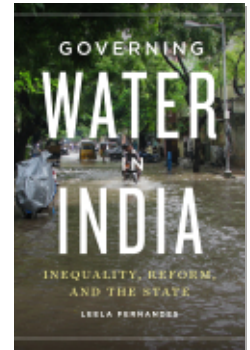




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4. Regulatory Extraction, Inequality, and the Water Bureaucracy in Chennai



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Regulatory Extraction, Inequality, and the Water Bureaucracy in Chennai

CITIES IN INDIA REPRESENT CRITICAL SITES FOR AN UNDERSTANDING of how institutional reforms have shaped the governance of water in the post-liberalization period. Policies of economic reform have intensified the political and economic power of metropolitan urban centers. Reforms of the governance of water produce a redistribution of state power that is shaped by this ascendancy of a city-based model of development. On the one hand, reforms expand the centralized authority of some city-oriented agencies of the water bureaucracy. On the other hand, policies of decentralization target small towns and rural areas in ways that both reflect the political and economic weaknesses of these localities and intensify the control of local state governmental authorities over these areas. The realm of urban governance thus tells us a story about the postliberalization state—one that speaks to a broader set of changes in the underlying relationship between the city, small towns, and rural areas.

While urbanization has been accelerating and small towns in India have been growing in both number and economic importance, the major metropolitan cities and their environs—Mumbai, Delhi, Bengaluru, Kolkata, Chennai, Hyderabad, and Ahmedabad—remain the central sites for the implementation of economic policies of liberalization, the concentration of wealth and investment, the centers for population growth, and the locus of political power. In

this context, metropolitan cities do not represent bounded urban sites that are limited to the territorialized administrative boundaries of metropolitan cities. Cities are microcosms of global-national patterns of reform and are spatial sites that are deeply imbricated in interconnected social and economic relationships with both the urbanizing communities that populate their immediate peripheries and distant rural localities that appear far from their borders. These shifts take place in a context where increasing demands on often scarce water resources for drinking water, agricultural, and industrial needs in the postliberalization period are deepening the pressures on water bureaucracies. Urbanization has been producing new strains on scarce water resources and water-related infrastructure.

Consider the following example of some of the challenges that Chennai has faced in the context of oscillating pressures of floods and droughts. Chembarambakkam Reservoir is one of the three major reservoirs that supply water to the city of Chennai. In December 2015, delays in opening the sluice gates of the reservoir were widely reported to have been a key factor in producing historic flooding in Chennai during a four-day period of unprecedented heavy rainfall.¹ Two years later, in a period of unprecedented drought, the assistant engineer who was responsible for managing the gates pointed to the depleted reservoir and reflected on the stress and anxiety he had experienced during the flood. He had spent ten days monitoring the water levels on his own while facing the grave possibility that a breach in the reservoir would cause a catastrophic flood. He recounted the consistent phone calls from governmental officials and the fear he felt that he would be blamed if the reservoir were breached (interview and field visit, January 19, 2017). The reservoir lies at the edge of Chennai and is surrounded by numerous small towns and urbanizing localities that are classified as the “peri-urban” areas that often appear as the unplanned outgrowths of metropolitan cities in India. Had the reservoir collapsed, the flooding would have been catastrophic for these localities. In the context of the dwindling water supplies of the drought-affected reservoir that we were looking at, the engineer’s memory of the flood was laced with irony.

This anecdote encapsulates the entangled story of state practices and the patterns and contradictions that shape and constrain governance over water and water infrastructure. The misjudgment of local state officials on the opening of the sluice gates that exacerbated the flooding in Chennai points to the serious implications of bureaucratic action—and inaction. The dwindling

levels of water in the reservoir, two years later, point to the strains on the state during periods of water scarcity, as it must manage the growing demands for water from a heavily urbanized city whose boundaries have been steadily expanding. Underlying this account of the pressures during times of what appear to be “natural” calamities of flooding and drought are deeper structural pressures that various models of urban development have placed on the city. Expanding development on wetlands has increased the severity of the floods, as there are no natural drainage areas to catch the water. These processes of urban development have in turn increased demands for water for drinking supplies and agricultural needs, as well as for industries, as private investment has expanded in Tamil Nadu over past decades. Meanwhile, broader human developmental activities that may be shifting weather patterns and producing natural phenomena such as failed monsoons create unpredictable strains on the state and on its ability to manage competing demands in times of water scarcity.

As I stood with a group of engineers from the Public Works Department listening to them discuss the weight of these strains, another assistant engineer commented on how much the surrounding areas had changed over the past two decades. Pointing to these areas, the engineer commented, “This was all agricultural before. In the 1990s, the government said, ‘Let it become urbanized’” (interview and field visit, January 19, 2017). The assistant engineer was suggesting that the government began tacitly withdrawing support for the surrounding agricultural communities and in effect allowed the urbanization to occur. What appears as a disorganized urban outgrowth of the city of Chennai was in fact shaped by state decisions on the allocation and withdrawal of resources. The offhand comment, “The government said, ‘Let it become urbanized,’” provides a microinstance of the centralized authority of state governments over the reallocation of water resources. We see here the often hidden intentionality of the withdrawal of the state—in this case through stopping the procurement of agricultural products that often sustains agricultural communities.

In this example, the removal of state support did not embody a transition from the centralized state support of the developmental state to the kind of decentralized model of governance that is conventionally associated with reforms. Rather, the withdrawal of support reflected a reorientation of centralized state authority and a shift of the state’s resources away from the agricultural communities. The state does not abandon but restructures its

welfarist framework—it produces a redistributive shift that reallocates water resources to privileged groups within wealthier urban centers. This accentuates long-standing socioeconomic inequalities within urban centers while deepening new divides between larger urban areas and smaller rural and urban towns. Institutional reforms in the process produce or intensify inequalities, such as those of class, locality, caste, and gender.

Institutional reforms provide the mechanisms of regulatory extraction that produce differential access to water resources and intensify these relationships of power both within and between urban and rural communities. Institutions are the heart of governance, and they have the capacity to ameliorate, reproduce, or intensify inequalities. In the postliberalization era, patterns of inequality are produced and intensified by institutional reforms that give some city-oriented state agencies new forms of authority while weakening other bureaucratic agencies. Policies of reform in this context produce an institutional redistribution of authority rather than a framework of decentralized or participatory governance. Meanwhile, policies of decentralization tend to target small towns and rural areas that are politically and economically weaker than metropolitan cities. Reforms in effect produce a form of differential decentralization that embodies these underlying relationships of power. In this process, regulatory reform is transformed into a process of regulatory extraction that encodes relationships of power both within and between urban and rural communities.

Reforming Chennai's Water Bureaucracy

Chennai's water bureaucracy has experienced significant shifts in its institutional landscape in the postindependence period. The state government embarked on a significant program of reform, the Tamil Nadu Water Resources Consolidation Project, through a \$282.9 million loan funded by the World Bank from 1995 to 2004 (WB 1995b; the total project cost was \$491 million). The project was one of only three set up in states that sought to implement the Bank's new integrated water resources management approach in the early stages of liberalization in India (WB 1995b; the other states were Odisha and Haryana). The project engaged in a comprehensive reorganization of the management of Tamil Nadu's water resources along the lines of conventional dominant global models that have emphasized the modernization of irrigation systems, technocratic improvements in the management

of water resources, and the creation of participatory frameworks through Water Users' Associations. A key dimension of the reorganization was a shift to water planning based on river basins that would cut across various water users. Indeed, as we will see, the project has reshaped institutions as well as created new organizations and state practices at both the state and local community level. More significantly, such shifts toward new regulatory mechanisms have in turn produced new forms of centralization that complicate the policies and rhetoric of decentralization. First, reforms have mirrored broader patterns that have characterized this kind of institutional regulatory transplant. These new regulatory practices have simply been molded onto existing institutional relationships and practices through a form of regulatory "shell" that is often the reality of global institutional transfers (Dubash and Morgan 2013). In this context, new regulatory practices have been shaped by the relationships of power between the various institutions that make up the water bureaucracy and by the underlying political-economic structures of development. These are the key dynamics of reform rather than the idealized global norms of accountability and technocratic and participatory efficiency of global institutions such as the World Bank. Second, and more significantly, policies of institutional reform have provided the means for new forms of centralization. The Bank's turn toward an emphasis on state accountability and ownership of reforms has produced the institutional scaffolding—through policy, legislative, and organizational changes—that has consolidated modes of centralized state authority over water.

Within Tamil Nadu's institutional landscape, the Public Works Department has retained control over irrigation as well as over the regulation and storage of water. Tamil Nadu's Public Works Department, in keeping with the historical weight of its institutional authority, is the only such department in the country with control over irrigation. This preservation of authority has meant that the PWD has remained a leading institutional actor within the water bureaucracy. However, the PWD's institutional monopoly has also been weakened by various phases of institutional reform. The first phase of institutional restructuring that significantly shaped Tamil Nadu's water bureaucracy took place in the 1970s. A major set of institutional changes in the 1970s restructured the Public Works Department (PWD) through the splitting off of drinking water supply needs for both rural and urban areas. Chennai's water supply and sewerage needs were placed under the newly formed Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB,

more commonly known as Metrowater) in 1978, and the state's water supply was placed under the purview of the Tamil Nadu Water Supply and Drainage Board (TWAD) in 1970. Meanwhile, the Chennai Municipal Council has also remained an important actor in this field, as it has maintained control over storm drainage management as well as the management of urban development, which has a direct impact on water management. Water management in the state, once under the sole purview of the historical, imperious institution the Public Works Department, is now shaped by a mosaic of institutions with distinctive yet interconnected and overlapping functions (see figure 4.1).

Institutional reforms that have taken place since the 1990s have continued their focus on regulatory reform. The emphasis on institutional restructuring has in large part stemmed from the fact that water resources have long been overutilized in the state. Consider, for instance, the assessment of the external consultancy firm that was hired for Tamil Nadu's Water Resources Consolidation Project. The firm recommended that the project focus on "upgrading technical and management skills" since "Tamil Nadu has developed its surface and groundwater resources almost to physical limits" (WRO 1996). The PWD was consequently reorganized, and the Buildings and Water Resources wings of the department were split into separate organizations. Given that water resources in the state were already overexploited, World Bank-sponsored reforms focused on institutional reorganization that could enhance the management of water resources. As the stated objectives of the Water Resources Consolidation Project noted, "Under the project, a formerly construction oriented Public Works Department (PWD) would be refocused and strengthened as a state water agency responsible for multi-use water planning and for providing irrigation, drainage, flood control and bulk water supply services. Expenditures would be refocused to emphasize maintenance and modernization of existing facilities, and beneficiary participation linked with cost recovery would be integral to the service improvements" (WB 1995a, 1). To that end, the project successfully led to the establishment of a new regulatory organization within the PWD, the Water Resources Organisation. The reorganization along four regions in the state (Chennai, Madurai, Trichi, and Coimbatore), each with its own chief engineer, was specifically aimed at deepening the decentralization of water governance.² The focus of the Water Resources Organisation was specifically geared toward what the government would term "the effective management

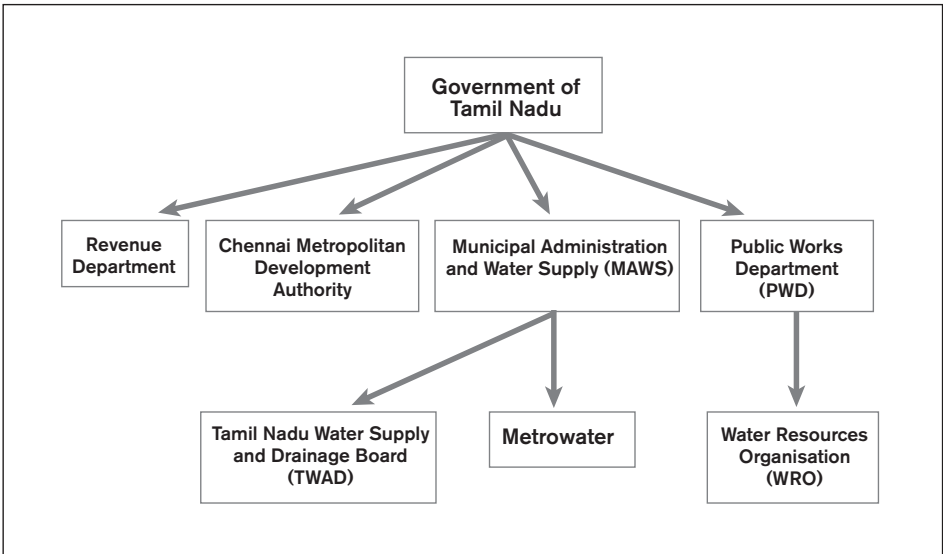


FIGURE 4.1. Chennai's Water Bureaucracy, identifying the major bureaucratic organizations and their administrative reporting lines in Chennai's water bureaucracy

and distribution of Surface and Ground Water for its optimum utilization in a rational and scientific manner by all water using sectors.”³

Despite these endeavors aimed at improving and rationalizing institutional practices through regulatory reform, water governance has been shaped by the historical legacies of bureaucratic organizations as well as the domestic political and economic priorities of Chennai's regime of governance. Consider, for instance, the ways in which periodic flooding in Chennai has been affected by relationships between key bureaucratic organizations. The rapid pace of urbanization in Chennai began in the 1970s (see table 4.1).⁴ In a precursor to the historic 2015 floods, Chennai experienced extreme flooding in 1976 in large part due to drainage problems as a result of urbanization (MMDA 1993, 2–3). Chennai's stormwater drainage system is laid alongside the edge of roads rather than underground, and there are “numerous cross-connections between the foul and stormwater systems” (6–2). While the newly formed Metrowater was given authority over Chennai's sewer system, stormwater drains remained within the purview of the Madras Metropolitan Corporation. As a Madras Metropolitan Development Authority

TABLE 4.1. Urbanization in Tamil Nadu

Year	Urban		Decadal urban growth rates	Rural	Urban population added during the decade (%)	# of urban towns
	population (millions)	Share of urban population (%)		population added during the decade		
1901	2.72	14.15	—	—	—	133
1911	3.15	15.07	15.51	—	—	162
1921	3.25	15.02	8.86	61.57	13.63	189
1931	4.23	18.02	23.40	56.48	53.28	222
1941	5.17	19.7	22.30	66.26	33.74	257
1951	7.33	24.35	8.39	43.92	56.08	297
1961	8.99	26.69	22.59	53.56	46.44	339
1971	12.46	30.26	38.64	53.75	46.25	439
1981	15.95	32.95	27.98	51.63	48.37	434
1991	19.07	34.65	19.59	58.05	41.95	469
2001	27.48	44.04	44.06	-28.41	128.41	832
2011	34.95	48.45	27.16	23.29	76.80	1097

SOURCE: Government of Tamil Nadu, "Urban Scenario in Tamil Nadu Census of India," www.tn.gov.in/cma/Urban-Report.pdf and Census of India 2011 (Chennai 2021 population was estimated at 8.65 million).

report on stormwater drainage noted, a proposal to transfer the management of stormwater drainage to Metrowater was opposed by the Madras Metropolitan Corporation (MMC) because the MMC was in charge of road infrastructure, which was in turn dependent on the functioning of the roadside drainage system, given that the system is laid along the edge of the roads rather than underground (6-2). As the report went on to note, stormwater drainage was underfunded and was the lowest priority for the MMC (6-3). The report notes similar smaller institutional fractures in the management of water-related matters between the MMC, Metrowater, and the PWD. For instance, all three entities were embroiled in small-scale disputes over the control and management of arterial drains. While arterial drains that would flow into rivers were the responsibility of the PWD, the MMC and the PWD were competing for authority over the management of drains that were receiving outfall from stormwater drains. Meanwhile, according to the report, foul sewage, which was under the purview of Metrowater, was at times "discharged illegally by users to arterial drains and to channels maintained by

PWD” (6-3). Such forms of competitiveness and the impetus that bureaucratic organizations feel to protect their spheres of authority are, of course, an intrinsic element of all institutional landscapes. However, they also shed light on the ways in which the historically contingent material nature of infrastructure can both deepen and be shaped by such institutional cleavages. In this instance, the specific kinds of connections between the stormwater drainage system, the sewer system, and roadways deepened the obstacles to reorganizing the management of the stormwater drainage system in ways that could provide more effective flood control.

Meanwhile, the deeper underlying institutional division that is noted in the government report has to do with the primary cause of heightened problems with the stormwater drainage system, which it identifies as the “rapid pace of urbanization” (MMDA 1993, 2-3). While the report reproduces a familiar state discourse on the problem of “encroachments” on rivers that affect flood drainage, it also points to problems with the construction of the Mass Rapid Transit system, which had just begun in the early 1990s, as well as the spread of “impermeable surfaces,” such as buildings, roads, and pavements, which were intensifying the threat of flooding and which, over two decades later, would lead to the historic 2015 flood that brought the entire city to a standstill.⁵

What is of critical significance in this story of institutional cleavages over infrastructure management is the ways in which the emphasis on decentralization in effect provides both the institutional and political space for the policies of urban development that strain the city’s water resources and infrastructure. While decentralization in this case was targeted at the water-related entities of the PWD, this process was accompanied by a centralization of power within other components of the state government, whose developmental agendas were being shaped by policies related to liberalization. The fraught institutional cleavage in this instance lies with the separation between urban developmental decisions and activities placed under one of the major governmental bodies in the city, the Chennai Metropolitan Development Authority (CMDA) on the one hand and the various organizations that make up the water bureaucracy on the other. Institutional reforms, such as the Water Resources Consolidation Project, that have been supported by global models of water management have treated the water bureaucracy as a closed system that can be isolated from state structures and policies that regulate land and development in the city.

Consider, for instance, the internal policy and strategy discussions of the Water Resources Organisation that were instituted through the Water Resources Consolidation Project reforms. The department's evaluation of its policies and strategies focused on a broad and nuanced understanding of the structural problems posed by urban developmental practices. The most significant concerns of the WRO's report were focused on the pressures of urbanization being produced by business interests in the real estate market. As the report noted, the encroachment of water bodies around the city, which were intensifying the strain on the city's management of water resources, were being affected by fact that "the lucrative prices offered by the real estate businessman for the urban lands lure the agricultural land holders to sell their agricultural lands for housing purposes" (PWD 1994, 172). While the Tamil Nadu government had instituted laws to regulate the conversion of agricultural land to residential housing, the report noted that "in spite of these steps taken by the Government, the conversion of wetlands goes on in view of the high prices offered for the land" (173).⁶ The division in institutional interests between the planning authorities of the government and the water bureaucracy are well illustrated in this acute assessment of the transformation of the real estate market that was taking root as India began liberalizing its economy. Chennai's IT corridor, for instance, was built across wetlands, while expanding residential developments have substantially encroached on floodplains in the metropolitan area. This process has continued to expand as urbanization has extended beyond the borders of the city. As one news report noted, "Planning permissions inside the Chennai Metropolitan Area (CMA) are based on whether the builder gets 'No Objection' certificates from Metrowater, electricity boards, traffic and fire services. However, a promoter building a 27-storeyed complex beyond Uthandi, outside CMA limits, will approach the directorate of town and country planning and local authorities who don't thoroughly scrutinise the applications, says the official."⁷ Indeed, in 2021, Tamil Nadu is now one of the most urbanized states in the country, with 48.4 percent of the population living in urban areas.⁸

The WRO's report further assesses the strains that unplanned urbanization have placed on the city's water sources and supply in light of the reform policies that have actively encouraged state governments to attract and compete for investment. Growing industrial investment in the city began to intensify stresses on the city's water supply, particularly with competing demands from industrial and residential consumers. In response, the Water Resources

Organisation recommended both prioritizing drinking water over industrial needs and creating new regulations on the establishment of new industries based on their water consumption needs that would “permit only industry that doesn’t require large quantity of water” (PWD 1994, 163).

This synopsis of WRO policy evaluations and recommendations reveals a more heterogeneous bureaucratic field than do conventional unitary portrayals of India’s bureaucracy either as essentially corrupt and in need of reform or replacement by private sector management or as a simple bureaucratic arm of private sector interests. The WRO, in this context, was attempting to execute its regulatory function. However, such regulatory attempts were foreclosed by the state government’s centralized push for investment in accordance with the broader global-national norms of liberalization.

Such processes point to the deeper internal structural contradictions of the global norms of economic and institutional reforms that are transplanted to contexts in non-Western countries. In this case, for instance, the Water Resources Organisation’s recommendations reflect a bureaucratic organization that is working effectively and that is trying to manage the strains of developmental demands on scarce water resources. The WRO, in effect, is attempting here to perform its regulatory functions. However, the central obstacles to the organization’s effective institutional practice in this case lie not in any intrinsic bureaucratic dysfunction within the organization but in more powerful sections of the state bureaucracy that are pushing forward with urban developmental practices that have become highly lucrative in the postliberalization period.

Consider another example of the internal contradictions within state bureaucracies. In response to the effects of rapid urbanization on water bodies, the Government of Tamil Nadu passed an order to regulate and restrict the conversion of agricultural land to housing sites (PWD 1994, 172; the law was passed in 1991). However, as the PWD’s Water Resources Organisation would note in an internal report, while planning authorities needed prior agreement from the Agricultural department for such construction and were specifically meant to avoid building on wetlands, “In spite of these steps taken by the Government, the conversion of wetlands goes on in the view of the high prices offered for the land” (173). Equally significant was the fact that the order specifically exempted the construction of government buildings from this regulatory process (IWS 1994). The result has been that a number of “encroachments” on water bodies in and around the cities have been due

to the construction of government buildings that cannot be removed (interview with director, Centre for Water Resources, Anna University, January 11, 2017). The water bureaucracy is placed in an institutional environment in which they have little control over the macroeconomic and developmental decisions that have been systematically straining the water supply of the city. There is a fracturing of the regulatory state that produces this structural contradiction. State water resource management organizations are tasked with regulating the city's water supply in a broader regulatory regime that does not enforce formal regulations of land use and urban development. A recognition of these contradictions is markedly absent from global and national policies and discourses of bureaucratic reforms that have been a central part of liberalization in India.

In practice, this has meant that the bureaucratic organizations concerned with flooding have targeted encroachments by groups that are socioeconomically marginalized and politically less powerful than state governmental organizations invested with power over land and development. Anthropologists Karen Coelho and N. Raman (2013), for instance, have argued that the government's water body restoration projects in the city have focused on the eviction of poorer, vulnerable communities through slum clearance activities while continuing with accelerated large-scale developmental activities, which are the primary cause of environmental degradation in the city. They note that the Tank Encroachment Act (2007) "ignored or reversed long-established policies guiding slum clearance in the state of Tamil Nadu and vested unprecedented powers in the Public Works Department (PWD) and the District Collector's Office to effect evictions, entirely bypassing the Slum Clearance Board. The thrust to revive storage capacity in water bodies received powerful political backing by the state's ministers, legislators, and members of parliament in the late 2000s" (2013, 151). In this context, the PWD has acted as an enforcement arm for the state's developmental agendas in ways that have transformed metropolitan city environmental agendas into the kind of class-based endeavor that has been framed through the exclusion of socioeconomically subordinate groups across the country (Fernandes 2004). Aspects of internal departmental strategies for the management of water resources do also tangentially echo class-based concerns surrounding the impact of the "encroachments" of the urban poor with particular concerns about "slum dwellers and the floating population from the other parts of the state, polluting the environment" (PWD 1994, 77). What are in fact

marginal references in the internal planning discussions of the WRO nevertheless are transformed into the politically viable default target of the state. It is here that we see how the distribution of institutional power matters. State administration structures governing land and development outweigh the regulatory potential of the water bureaucracy.

The examples of the divergence between the reforms aimed at decentralization in the water bureaucracy and the intensification of state governmental authority through formal and extralegal modes of urban development are not isolated instances. Nor are they simply evidence of the corrosion of governance by domestic politics. Rather, they are symptoms of processes of reform that consolidate state authority through the growing political and economic power of metropolitan cities. This centralization of power through the space of the city is an inherent part of the twin processes of economic reform and institutional decentralization; the regulatory state is transformed into a mechanism of regulatory extraction that is encoded in processes of institutional and economic reform.

Inequality, Regulatory Extraction, and the Redistribution of Bureaucratic Authority

“There is no PPP [public-private partnership] model here. We don’t want private financing. Water is a public good” (interview, August 17, 2016). This emphatic assertion by a senior engineer at Metrowater represents a sharp deviation from dominant understandings of the impact of reforms on the water sector. Debates on water reforms in India have often been shaped by a preoccupation with the effects of privatization. Critics of liberalization have called attention to the dangers of privatizing water resources, and proponents of reforms have largely focused on the need to harness private sector participation in the development of water-related infrastructure. Indeed, Tamil Nadu has often been held up as an example of a state that has taken the lead in the privatization of the water sector. Processes such as the implementation of reforms within utilities such as Metrowater, the establishment of the Tamil Nadu Urban Development Fund, and the increasing reliance of Chennai on the private supply of water have led to an understandable emphasis on the ways in which privatization has transformed the management of water resources in Chennai (Coelho 2005a, 2010; Gopakumar 2012; Mahalingam, Devkar, and Kalidindi 2011). However, a sole focus on the logic

of privatization also masks more complex sets of relationships between the state, civil society, and private capital—a relationship that consolidates new forms of centralized state authority.

The adamant rejection of a model of private financing by the Metrowater engineer represents more than an idealized assertion of the publicness of the water utility's function or a political defensiveness against the role of the private sector. It captures the ways in which various facets of state institutions and state power shape the creation of water markets even within a state that represents a strong case of the implementation of reforms and policies of privatization.⁹ State practices actively shape the formation of water markets through the regulation of resources. An analysis of Chennai's water supply provides an in-depth understanding of this remaking of state power and markets in the context of global processes of reform that are shaping India's society and economy. Such an analysis moves beyond a city-centered story of urban inequality and requires a deeper engagement with the ways in which state practices emerge from, intensify, and manage complex inequalities both between and within urban and rural localities. Chennai's water supply is the product of historically contingent state-driven configurations of land and water usage that cut across traditional analytical boundaries between "the city" and peri-urban and rural areas in India.

Expanding urban development in Chennai has produced significant transformations in the configuration of land and water usage in and around the city. Chennai's population grew from 1,420,000 in 1951 to 8,653,521 in 2021.¹⁰ Population estimates that include urbanized and suburban areas outside the city limits placed the population at over ten million in 2017. In order to keep pace with the corresponding rise in water needs for the city, the two major water organizations, the PWD and Metrowater, have engaged in a steady development of water sources and infrastructure. The city's major sources now consist of rain-fed reservoirs, groundwater, recycled waste water, and desalinated seawater. The state has made efforts to expand and diversify its sources of water, for instance by making rain water harvesting mandatory since 2002. Nevertheless, rain-fed reservoirs remain the primary source of Chennai's water supply. In 2016, Metrowater estimated that 65 percent of Chennai's water supply was provided by its reservoirs. The combination of Chennai's heavy dependence on rainfall for its water supply and the intense demands of urbanization have meant that reservoir supplies are inadequate sources of water supply for the city. In periods of drought, the city's supplies

are placed in a crisis. The result has been that the city has increasingly relied on groundwater that is transported from rural and peri-urban areas (Butterworth et al. 2007; Janakarajan 2004).

In the context of extreme drought, with the failure of both monsoons in 2017, Tamil Nadu's water supply witnessed a severe crisis. Chennai's water reservoir levels had dropped below 13 percent by March, and water supplies across the state were drying up. The state government identified six hundred borewells across the state that would be used to supply drinking water for cities. Metrowater was designated to complete the diversion of water with a budget of Rs. 900 crores within four months.¹¹ This acute set of emergency measures in fact represented a much longer process of the state's diversion of water resources to meet city needs that had begun in earlier historical phases, in both the colonial and in the postindependence period. The emergence of such groundwater markets is not merely a natural offshoot of the shift toward privatization but a product of the intersection of state power and historically produced structures of political economy that precede recent decades of reform. In an important research study of irrigation law in Tamil Nadu, Carolin Arul (2008) has shown that the harnessing of irrigation water for Madras's water supply needs in fact stems back to colonial legal and state frameworks. In the early twentieth century, the colonial state would at various periods order the stoppage of irrigation purposes in order to ensure the supply of water to Madras (Arul 2008, 142). Such historical practices continued in the early decades of developmental activity in the post-independence period.

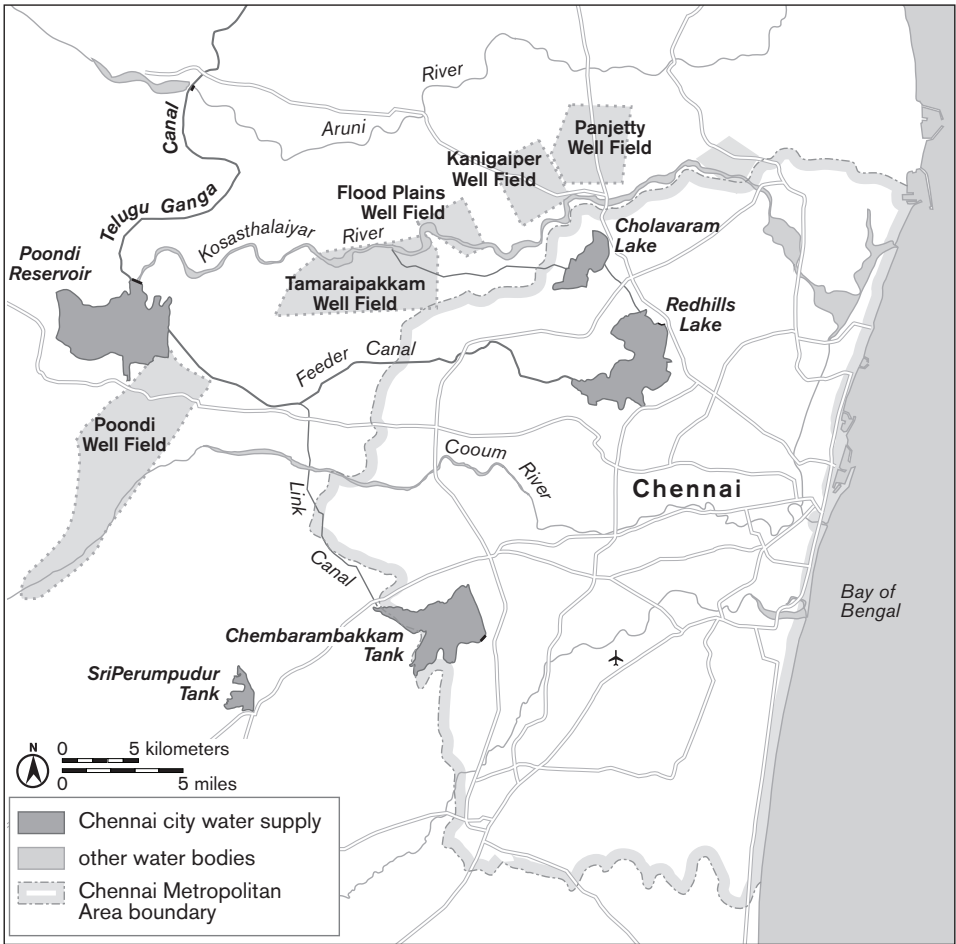
The expansion of water sources to meet Chennai's water needs gradually produced forms of infrastructural development that have transformed land regimes in both the city and the state of Tamil Nadu. This was facilitated by the strong authority that the state has over water resources. Land acquisition was historically always a dimension of the PWD's authority. The workplace code for employees specifically noted that "there is no objection to local officers negotiating with the owners of land with the object of coming to an amicable agreement" when necessary for the construction or management of water-related infrastructure through the legal framework of the 1894 Land Acquisition Act (GTN 1986, 64). The PWD also held the lease of land for the administration of water sources such as canals, drains, and channels (66). Meanwhile, in conjunction with the state's command approach to agricultural development in the first decades of independence, the PWD also

exercised control of the water supply with “complete control over the larger works of irrigation” (GM 1958).

In the early decades of independence, the transfer of irrigation rights to serve the city’s water supply began with the expansion of reservoirs designated to serve the growing urban population. The city’s single major source of water from a rain-fed reservoir, the Poondi Reservoir, which was constructed in 1944, was expanded to include the Redhills Reservoir and Cholaram Tank (see map 4.1). Irrigation rights from Cholaravam Lake and Redhills Lake were transferred for the city’s supply in 1962 (Anbarasan 2010, 29). In the period 1966–69, the United Nations Development Programme (UNDP) conducted a series of studies that would first identify and recommend the usage of groundwater aquifers to meet city needs (31).

In an acknowledgment of the city’s growing reliance on groundwater extraction in the following decades, a UNDP report noted that despite growing water needs, “fortunately, groundwater resources are proving to be a better than hoped for potential” (UNDP 1985, A-1). The report outlined the framework developed in conjunction with governmental proposals that would become the blueprint for the intensified extraction of water resources from rural to city consumption in the postliberalization period. The report specifically recommended the “purchase of irrigation water as a backup source of supply” and noted that the “Water Resources Planners report of May 16, 1985 outlines a proposal to call for farmers to forego the December 15–April 15 agricultural crop in the disaster ‘double red code years’” (A-2). The agency then recommended the developmental framework that would underpin the establishment of water well fields that were not yet under the purview of Metrowater. As the report put it, “The mechanics for accomplishing the exchange of irrigation water for use by the city would be visualized as follows: A strategic reserve well field would be set up by legal description and legislation.” The report identified the “Poondi-Tamarapakkam” well field as “the logical choice,” given its proximity to Poondi Reservoir (A-2). The well field model of water supply for Chennai would later expand to include additional well fields and formed the underpinning of the underlying extraction of water from peri-urban and rural areas for city consumption.

The architecture of this planning process reveals two critical facets regarding the structuring of water markets in Tamil Nadu. First, the planning report underlines some of the historical continuities between the state-led developmental model associated with the early decades of Indian independence (in



MAP 4.1. Chennai's Water Supply System, showing key sources of water that supply residents of the city of Chennai. The map draws on author's research and data from Chennai's major water utility (Metrowater).

conjunction with global developmental norms of the time) and recent trends in the postliberalization period. As we have seen with the effects of underlying structures of political economy on interstate water sharing between Karnataka and Tamil Nadu in the previous chapter, the underlying model of rapid, extractive development continues to shape the management of water resources. Second, water markets that now shape the distribution of water resources in the state have not emerged through natural rhythms of supply and demand but have been structured in significant ways by state practices and have continued to consolidate the centralization of state control over water resources.

Consider, for instance, how the report's call for "legal description and legislation" unfolded through legal and institutional reforms in the state. The report noted that the "city must, as a minimum, have control over i) drilling of new wells and ii) undesirable changes in cropping patterns" (UNDP 1985, A-3). The report then concluded with a broader recommendation for reform that would expand the authority of Metrowater, the bureaucratic institution that had now replaced the PWD in the management of Chennai's water supply. As the report stated,

In order to introduce conjunctive use of water, the best course of action is to promulgate an ordinance which is necessitated to fulfill the intended functions of MMWSSB [Metrowater], i.e., to provide sufficient supply to water to cater to the needs of the ever and fast growing city of Madras.

If conjunctive use and recharge of water is to continue on a long term basis it is possible, if the State Government is willing, to enact a bill to regulate and control extraction and use of ground-water in any notified area. Provisions for such a bill have been suggested in the model bill circulated by the Central Government.

The State Government if it so desires, could also, extend the area of jurisdiction for the MMWSSB for certain limited functions and powers. (A-6)

Indeed, the Chennai Metropolitan Area Ground Water (Regulation) Act was enacted in 1987. The enactment of such regulatory legislation, in practice, has contradictory implications. Regulatory regimes are in fact necessary to manage the overexploitation of groundwater. In the case of Chennai, for instance, regulation of groundwater within the Chennai area was necessary to prevent the commercialized overexploitation of water through private

markets. Metrowater was able to curb the commercial extraction of groundwater within the metropolitan Chennai area by stopping the issuance of permits for the extraction and sale of groundwater (PC 2007, 26). The result was the recovery of aquifers in southeast Chennai (the Thiruvanmayur Aquifer) and North Chennai that were being depleted by the commercial sale of groundwater. However, the UNDP report also illustrates the ways in which regulatory legislation has hidden links to developmental structures that are built on the political and socioeconomic power of cities in ways that reproduce centralized state authority through city-centric models of urban governance.

In the post-1990s period, while global, national, and state governmental policies and rhetoric promoted decentralization, regulatory state legislation was being melded with the centralization of state control. The political and economic dominance of the city of Chennai in relation to the surrounding urban and rural communities was encoded in dual legislation enacted for the state's authority over groundwater resources. While the 1987 bill was reworked for the Chennai metropolitan area in 2002, the remainder of the state's groundwater resources was placed under the purview of separate legislation. A parallel, stringent bill invested the government with the "power to develop, control, regulate and administer the groundwater in the State."¹² As with the Chennai metropolitan area bill, the Tamil Nadu Groundwater (Development and Management) Act, 2003, developed a regulatory framework based on a strict system of licensing and permits, and the state government placed restrictions on the hours of operation of pumps.

In practice, the bifurcated nature of this legislation both reflected and facilitated the extractive relationship between the city and neighboring towns and villages. While the expansion of Metrowater's regulatory powers has been effective within the metropolitan areas, growing water needs in Chennai have meant that Metrowater has continually expanded its own direct use of well fields in the metropolitan area as well as its reliance on groundwater supplies from peri-urban and rural areas. For example, in 1983–86, Metrowater had begun to expand its well fields, and the Thiruvanmayur Aquifer itself was taken over by Metrowater from the Tamil Nadu Water Supply and Drainage Board (TWAD), the organization that governs rural drinking water supplies (Anbarasan 2010, 31). The 1987 act thus implicitly encoded the expanding power of Metrowater and the primacy of city drinking water needs in addition to providing a needed regulatory system. The fractured legislation that separated out groundwater regulation in Chennai and the rest

of Tamil Nadu further reflected and encoded this underlying imbalance in the regulatory system. Since Metrowater is not a governing authority accountable for the rest of the state's urban and rural groundwater resources, it is able to expand its reliance on rural water markets without any corresponding institutional accountability. The practical effect of this relationship has been that the groundwater market has continued to expand, and water is often pumped continuously over a twenty-four-hour period (interview, director of Centre for Water Resources, Anna University, August 16, 2016). Since the enforcement of groundwater legislation is itself structured by state power and underlying inequalities between the city and surrounding areas, it is unsurprising that the rules of regulatory structures for the rest of the state of Tamil Nadu have remained unimplemented.

The divided regulatory legal mechanisms facilitate the state's gradual redistribution of water resources from rural to urban metropolitan citizens. Meanwhile, the state government did not fully implement the 2003 act by framing specific rules and regulations, allowing it to take the form of a regulatory shell that would enable the continued extraction of groundwater.¹³ As a Tamil Nadu government report would note, "In times of extreme drought condition, if the city is in need of water to be transported form distance [sic] sources, the Government may have to take a policy decision to suspend the irrigation rights (of course paying compensation for crop losses if any)" (GTN 2000, 9). The result is that the regulatory state enforces an extractive configuration of water (and land) usage that both builds on and produces unequal political-economic structures.

The creation of new regulatory state practices is part of a systematic process of postliberalization institutional reforms that were implemented through the major World Bank-funded Water Resources Consolidation Project. In addition to the institutional restructuring that I discussed earlier, a key dimension of this project was the focus on the mapping and management of groundwater and the implementation of an adequate institutional process for land acquisition and rehabilitation for people displaced by water-related infrastructure projects. The state's mapping of groundwater resources has increasingly become a critical dimension for the management of water resources. The WRCP established the State Ground and Surface Water Resources Data Centre, with improved technological capabilities that now provide monthly monitoring of control wells. However, as a reflection of the stratified institutional field, the monitoring of groundwater is also conducted by Metrowater

and TWAD within Tamil Nadu as well as the central government's Central Ground Water Board. Given the increasing pressures of water scarcity, data collection on groundwater has become one of the most significant dimensions of both state planning and state power.¹⁴

The ability of the state to track groundwater resources in periods of crisis becomes one of the central means of extracting water for consumption, primarily for the Chennai metropolitan area. As early as the late 1990s, a government report would note that "in drought years the Chennai Metropolitan Water Supply System is exploiting groundwater [in the Chennai basin] to the maximum extent possible" and that the overexploitation had begun to produce seawater intrusion (PWD 1997). By 2004, after a period of drought produced by deficient rainfall, the Data Centre would report that "almost in the entire city [the] water level has gone down considerably when compared with water level of January 1994 . . . [indicating] enormous pumping of groundwater during the last decade" (CE 2015). By 2017, after a period of severe water scarcity that was produced by another failed monsoon, the exploitation of groundwater had reached a severe crisis in the state.¹⁵ The state's mapping and regulatory control of groundwater resources will thus continue to remain a central site for the exercise of state power.¹⁶

However, despite this sustained process of water mapping by the state, the institutional disjunctures that I have addressed shape the extent to which this state endeavor translates into sustainable water policies. We have already seen that the PWD's Water Resources Organisation often cannot effectively manage water supplies in sustainable ways in the face of both state governmental policies that continue to promote urban development in the context of lucrative real estate deals and a metropolitan city-centered model of liberalization. For instance, most policy decisions continue to be based on land usage and land cover data rather than on groundwater storage (Chinnasamy and Agoramoorthy 2015, 2140). Regulatory state authority of land and water are, as we have seen, implemented by separate sets of bureaucratic institutions. This account of institutional cleavages that have fragmented regulatory mechanisms is more than a mere story about the dysfunctions produced by institutional fragmentation. Institutional reforms that have sought to produce rationalized efficiency and decentralization have produced a differentiated bureaucratic field that mirrors broader political-economic processes of restructuring. There is, in effect, a redistribution of institutional power

that encodes the inequities that shape the political economy of India's liberalizing state.

The ascendancy of India's metropolitan cities within India's liberalizing economy has meant that utilities serving metropolitan areas have also grown in power. While the restructuring of the Public Works Department occurred in the late 1970s, Metrowater's institutional power has continued to grow in relation to both the PWD's Water Resources Organisation and TWAD. The spatial aesthetics of the PWD's irrigation branch and Metrowater in many ways embody the shifting relationship. PWD's irrigation branch is housed in the imposing colonial building that embodies the historical legacy of its political and economic power. Yet the building is sparsely occupied, without any of the technological upgrades that are used to brand India's new economy. In contrast, Metrowater's smaller complex has the visual markers of this new economy. Flat-screen televisions are lodged over elevators displaying the utility's technological upgrades at its reservoirs and desalination plants.

This, of course, does not mean that the PWD does not have its own sites of power within the water bureaucracy. The newly reorganized Water Resources Organisation, which manages the state's water sources, has had significant technological upgrades, particularly in relation to the detailed mapping and data collection of groundwater resources. However, the dynamics between the PWD and Metrowater were succinctly captured by the engineer overseeing the Chembarambakkam Reservoir. Standing at the top of the supply tower, we could see the brand-new black pipeline that carried water to Chennai. Near the pipeline were two white buildings owned and run by Metrowater. Pointing to a smaller, shabbier building owned by the PWD, he recounted, "Every year, Metrowater comes and whitewashes the buildings, but they never do the PWD building" (interview, January 19, 2017).

While interagency cooperation is crucial for the management of Tamil Nadu's water supply, the steep competitive strains between urban and rural water users in the context of water scarcity have been reproduced within the institutional divisions of the water bureaucracy. The management of groundwater, for instance, falls under the purview of numerous organizations, including TWAD, Metrowater, PWD, the Directorate of Rural Development, and the Agriculture and Farmers Welfare Department. Internal governmental reports point to the lack of integration between these departments. For instance, the

World Bank-funded consultancy report called attention to the obstacles to shifting irrigation resources to drinking water supply needs. Arguing that the “water resources organization (PWD) enjoyed a strong lobby for irrigation needs,” the consultancy firm went on to note that “such absence of coordination between the departments results in water not being allocated according to the declared Water Policy Priorities. Requests for the provision for drinking water from new storage projects, earmarked for irrigation by WRO, are usually denied” (WRCP 2001, 23). An internal governmental review would echo this perspective on competing institutional agendas, noting, for example, that “a plethora of agencies are involved in watershed management of the catchments,” producing a kind of fragmentation in which “with [the] formation of smaller districts [the] absence of a pro-active leadership and central authority for coordinating the activities of the various agencies and departments and for focusing on effective water resources management is acutely felt” (GTN 2003, 62). On an everyday level, one assistant engineer noted that the sharing of data would often become a source of contention between different wings of the water bureaucracy. Given the scarcity of water sources and the intense competition between departments representing different water users and consumers, scientific data on the availability of existing water supplies becomes a critical site for control and contestation within the stratified water bureaucracy.

The nature of such contestation is shaped by both political considerations and structures of political economy. For instance, the deepening inequalities between Chennai and the rural and smaller urban areas have weakened the institutional power of TWAD, the agency in command of rural drinking water supply. As Govind Gopakumar has argued, “Unlike Metrowater, the TWAD Board has been unable to maintain a revenue surplus as a result of the inability of many small rural and urban bodies to pay their bills. The irregular flow of revenue has directly threatened the existence of the TWAD Board. The institutional robustness of Metrowater and the corresponding weakness of the TWAD Board have reinforced the distinction between the availability of water supply in Chennai and its periphery” (2012, 118).

In the past, electoral considerations meant that particular rural constituencies could hold state officials accountable. However, the rising importance of urban development and a growing urban middle-class dominance of public spheres of communication have also produced a shift toward the political and urban power of city centers such as Chennai. The shifting relationships

of power within the water bureaucracy are not a story of declining state power but a shifting of power between state structures and institutions.

The regulatory frameworks of water management in Tamil Nadu have been shaped in significant ways by underlying structures of inequality that have, in practice, transformed regulatory practices into an extractive relationship both between urban and rural communities and within these communities. Such structural contradictions rupture the state's regulatory framework, as they exceed the state's ability to manage this extractive relationship. The overexploitation of groundwater sources in Chennai has meant an increasing reliance on the supply of groundwater from rural areas in ways that contradict Tamil Nadu's formal legal regulations. The result is that the state's regulatory framework itself has been placed in a conflicted state of paralysis. In 2013, in recognition of both the gap between the formal framework of the law and the actual exploitation of groundwater and the reliance of this extraction for water supplies, the Tamil Nadu government repealed the 2003 groundwater act.¹⁷ A year later, the government attempted to pass new ordinances both placing regulatory limits on new construction outside the metropolitan Chennai area that would impact groundwater and banning the extraction of water by packaged drinking water industries from groundwater blocks with either an overexploited or a critical status.¹⁸ The ban on packaged water units was itself an attempted retroactive regulatory correction, as a 2012–13 report by the comptroller and auditor general of India had already documented the unregulated exploitation of Tamil Nadu's groundwater by the packaged water industry due to the absence of adequate state regulation.¹⁹ As one media report noted, such units had to gain a No Objection Certificate from the state and then apply for a license from the Bureau of Indian Standards. Yet while state water authorities had only issued such certificates to 2 of 49 units that had applied for licenses, 440 units had received licenses. As with the institutional fissures with organizations overseeing land usage, the water bureaucracy, with the knowledge of the deep strains on groundwater, was not able to effectively wield regulatory power in the face of more powerful bureaucratic entities. Further, complicating these regulatory failures, the packaging industry filed a lawsuit challenging the new ordinance by capitalizing on the state's own regulatory failures. The industry argued that the state's own repeal of its 2003 act without implementing it meant that the state had no legislative authority to regulate groundwater.²⁰

Regulatory state frameworks have thus inadvertently been transformed into mechanisms for the extraction of water supplies to serve the Chennai metropolitan area. In this context, the structure of Chennai's water supplies is a fraught story of conflict over land and water that cannot be understood through a methodological or analytical lens that reifies the territorial boundaries of the city. The contours of this water market are structured by conscious practices of state intervention and the withdrawal of state action in this management of land and water usage. An understanding of the making of water markets in the city and state thus necessitate an analysis of the ways in which state power reconfigures land and water in ways that build on historically contingent political-economic structures of inequality and city-centric developmental extraction in the postliberalization period. Such practices are shaped by domestic political considerations that are in turn contingent on relationships of power between socioeconomic groups.

Land Usage, Water Markets, and the Reconstitution of Public Welfare

In the postliberalization period, the production of water markets through the extraction of groundwater in rural and peri-urban Tamil Nadu occurs along two major pathways that center on both state intervention and the withdrawal of state action. The state's focus on groundwater extraction draws on a long history of state-led agricultural development in India that produced a major turn toward tube well irrigation. Tamil Nadu is one of the largest producers of agricultural products in India (Chinnasamy and Agoramorthy 2015), and the state's reliance on groundwater for irrigation has led to a full utilization of water supplies for irrigation and also spurred a corresponding shift from noncommercial to commercial crops. It is worth noting that while there is now a systematic transfer of water resources to the Chennai metropolitan region, irrigation for agriculture still represents the largest portion of water usage in the state (see table 4.2). What is changing, then, in postliberalization is not the state's command of water resources for particular economic activities but the state's priorities. The postliberalization period is marked by a shift in state priorities toward urban-led development and the drinking and industrial water needs for consumers and investors in the Chennai metropolitan area. This shift, as we have seen, builds on both colonial and postindependence trends where the state has actively shaped

TABLE 4.2. Sectoral water demand, Tamil Nadu

Water demand by sector	1994 (MCM)	2001 (MCM)	2010 (MCM)	2020 (MCM)
Irrigation sector	2,066.0	49,978	43,220	49,850
Domestic sector	181.8	2,222	1,000	1,200
Industries	86.23	1,555	1,500	1,700

MCM = million cubic meters. Sources: PWD 1994, 148; GTN 2003, 47; 2010 and 2020 figures are estimates, cited in Suresh 2021, 7.

the transfer of irrigation water to supply the city's needs when needed. For instance, pumping from peri-urban villages started as early as 1965 (Janakarajan et al. 2007, 54). What has changed is the intensification and systemic nature of this transfer and the reforms of regulatory state practices that enable this transfer.

Consider, for example, the impact of Metrowater's new legal powers over water resources. The expansion of Metrowater's powers has enabled the utility to directly purchase water rights from farmers. The utility, of course, operates under pressures of its own, as it is faced with the task of meeting rising water needs in an expanding metropolitan area in a city and state that experiences chronic water scarcity. One senior engineering executive explained to me that in the 2002 drought, Metrowater had to "convince farmers" to supply water for Chennai's drinking water needs and had a Rs. 1 crore daily expense when water was supplied purely by lorries (interview, August 17, 2016). Or, to take another example, NGO project staff working in peri-urban areas "were informed that the officials invoke an emotional argument while searching for water sellers: *that if you cannot supply water to your own people in Chennai, how can we ask water for our farmers from Karnataka?*" (Janakarajan 2004, 10) In this context, Metrowater becomes the arm of the state that draws on both financial incentives and the affective dimensions of ethnicized citizenship that have been intensified in the context of interstate conflicts over water.

Metrowater's role in structuring water markets in ways that produce a transfer of water from rural and peri-urban to city needs has been reinforced by other state structures in Tamil Nadu in the postliberalization period. Madras High Court decisions have shown preference given to supply drinking water to the city and the state's purchase of water rights that enable the transfer of irrigation tanks to serve city water supply needs (Arul 2008). A

significant example of this is evident in Carolin Arul's discussion of the New Veeranam Extension Project, designed to transfer water from Veeranam Lake in Cuddalore District for Chennai's water supply. The scheme, first conceived in 1969, began to take shape in earnest only in the midst of India's liberalized developmental expansion in the 1990s and was finally commissioned by the AIADMK government in 2002.²¹ Arul's research shows that both political leaders and the courts intervened (including a personal visit by the chief minister in 2004) to preserve the rights of the state to divert water in the face of farmer resistance to the project. A court case that "protested the hardship to agriculturalists and preferential treatment for Chennai metro residents" and included a "a flood of letters from farmers including some signatures with blood" (Arul 2008, 232) was dismissed with the court simply asking the government to explain the project to the farmers.

What is central to an understanding of the postliberalization state is that the government, in this context, is not merely mediating between competing water users or legal parties. Rather, the combination of legal judgments, policy frameworks, and executive decisions taken together reinforce the state's rights over water resources rather than those of water users who may have had long-standing rights based on use. Conceptions of public welfare and public trust become the means for a recentralization of state authority. As in the colonial and twentieth-century developmental periods, the state asserts claims of protecting the "common good" and representing the public interest by asserting its authority over water resources. It is the state's definition of public welfare that shapes the structuring of water markets. In the case of the New Veeranam project, the state's response to the court case was the 1994 Water Policy of Tamil Nadu, which prioritizes drinking water needs and which is in accordance with the framework of India's National Water Policy. As one assistant engineer at the PWD put it, "The water needs are in agriculture, but we are told to give priority to drinking water" (interview, January 19, 2017).

This practical and political determination of policy priorities represents a process of restructuring that is more than a reflection of long histories of unequal development. State policies and the distribution of resources in India have long been shaped by the interests of dominant social groups in ways that have in turn intensified inequalities that have undergirded formal citizenship rights. The dynamics of the postliberalization state in this context do not represent a retreat from the theories and ideals of India's version of

social welfare norms. The regulatory regimes that are set up in conjunction with policies of reform produce a framework for the state's reassertion of its long-standing authority over public social welfare. In this context, the welfarist dimensions of the state are not reduced; rather, they are redistributed in line with the new policy goals of a liberalizing state.

This authority of the state over water resources has been backed by the Supreme Court, where a 1997 decision reinforced the conception of water as a public trust, where the "state as a trustee is under a legal duty to protect the natural resources. These resources meant for public use cannot be converted into private ownership" (Cullet 2009, 43). However, the idea of the public trust has been shaped by distinctive hierarchical and spatialized conceptions of the public sphere in the postliberalization era. The public good is increasingly identified with specific, dominant representations of metropolitan middle-class citizens (Fernandes 2006) and the new model of city-based economic growth, which has been characteristic of the postliberalization period and is now embodied in governmental programs such as the Smart Cities Mission. The irrigation-driven strategy of the early decades of developmentalism that was linked to food security needs has now been replaced by a form of growth that is largely driven by new economy sectors such as the services sector and IT, which are concentrated in metropolitan cities and their surrounding urbanizing areas.²² For example, according to the Ministry of Finance's *Economic Survey*, the services sector "contributed almost 66.1% of its gross added value growth in 2015–2016," making it a crucial foreign exchange earner (MF 2016). Given that water consumption is much higher in cities than in rural areas, such patterns deepen inequalities between rural and urban areas. While irrigation remains the primary sector in terms of overall water consumption, the growing significance of urban-led growth is in the process of restructuring the distribution of water resources in significant ways. Shifts from the developmental state's promotion of the rapid expansion of agricultural productivity to address food security in the early decades to an increasingly city-based state strategy of economic growth have intensified the competition for water resources between different sets of users, ranging from industries to farmers to various social groups in urban and rural areas (Ballabh 2008; Joy et al. 2008).²³

The socioeconomic strains produced by the effects of this reorientation are illustrated by the state's reactions to farmer suicides brought on by financial distress and severe drought in Tamil Nadu in 2017. In response to a public

interest litigation suit filed by an NGO in Tamil Nadu (Tamil Nadu Centre for Public Interest Litigation), the Supreme Court ordered the Tamil Nadu government to address the plight of farmers and to provide a reply to the court within two weeks. In their rejoinder, the Court bench noted,

The state stands on the position of a *loco parentis* to the citizens and when there are so many deaths of farmers in the state of Tamil Nadu, it becomes obligatory on the part of the state to express concern and sensitiveness to do the needful and not allow the impecunious and poverty stricken farmers to resign to their fate or leave the downtrodden and the poor to yield to the idea of fatalism. . . . *The concept is alien in the welfare state and social justice which is required to be translated into a democratic body polity* [emphasis added]. As is manifested from the assertions and the grievances, deaths are due to famine and other natural causes and also due to immense financial problem[s]. The state, as the guardian, is required to see how to solve these problems or to meet the problems by taking curative measures treating it as a natural disaster. Silence is not the answer.²⁴

The rhetoric of the bench, while laced with paternalistic conceptions both of the state-citizen relationship and of farmers, provides an acute statement on the need for the preservation of the responsibility of the welfare state. At one level, this response illustrates the contested nature of the Indian state and the potential for political and social pressure within the contours of democratic state institutions. However, at another level, this intervention reflects an institutional pattern in which the Supreme Court once again exceeds its traditional purview of power and authority because of the failures or lack of executive governmental action. As with the case of interstate conflicts, failure of action by both the central and local state governments prompted the Supreme Court to intervene in a policy arena that should traditionally fall within the executive branch of state authority. The Supreme Court intervention in this case (which also occurred after the Madras High Court refused the petitioner's plea) reflects the underlying recasting of the welfare state, which in theory "is required to be translated into a democratic body polity" but in practice has been reoriented to serve new state norms of welfare in the postliberalization period, which in this case prioritize city over rural needs.

The production of such state priorities is not adequately understood purely through stereotypical conceptions of bureaucratic indifference or

corruption. For instance, the identification of drinking water needs as a priority in national and state governmental policies is a goal that is, in theory, fully in keeping with and a necessary dimension of an inclusive conception of the welfare state. Furthermore, the assertive moves of a water utility are fully in keeping with the bureaucratic objectives of providing water for Chennai's population. Water shortages in Chennai are, of course, a real crisis. What is at stake is an understanding of how economic policies in the postliberalization period have redrawn the regulatory boundaries of the welfarist dimensions of the state in line with the investment-driven urbanized centers of development and progress and the corresponding models of water markets that serve these centers. The state has in effect been actively shaping water markets in and for the city of Chennai.

A second dimension of the state's role is alluded to in the Supreme Court's admonition, "Silence is not the answer." The postliberalization state also structures water markets through an absence of action or intervention. This lack of institutional capacity is not identical to formal policies of privatization that curtail the role or power of the state in order to draw in the private sector. Rather, private markets emerge when the state either fails or chooses not to intervene without necessarily abandoning any formal authority or power. Consider, for instance, the expanding groundwater market, which, as we have seen, has increasingly become a primary source of water for both domestic and industrial users in Chennai. The anecdote that I began this chapter with points to the ways in which the state's gradual withdrawal of water resources for irrigation has allowed urbanization to take place.²⁵ The result is, paradoxically, that the lack of adequate supply of water for agriculture furthers the impetus of farmers to resort to selling groundwater. As a Government of Tamil Nadu report notes, "Many farmers have reported that mainly dwindling water supplies from the wells and increased labour problems both in terms of wages and availability constrained irrigated crop production. Further increased cost of inputs compared to output prices discouraged irrigating several crops. Hence farmers were forced to sell the water after meeting their requirement for standing coconut and other crops" (GTN 2003, 139).

In addition to declining water supplies leading to the sale of water, other groups of farmers must also rely on the purchase of water to supplement the exhaustion of well tanks (GTN 2003, 139–40). Other forms of state practices have also inadvertently contributed to the emergence of water markets. The populist agendas of Tamil Nadu's electoral politics have included the provision

of heavily subsidized electricity to farmers. This has meant that pumping of groundwater has been a financially profitable endeavor for landowners with rights over groundwater (Janakarajan et al. 2007; Packialakshmi, Ambujam, and Nellyat 2011). While, as I have noted, there are restrictions on the hours of pumping, the state's nonimplementation of such regulations becomes a de facto method of enabling groundwater markets to continue to supply water for urban needs. The economic effects of such markets are themselves contradictory. In some cases, marginal farmers may benefit from the sale of groundwater, while landless laborers stand to suffer the most, as they lose employment with the decline of agriculture (Packialakshmi 2012). Meanwhile, the regulatory system itself produces contradictory effects. As one government report notes, farmers complained that when they received government loans to dig wells, the delays they experienced in getting clearance certificates placed them at a disadvantage, since for wealthier farmers, "the certificate need not be obtained when people dug wells with their own money. Due to this the wells already dug by farmers after obtaining the clearance for minimum spacing get affected and causes reduction of yield in the wells" (GWB 1992). Thus, the investment in groundwater markets for farmers is also a risky venture, particularly for less well-off farmers, as the nature of groundwater is fluid and the extraction of wells in one area has a significant impact on neighboring wells. In this context, the state's early attempt at regulating groundwater extraction in the 1990s had an inadvertent detrimental effect on less privileged farmers who are dependent on government loans.

The emergence of water markets is a product of a diverse set of state policies and absence of action in the context of a model of development that continues to place needs on the supply of water for both domestic and industrial consumption in and around Chennai. While internal institutional conflicts over the supply for rural versus urban areas are often cast as a conflict between agricultural irrigation needs and drinking water supplies, Metro-water's purchase of water from farmers is also designed to serve industrial needs (Ruet, Gambiez, and Lacour 2007). The result is the creation of a multitude of practices that form an informal groundwater market on the periphery of the city. In South Chennai's IT corridor, twelve hundred tankers provide water to this peri-urban area per day (Packialakshmi, Ambujam, and Nellyat 2011, 427), with deleterious effects for agriculture in neighboring villages that the water was being extracted from. Indeed, the continual movement of water tankers is a common sight on the streets of Chennai and is a continual



FIGURE 4.2. Water Tanker in Chennai, showing one of the private water tankers that routinely transport water from rural and peri-urban areas to the city of Chennai. Chennai's businesses, residents, and water utility (Metrowater) purchase the water from private dealers.

visual reminder of the daily extraction of water resources for urban needs in and around the city (see figure 4.2). The overextraction of groundwater has had further ecological impacts, as it has resulted in seawater intrusion that has further jeopardized water sources for the city (interview, chief engineer of irrigation, PWD, January 11, 2017).

The systemic extraction of rural groundwater for urban needs points to the ways in which the regulatory state is shaped by deeper relationships of power. At one level, state practices shape markets through inaction—that is, through forms of regulatory failure and institutional incapacities, as well as the withdrawal of action. Water markets in this context are not the creation of reform-driven models of privatization but the result of an accumulation of informalized practices that fill the void produced by state incapacities or intentional inaction. The result is that both state action and state inaction have redistributive effects that undergird the global and state languages of technocratic efficiency and management. More significantly, the nature of the regulatory state in this sector is such that the burgeoning formal and informal private water markets are a product of state planning. That is,

the intentional *withdrawal* of state action—in this instance by not enforcing existing groundwater legislation—is an interventionist state strategy of managing and consolidating the dominance of urban-led development, which has intensified in the postliberalization period.

State Power and the Question of Privatization in Chennai

The postliberalization period in India is generally associated with both the rhetorical and policy shifts that have foregrounded the private sector and the need for private investment in various sectors of the economy that were once the purview of public sector control. In the context of Chennai, as we have seen, the effects of this model on water resources and infrastructure have been an indirect one embodied in the intensification of urban development and the corresponding shifts of the usage of land and water. Such developmental models are concrete examples of new business-state relations that shape the political economy of liberalizing India (Jaffrelot, Kohli, and Murali 2019). However, the dominant global model that encourages infrastructure funded by private capital has not significantly shaped the construction and management of water infrastructure either in Chennai or in rural areas in Tamil Nadu.

This necessitates a rethinking of public debates over water sector reforms in India, which often splinter into political positions in opposition to or in support of privatization that do not capture the complexities of state power. Consider, for instance, some of the broad patterns of private and public control over water resources and infrastructure. Research on changes in the control over water has demonstrated that there are some cases in India that can serve as examples of straightforward forms of privatization. Examples of overt forms of privatization include the privatization of rivers in India, such as the privatization of a river in Chhattisgarh through the lease of a stretch of river to a company (Cullet 2009, 48). Or, to take another well-known example, the rapid expansion of the soft drink and bottled water industry produced a high-profile court battle to ban Coca-Cola and Pepsi products in Kerala (Aiyer 2008).

A closer analysis of patterns of privatization shows a more complex configuration of the relationship between the public and private control of water and water-related infrastructure. Consider, for instance, the case of public-private partnerships, one of the key dimensions of the new global-national

model for water governance. Trends do show an increase in the establishment of water sector PPP projects in India. By 2011, the World Bank estimated that there was a gradual growth of such projects, with five million in urban areas receiving water from institutional arrangements involving private sector participation (Swaroop 2011, 6). Patterns of privatization are discernible in the water sector in India but do not dislodge conventional forms of state bureaucratic authority. The state, in effect, remains the central actor that controls water resources. While international organizations such as the World Bank have provided significant funding for water-related projects in the state, such projects have been implemented and managed through state institutions.²⁶ Reforms have taken the form of institutional restructuring and the subcontracting of projects in order to streamline these institutions. However, while such restructuring has reworked the relationships between institutions, the state has maintained clear control over water resources. In times of crises such as floods and drought, the state government's focus has been on pressing claims for relief and compensation from the central government. The role of private capital in this context has been focused on smaller urban localities.

The model of privatization that has been implemented as part of reforms in Tamil Nadu's water sector has been one that has focused more on internal, workplace restructuring within the water bureaucracy. Such reforms have unfolded along the familiar lines of the reorganization of management and the streamlining of the staff of both Metrowater and the Water Resources Wing of the PWD. In the case of Metrowater, the utility has systematically engaged in a reduction of its staff, even as the area of coverage under the utility has expanded. While the utility had shrunk from 7,400 to 2,060 employees by 2016, it had added forty-two urban local bodies covered by its water supply in 2011 (interview, August 17, 2016). The restructuring was accompanied by practices of subcontracting of both planning and infrastructure construction contracts to external consultants. Meanwhile, in the case of PWD, staff reductions have occurred through the maintenance of vacancies rather than more politically charged processes of retrenchment. While senior ranks of the organization have been maintained, vacancies for junior level posts are either left vacant or hired on temporary project-related contracts rather than in permanent positions (interview with assistant executive engineer, PWD, January 18, 2017). For example, World Bank-supported reforms that reorganized the PWD along the lines of basin river management were well received by senior employees because the reorganization expanded

the number of chief engineers (the senior-most rank) within Tamil Nadu; each river basin thus now has its own chief engineer (interview with chief engineer of irrigation, PWD, January 11, 2017).

In contrast, the major global privatization principle for the water sector—the prescribed move toward cost recovery through water metering—has been slow in its implementation. Consider, for instance, the ways in which the political difficulty of charging urban users for water consumption in Chennai has stunted such reforms. One of the major global norms that is put forth by global institutions such as the World Bank is the construction of water as an economic commodity. The World Bank has systematically promoted projects and policies that have required establishment of water meters and user fees as a way of rationalizing the use of water. However, eight years after this initiative was launched in Chennai, the utility was still trying to jump-start it by beginning to meter a set of commercial buildings.²⁷ Indeed, in my interviews with engineers at Metrowater, an overhaul of the metering system and the use of smart meters was still being presented as a major new initiative needed to manage consumption, particularly given low charges for water usage (interview, August 17, 2016). By the beginning of 2021, Metrowater was set to complete the installation of meters in all commercial establishments with plans to expand this to consumers in Chennai.²⁸

While critics rightly point to the problems of global dominant discourses that commodify water (particularly for socioeconomically marginalized communities), in practice the lack of metering has also subsidized wealthier communities in the city. Without a systematic metering system, Metrowater has used the control of water supply, through control of the hours of piped water supply, as a means of managing consumption. One senior engineer at Metrowater, for instance, noted that given the low water charges, this was the only means the utility had for managing supply and consumption (interview, August 17, 2016). The pressures of scarce water supplies have been such that the utility keeps track of how water is being consumed through the specific monitoring of pipe supply to kitchens and to the rest of the household, as there are separate pipes for these two kinds of supply (interview with professor of civil engineering, Anna University, August 16, 2017). This has meant that water is supplied by Metrowater for two to three hours a day. While wealthier consumers can supplement this by purchasing private water, low-income communities rely heavily on supplies from the utility. In this case, while the formal commodification of water through metering has been forestalled,

there has in fact been an informal commodification of water through the default reliance of wealthier consumers and businesses on private suppliers. This in turn leads to the prevalence of corrupt and organized networks colloquially known as the “water mafias.” Privatization here unfolds through the limits of the water bureaucracy’s ability to effectively regulate water through formal practices. The inadequacies of regulation open up the space for informal and formal water markets to emerge.

These practical microdynamics illustrate the complexities involved in the emergence of water markets. Privatization in this context is a subsidiary process in the reforms that have been carried out. The kinds of inequality that critics of privatization have been concerned with are shaped not by a simple transition from public to privatized goods but through a reworking of which public matters. For instance, the government provision of free water that is directed toward the benefit of relatively privileged consumers with access to piped water supplies and the ability to pay for water may inadvertently intensify both inequities of access to water and the skew of the distribution of public resources toward wealthier urban groups. Consider, for instance, the Aam Aadmi Party (AAP) political party’s promise to provide free water in Delhi in the 2014 elections, which marked its first major electoral success. The provision of water in Delhi requires the long-distance transportation of water from groundwater sources in other locations, which could in effect serve to reinforce an extractive relationship in the name of equity. According to some estimates, as much as 70–80 percent of water subsidies do not reach the poor (Foster, Pattanayak, and Prokopy 2003; McKenzie and Ray 2009). On the other hand, the promise of 24/7 service delivery in exchange for user fees, one of the key features of the dominant model of water sector reforms, would also produce acute inequities for communities that either cannot afford to pay user fees or do not have access to piped water. Such questions of access are particularly significant given the ways in which caste structures access to water at the local level; low-caste communities may in effect not have adequate access to water, even if communal piped connections exist or are provided through infrastructural development. An adequate assessment of the impact of water sector reforms on such questions of equity complicates ideologically driven positions for or against privatization. In the backdrop of such nuances lies the fact that reforms have often intensified state centralization and intervention rather than practices of decentralization or participatory management. What then becomes of two

of the key facets of such reforms—the principles of privatization and decentralization? Such principles in effect target both the less powerful segments of the water bureaucracy within the metropolitan city and less politically and economically powerful sites in rural and small-town India.

Private Capital, Reforms, and the Remaking of State Power in Small Towns and Rural Communities

Significant institutional and financial restructuring, which is conventionally associated with economic reforms, has largely focused on urban communities that are classified under the rubric of “urban local bodies” (ULBs).²⁹ Tamil Nadu has developed a financial model for infrastructure development that is often portrayed as both a national and global model for structuring public-private investment for ULBs. The Tamil Nadu Urban Infrastructure Financial Services Limited (TNUIFSL) has emerged as a highly successful fund manager that raises private funds for the Tamil Nadu Urban Development Fund (TNUDF). The TNUDF was established by the Government of Tamil Nadu in 1996 as “the first public-private partnership providing long term financing for civic infrastructure” (TNUDF 2016, 1). The fund was based on financial models advocated by the International Bank for Reconstruction and Development (Mahalingam, Devkar, and Kalidindi 2011). The TNUIFSL funds are provided as loans to urban local bodies for infrastructure development and have been a central means of restructuring local administrations in these urban areas. In contrast to other sectors of the economy, private capital has not had a significant interest in investment in water infrastructure. The complexities of managing and maintaining water-based infrastructure (including high costs and the length of time for the implementation of such projects) have made the water sector a less attractive option for private investors. TNUIFSL is thus in many ways a distinctive enterprise, as it includes water infrastructure in its lending program. However, the specific fund for water-based infrastructure, the Water and Sanitation Pooled Fund, is a trust owned and fully funded by the government (through grants or loans taken out by the government) (interview with managing director, TNUIFSL, January 12, 2017). As the managing director of the fund noted, there are significant challenges to raising private funds for water infrastructure, and the fund is a pooled fund because the funds are smaller.

The TNUIFSL in effect manages the disbursement of both private and governmental funds in order to enforce objective financial and planning standards without the intervention of politically oriented state agencies. Money from external international agencies is sent first to the Government of India, then disbursed to the Tamil Nadu government, and finally managed by the fund. The financial structure ensures that neither the central nor the state government directly spends the funds received (interview, January 12, 2017). As the managing director said, “We think of ULBs as corporations not government.” This approach to ULBs is echoed in the funds planning approach, which is framed around a city corporate and business plan (TNUIFSL, n.d.). ULBs seeking a loan must develop a city corporate plan in order to demonstrate that they are able to illustrate long-term financial planning (interview, January 12, 2017). The fund approves loans only for local bodies that demonstrate financial viability. This strict approach has made the fund a highly successful financial enterprise. In its first sixteen years of operation, from 2002 to 2020, it has reported a “100% collection efficiency,” making it a model that has now attracted international attention (TNUDF 2020; interview, January 12, 2017).

TNUIFSL’s model of financing and urban infrastructure development is part of the larger set of economic reforms that have emphasized financial decentralization and have devolved funds to local governmental bodies. It is in this realm of weaker and smaller urban localities that we see the dominant national-global model of privatization and decentralization being implemented. However, there are, even in this context, limits to this implementation. Urban local bodies often have had limited resources and have had to resort to taking out loans from financial agencies. Moreover, while the establishment of financial models such as TNUIFSL was intended to create independent financial pools of funding without government support, in reality private investors have been wary of the risks involved in supporting both ULB infrastructure projects and water-related infrastructure in particular. Sonia Hoque has noted that the majority of urban infrastructure projects in ULBs “depend on subsidized funds from state governments and semi-public financial institutions that lend to ULBs relying on state government guarantees” (2012, 7). In 2015–16, close to 49 percent of the Tamil Nadu Urban Development Fund’s financing came from the state and central governments. Financing for water-related projects has required governmental backing in order to mediate such risks (Venkatachalam 2005). TNUIFSL’s financial model

has worked because it has been backed by government guarantees as well as a significant credit line from the World Bank. Hence, the model does not represent a clear-cut case of a shift toward the privatization of the water sector.

Financial requirements of budgetary discipline are indeed imposed on urban local bodies in accordance with the norms of private financial investors. However, the investors are sheltered from financial risk by governmental protection. This form of privatization in fact does not represent a retreat of state support; rather, it represents a shift from the state support of local governments to the protection of financial capital. L. Krishnan has noted that TNUDF, the development institution that is managed by TNUIFSL, was specifically “designed to take urban infrastructure financing out of the realm of government budgetary allocations and regulations and instill it with a business orientation that would accelerate financing decisions and encourage innovation” (2007, 238).³⁰ As Krishnan, who was former special secretary to the Government of Tamil Nadu, further notes, this was in large part due to a lack of state resources for urban infrastructure. In 2001, the state of Tamil Nadu needed an estimated \$2 billion for infrastructure for ULBs, with a significant portion of this needed for water infrastructure (242). Within the broader structural relationship of inequality between the Chennai metropolitan area and rural communities, ULBs have tended to suffer from significant deficiencies in water infrastructural development, including the lack of the adequate provision of drinking water supply (Harriss-White 2016, 4). However, while the intention of this program was to address such infrastructural problems through private financing, in practice the model resorted to replacing the state support of local governments with the state support of private capital.

TNUIFSL’s model of public-private funding has both similarities to and differences from dominant global models that have stressed financial soundness over questions of citizenship access and equity. In the case of water-related infrastructure, the fund adopts global norms of enforcing water tariffs. In contrast to Chennai, water supplies and infrastructure in ULBs that receive funds require the acceptance of user tariffs. However, while there is a one-time connection fee for households, monthly tariffs are determined on a graded system based on landownership. According to the managing director, the fund has the objective of providing “equitable and continuous supply of water” and ensures that water infrastructure projects take a holistic approach that encompasses all connections from the water source to the

user. While Metrowater's inability to institute tariffs has meant that wealthier households have benefited from state-subsidized water resources, the TNUIFSL has attempted to institute an equity-based system that deviates from global models of water tariffs in ways that seek to address socioeconomic inequality (interview, January 12, 2017).

However, the business-oriented model of financial viability also produces other kinds of inequity for other rural and urban localities. The vast majority of ULBs generally have weak finances that would not allow them to qualify for loans. The TWAD Board has also therefore "not maintained a revenue surplus since many small urban and rural bodies are unable to pay their bills" (Gopakumar 2012 62). The result is a further weakening of TWAD's institutional and financial standing in ways that further disadvantage rural communities in the state.³¹ The kind of restructuring that is associated with dominant global norms thus has a more significant impact on small towns and rural communities both by introducing new corporate models of governance and by intensifying the financial marginalization of smaller urban local bodies. Such processes have a stratified effect on state institutions that reinforce the inequalities between the metropolitan city and wealthier urban local bodies on the one hand and rural and small-town communities on the other (Kundu 2001).

If new models of financing have been a key feature of reforms for small towns, the need for the participatory management of water resources has become a dominant discursive frame that has been promoted by global institutions and NGOs and incorporated within national and local state policy approaches to rural India. The primary institutional reforms that have been implemented by the state have been modeled around prevailing global models of decentralization and the creation of Water Users Associations in rural areas.³² However, Tamil Nadu provides vivid examples of the ways in which programs of decentralization can in effect reinforce or produce new forms of centralized state authority. Consider some of the critical insights of Satyajit Singh (2007), who led the World Bank's Water and Sanitation Program's Rural Team from 1999 to 2002. Singh presents a nuanced critical assessment of attempts at the decentralization of water governance across various states in India. Writing about the case of decentralization in rural Tamil Nadu, Singh documents the ways in which key positions in newly established water committees were staffed by the major rural state bureaucrats of the district and the Tamil Nadu Water Supply and Drainage Board (TWAD). In this

framework, while the Village Water and Sanitation Committee is given the responsibility for water governance (ensuring the operation, management, and sustainability of water supplies), the authority over funding, design, and implementation of water infrastructure rests with the conventional structure of the state's water bureaucracy. The result, as Singh notes, is that there is a "system of unclear accountability" in which "the new deconcentrated system uses PRI [Panchayati Raj Institutions] as line agencies of the state as and when it is useful to the state" (2007, 206). This process parallels the ways in which the PWD has retained its authority over Water User Associations in Tamil Nadu (see chapter 2). Decentralization in this context devolves state responsibility to new organizations of local governance while retaining the centralized authority of long-standing bureaucratic organizations.

This reworking of state power is not unique to the case of Tamil Nadu. Rather, it is built into the institutional process of reforms. For instance, the decentralization of rural water governance contains within it an internal contradiction. For example, the Public Health and Engineering Departments have been asked to design their own reforms, and as Singh notes, "It is indeed naïve of the central government to expect the PHEDs to write themselves out of existence! The structure of the implementation of the reforms ensures the sabotage of the reform process itself so there would be a policy reversal" (2007, 199). This sabotage of decentralization points to a need for a deeper rethinking of the question of regulatory reforms in the water sector. The transformation of decentralization into new networks of state power points to the ways in which such institutional reforms contain within them the nodes of centralized power. From such a perspective, the recentralization of state authority of water resources is not simply a form of bureaucratic sabotage but an intrinsic dimension of both the national and global model of reforms that has recentered the authority of state governments. Centralized state control is, in effect, reconstituted at a different spatial scale.

Intersecting Inequalities and the Stratified Space of the "Local"

Given the transformation of institutional reforms into processes that reproduce various forms of state-led extraction and control, such reforms then inevitably become entangled in long-standing socioeconomic inequalities. The state-led process of regulatory extraction becomes enmeshed in the

varied forms of socioeconomic stratification that produce enduring structures of inequality both between and within urban and rural spatial locations and communities. While there are new systemic forms of extraction that produce a structured relationship of inequality between the city and the remainder of the state, rural and urban communities are, of course, not homogeneous categories. Poorer communities within cities do not have the same access to water resources as middle- or upper-class communities (Anand 2017; Dasgupta 2015). Such inequalities are reworked in the processes of regulatory reform that are enacted.

For example, a central dimension of Tamil Nadu's Water Resources Consolidation Project was the creation of regulatory mechanisms to manage land acquisition for water infrastructure construction and management. The World Bank incorporated a focus on planned land acquisition and economic rehabilitation as a key component of its funding for the reforms of Tamil Nadu's water sector (spending a total amount of \$5.3 million).³³ While on one hand, the objective of ensuring systematic compensation for individuals and families displaced by infrastructure projects provides an important mechanism for preserving socioeconomic rights, such regulatory reforms have also institutionalized the state's right to displace individuals in the service of developmental goals. A new governmental organization, the Land Acquisition and Economic Rehabilitation Office, was instituted as part of the reforms along with new governmental policies for land valuation by "negotiated settlement" in order to provide "speed and flexibility in determining compensation levels based on full market value and transaction costs for purchase of fully equivalent agricultural land" (WB 1995a, 8). Aspects of the new regulations attempted to address deeper forms of socioeconomic inequality, for instance by including landless laborers within the formal definition of individuals affected by development projects, thus making them eligible for compensation (127). However, the World Bank itself provided hints of limits to its rehabilitation objectives even within the terms of irrigation projects that it funded as part of the WRCP. The project completion report stated that "project-affected persons (PAPs) are as well off or better than their previous situation" but also noted delays in the transfer of lands (Rajagopal 2005).

Another appraisal of the rehabilitation project, while praising the LAER (Land Acquisition and Rehabilitation Office) as an innovative measure, noted, "The separate component for land acquisition and economic rehabilitation worked well for acquiring land, but faced some limitations in rebuilding the

livelihoods of those adversely affected by the project” (OEDWB 2005, 2). Consider, further, the details of the process of displacement and rehabilitation through one scheme that was part of the Bank-funded project in Tamil Nadu, the Mordhana Reservoir scheme. As part of financing regulations, a detailed report of the government’s rehabilitation plan was submitted to the Bank (ORG 1994). The project, one of nine schemes that were funded, was centered on the construction of a dam and water storage facility that was intended to stabilize irrigation for the area both for irrigation supply and for flood control. The area affected was estimated at 133.62 ha. of land in two villages, of which 46.28 ha. was under private ownership (ORG 1994, 2; the rest was already government land and was under the control of the PWD). A detailed survey conducted as part of the report indicated that the majority of land losers were from low-caste (Other Backward Classes and Scheduled Castes/Dalits) small and marginal farmers (7). The survey provides an important picture of the stratified socioeconomic effects of such small rural infrastructural projects, which are generally rendered invisible in the context of the more visible developmental activities in cities and urbanized areas. At one level, the institutionalization of market-based compensation for land and housing as well as the creation of formal channels for grievances in the process represent a positive regulatory advance in contrast to arbitrary rehabilitation or uncompensated displacement. However, the long-term effects of the compensation are structured in significant ways by the intersections of caste, class, and gender inequality inherent in landownership and therefore in the corresponding implications of rehabilitation. According to the survey, 44 percent of the displaced people intended to spend their compensation on the purchase of agricultural land, and a quarter intended to invest in land development and the purchase of livestock. While these segments of the affected villages could potentially acquire a sustainable livelihood and in some instances benefit from the compensation, the remaining third of the affected population needed to use their compensation for immediate subsistence needs or to pay off debts (10). The process of rehabilitation does not provide any assessment or avenue for the future sustained livelihood for this marginalized section of displaced people, primarily from OBC/SC castes.

The state’s management of displacement and rehabilitation was also structured in significant ways by gender. Rehabilitation was structured around gendered definitions of landownership, despite the fact that women

play a significant role in both farming and the management of water resources. In the case of the microdynamics of the Mordhana scheme, the survey revealed that eight women expressed a negative impact on their economic standing. Five women indicated that they had to take on wage employment because of the loss of land, and the rest indicated they had to commute longer distances to other villages in search of work (ORG 1994, 15). In addition, the policy of rehabilitation excluded female adult members of affected households. As the report noted, "Major daughters have not been included for MA [maintenance allowance] and RA [rehabilitation assistance], since [a] majority of them get married within 20 years of age and inclusion of them entails [a] lot of complications which would be difficult to tackle for a smaller LA & ER [land acquisition and economic rehabilitation] cell" (38). The regulatory policy reform thus institutionalized a gendered conception of both labor and family that erased the labor of female members of households as well as the fact that long-standing historical patterns have shown the persistence of (often undercounted) female-headed households in rural contexts in India (Agarwal 1994).

Such infrastructural projects intensify long-standing intersecting inequalities of caste, gender, and class despite the best efforts of such reforms to provide for ameliorative measures for marginalized socioeconomic communities. The regulatory mechanisms of the state, of course, always contain the strong and self-evident risk of reproducing the inequalities and exclusions that shape local communities in both urban and rural areas. Institutional reforms that have attempted to produce greater farmer participation in the management of water resources have also tended to reproduce or intensify such inequalities. One in-depth study on the Lower Bhavani Project commissioned as part of the state's assessment of its institutional reforms revealed that village hierarchies and gendered social norms (such as domestic responsibilities and patriarchal resistance to women's participation) posed considerable constraints on the participation of marginal farmers (CWR 2003). The report's survey found that a "majority of Scheduled Caste farmers felt that agency officials discriminate against lower caste men" and that a "majority of women farmers say there is discrimination by officials and felt that [in] the WUA activities males are favored" (CWR 2003, 92). Such forms of social discrimination were compounded by the intersection with class inequalities. For instance, marginal farmers were prohibited from participating by the lack of resources to forgo

wages or invest money for travel expenses to attend meetings. Given that the report estimated that in the state of Tamil Nadu as a whole, 73 percent of landholdings were owned by marginal farmers and that marginal farmers were a rising trend (CWR 2003), the obstacles to their participation represent a significant limitation on the WUAs' representativeness.

These patterns of exclusion illustrate the ways in which intersecting inequalities are embedded within decentralized institutions that have been established for the management of water resources in rural areas. Institutional reforms in agricultural areas are enmeshed in long-standing socioeconomic hierarchies in ways that do not expand inclusion or access in the management of water resources. Such hierarchies have produced episodic forms of local protest. In one instance, local villagers from Velliyur attempted to stop Metrowater from purchasing water from their village through both direct social action and legal action (Janakarajan et al. 2007, 56). These protests are often spearheaded by women, as they are responsible for managing household water needs and resources, and in two instances women's organizations were able to successfully stop the sale of water to Metrowater (Janakarajan 2004, 10).

Consider further how the rural-urban relationship that undergirds groundwater markets is shaped by a multilayered set of inequalities of class, caste, and gender. The ownership of land and the natural constraint of whether groundwater is present are critical factors that shape whether farmers are able to benefit from the groundwater markets. Scholarship on rural markets in Tamil Nadu has shown that the sale of water intensifies various forms of inequalities within rural and peri-urban areas. Larger landowners have benefited from the rise in groundwater markets, while landless agricultural laborers who lose employment when land is diverted from agriculture to water extraction are the most adversely affected (Ruet, Gambiez, and Latour 2007).

The growth of water markets has increased competitive water extraction and also exacerbates inequalities between water sellers and water purchasers (Moench, Caspari, and Dixit 1999). Less well-off farmers also accumulate debt when they take out loans for water extraction infrastructure only to find that their groundwater levels are insufficient or depleted by competitive extraction to provide profits (Janakarajan et al. 2007, 58). Gender- and caste-based inequalities that structure landownership have also been reproduced within expanding groundwater markets. The establishment of water markets

produces deeper land transformations by transforming property rights in significant ways (Ruet, Gambiez, and Latour 2007). Consider the effects of one Metrowater agreement with farmers in a peri-urban area. Prior to the agreement, while farmers engaged in the private exploitation of groundwater, the water remained in customary terms a common resource, which marginal users such as dependent and semidependent farmers in the area had access to (Ruet, Gambiez, and Latour 2007, 118). Yet, after the agreement, transfers of water within the area were stopped, resulting in “a de facto privatisation of the *access* to the resource, that is, a quasi-privatisation of the resource. The implementation of the agreement pushes towards de-alignment of the property rights structure from something close to common property towards a system that is nearly constitutive of a private regime” (Ruet, Gambiez, and Latour 2007, 119).

There is, in effect, a paradox in this reconfiguration of public goods and private rights. The maintenance of the public supply of water for the metropolitan city area deepens the commodification of water in ways that narrow the public domain of this peri-urban area. Such processes have contributed in significant ways to India’s deepening agrarian crisis in the postliberalization era.³⁴ As one study has shown, in the case of Tamil Nadu, “water marketing villages are experiencing a decline in agriculture from 20 to 95% during 1990–2007, drinking water scarcity (quality wise as well as quantity wise), depletion of the water table from 0 to 6 m bgl during 1971–2007, the necessity of . . . depending on private water, and the related economical burden due to the informal nature of extraction” (Packialakshmi, Ambujam, and Nellyyat 2011, 436). The state’s conception of the public good is in the process stratified by a city-periphery model that has become fully entrenched in the postliberalization period.

While the extraction of water is shaped by accentuated structural inequalities between rural and urban communities, urban communities are also of course marked by internal inequalities. High-income groups use bottled water and private water supplies, middle-income groups use hand pumps, and low-income groups use Metrowater hand pumps located on streets (Saraladevi 2013, 152). This class-based differentiation in water infrastructure (see figure 4.3) is also gendered, as women are responsible for the labor entailed in obtaining water for household needs. Socioeconomic status is also shaped by the calculus of electoral politics. Thus, marginalized communities that are politically organized may also use protests to pressure local



FIGURE 4.3. Tamil Nadu Housing Development Water Source, showing the communal water pump from a low-income housing colony under the administration of the Tamil Nadu Slum Clearance Board

state officials. Given that wealthy and upper-middle-class families have a steadier supply of private water resources, it is also the case that lower-income communities that rely more fully on Metrowater may be more likely to protest disruptions in supply. In this context, there are ways in which even poorer communities are stratified in complex ways. For instance, sections of the urban poor that have received state-supported housing through

Tamil Nadu's Slum Clearance Board may have more political leverage than poor communities living in informal settlements.

Consider one stark example of the stratification of water markets and the urban poor in Chennai. In a housing development of the Tamil Nadu Slum Clearance Board (TNSCB) on the outskirts of the city, the sewer and water lines had been breached, resulting in residents receiving contaminated water for a period of two months. One of the women indicated that she had noticed the water had taken on a greenish appearance and she knew something was wrong. She stopped using the water and began buying water in tin cans. However, she said that she continued to collect water from the community pipe (gendered norms mean that women are responsible for ensuring that water is collected for household needs). When I asked why she would still collect contaminated water, she responded that she was collecting it and selling it (interview and site visit, August 18, 2016). This example is a stark illustration of the entangled contradictions of water bureaucracy, water markets, and inequality in Chennai. The delay in the repair of the breached pipes meant that inadequacies in the water bureaucracy compelled this woman to rely on informal private water markets. Yet her ability to sell polluted water through informal private water markets also underlines the deep stratification of poverty. The combination of socioeconomic marginalization and water scarcity produces stratified water markets among the urban poor. Meanwhile, underlying this story of markets, poverty, and survival is a deeper story of institutional cleavages in the water bureaucracy. The engineer in charge of the complex knew about the breach but said he was helpless since he was employed by the TNSCB and the infrastructure was maintained by Metrowater. According to the engineer at the housing site, as an employee of the TNSCB, he was responsible for water infrastructure maintenance within the buildings and homes (interview, August 18, 2016). Thus, the institutional division of authority meant that the on-site engineer could do little to jump-start repairs of the pipes. The institutional cleavages within the water bureaucracy themselves reflect the relationships of power that shape access to water within and between urban and rural communities in Tamil Nadu.

Institutional reforms produce a redistribution of centralized institutional power rather than a shift from centralized to decentralized state governance.

The implications of such shifts in governance have far-reaching consequences for the political economy of the state. Urban governance in this context cannot be understood through a reified lens of a territorially bound city. New modes of urban governance intersect with the historical weight of both bureaucratic and political-economic structures in ways that reconfigure the use of land and water across the divides of rural and urban spaces in the state. The changes produced by economic liberalization do not unfold either according to dominant models of “neoliberalism” or through models of reform that assume a linear reworking of the relationship between the state and private capital. Rather, the politics of water are shaped by the socio-economic inequalities and institutional relationships of power that stem from the models of city-centered urban development that are being produced by both state practices and private capital investment in the postliberalization period.

This focus on the restructuring of Chennai’s water bureaucracy allows us to gain a deeper understanding of the workings of the postliberalization state that are not adequately captured by exceptionalist narratives of bureaucratic corruption and state failure in India. The overdetermined processes that constrain the ability of water bureaucrats to effectively manage water resources are deepened as competition over water resources is intensified by accelerating and unplanned models of urban development in the postliberalization period. Monolithic stories of state failure—whether they are told in terms of incapacity, corruption, or the capture of the government by private interests—are accurate but not sufficient for an adequate understanding of the state.

An adequate understanding of the state requires a deeper understanding of the nature of bureaucratic agency. Take, for example, the case of Chennai’s struggles with the management of droughts and floods. Such crises are not new to the city, which has had a long history of coping with floods and droughts.³⁵ Yet shifting weather patterns and the potential impact of intensified swings between drought and floods that are associated with climate change produce new and daunting challenges for state employees in the city and the state. Consider, for instance the technical challenges of operating the city reservoirs. From a civil engineering perspective, reservoir operation has become increasingly difficult, as there are conflicting objectives of keeping a maximum amount of water in storage to cope with water demands on the one hand and ensuring enough empty storage space for storing flood waters

on the other (Anbarasan 2010, 4). Since the state cannot construct new reservoirs for the city, bureaucrats struggle with planning for floods in the winter and drought in the summer. State employees in the water bureaucracy are often faced with managing crises that are the product of state policies that they have little control over. It is this question of bureaucratic agency that I turn to in the next chapter.