water supply for Mumbai is a master balancing reservoir north of the northern suburbs of the city. Over the years, the available water in this reservoir has been augmented by several timely projects—the Upper Vaitarna Project (1972), the Bhatsa I (1981), Bhatsa II (1989) and Bhatsa III (1996) projects. The distribution of this water to the city has two components. First, there is a secondary transmission system comprising a network of mains and inlets carrying water from the master balancing reservoir to a network of service reservoirs. These service reservoirs are located at higher-

<sup>1</sup>Most of her ethnographic work was conducted in 2009-10 in Mumbai's M-East Ward, a geographically contiguous, administrative, electoral and hydraulic unit.

elevation points across the city and the suburbs. Second, there is a tertiary network that supplies water from the service reservoirs to the city's end users. The responsibility of distributing the water to users, therefore, primarily falls upon the various service reservoirs with water dispensed by gravity to various parts of the city which is divided into 110 water supply zones. So, in terms of the problem of water supply, the challenge as Björkman clarifies, is not one of limited water resources. Rather, it is a 'hydrological and technological problem of how to maintain water pressure during times of the day when so many taps were open at the same time.' The desired strategy of the Hydraulic Engineering Department (the water department) of the Mumbai Municipal Corporation (MMC) to address the problem, at least on paper, is to stock up the service reservoirs during off-peak hours and then to carefully coordinate the distribution of water from the various service reservoirs to the different parts of the cities.

To me, the most fascinating part of the book, indeed its high point, is the detailed ethnographic work that Björkman puts in to bring to light the full scope of this careful and complex coordination exercise. She approaches multiple sources to stitch together her story—engineers at all levels of the MMC, staff and workers of the water department, including the *charivallas* or key men responsible for the opening and closing of the valves through which the actual coordination in the water distribution system takes place, plumbers, and, of course, end users. She ties the different narratives in elegant and lucid prose and succeeds in drawing in the reader to the magnitude of the complex coordination exercise. So, by the time we reach page 69, the reader is completely keyed in on the problem at hand:

Designing and operating the new distribution system thus required trial-and-error mathematical modeling of the networks governed by each of the service reservoirs in order to simulate the demands made on the system during peak hours. The simulations require inputs of data on each and every component of the distribution system: pipe diameters, distances, friction coefficients, flow estimates in each section of the system, details of each pipe junction (or 'node'), and estimated daily and peak demands for each node in each water supply zone. This analysis of pressures, timings and flows must be reworked every time a water main is enlarged or introduced into the system in order to ensure adequate supply across each zone.

Several implications follow from Björkman's careful analysis. An intricate network of information is required to operate the system. Simple theoretical simulations are not adequate to effectively operate it. Continuous improvisation and experimentation on a trial-and-error basis is required to augment information about the distribution system. Given the intricacies of the informational network, there is a need on the part of the water department to carefully document what is known. All of this constitute extremely labour intensive processes. Finally, much about the system is fundamentally unknown. So, caution needs to be exercised when changing the status quo. The last point speaks to the constant need to improvise on theoretical plans as new circumstances emerge. This has much to do with the pace at which the city has grown. Very often the actual growth of the city has been at odds with the anticipated or planned growth. This has meant that the water department has been forced

to supply water to several locations directly from the secondary system rather than via the tertiary one. Further, the changing shifts in demand patterns forces the department to experiment more and more with the intermittent supply timings.

So, how has urban planning kept up with these growing challenges? In another incisive part of the book, Björkman launches a systematic critique of urban planning in the city, characterizing its operation as one with a clear lack of vision, involving actions that were antithetical to the informational complexities of the distribution system and marked by a total policy paralysis. Her major point of contention is the policy debate surrounding the desirability of private sector participation and investment in the water distribution network. Now, whereas some private sector participation and investment in the distributional network need not necessarily be undesirable,

what happened in Mumbai is that this debate meandered on for way too long, from the 1980s to the 2000s. As a consequence, the water department was left in a total limbo and uncertainty regarding its role in the future scheme of things. This had several serious consequences. In this period of policy uncertainty, the department began to cut down significantly on hiring. One of the casualties from this was the complete breakdown of the survey and documentation procedures of the complex information system on which the water distribution network is built. As a result, as time progressed, Mumbai had a water department, which at an institutional level, knew less and less about its water networks. The regular auditing of the city's 110 water supply zones using labour intensive pito-gauging system was also given up. As such, the department became more and more disconnected from locality level knowledge about pressures, timings and flows. What made matters worse over time was that heavy levels of private construction and real estate development followed patterns that were not in line with the careful blueprints that had been envisaged going back to the 1960s and 70s.

Further, the fact that there was no proper documentation of the underground water distribution network meant that, for most parts, the water department had very little documented information about the new water infrastructure set up in the city to keep up with this real estate development.

Another naïve assumption surrounding the privatization debate that Björkman points out is the belief that advanced, high-tech, labour-saving technologies and tools could be introduced that would make the working of the water distribution network completely knowable. But as she notes, this knowledge-production project was fundamentally incoherent and incommensurable with the material infrastructure of Mumbai's existing water network. As a result, this exercise produced a series of discordant data that was totally at odds with what was known at the local level within the water department. Björkman also highlights the role of the World Bank in the many misadventures surrounding these new policy initiatives. She makes a compelling case as to why Mumbai's hydraulic chaos must be considered as yet another site in the Bank's long list of failures, specifically when it comes to importing knowledge from outside with no regard for local specificities. Eventually privatization of Mumbai's water distribution was a non-starter because of the lack of reliable data, which, as Björkman points out, was itself, in part, a result of



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the ways in which this two-decade long privatization debate had totally destroyed the water department’s knowledge base of the distribution networks. It is worth pointing out that what makes Björkman’s analysis of this policy impasse particularly compelling is her ability to tease out these findings from detailed interviews with several veteran engineers and technocrats in the water department.

The other set of fascinating accounts that Björkman provides is regarding the ways in which the different affected parties have dealt with the breakdown of the water department’s institutional knowledge base of the water distribution network and its consequences. Through detailed ethnographic work, she shows how this institutional structure has been replaced by local, decentralized arrangements, all geared to the elusive project of making sense of the city’s unpredictable water flows. She carefully details how knowledge about the water infrastructure has got more and more fragmented over time, both within the water department and outside. For instance, consider the operation of the tertiary network. On paper, the implementation of the supply plan under it is the responsibility of the city’s three assistant engineers (Control) who sit in different regional offices. It is their responsibility to calculate and implement the precise operation of the opening and closing of the city’s more than 800 valves as well as determine their timings. However, as pointed out above, the water department’s institutional knowledge base on these valves’ precise location and exact procedure to open them is almost nonexistent. As a result, this responsibility in actuality gets devolved to ward-level offices, where this exercise is conducted by the ward’s three to four *chavivallas*. What’s more, this fragmentation of knowledge is not confined to different levels of the water department. For instance, in many places, local plumbers who do not officially belong to the department have better information about the location of pipes and the operation of water pressures and flows in the region than the engineers of the department.

What emerges forcefully in the analysis is the power of knowledge networks surrounding water. Such knowledge in today’s everyday Mumbai is an incredibly crucial and elusive resource. Those who are perceived to control it and in the know wield considerable social influence. But, given the sheer unpredictability and volatility of the water network, it becomes impossible to distinguish knowledge from hearsay. As such, the water network becomes the source of intense rumour and speculation. For the everyday citizens of the city, the name of the game, then, is to forge and maintain elaborate knowledge-exchange networks. Taking the right decisions in this regard is the only way to mitigate the hydraulic risk that everyday living entails. By interrogating multiple locations, Björkman is able to paint a telling picture of these risks and strategies to mitigate it.

Not surprisingly, such uncertainties surrounding the availability of water and the need to forge effective networks of knowledge and influence to hedge against its volatility, animate the electoral process. Those seeking political office have to engage in the inevitable performative of demonstrating their hydraulic influence—that they have a way of controlling and influencing the process by which

water appears in the taps. But, given that no one quite understands how water flows, electoral competition becomes the terrain of contesting hydraulic performatives. Those who can prevail in these contestations become politically powerful players in the city, either as elected officials or critical power brokers. Once again, Björkman’s ethnographic work in making this case is first rate.

However, one aspect of the book that I found limiting was the author’s inability to step out of her ideological moorings. This prevents her from pursuing more effectively her ethnographic findings and letting it lead her to analytically deeper terrain. As impressive as the list of places that she goes to in pursuit of her rich ethnographic material is, it is her inability to even take small steps into places outside her ideological belief system that is slightly disappointing. For instance, she steadfastly holds on to the ideological position that all market based interventions and reasoning is flawed. This prevents her from even considering the possibility that not all market based interventions may be in the service of some grand neoliberal agenda.

Take the slum redevelopment scheme that has been in place in Mumbai since the 1990s. The scheme encourages private sector participants to enter into negotiations with slum dwellers to construct new, on-site apartment buildings for these dwellers. To incentivize such private sector participation, the private partner receives development rights for either a part of the property or in an alternative location. Is the scheme perfect? Of course it is not. Given the well documented nexus between politicians and builders in the city, it will be naïve to think that it won’t, in part, be exploited in perverse ways by builders. At the same time though, given that this nexus is so well entrenched, it will be equally naïve to think that state run programmes have not (or will not) be similarly exploited. The fact remains that the public policy challenge of providing housing to Mumbai’s slum dwellers is a gargantuan one. The population of the Mumbai metropolitan area is about 20 million. Of this, more than half live in slums. So, if we take the average family size to be about 5 people, then about 2 million housing units are needed to provide housing to slum dwellers. It is impossible for any government to make that kind of a public investment in housing. So, if the private sector can be recruited to solve at least part of the problem, then it is not a heretical proposition. However, Björkman does not see it that way and thinks of this scheme as part of the problem. It does not appear that she is willing to consider an alternative viewpoint in this regard. For instance, given her thorough ethnographic investigations, it is surprising that she did not think it worthwhile to speak to civil society organizations and NGOs like The Society for the Promotion of Area Resource Centres, The National Slum Dwellers Federation or the Mahila Milan who have actively engaged with this scheme as a way of figuring out a solution to the housing problem for slum dwellers. By engaging with such market based solutions, have such organizations become ideologically impure and unworthy of a conversation for Björkman? In my reading, ultimately, it is this ideological intransigence that prevents this work from reaching its true potential.

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*Water: Growing Understanding, Emerging Perspectives* edited by Mihir Shah and P.S. Vijaysankar, part of the series titled Readings on the Economy, Polity and Society, is a collection from the *Economic and Political Weekly* (1990 to 2014) and, reflects the multidimensional, multidisciplinary character of management of water.

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