
Hybrid Modes of Urban Water Delivery in Low- and Middle-Income Countries

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Summary

Most urban residents in high-income countries obtain piped and treated water for drinking and domestic use from centralized utility-run water systems. In low- and middle-income countries (LMICs), however, utilities work alongside myriad other service providers that deliver water to hundreds of millions of city-dwellers. *Hybrid* modes of water delivery in urban areas in low- and middle-income countries are systems in which a variety of state and nonstate actors contribute to the delivery of water to households, schools, healthcare facilities, businesses, and government offices. Historically, the field has evolved to include within-utility networks and outside-the-utility provision mechanisms. Utilities service the urban core through network connections, while nonstate, smaller-scale providers supplement utility services both inside and outside the piped network. The main reform waves since the 1990s—privatization and corporatization—have done little to alter the hybrid nature of provision. Numerous case studies of nonutility water providers suggest that they are imperfect substitutes for utilities. They reach millions of households with no access to piped water, but the water they deliver tends to be of uncertain quality and is typically far more expensive than utility water. Newer work on utility-provided water and utility reforms has highlighted the political challenges of private sector participation in urban water; debates have also focused on the importance of contractual details such as tariff structures and investor incentives. New research has produced numerous studies on LMICs on the ways in which utilities extend their service areas and service types through explicit and implicit relationships with front-line water workers and with supplemental nonstate water suppliers. From the nonutility perspective, debates animated by questions of price and quality, the desirability or possibility of regulation, and the compatibility (or lack thereof) between reliance on small-scale water providers and the human right to safe water, are key areas of research. While understanding the hybrid nature of water delivery is essential for responsible policy formulation and for understanding inequalities in the urban sphere, there is no substitute for the convenience and affordability of universal utility provision, and no question that research on the conditions under which particular types of reforms can improve utility provision is sorely needed.

Keywords: water, urban, utility, corporatization, privatization, hybrid, infrastructure, informal, small-scale water providers, tariff

The Hybrid Nature of Urban Water Services

Most urban residents in high-income countries obtain piped and treated water for drinking and domestic use from centralized utility-run water systems. Accordingly, water research in the fields of economics, public administration, urban studies, political science, and civil engineering has traditionally focused on service provision by these legally independent, regulated providers—under either public or private ownership. A spate of new research accompanied the infrastructure privatization wave of the 1990s that transformed the politics of provision by many of these providers. The performance and long-term political viability of privatization and related institutional reforms remain major topics of debate in the field. Turning to low- and middle-income countries (LMICs) of the Global South, however, the focus on utilities fails to capture the myriad other service providers that deliver water to large numbers of city-dwellers. While ~3.3 billion urban residents had piped water services in 2015, almost all of it delivered by large or small utilities, ~580.8 million accessed water exclusively through nonpipied sources. Of the latter group, 193 million lived in Central and South Asia and 129.8 million in Sub-Saharan Africa (<https://washdata.org/data/household#!/dashboard/new> [<https://washdata.org/data/household#!/dashboard/new>](https://washdata.org/data/household#!/dashboard/new)). The major utility reform waves of the last 30 years, privatization and corporatization, have not eroded the strong presence of nonstate providers.

This article reviews hybrid modes of water delivery in urban areas in low- and middle-income countries. Hybrid systems are those in which a variety of state and nonstate actors contribute to the delivery of water to households, schools, healthcare facilities, businesses, and government offices. These hybrid modes encompass water utilities, which remain the form of provision to which most communities aspire. However, many other providers deliver water, even inside utility networks, because water flows through these networks are often intermittent and of poor quality. Both inside and outside utility-served areas, for example, households and businesses draw upon household or community-managed wells, purchase water from those with better services, buy water from a variety of small-scale providers, or rely on user-owned cooperatives and small-scale private network operators.

Understanding this complex *hybrid* waterscape is essential. It allows researchers to develop a nuanced understanding of how water is actually provided in cities of the Global South—including the various forms of services received as well as the organizational, financial, and political interests involved in delivery. Understanding the range of actors in water delivery helps to interpret data on service and access, assembled by international agencies, with greater accuracy. Possession of a network connection, for instance, cannot be interpreted as exclusive reliance upon utility water. An appreciation for the distinctive constraints and motivations of different types of providers also allows researchers to offer informed policy proposals encompassing different modes of provision and their complementarities or tradeoffs. Furthermore, the hybrid nature of water delivery reflects the broader politics of public service delivery. Water is, after all, one of the most essential ingredients for lives and livelihoods. Understanding who receives water, and at what prices and quality levels, provides a critical lens into power relations in the most rapidly growing demographic settings in the world: cities of the Global South.

This article reviews research from a range of social science disciplines and policy reports on the urban water sector in low- and middle-income countries. It begins with an account of the historical evolution of the field, for both within-utility networks as well as outside-the-utility provision mechanisms. Significant ongoing debates in the literatures on urban water politics, financing, and policy, for utility-provided water systems and nonutility delivery are then reviewed. While acknowledging the hybrid nature of water delivery is essential for responsible policy formulation and for understanding inequalities in the urban sphere, there appears to be no substitute for the convenience and affordability of universal utility provision. Much more research is needed on the types of policies, financing mechanisms, and conditions under which utility reform can lead to improved service quality and access, especially for lower income residents.

Historical Debates

Utilities service the urban core through network connections, while a variety of nonstate, smaller-scale providers supplement utility services both inside and outside the piped network. This pattern is especially prevalent in postcolonial contexts, where piped networks were originally built to serve just a small portion of the population. Within the core network, supplementation of utility services is necessary whenever supplies are intermittent or water quality is poor. Research on privatization shows that it has not been a panacea for improving the reach and quality of urban water services in low- and middle-income countries; corporatization, or the establishment of legally independent utilities, has not been one either. Meanwhile, numerous case studies of nonutility water providers suggest that they do reach millions of households with no access to piped water, but the water they deliver tends to be of uncertain quality and is typically far more expensive than utility water, in part because utility water is often subsidized.

Utility Provision

Utilities in LMICs typically provide water to only some parts of the city; the service is often intermittent, and operational and maintenance (O&M) costs are not consistently recovered, though recovering O&M costs is one of the aims of tariff-setting. A large body of research in political economy, geography, and water policy has examined efforts to commercialize these water utilities—or reorient delivery so that populations served are treated as customers that pay for service—as a means of improving the reach and quality of piped water services in low- and middle-income countries. In line with broader neoliberal arguments about the importance of reducing government intervention in the economy and new public management approaches to administrative reform, advocates of commercializing services—that is, charging consumers prices that cover the costs of delivering water and enforcing payment—argued that it would enhance utility revenue streams and thereby allow utilities to invest more in network maintenance and expansion (see discussion and references in Herrera, 2014, p. 18). Proponents argued, however, that commercialization was not politically viable under status quo arrangements. Water utilities faced pressures from elected officials to keep prices low, refrain from enforcing payment, and engage in patronage employment (Foster, 2005; Savedoff & Spiller, 1999). This diagnosis was used to explain service quality problems and the failure of utilities to expand their networks in line with urban growth. It was also used to explain the

failure of a first generation of *performance contracts* between state-owned enterprises and national governments that were intended to incentivize and hold them accountable for improvements in service coverage, quality, and operational efficiency (e.g., Shirley & Xu, 1997).

To escape this low-level equilibrium, it was argued, institutional reform was necessary: utility managers should be insulated from the direct influence of public officials so they could introduce cost recovery measures (see Herrera & Post, 2014, p. 628; Savedoff & Spiller, 1999). The most extreme reform proposal to emerge was privatization—typically the transfer of management and investment responsibilities in publicly owned systems to private operators through long-term contracts called *concessions*.¹ Though strongly promoted by international institutions like the World Bank (see Bakker, 2013; Goldman, 2005), privatization efforts were also embraced by local public officials and technocrats concerned with a lack of finance for infrastructure upgrades and service deficiencies (e.g., see Post, 2014 on Argentina).

A large literature in water policy, development studies, geography, and applied economics has examined the wave of water utility privatizations in low- and middle-income countries that crested in the mid- to late 1990s. On balance, scholarship finds that private operators increased network coverage though not necessarily more than comparable public sector operators would have done.² Moreover, the performance of private providers has been variable (Marin, 2009). Many private operators did not meet the investment obligations contained in their original contracts (see Davis, 2005; Marin, 2009, p. 3). The literature cites numerous instances in which private concessionaires pushed to renegotiate their contracts (e.g., Post, 2014, pp. 111, 115 on Buenos Aires and Santa Fe, Argentina; Wilder & Romero Lankao, 2006, p. 1984 on Aguascalientes, Mexico; Wu & Malaluan, 2008, p. 216 on the Manila concession). Scholars have cited other instances in which investment obligations were not honored (Bakker, 2007, 2010; Loftus & McDonald, 2001; Marin, 2009, p. 49). In other words, privatization did not serve as a panacea for coverage deficits and thus did not obviate the need for many city-dwellers to find alternative sources of supply.

Why did promised investments not materialize? Some researchers have suggested that monopoly power gave profit-seeking investors undue leverage with host governments and regulators (e.g., Lobina, 2005; Loftus & McDonald, 2001, p. 198), a perspective that is consistent with large-N econometric studies of contract renegotiations in infrastructure sectors (Guasch, 2004). Another important contributor to disappointing investment rates, however, has been electoral pressures. Expectations that privatization would smooth the introduction of cost recovery policies were unrealistic: while personnel management became less politicized and water rates often increased, regulatory agencies established to monitor privatized providers routinely bowed to pressure from elected officials to block or postpone rate increases when they proved politically unpopular (e.g., Post, 2014, pp. 84, 121 on Salta and Mendoza, Argentina; Vargas, 2008, p. 34 on Limeira, Brazil; Wilder & Romero Lankao, 2006, p. 1984 on Mexico City and Aguascalientes).³ Judges also intervened to block other cost recovery policies such as service disconnections for nonpayment (see Argo & Laquian, 2004, p. 14 on Indonesia; Post, 2014, pp. 97, 115 on Argentina). Scholars cite a number of reasons that pricing and collections remained political following privatization: water is often considered a human right or at least an essential resource (see Baer, 2017; Bakker, 2007;

Morgan, 2011), large fractions of the urban poor have low or highly variable income streams, making it difficult for them to afford regular utility bills; and services are controlled by a profit-making monopoly, which makes an attractive political target (Post, 2014).

The balance of the scholarship thus suggests that privatization has not shown itself to be a sure means of increasing service coverage and improving service quality where it has occurred. Perhaps more importantly, privatization is unlikely to occur on a widespread basis: investors have entered very few contracts—coming to serve only 5–13% of the world's population, primarily in upper middle-income countries (Bakker, 2013, p. 256; Budds & McGranahan, 2003). Private investors also increasingly prefer to invest in autocratic countries, where they expect fewer political influences upon rate-setting (see Bakker, 2013; Post, 2014). Taken together, the politicization of price-setting and limited private sector appetite for contracts in poorer locales suggest that privatization will not improve utility finances sufficiently to ensure city-dwellers' water needs are met; to eliminate coverage deficits, the public sector would need not only to set ambitious targets for private providers, but also to subsidize privatized utilities more extensively than has occurred.

Another literature examines a related set of institutional reforms: corporatization, or the establishment of legally independent, state-owned utilities (see Bakker, 2003a, p. 337, 2003b, p. 12; Furlong & Bakker, 2010; McDonald, 2016; McDonald & Ruiters, 2005, pp. 17–19). Reform advocates in institutions such as the major development banks promoted corporatization for broadly similar reasons: legal autonomy, the separation of utility revenue streams from regular government budgets, and oversight by a set of political appointees with terms that did not overlap with those of local elected officials would allow for greater political insulation, and thereby empower utility managers to implement cost recovery policies (Besant-Jones et al., 1994, p. 37; Muir & Saba, 1995; see also Herrera & Post, 2014). Reforms suggested by the New Public Management literature, such as performance-based pay for managers, could be introduced more easily in such contexts. For local governments, corporatization also represented a means of addressing criticisms of public providers without undertaking privatization, which was often very controversial. State water providers were corporatized in at least 35 countries (Herrera & Post, 2014, p. 628). The literature on corporatization, however, suggests that mayors and other elected officials continued to exert strong pressure to prevent rate increases (see Gilbert, 2007, p. 1571; Herrera, 2014, 2017). It is therefore unclear if corporatization will increase water utilities' revenue stream dramatically enough to finance major network expansion and upgrade projects. Moreover, just as privatization has stumbled, so too has market-driven public sector reform. Studying Mexican utilities, Herrera (2017) found that local officials only move forward with corporatization under very particular circumstances—namely, in the presence of a strong middle class, a strong business community concerned about the local economy, and governance by a political party catering to these two constituencies. All in all, the literature suggests, these twin reform waves have not produced utilities that offer high quality services to all urban residents of the Global South. Despite notable cases of successful reforms, such as Kampala (Berg & Mugisha, 2010) and Manila (Wu & Malaluan, 2008), new approaches are clearly needed. In the meantime, hundreds of millions still need to look elsewhere to satisfy their basic water needs.

Non-Utility Provision

Research in water policy, geography, and urban studies has documented a plethora of provision mechanisms in addition to, or as a substitute for, utility-run piped networks. The literature indicates that non-utility providers meet important, unmet needs for domestic water, but do so at higher cost and with lower quality than the (private or public) utility. Non-utility sources include community- or cooperative-run small networks (e.g., Cheng, 2013), tanker trucks with hoses (e.g., Srinivasan, Gorelick, & Goulder, 2010), publicly accessible wells (e.g., Burt, Ercumen, Billava, & Ray, 2018), vendors with pushcarts or bicycles (e.g., Collignon & Vézina, 2000; Kjellén, 2000), water kiosks (e.g., GTZ, 2009), household-scale infrastructure such as harvested rainwater and private wells, and as-needed water sharing arrangements such as resale of utility water to neighbors (Zuin et al., 2011), exchange of water for other goods and services, and gifts of water (e.g., Wutich, Beresford, & Carvajal, 2016; Zug & Graefe, 2014). Almost all these are privately supplied sources, and, with some exceptions such as municipality-run kiosks and public wells, receive no government resources. The less effective and active the state is with respect to service delivery, the more likely it is that nonstate providers will emerge (Post, Bronsoler, & Salman, 2017). Small-scale vendors and local resellers are the most common suppliers, especially where there are few subsidized standpipes (public taps) and in post-conflict situations (Keener, Luengo, & Banerjee, 2010; Kjellén & McGranahan, 2006).

Accurate counts of either the suppliers or the customers are hard to come by (Kariuki & Schwartz, 2005). In 2000, a 10-country study in sub-Saharan Africa estimated that over 75% of the urban poor were served by small-scale private water providers (Collignon & Vézina, 2000). By the end of 2015, about 2.1 billion people globally were without piped supplies, including 20% of urban residents (WHO & UNICEF, 2017), and were presumably dependent on one or more types of non-utility providers.

Early studies of small-scale vendors often portrayed them as exploitative or even predatory; resold municipal water or water from the “terrible trucker dragons” (Solo, 1999) was, and remains, expensive per liter and often of poor quality (although piped water quality may also be poor, as noted below). The 1990s saw a shift in this narrative, as researchers at the World Bank and elsewhere started to analyze the impacts of private sector participation in the water sector, and confronted anew the long-standing “other private sector” (Davis, 2005; Solo, 1999). Reselling, providing water outside the reach of the utility, and self-provisioning were seen as filling a much-needed gap (Kjellén & McGranahan, 2006) and became a way of extending the water network without laying down pipes (Crane, 1994). The entrepreneurial spirit of private operators was praised (Schaub-Jones, 2008), and ethnographies of tanker operators and pushcart vendors produced sympathetic accounts of their arduous workdays (e.g., Kjellén, 2000). Subsequent work argued that private sellers could even be better for the poor than utility connections. Utilities often cannot connect homes in haphazardly built up settlements, and vendors sell small volumes of water at lower prices than the cost of a connection (Schaub-Jones, 2008). Many water policy documents consider non-utility providers to be a practical way of supplying low-income households, especially in peri-urban areas. Urban water scholars therefore urged national governments and international agencies to take seriously the role that tankers, vendors, kiosks, and other providers can play in extending access to the unserved.

Small-scale water providers (SSWPs) or small-scale independent providers (SSIPs) are considered independent from the utilities in that they are discussed as emerging autonomously to deliver water beyond the reach of the formal network. This separation has been questioned in critical urban planning studies; in some instances, utilities actually delegate the job of last-mile provision to standpipe and kiosk “managers” and small-scale cooperatives who run spaghetti-type local networks (Cheng, 2013; GTZ, 2009). SSWPs are also considered part of the informal urban sector, meaning that they are often unregistered, may be operating illegally (though not necessarily so), and generally fall outside the range of state regulatory mechanisms. Finally, SSWPs and forms of self-provisioning (such as fetching water from public wells or harvesting rainwater) have been historically treated as intermediate options in places where the formal piped network has not yet arrived (see Davis, 2005; Kjellén & McGranahan, 2006). The allegedly informal and interim natures of SSWPs have been questioned in newer work. To the extent that SSWPs do operate outside the purview of the utility, they are unregulated with respect to water quality or water affordability and uncommitted to any standards for either. Concerns about both quality and price have complicated the argument that vendors and kiosk operators may be better for the poor than getting connected to the utility-run network.

Numerous studies provide evidence that the quality and price of water provided by SSWPs is worse than that offered by utilities. Evaluations of water utilities in the Global South tend to focus on water quantities and frequency of delivery. In contrast, many studies of smaller-scale providers assume that relatively small volumes of water are being fetched or purchased, and focus instead on the quality of fetched/vended water and its impact on health outcomes (Amrose, Burt, & Ray, 2015). The Joint Monitoring Program of the WHO and UNICEF defines access to “safely managed drinking water” as water that is free from pathogens, and used for drinking, cooking, food preparation, and personal hygiene (WHO & UNICEF, 2017). It should also be “sufficient” for domestic needs and available “reliably close” to the home (WHO & UNICEF, 2017). In LMICs, even piped water may not satisfy all three criteria (Kumpel & Nelson, 2013; Lee & Schwab, 2005; Onda, LoBuglio, & Bartram, 2012). Globally, there is little available data on the water quality provided by non-utility sources. Place-based studies show that protected, non-piped sources (called “improved sources” in the drinking water literature) are often not safe to drink: this has been reported for stored rainwater in Cambodia (Shaheed et al., 2014), vended water in Dar es Salaam (Kjellén, 2000), tanker-supplied water in Bangalore (Srinivasan et al., 2010), and groundwater as well as vended water in Jakarta (Kooy, 2014) and Maputo (Ahlers, Perez Guida, Rusca, & Schwartz, 2013). The few studies that have explored user perceptions of water quality from informal sources report that users are most often unaware of the quality (Constantine, Massoud, Alameddine, & El-Fadel, 2017).

When the water available for domestic use is not of potable quality, it needs post-collection or post-purchase storage and treatment. Many in-home mechanisms exist to treat microbial contamination—the most common form of contamination in LMICs—such as filtration, chlorination, boiling, and ultra-violet light. Many of these are widely available and efficacious; some, such as chlorine, are extremely inexpensive and thus highly cost-effective (Ahuja, Kremer, & Zwane, 2010). The overwhelming evidence from many studies over the past two decades, however, indicates that, aside from boiling, household-level uptake and use of these approaches remains low (Amrose et al., 2015 and references therein). Large-scale studies from Kenya and Bangladesh showed no discernible reductions in gastrointestinal diseases or increases in linear child growth from the introduction of household-based water treatments

(Cumming et al., 2019). Low-quality drinking water, whether piped or nonpiped, plus household-level treatment does not seem a practical approach to expanding access to *safe* drinking water for all (Clasen, 2010).

The cost of vended or resold water, especially the price per unit volume relative to the price charged by utilities, has been another major debate in this sector. The cost of non-utility water is paid in labor hours, cash, or both. Many towns and cities provide publicly accessible water points, such as shared standpipes, tanks and borewells, which are free to residents off the formal network, or on an unreliable and intermittently operating network (Burt et al., 2018; Connors, 2005). The costs of waiting, collecting, storing, and (possibly) treating water are called *coping costs* in the literature; these can be significant, especially for women and girls (United Nations, 2006, pp. 41–48), with some trips to fetch domestic water taking over an hour (Sorenson, Morssink, & Campos, 2011). A study from Kathmandu estimated that the time cost of collecting and storing water was valued at ~1% of total household income, on average (Pattanayak, Yang, Whittington, & Bal Kumar, 2005). In addition, walking long distances to collect water has been shown to be detrimental to child health (Pickering & Davis, 2012).

If non-utility water is paid for in cash, as opposed to in time and health outcomes, these costs are almost always higher per volume of water purchased than would have been charged by the utility. On the one hand, water supplies from tankers, carts, and kiosks save low-income households the cost of “last-mile” piping and the cost of a connection; connection costs, in particular, are often prohibitive for cash-poor customers (Connors, 2005 for Bangalore; Crane, 1994 for Jakarta; Kayaga & Franceys, 2007 for pre-reform Kampala). On the other hand, vended or resold water can sell for markups of tens to hundreds of times above the price of municipally supplied water (see e.g., Collignon & Vézina, 2000 for Bamako; GTZ, 2009 for urban Zambia; Ranganathan, 2014 for Bangalore; Srinivasan et al., 2010 for Chennai; Whittington, Lauria, & Mu, 1991 for Onitsha). The profit margins tend to be higher for tanker-supplied water and lower for small-scale vendors with pushcarts, once the hours and intensity of the necessary labor are taken into account (e.g., Crane, 1994). The affordability burden that these costs represent for low-income households is, in large part, responsible for the historic vilification of water vendors as exploiters of people’s “absolute and basic need for water” (Kjellén & McGranahan, 2006). Furthermore, relatively small volumes of water are purchased from private vendors or are collected and stored from public sources. Few studies exist on volumes of water used by households unconnected to the piped network, but in some cases even 50 liters per person per day, a common “human right to water” standard, is not available (Kumpel, Woelfle-Erskine, Ray, & Nelson, 2017). Water is at once a basic need, an economic good, and a symbolic good (Hanemann, 2006); this combination of characteristics makes charging high prices for small volumes of water especially controversial.

The twin challenges of quality and price, along with the recognition that small-scale water providers will be part of urban waterscapes for some decades to come, have led to repeated calls to take SSWPs seriously, recognize and regulate them, and incorporate them into city planning for water services (e.g., Gerlach & Franceys, 2010; Kooy, 2014; Schaub-Jones, 2008; Solo, 1999). But what does that mean, and who might benefit from or be hurt by such regulation? It is possible that regulating non-utility vendors will set standards for quality, but also raise the cost of operation for these vendors, who may then be forced to pass costs on to the very consumers that regulation is trying to protect. Water quality, affordability, and the challenges of regulation are the cornerstones of ongoing academic and policy debates on off-

the-network water providers. Utilities themselves are often at the forefront of developing hybrid models of service provision that call for collaborations with local cooperatives and SSWPs.

Current Debates

A significant body of research on water utility reforms, market-oriented management practices, and the many existing forms of non-utility water provision suggests that this hybrid service regime is likely to stay. Newer work on utility-provided water and utility reforms has highlighted the political and financial challenges of private sector participation in urban water; debates have also focused on the importance of contractual details such as tariff structures and investor incentives. New research has produced numerous studies from LMICs on the ways in which utilities extend their service areas and service types through explicit and implicit relationships with front-line water workers and with supplemental nonstate water suppliers. From the non-utility perspective, debates animated by questions of price and quality, the desirability or possibility of regulation, and the compatibility (or lack thereof) between reliance on SSWPs and the human right to safe water, are key areas of research.

Utility Provision

Debates on water utilities in LMICs since 2010 fall in four main areas: the financial and political viability of privatized water management; conversions back from private to public service provision; the influence of frontline utility workers in service delivery; and the relationship between utilities and supplemental, non-state providers operating within utility networks; and new approaches to public utility reform. These topics are debated in fields as diverse as anthropology, geography, political science, economics, and water policy, though conversations across field boundaries are limited.

A first debate examines the long-run political and financial viability of privatized water utilities in LMICs. Within the field of geography, scholarship examines efforts to *remunicipalize*, of which there have been at least a handful of prominent examples in the Global South, including cities in Ghana, Kazakhstan, Turkey, Mali, Argentina, Guinea, Tanzania, Malaysia, and Bolivia (McDonald & Swyngedouw, 2019).⁴ Most work in this vein argues that public sector provision is normatively desirable because social equity concerns and working conditions are more likely to be addressed by public sector agencies (e.g., Lobina, 2015; McDonald, 2018; McDonald & Swyngedouw, 2019). Scholars have examined who supports campaigns for remunicipalization, the obstacles faced by these campaigns, and the conditions under which they have succeeded (see McDonald, 2018; McDonald & Swyngedouw, 2019).

As Bakker (Bakker, 2010, 2013, p. 256) observed, however, many contract cancellations reflect not just (or perhaps at all) political movements, but rather the decisions of private sector actors to pull out of contracts that were unprofitable. Scholarship in political science, law & society, economics, and development studies has devoted more attention to the interplay between the concerns and interests of investors and elected officials under privatization in low- and middle-income democracies; this body of work aids in the understanding of the circumstances under which shifts back to public sector management occur. A first, consensus

observation is that some privatization processes are doomed to fail at the outset: when only one investor submits a bid, this reflects low potential profitability, and also increases the leverage of the firm submitting a bid, allowing it to negotiate more favorable (and politically unsustainable) terms behind closed doors.⁵ A second well-established pattern is that in the medium run, the political incentives faced by elected officials and regulators to cap price increases and block other cost recovery measures contributed to decreased investor interest in maintaining existing contracts. As Dubash and Morgan (2013) argued in the introduction of their edited volume on infrastructure regulation in the Global South, regulation in this context is infused with politics because of the high intensity of redistributive struggles and limited state capacity; legal independence may exist on paper, but rarely does so in practice. Fierce political competition can encourage politicians to focus on short-term interests in political survival rather than their long-run interests in infrastructure investment (Post, 2014). In the run-up to tight elections, incumbent officials face strong incentives to pressure regulators to block cost recovery measures. In the face of economic shocks, politicians face even stronger incentives to block the enforcement of controversial contractual provisions; for example, following the Argentine crisis, the government froze utility rates in pesos despite devaluing the peso by two-thirds (Post & Murillo, 2016). This means that in very competitive political contexts, particularly following crises, investors may be earning little, if anything, from their contracts.

Newer work suggests that certain types of investors are better able to navigate regulatory uncertainty and political competition. Research on the fourteen concession contracts granted at the provincial level in Argentina found that domestic investors with diverse portfolios in their contract jurisdiction faced stronger incentives to accept temporary losses during politically competitive periods, and could be compensated through other operations (Post, 2014). International firms, in contrast, tended to have fewer operations and thus fewer incentives to take temporary losses in the water sector out of concerns for other holdings. They also—in many cases—could file international arbitration cases for violation of contracts, which gives them an exit option if they have decided to cut their losses in a particular country market. Future research could more effectively combine the emphasis on political movements for remunicipalization described by the geography literature, with the agency, firm, and political factors emphasized in political science and elsewhere. Furthermore, it is likely that alternative factors explain patterns of premature contract cancellation in nondemocratic settings, where the vast majority of new privatizations are occurring (Bakker, 2013; Post, 2014).

Research has also focused on the organizational dynamics of public sector providers—examining the interactions between different actors within utilities themselves, as well as how government providers interact with a variety of other state and non-state actors while delivering services. One vibrant research area analyzes a phenomenon that is much more prevalent in LMICs: the role of frontline water utility workers, or street level bureaucrats—in water delivery. Water delivery networks are not nearly as automated in LMICs as elsewhere in the world. Utility employees or sub-contractors handle tasks such as meter reading and bill collection through routine visits to particular neighborhoods. In systems with intermittent supply, “valvemen” operate valves that let water in and out of particular neighborhoods as water pressure is allocated in rotation throughout the system (Hyun, Post, & Ray, 2018). A new wave of scholarship on the Indian water sector examines the relationships between these street level bureaucrats and households that rely on utility water, as well as the relationships

between these frontline workers and their supervisors. Ethnographic research, for example, suggests that valvemen exercise leverage vis a vis their supervisors because of information asymmetries: in the absence of accurate maps of the system, they often know the exact location of water pipes hidden by streets (Björkman, 2015, pp. 129–135; Hyun et al., 2018). Valvemen also often serve as a first point of contact between households and the utility, especially in poor neighborhoods where residents are highly reliant on intermittent deliveries and where much household time is lost waiting for water to arrive (Björkman, 2015, Chapter 6; Burt et al., 2018; Hyun et al., 2018). What remains unclear is the extent to which these frontline workers affect the allocation and timing of water flows to households, and how this varies across contexts. Examining Mumbai, for example, Anand (2017) suggested that frontline workers and politically connected “plumbers” can affect water flows, whereas Björkman (2015) is more skeptical about their influence, given the creaky and unreliable nature of the underlying infrastructure. Studies also describe how utility personnel or elected officials can exert pressure to secure other water-related benefits for their constituents, such as network connections, or system repairs (e.g., Davis, 2004; Lovei & Whittington, 1993). Taken as a whole, this literature usefully illustrates the *hybridity* of state providers themselves—that they are animated by internal politics, and that any diagnosis of barriers to improvements in service provision must be prefaced upon an understanding of these internal dynamics.

Another active research area is the supplementation of utility service provision by nonstate providers within the boundaries of the piped water network. As noted, water utilities provide piped services intermittently to approximately 300 million people in South Asia and Sub-Saharan Africa (Kumpel & Nelson, 2016), and water quality is often deficient. As a result, many households with network connections turn to alternative providers to supplement what they receive from the utility (e.g., Bakker, 2003a on Indonesia; Pattanayak et al., 2005 on Nepal). For example, a household might turn to a tanker truck delivery for supply in the middle of long intervals between utility supply days, a common occurrence in Indian cities (see, for instance Kumar, Post, & Ray, 2018 on Bangalore; Srinivasan et al., 2010 on Chennai). Supplementation is even more common in neighborhoods where only a subset of households has connections; unconnected houses may rely entirely on private vendors, or purchase water from households that possess connections (Heymans, Eberhard, Ehrhardt, & Riley, 2016; Mumssen, Saltiel, & Kingdom, 2018). Alternatively, where a communal standpipe is the main access point for large numbers of households, these standpipes may be free to the public as intended, or informally controlled and operated as businesses by local elites, politicians, or valvemen (on India, see Cooper, 2011, pp. 83–84; on Sub-Saharan Africa, see Keener et al., 2010, p. 18; on Indonesia, see Kooy, 2014, pp. 43–47). At other times, utilities deliberately outsource standpipe management in informal settlements to small entrepreneurs or vendors (see Collignon & Vézina, 2000, pp. 4–6 on Burkina Faso and Mauritania). Some scholars interpret these supplemental arrangements as collusive efforts by state elites to extract resources from the poor (e.g., Anand, 2011), whereas others view supplemental provision as providing needed additional services to populations in need (e.g., Bakker, 2003a; Pattanayak et al., 2005). Further research is needed to better understand how the relationships between the nonstate providers operating within the network, utilities, and elected officials vary across locales, and the implications of this variation for rates of network expansion and levels of service quality.

This growing recognition of the political and financial difficulties associated with privatization and corporatization on the one hand, and the extent to which government providers are affected by complex internal and external politics on the other, has prompted place-specific debates about alternative approaches to improving services by public providers. First, scholars have begun to examine historical precursors to corporatization efforts under the neoliberal reform wave. While historians have documented the creation of water utilities in the United States during the mid-19th century to early 20th century (see McDonald, 2018; Melosi, 2000), the exact formats for local public sector provision—and particularly the public sector precursors to the national parastatals that managed water supply under import substitution industrialization (ISI) in low and middle-income countries—have been understudied.⁶ As Acevedo Guerrero, Furlong, and Arias (2016) and Furlong, Acevedo Guerrero, Arias, and Patino Sanchez (2018) showed for the case of Colombia, some governments established “corporatized providers” that were legally independent of local governments in the early 20th century. Notably, Furlong and her co-authors found that these corporatized providers were not insulated from political pressures from the business community or from elected officials in practice—consistent with work on the contemporary politics of water provision by corporatized providers. Similar research beyond Colombia would be useful to understand if the case is particular, or whether corporatized providers existed elsewhere well before the neoliberal reform wave.

A second set of debates on public sector provider reform starts from the assumption that no one single institutional reform is likely to generate change on its own, and that service models will need to be tailored to local political, social, and economic circumstances (Heymans et al., 2016; Mumssen, Saltiel, & Kingdom, 2018).⁷ Much analysis of this sort appears in policy and research reports published by the World Bank and other international institutions. These reports echo an earlier wave of policy documents advocating for providing incentives to providers (as well as employees) for improved operational efficiency and an enhancement of utility revenue streams through cost recovery measures, often codified in performance contracts (see Mugisha & Berg, 2008; Shirley & Xu, 1997, p. 325). However, recent analyses emphasize that reforms tend only to be adopted and successfully implemented following catalyzing events that bring attention to sector needs, and in the presence of capable utility leadership and a firm political champion (Heymans et al., 2016; Mumssen, Saltiel, & Kingdom, 2018; Soppe, Janson, & Piantini, 2018). They also emphasize that reforms addressing efficiency, enhancing revenue streams, improving infrastructure maintenance, and attracting commercial capital need to be adopted sequentially, and tailored to local realities; there is no one “silver bullet” institutional change that will trigger a “virtuous cycle” of improvement on its own (Goksu, Trémolet, Kolker, & Kingdom, 2017; Heymans et al., 2016; Kingdom, Lloyd-Owen, Trémolet, & Ikeda, 2018; Soppe et al., 2018). Funding (and pressure) from IFIs and establishing independent regulators can contribute to the institutionalization of reforms, but cannot transform service providers on their own (Mumssen, Saltiel, Kingdom, Sadik, & Marques, 2018).

Moreover, IFI policy reports and academic scholarship concur that reforms aimed at improving provider efficiency, investment rates, and service quality must necessarily be paired with tariff-setting and connection policies that address vulnerable populations (e.g., Andrés et al., 2019; Estache, Gomez-Lobo, & Leipziger, 2001; Heymans et al., 2016). For example, a 2014 volume edited by McDonald and a companion 2016 *Utilities Policy* special issue contain case studies of corporatized providers that pursued such “public-oriented”

objectives (McDonald, 2014; McDonald & Swyngedouw, 2019). For example, Spronk, Crespo, and Olivera (2014) highlight the Uruguayan utility Obras Sanitarias del Estado's pursuit of universal coverage, service quality, and worker participation in decision-making. Scholars have also examined a variety of ways in which rate structures can be designed so that low-income households pay less for essential water services, through incorporating features such as zone-based tariffs, increasing block tariffs, and rates tied to household income.⁸ Related policy research emphasizes that such targeted approaches to subsidization can be low cost, and effective, ways of helping utilities' poorest customers. Recent research indicates that these aspirations are not necessarily achieved; many ostensibly progressive subsidy programs achieve disappointing results or even worse distributional outcomes than would exist if subsidies were randomly assigned, reflecting poor subsidy program design and errors of inclusion and exclusion (Contreras, Gómez-Lobo, & Palma, 2018; Fuente et al., 2016; Gómez-Lobo & Contreras, 2003). These models involve cross-subsidization between higher income and lower income users, or the subsidization of services for low-income households through general tax revenue—yet they have been used on numerous occasions by corporatized and privatized providers. This is an area ripe for new research; cross-subsidization models clearly call for a utility-based service, with SSWPs potentially playing a supportive role. While IFIs have issued reports examining successful cases of such reforms, there is little academic research to date on this topic.⁹

Non-Utility Provision

Current debates on the role of non-utility water provision in the urban waterscape address two broad questions: (a) the sense in which non-utility provision can be considered *informal* with respect to the formal utility and the municipality; and (b) the extent to which formalization and regulation can overcome some of the challenges of water quality and affordability. Taken together, these debates lead the literature to the overarching question of if and how a commodity—which privately provided, off-the-utility-network water almost inevitably is—can help meet the human right to adequate, safe, and affordable drinking water for all.

By the end of 2015, only four out of five urban residents globally had access to piped water supplies, not always on their premises, and often intermittent and unreliable (UNESCO World Water Assessment Programme, 2019). The significant size of the literature on small-scale providers, as well as the aforementioned difficulties in improving utility provision, indicates that non-utility provision is here to stay, and should be analyzed as a stable aspect of the urban waterscape. This recognition is not mirrored in national water policy documents and city plans, however, which continue to discuss non-state provision as temporary and informal. It has been suggested that water agencies pay little attention to informal service providers because they are simply too overwhelmed to account for them (e.g., Satterthwaite, Mitlin, & Bartlett, 2015), or, more cynically, that LMIC cities cultivating a “world-class” image find the messiness of vendors and truckers to be a poor fit for that urban imaginary (e.g., Goldman, 2011).

The question of whether non-utility water providers are necessarily informal, and in what senses they are informal, is now part of a larger debate that problematizes the concept of informality itself. This literature is dominated by urban geographers and urban political

ecologists who argue that informality cannot be defined as merely the absence of records and regulation (cf. Hart, 1973). Whereas early policy-oriented work on water tankers, vendors, and resale saw these supplies as unregulated, even makeshift, alternatives to the utility, emerging as business opportunities in the face of state failure (Collignon & Vézina, 2000; Schaub-Jones, 2008), this more critical literature challenges the binaries of private versus public or formal versus informal (Bakker, 2003a; Roy & AlSayyad, 2004). These works see the growth of the informal sector as a stable—and often planned—mode of urban life, overlapping in space and time with the formal sector, as opposed to as a casual by-product of an overwhelmed state (see Innes, Connick, & Booher, 2007; Roy & AlSayyad, 2004). Scholars have shown that, even where piped networks are expanding, infrastructure planning is not universalistic; it often prioritizes better-off or better-planned neighborhoods, creating “archipelagos” (cf. Bakker, 2003a) of good service surrounded by areas of unreliable or nonexistent service (e.g., Acey, 2012 on Benin City; Jaglin, 2008 on Cape Town; Loftus, 2009 on Durban; Peloso & Morinville, 2014 on Ashaiman). Thus flows of money and power drive flows of water, leaving the poor to fend for themselves; the left-out areas are perforce reliant on non-utility provision mechanisms (e.g., Bakker, Kooy, Shofiani, & Martijn, 2008 on Jakarta; Kacker & Joshi, 2012 on Delhi; Swyngedouw, 2004 on Guayaquil).

What are commonly called informal water provision practices take many forms. Residents can get free water by hacking into pipes or digging unauthorized wells; such actions can be seen as the “quiet encroachment” of the poor seeking services they feel entitled to, but are unable to pay for (e.g., Bayat, 2000 on Alexandria and Cairo). Some households continue to use rainwater or graywater even where municipal utilities operate, both as a way to save money and to retain control over their water (e.g., Meehan, 2014 on Tijuana). Bypassing the traditional utility may also be unofficially enabled—at a price—by the locally powerful or politically connected, thus creating a sort of *informal formalization* (e.g., Hackenbroch & Hossain, 2012 on Dhaka). The dichotomy between the well-defined formal and the ill-defined informal breaks down in particular for cities of the post-colonial South. First, the formal utilities may actively delegate slum water deliveries to local water cooperatives, especially in slums where payments may be hard to collect or land tenure may be fluid (Cheng, 2013 on Manila). Second, many previously colonized cities, which had a networked core for colonial representatives and no networks or poor networks for the “native” periphery, have allowed core-periphery disparities to continue long after independence (e.g., Acey, 2012; Jaglin, 2002, 2008; Loftus, 2009). Third, new intra-community disparities in urban water delivery create the need for informal water providers. In this vein, Anand (2012) argued that Muslim strongholds in Mumbai are deliberately given less piped water than Hindu-majority areas, while Ranganathan (2014) showed that Bangalore’s infamous “water mafias” not only deliver groundwater to unpiped areas, but are active in shaping both land and water regimes in collusion with city authorities. These works argue that the boundary between utility and non-utility provision, or between formal and informal, is not clear, and to interpret non-utility providers as simply providing *supplemental* services is naïve.

Despite the unclear boundary between the formal and the informal, there is a growing literature on whether, and how, greater formalization and regulation, can help overcome the price and quality challenges of “the other private sector.” High prices and uncertain quality continue to define the non-utility water sector. Data from Tanzania, for instance, shows that residents who rely on delivered water are likely to spend over 5% of their annual income on water (UNESCO World Water Assessment Programme, 2019, p. 22). Free water from public

sources, such as deep wells or street-corner taps, can be of such low quality that it cannot be used for drinking or cooking (Amrose et al., 2015). Bottled water is known to cost hundreds of times per liter than utility-supplied water, but it has become a primary source of drinking water in middle-income countries such as Turkey, Indonesia, and the Philippines (WHO & UNICEF, 2017, p. 37). Tests have shown that, steep prices notwithstanding, bottled water in LMICs is often contaminated (Cohen & Ray, 2018).

Discussions on formalizing or regulating the small-scale private sector typically take place in the shadow of discussions about reforming urban water utilities (i.e., the formal sector). Manila Water, for instance, as it underwent privatization and contractual reforms, sought to contract with water cooperatives, which then became responsible for “last mile” delivery and billing. In effect, this made hitherto unaffiliated cooperatives the disciplining arm of the utility (Cheng, 2013) in difficult-to-access areas. Water utilities in African cities have, since then, adopted versions of the hybrid utility-SSWP model, especially with local cooperatives. In Ouagadougou, for instance, the formal utility operates banks of meters, from which residents run flexible “spaghetti” pipes into their homes, and pay their bills to cooperatives who function as an extension of the utility (Heymans et al., 2016). A major innovation whereby piped water access is being extended in cities such as Nairobi and Kampala is the prepaid water meter, often operated by a (former) water-seller (Heymans et al., 2016). Prepaid meters protect utilities from non-revenue water “sales” and poor customers from water bills they cannot pay. However, the creditor-debtor relationship changes in this system; a prepaid water meter means that thousands of low-income households are lending interest-free money to the water utility, whereas a conventional metering system reverses that relationship. Measures taken to recognize and support small-scale water providers can also function to control the former vendors while enhancing their capacity to serve unserved areas (Ahlers et al., 2013 on Maputo). These types of efforts have gained ground since Cochabamba’s failed privatization, in which the private concessionaire, Aguas del Tunari, sought exclusive rights to deliver water in neighborhoods where informal water vendors, tankers, and private wells had previously supplied water (Nickson & Vargas, 2002).

Overall, calls to take non-utility sources seriously or to incorporate them into formal water planning have rarely been translated into practice, as there is little consensus on what regulating SSWPs would entail, and on who would benefit or lose (Gerlach & Franceys, 2010). The high prices they typically charge may or may not reflect high profit margins and may become even higher for the poor with regulations whose consequences have not been thought through (Davis, 2005; Tremolet & Hunt, 2006). Regulation with respect to water quality appears to be even more of a challenge (Wutich et al., 2016); Portugal’s famed *aguateros* have made efforts to meet the water quality standards of the formal utilities (Loach, Melgarejo, & Lombardo, 2000), but this is rare. However, the call to bring SSWPs into a framework that reflects the Key Performance Indicators that govern utilities regulation is increasing: In the catchy phrase of the Eastern and Southern African regulators, ESAWAS, water and sanitation SSWPs must be regulated because “every football match needs a referee” (ESAWAS & WSUP, 2020). Kenya’s national water and sanitation regulator, WASREB, is building partnerships with reselling kiosks and standpipe operators in low-income neighborhoods to strengthen their accountability to their poorer customers and to protect the human right to water (Kenya’s Water Services Sector, 2018). These efforts are reported in IFI-produced policy reports, but

less so in the academic literature, where there is scant evidence thus far on whether, and what sort of, regulation is necessary for affordable, safe, and universal access to drinking water.

All of these questions ultimately lead to the overarching question with respect to non-utility water provision: Can the decentralized efforts of households, cooperatives, and SSWPs play a significant role in meeting the basic-needs volume and quality for drinking and domestic use—for all? General Comment 15 of the United Nations explicitly names a basic water service as a human right (Office of the High Commissioner for Human Rights, 2003). This has since been validated in the spirit and wording of Sustainable Development Goal 6.1, which calls for “universal and equitable access to safe and affordable drinking water for all.” When water (or anything else) is a human right, it can be provided via private entities, but a basic-needs volume must be made free of charge at the point of use if the user is unable to pay. Piped water can be delivered with lifeline rates for low-income consumers; even loss-making lifeline rates can be partially recovered through well-designed cross-subsidization across all utility consumers. However, lifeline rates or their equivalent would be a challenge with non-piped water: All SSWPs charge for all the water they sell, as they must cover their costs or go out of business. Some scholars have argued that, in specific circumstances, non-piped sources may indeed play a role in advancing the human right to water. This case has been made for water vendors who self-organize to serve the poor at fair prices (and reasonable quality) in peri-urban Cochabamba (Wutich et al., 2016); a more tentative example is water sold in small sachets in West Africa, which generate significant plastic waste, but whose quality is improved in accordance with WHO guidelines (Stoler, 2012).

In general, human rights advocates and scholars tend to favor public provision, or at least firm public involvement, whereas advocates and scholars of efficiency and market-based choices tend to favor more decentralized supply and private involvement (Bakker, 2014). In this debate, the massive growth of bottled water in almost all LMIC cities, fueled by well-financed advertising as well as the fear of poor-quality municipal water, is especially pertinent. This mainly formal and semi-regulated source of drinking water is now the fastest-growing, but least analyzed, non-tap water supplier in middle-income cities, for instance in Indonesia, Mexico, Turkey, and the Philippines (WHO & UNICEF, 2017, p. 37). The WHO and UNICEF, as of 2017, have accepted bottled water as a possible path to the fulfillment of SDG6.1—if it is readily available and safely managed. On the other hand, bottled water is the most fully commodified form of drinking water and currently functions as a middle-class method of opting out of utility-provided water (Cohen & Ray, 2018; Ferrier, 2001) rather than as a realistic way for the near-poor to obtain an affordable drinking water supply. With respect to non-utility water, in particular SSWPs or packaged waters, the literature is still grappling with the question of whether a human right can be met when the underlying delivery model is that of a business rather than that of a service.

Water and the City

The hybrid nature of urban water services is likely to be a feature of LMICs for some years to come. While utilities service the majority of city residents, their services are often unreliable and inadequate, and the quality of water delivered is frequently poor. Both inside and outside of utility-served areas, a host of small-scale, alternative providers supplement utility services.

The latest entrant into the non-utility sector is bottled or packaged water, sold by local and multi-national corporations. The literature strongly suggests that the water delivered by such means, while essential, is almost always expensive and too often of poor quality.

Improving water services requires careful consideration of this hybrid waterscape. Existing datasets on the number of households with network connections or access to improved sources may not adequately capture everyday practices; even citizens who possess a network connection may actually secure supplies from multiple providers. They may approach one type of vendor for water for cooking but purchase bottled water for drinking. Thus, even obtaining estimates of unmet basic needs and household expenditures on water supply may require more disaggregated forms of data than that available from sources such as the Joint Monitoring Program of the WHO and UNICEF.

Improving the quality of service provision, whether within or outside utility-run networks requires closer attention to the incentives (and constraints) of these different types of providers. It is clear that the types of tariff formulae, investors involved, and regulatory frameworks in place influence the extent to which investment occurs and services improve. This is arguably true for utilities as well as SSWPs. It is also clear that privatization and corporatization on their own will not eliminate coverage deficits or other service problems within piped networks. This suggests that scholars and policy analysts should devote considerable energy to considering how to best incentivize non-utility providers to improve the quality of the water they provide and to charge prices that the population can bear. How to best regulate small-scale enterprises or to bring them into partnership with municipal utilities to achieve such goals is a focus of utility reform in several African countries. National and local reform efforts should prioritize finding creative ways to regularize these enterprises, so that they can deliver better services, and not become resistant to utility expansion in areas that they consider their *beats*.

While non-utility providers are here to stay and offer essential services to hundreds of millions, it seems unlikely that even significant efforts to regulate their operations will yield services that can compare in terms of price and quality with those provided by (adequately-run) water utilities. Water utilities are more likely to have the economies of scale to build and operate water delivery and treatment systems, engage in centralized and coordinated efforts to monitor and control water quality, and transfer water over significant distances. Small-scale, alternative providers cannot do any of these things. Utilities, because they service the wealthiest users and service large populations, are at least theoretically able to cross-subsidize services in a way that would be next to impossible for non-networked providers. They may also receive subsidies from the state, which they can use to subsidize low-income households. In addition, monitoring the price and quality of services provided by a single metropolitan utility, or a small number of utilities in a large metropolitan area, is easier than monitoring prices and water quality from myriad small entrepreneurs. Finally, utility-provided water reduces, even when it cannot eliminate, the significant fetching, storing, and rationing burdens associated with several types of non-utility water. For all these reasons, international reform efforts should privilege incentivizing existing utilities to expand coverage and improve services, so that, over time, fewer individuals remain reliant on stand-alone small-scale providers.

Recognizing the hybridity of the urban waterscape in LMICs also provides a crucial lens with which to look at urban politics writ large. How water services are organized is, in part, a reflection of power relations in rapidly growing cities. Every urban household needs water, and cannot simply rely on a well in the backyard. Patterns of access to water of different quality, convenience, and frequency thus reveal a great deal about who has power and influence at the local level. This is especially pertinent for post-colonial cities with a legacy of race and class discrimination, and for cities in which tanker owners and water vendors operate with the implicit backing of local operatives and power brokers. Analyzing decision making within utilities about where to extend service and where to direct flows of water, therefore sheds important light on fundamental questions about who governs the city and who has realized rights to the city in practice. These questions can only become more salient over time, as climate-change induced floods, deteriorating quality of source waters, and higher service expectations from ordinary citizens combine to exert pressure on water utilities around the world.

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Notes

1. Concession contracts can be distinguished from privatizations entailing the sale of a state-owned company and its assets (divestiture), management or lease contracts involving no investment obligations for private operators, and build-own-operate transfer (BOT) contracts, in which private investors built and operated facilities and then transferred them to the public sector.
2. Examining 49 privatized water utilities in Latin America, Andrés et al. (2008, pp. 161–165) found coverage and access increases, but the increases were consistent with existing trends. Clarke, Kosec, and Wallsten (2004) reached similar conclusions for Argentina, Bolivia, and Brazil. Using a quasi-experimental design, Galiani, Gertler, and Schargrodsky (2005) found that private operators performed better than comparable public sector providers on average in Argentina, as did Hailu, Osorio, and Tsukada (2012) in Bolivia.
3. Regarding price increases, Andrés et al. (2008, p. 174) reported that 49 privatized developing country utilities received average real rate increases of 15.7% with privatization and 24% subsequent to privatization.
4. World Bank data suggests that approximately 6% of privatization contracts in the water and sanitation sector have been cancelled prematurely (McDonald & Swyngedouw, 2019). Note that the cancellation of privatization contracts and subsequent returns to public sector management do not involve “remunicipalization” when the state/provincial or national government is responsible for water services.
5. This argument has been applied to well-known cases of early and contentious contract cancellations, such as those in Cochabamba, Bolivia, and Tucumán, Argentina (e.g., Hailu et al., 2012, p. 2565 on Cochabamba).
6. See Herrera and Post (2014) on the creation of national parastatals in the sector.
7. This line of argument builds upon social science scholarship highlighting the unexpected effects of institutional models when they are adopted in new contexts. See Andrews (2014) and Evans (2004).
8. E.g., Muller (2008) on lifeline and increasing block tariffs in the context of corporatization in South Africa, Post (2014) on zone-based tariff formulae in Argentina under corporatized and private sector management, Davis (2005, p. 169) on means-tested consumption subsidies in Chile following privatization.

9. A key exception relates to tariff and subsidy design, where (as noted above) there has been significant debate.

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