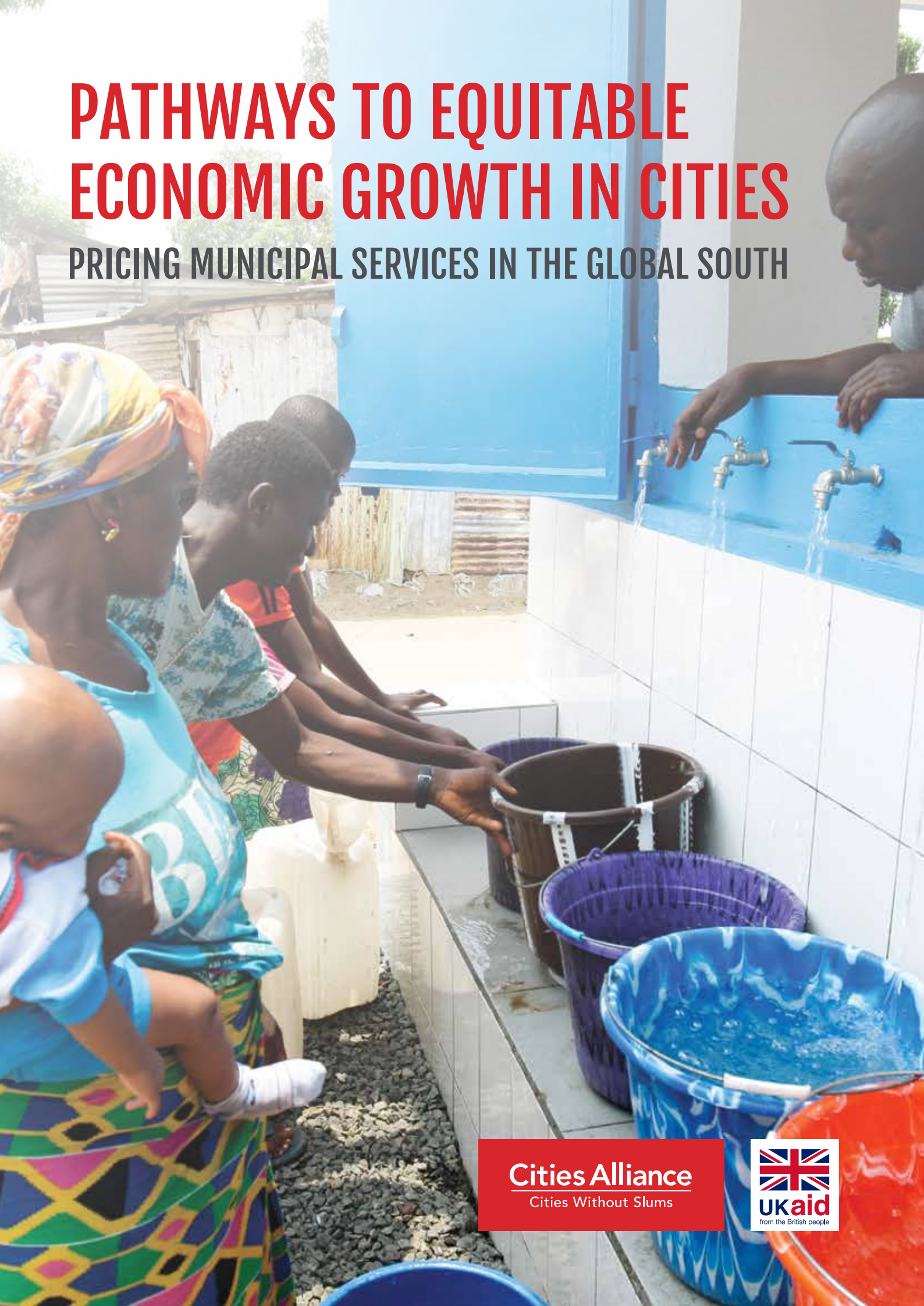
PATHWAYS TO EQUITABLE ECONOMIC GROWTH IN CITIES

PRICING MUNICIPAL SERVICES IN THE GLOBAL SOUTH



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EXECUTIVE SUMMARY

The report adopts a broader viewpoint of the municipal price system not as a set of discrete financial decisions but rather as a reflection of governance arrangements which are deeply embedded in a set of overlapping policy, planning, and operational domains.

Based on the review of the literature on municipal pricing schemes and tariff structures in the global South and the case studies analysed, a persisting supply-side bias is shown, which has guided public finance, international technical assistance, and established practices in the provision of infrastructure services. The demand side has not received an equivalent level of interest and emphasis, although the imbalance is gradually shifting, highlighting new questions and concerns around conventional pricing strategies that were thought to have beneficial effects on access to quality and affordable services.

Institutional arrangements and incentives matter to better pricing performance, but studies that focus on only a narrow subset of conventional variables risk missing influential factors often at the sub-municipal (i.e., community) level. For instance, in the case of low-income cities that urbanise rapidly, price setting occurs through complex mechanisms that often do not involve a single provider, but rather a series of "handshake agreements" between households and small-scale informal providers. In this environment, the sheer number of stakeholders (national operators, local governments, formal-informal private sector, community groups) operating within the provision of one particular service blur the "traditional" lines between public and private responsibilities for service provision. Therefore, it is necessary to develop new knowledge that better reflects the idiosyncratic but historically determined bureaucratic relations, social conditions, and institutional arrangements that bear on the effectiveness of municipal pricing schemes in cities in the global South.

In the second part of this report, the experiences of four countries: Accra (Ghana), Bengaluru (India), Buenos Aires (Argentina), and Cebu (the Philippines), in providing and pricing municipal services, specifically sanitation, solid waste, services, and water in particular cities are illustrated. Using empirical evidence, we confirm that prices rarely reflect environmental and social externalities or the willingness-to-pay of the consumers. In some cases, pricing strategies exclude the most vulnerable or are regressive in nature.

Elements necessary for rethinking pricing from a pragmatic perspective thus must be based on the notion that managing the municipal price system is an information-intensive endeavour that requires the following:

a. Measuring and updating information on ability and willingness-to-pay.

b. Revising lifeline tariffs and other multipart pricing schemes as the nature of demand changes.

c. Dynamic and flexible pricing mechanisms to ration supply to achieve conservation goals and to "price-in" environmental and other externalities, e.g., investments.

d. Transparent policies that clearly identify the sources and recipients of pricing subsidies.

This has implications for the role of pricing mechanisms for achieving greater efficiency, equity, and sustainability:

- If managing the municipal price system is an information-intensive endeavour, categories of cities need to be treated differently within national pricing policies. More pricing and revenue autonomy should be granted to better-performing cities enforcing regulations or meeting performance standards in national policy. For cities where financial management performance is low, national and higher subnational governments must invest in technical capacity. While technical capacity is likely to be associated with city size, the relationship may not be entirely linear in the global South.
- Finally, even where the calculation of marginal and average costs is technically feasible, and relevant variables are incorporated (e.g., inflation in factor prices), adjusting prices to reflect these costs depends on local political economy factors which play out within a set of dynamic, non-linear relationships — political influence, extending from global to local levels, matters. If local governments must seek approval from higher-level authorities to raise service prices, reform initiatives must consider the coordination costs involved in the process.

Changes to pricing schemes, even when they are far below cost-recovery levels, generate both intended and unintended consequences — these need to be adequately considered and properly communicated to all stakeholders during pricing reforms for urban services.

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Abbreviations and Acronyms

AASA	Aguas Argentinas S.A.
ADB	Asian Development Bank
AySA	Agua y Saneamientos Argentinas S.A.
AMBA	Metropolitan Area of Buenos Aires
BBMP	Bruhat Bengaluru Mahanagara Palike
CABA	City of Buenos Aires
IBT	Increasing block tariffs
INDEC	Instituto Nacional de Estadística y Censos
MCWD	Metropolitan Cebu Water District
MSW	Municipal solid waste
O&M	Operations and maintenance
OSN	Obras Sanitarias de la Nación
PPP	Purchasing power parity
SWM	Solid waste management

1.

FORMULATING EFFECTIVE MUNICIPAL PRICING POLICIES TO FOSTER EQUITABLE ECONOMIC GROWTH: AN INTRODUCTION

Providing municipal services to growing populations in rapidly urbanising cities continues to be a difficult challenge. The supply of local services through public provision has not kept pace with continuous urban demographic growth since the late 1950s, when the end of the colonial period in Africa and Asia led to accelerated urban growth. The spatial distribution of urban growth across national territories has gone far beyond national capitals and now extends in many countries to secondary cities that barely existed several generations ago (Roberts 2014). As demand has changed, both in quantity and quality of services for water supply, sanitation, electricity, transport, solid waste management (SWM), environmental services, housing, education, and health, countries and cities have experimented with new institutional forms and pricing policies in response.

In many cities, these institutions included single-sector agencies, such as water boards in India or water supply agencies in Anglophone Africa and Latin America. Their primary challenge was to remain financially viable as the demand for the expansion of their services grew on a daily basis. Experiments with the provision of water supply occurred in many countries, yet even with an enormous increase in water supply recipients during the UN's International Drinking Water and Sanitation Decade of the 1980s, with 550 million people receiving water supply, at the end of this decade more people did not have water than in 1970. Population growth and explosive demand outstripped the institutional capacity to provide water.

Over time this reality led to the integration of water supply and sanitation in municipalities, taking advantage of the obvious benefits of closer municipal management of project investments and operations. The concern to maintain positive financial balances was accompanied by efforts to estimate affordability, to develop low-cost technologies, to design cross-subsidy schemes and differential pricing, and later, in the late 1980s and 1990s, to undertake privatisation of water supply and other services under the assumption that private management of municipal services could be more efficient. But this also proved illusory, for reasons having to do with unrealistic pricing policies, the perceived obligation of private firms to provide the expected financial returns to private capital and shareholders, and contractual flaws such as the absence of specific obligation of service coverage expansion and a clause preventing a company's excessive return in equity.

This agenda was further complicated by growing awareness of the environmental costs associated with using existing water sources, avoiding pollution, and finding safe places to dispose of liquid and solid waste. No longer could the profit motive be an acceptable rationale for private management of municipal services, as urban residents became increasingly vocal about the need for sustainable environmental management, even if this goal was difficult to articulate, measure, or deliver.

The challenge of formulating effective municipal pricing policies has been complicated by global macroeconomic volatility, as many countries have been unable to adjust to continuous changes in the global economy. On the one hand, municipalities have become increasingly dependent on central government financial transfers. On the other hand, those same central governments have frequently found themselves with limited financial resources

and facing international demands for financial austerity. Municipalities have not been considered the "favourite sons" of national governments. The promise of decentralisation of the 1980s has not been accompanied by the necessary financial resources. Own-source revenues have been scarce in practically all countries.

This evolving situation has led to what might now be understood as a "municipal pricing crisis". What kind of pricing is appropriate for what kind of services in what kind of urban areas? This is clearly not a one-size-fits-all situation. Rather, municipal authorities must develop approaches to pricing that make economic, financial, and social sense in their own communities.

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The challenge to municipal authorities, however, is now much more complicated because they are also called to reconcile the need for equity and efficiency simultaneously. Services must be provided for the poor and socially excluded while at the same time, assuring services needed to increase economic productivity. The list of objectives grows faster than either the solutions or the efforts to achieve them. The pressure of climate change adds new urgency to these dilemmas.

The overarching objective of this report is to examine the relationship between pricing principles, policy, and approaches to equitable citywide municipal service delivery, in order to provide guidance on how local governments can use price-setting powers to support equitable economic development at the local level. This report is not intended to conduct in-depth sector analyses, but its aim is to identify and analyse key common factors and issues that affect municipal service pricing mechanisms across sectors and their impact on economic efficiency, financial sustainability, and equity.

The approach outlined in this report focuses on the critical links between pricing principles, access to services, and the realisation of equitable economic growth for cities. Allowing cities to better exploit agglomeration economies through flexible and differentiated pricing policies will not only enhance economic growth but can result in growth that yields a better distribution of benefits for the world's most vulnerable populations. Differentiated pricing policies are not the same as differential tariffs based on income, but rather imply flexibly tailoring policy provisions based on the unique characteristics of different types of urban agglomerations (e.g., metropolitan regions vs. rural municipalities).

A proactive and intentional pricing strategy that drives changes in urban service delivery is a basic condition for inclusive growth in cities. Laissez-faire approaches do not work; opportunities have to be effectively managed. In this view, pricing mechanisms constitute an instrumental policy tool for the improvement of access to local public services and the promotion of physical and social mobility and interaction, information flow and knowledge spillovers occurring in cities.

The methodology used to respond to these questions and the larger objective is twofold, beginning with a literature review and then proceeding to case studies. First, we summarise the theoretical and conceptual literature on pricing mechanisms in the context of municipal service provision. This analysis predominantly focuses on the selective literature on pricing mechanisms in municipalities of the global South across different types of services, while also referring to insight from past and current experiences from cities in the global North. The objective of this overview is to present common practices and discuss strategies in pricing

approaches for different services, considering potential trade-offs in efficiency, equity, and sustainability. This review is presented in Chapter 2 of this report.

In the case study section, municipal approaches to pricing for specific service types are illustrated. The purpose of the case studies is to highlight the diversity of possible institutional arrangements and pricing options that municipalities have adopted and the outcomes that choices have had on different dimensions of equitable development. The case studies indicate the importance of contextual factors in relation to pricing mechanisms and emphasise the absence of one-size-fits-all solutions in pricing municipal services. The case studies are presented in Chapter 3.

The enormous variety observed in the institutional architectures of the case studies, as well as the wide range of coordination challenges to be addressed in delivering municipal services, make it unrealistic to derive a single pricing model and decision-making process that municipalities should follow. However, this does not alter the basic conclusion that current pricing strategies insufficiently target and support the most vulnerable and tend to generate new (or reinforce existing) inequality in cities.

Chapter 4 identifies common challenges across the case studies and identifies a series of recommendations for different levels of government. Most importantly, it emphasises the need for different levels of government, international agencies, and the research community to better understand the real nature of urban demand for municipal services in the global South. The ultimate aim is to help municipalities to diagnose their own needs and identify their own pathways to knowing best what is realistically achievable, rather than present strong policy recommendations that can quickly appear out of context.

FIGURE 1: Waste picking in Monrovia, Liberia. Cities Alliance 2019

2.

THE MUNICIPAL PRICING SYSTEM: BASIC PRINCIPLES AND PRACTICE

Recent assessments of both city-level case studies and cross-country analyses have revealed continuing gaps between the normative theory of municipal finance and practice in the global South (Smoke 2008; Bahl et al. 2013; Smoke 2014). These gaps relate specifically to the practical political and institutional complexities that slow price increases for specific services and reduce or erase incentives to intentionally design pricing schemes for municipal services around location-specific characteristics and drivers of demand at the neighbourhood level.

Basic principles for assigning expenditures and revenues to local governments are relatively well defined, if not broadly used for selecting local revenues to fund the supply of municipal services and finance capital expenditures (Bahl and Bird 2008; Bahl and Bird 2018). For instance, municipal finance experts generally agree that user charges and fees should play a more prominent role in financing urban services delivery (Downing 1992; Bird and Tsiopoulos 1997; Bird and Slack 2017). The reasoning is relatively straightforward: local governments are responsible for the provision of specific services like water supply and public transport that yield direct benefits, which can be measured and billed to individual consumers. By the start of the 21st century, "wherever possible, charge" had become a mantra within the conventional guidance provided to urban governments in the global South (Bird 2001, p. 120).

Conventional municipal finance theory advances a variety of reasons for greater use of user charges or fees to finance urban services delivery. First, like local taxes, user charges or service fees provide urban governments with much-needed revenue to fund the supply and expansion of local services. For any service provider (public or private) working in cities, a reliable and consistent revenue stream (i.e., positive cash flow) opens many opportunities. Revenue from user charges/fees provides the basis for mobilising capital funds from the private sector, creates the stability needed to diversify procurement markets serviced by small firms in the informal sector, and facilitates longer-term financial (including personnel management) and spatial planning that is essential to steering rapid urban growth.

Second, when user charges are set as equal to marginal costs (i.e., the cost of producing an additional unit of the service), they serve as a signal that carries information useful for urban investment project planning.[1] If residents or enterprises pay for municipal services at prices that are equal to or above marginal cost, they value them. Their consumption signals to municipal governments that, when existing capacity is reached, the output of the service should be expanded. Better pricing is also connected to accountability for local service delivery. Service charges that cover marginal costs help make the connection between cost and consumption more transparent for residential and commercial consumers, providing information useful to make informed assessments of the performance of entities responsible for service delivery.

[1] *Under some conditions, marginal costs can fall below average costs, with service producers at risk of bearing large losses (e.g., costs related to upgrading trunk infrastructure). Fundamentally, effective pricing practice for municipal services is based on the accurate estimation of financial, economic, and environmental costs at the investment project level (Prud'Homme 2005). Because of space constraints, this review will not go into technical details of methodologies and approaches to costing urban services. See Jenkins et al. (2011) for a textbook treatment of investment project costs. Bird (2001) provides a summary review of the three main approaches to costing: marginal cost, average cost, and average incremental cost.*

Municipal governments, utility managers, and financial planners rely on pricing measures for a variety of purposes.[2] To broadly organise, these purposes include the following:

- Generate revenue which can then be allocated to essential public expenditure functions, such as new capital investment, operations (including salaries) and maintenance, and debt repayment obligations.
- Allocate or ration the use of infrastructure facilities and other common-pool resources in urban areas between different uses and users.
- Signal both short- and long-term adjustments to the composition of public investment and spatial concentration of urban development.
- Shift local preferences for different municipal goods and services.
- Increase the range of choices available to the public and influence the distribution of real income in urban areas.
- Channel subsidies to more transparently target the most vulnerable populations.

Ideally, these purposes are pursued by incorporating the basic elements of municipal pricing schemes and sector-specific tariff structures into unique combinations that balance local demand and local costs.[3] In addition, the pricing schemes and tariff structures need to consider the whole city and take all citizens into account. From the perspective of local governments, the following are relevant criteria[4] that shape the design of a tariff structure:

- Institutional: What information is admitted into the process of determining price levels and tariff structures? Who has decision-making authority?
- Administrative: Who enforces pricing regulations? What are the enforcement procedures? What are the metering and billing procedures?
- Economic: What is the distribution of income in the urban area? What are the price and income elasticities of demand for specific services?
- Spatial: Who (residential/commercial) is located where? What are the topology and geography of the city and the built environment?
- Technology: What technologies are available to deliver supply? What are the metering and billing technologies available?
- Financial: What are the interest rates for private/public borrowing? What is the cost of equity? What are the inflation rates?

The design and implementation of pricing measures for municipal services are typically guided by four normative objectives: full cost recovery, economic efficiency, equity, and administrative simplicity.[5] Cost recovery goals can range from the full supply cost (O&M + capital charges), to the full economic cost (supply cost + opportunity costs + economic externalities) to the full cost (supply cost + economic cost + environmental externalities) (Rogers et al. 2002). Efficiency is generally evaluated along two dimensions: minimising distortions of economic decision-making by individuals and firms and increasing the correspondence between cost and consumption. Equity carries an array of different meanings but frequently is reduced to ensuring that users pay for the benefits they receive (benefit principle), which also contributes to efficiency, or that users pay according to their means (ability-to-pay principle) (Barberán and Arbués 2009). Administrative simplicity is understood as avoiding complicated designs that are either costly to administer or distort tariffs as a price signal that communicates information to influence consumer behaviour.

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[2] *See Thompson (1968) for an early and concise explanation of the potential uses of municipal prices as a tool for city management.*

[3] *Similarly, because of space constraints, this review assumes basic understanding and therefore will not unpack the various charges that make up the core elements of tariff structure, such as connection charges, fixed charges, volumetric charges, block charges, and/or minimum charges.*

[4] *In addition to these criteria, national governments with substantial pricing responsibilities are often interested in unit cost differentials for labour and material inputs across urban areas.*

[5] *These objectives are described in detail in Bahl and Linn (1992), but their origin is in classic welfare economics of the public sector (Musgrave 1959).*

Finally, user charges, fees, and other pricing measures are considered an important part of the *overall* local government revenue base adequate to finance public expenditure functions assigned to local governments. Pricing measures for specific municipal services cannot be divorced from the local revenue assignment, which is deeply embedded in the national fiscal system (Martinez-Vazquez and McNab 2006; Smoke 2015). National fiscal frameworks include the division of functions within the intergovernmental institutional structure, intergovernmental funding arrangements, and sector-specific and general-purpose financial management regulations covering urban investment and municipal operations. Interactions between powerful stakeholder interests and decisions within various components of the national fiscal system contribute over time to formalising de jure policy frameworks for pricing municipal services. These interactions also give rise to incentives that shape the design intentions of local financial planners and de facto pricing practices by municipal authorities (Smoke 2014).

The sheer diversity of countries and municipalities mean that it is possible to discern and highlight only a few trends in municipal pricing policy and practice over the past few decades. Importantly, the inability to expand the provision of services in cities in lower-income countries and their informal urban areas for low-income households has been a persistent worrying trend. For instance, in sub-Saharan Africa, most urban residents lack access to basic sanitation. Sanitation conditions in urban areas of the region have improved only slightly, and most of these improvements were the result of private household investments in non-networked sewerage infrastructure (WHO/UNICEF 2017).

Against this backdrop, core concerns around cost-recovery performance, cash deficits, and the debt position of municipalities and utilities remain unchanged. However, new concerns like environmental externalities and climate change have gained prominence among various sustainability issues in the urban infrastructure sector (CCFLA 2015). The 2016 Water Industry Report found that concern over these issues is driven primarily by water industry providers, although they are increasingly acknowledged by managers of water-only systems and integrated water, wastewater, and stormwater systems (Black & Veatch 2016).

Regarding specific tariff structures, there has been a noticeable shift over the past three decades from uniform volumetric and flat-rate structures to tiered pricing schemes in the urban water sector. Increasing block tariffs (IBT) are now being used in a majority of low- and middle-income countries (GWI 2018). Tiered (or multi-part) pricing approaches force customers to pay a marginal price that changes with the quantity consumed. A common feature of IBTs, used to balance cost-recovery concerns with equity objectives, is pricing the first block of consumption at a "lifeline" rate (sometimes even free) to ensure that urban water services are affordable for the poorest residents. Increasing block tariffs are also thought to provide a lever to manage water conservation efforts by setting higher prices for the highest consumption blocks. Finally, in contexts where higher-income households or firms use more water than low-income households, IBTs can help cross-subsidise service costs for poor households.

Recent global and cross-country assessments of water tariffs report consistent cross-subsidies from commercial to residential consumers, with average residential charges totalling around 1.5% of household income (Hoque and Wichelns 2013). Evidence on the equity impacts of IBT structures, however, reveals a more complicated and nuanced picture. Some experts contend that the assumptions which underpin the use of IBTs — that the poor use less water than the rich — are incommensurate with a more complex reality on the ground and therefore should

[6] *In a recent modelling exercise published in World Development exploring the impacts of a shift from uniform volumetric tariff to an IBT, Nauges and Whittington (2017) found that when cost recovery is low, IBTs do not target subsidies to the poorest households. Moreover, a shift from uniform volumetric to increasing block pricing introduces additional losses in economic efficiency.*

not guide pricing decisions (Whittington et al. 2016).[6] Empirical studies support these concerns. In an analysis of the incidence of subsidies for water delivered through an IBT in Nairobi, Fuente et al. (2016) found that high-income and nonresidential customers receive a disproportionate share. In South Africa, the Provincial and Local Government Department noted that a large number of non-poor households access subsidies, severely hampering the feasibility of subsidising lower-income households in these municipalities (Department of Provincial and Local Government, South Africa, 2012).

Still, for the urban electricity sector, many experts see promise in tiered pricing schemes for more aggressive demand management in the quest to reduce greenhouse gas emissions and accelerate investment in renewables. The introduction of a new tiered residential electricity pricing system in 2012 in China increased marginal prices for the second and third blocks. The reforms have been successful in curbing residential consumption, with the effects largest among those households with the highest income and largest expenditures on electricity (Zhang and Lin 2018; Du et al. 2015).

As tiered pricing schemes have become more common in the global South, recognition of the need to simplify tariff structures to ease administrative costs and make pricing more transparent for consumers has grown. Dovetailing with concerns over cost recovery, the emphasis on pricing transparency and tariff simplification has fuelled interest in "smart cities" technologies — low-cost digital sensors, meters, controllers, and servers — used to bill for consumption and monitor demand in "real-time" (Marvin et al. 1999; Glasmeier and Christopherson 2015). While sizeable smart-city programs are being implemented in countries across East Asia, South Asia, and Africa, the evidence of their impact on prices and broader urban service delivery outcomes is inconclusive.

If information and communication technologies are to have an impact on basic objectives like cost recovery, they must overcome a daunting set of systemic pricing challenges. For instance, prices charged for *formal* urban services remain far below even the minimal costs of operations and maintenance. Table 1 presents cost-recovery performance for a sample of 120 water utilities in Africa (van den Berg and Danilenko 2017). Cash flow-based operating cost recovery is the most important performance indicator for local service delivery. As the data demonstrate, the median performance in both low and middle-income countries is a negative cash flow state. Even at 133% of operations and maintenance (O&M) costs, the top 10% of performing water utilities in middle-income African countries do not perform well enough to generate sufficient surpluses to finance capital charges for system expansion independently.

TABLE 1: Cost Recovery among bottom and top-performing water utilities in Africa.

Variable	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%
Operating cost recovery (billed revenues as % of O&M costs)					
Low income	73	88	100	115	136
Middle income	79	83	105	136	144
Cash-flow-based operating cost recovery (collected revenues as % of O&M costs)					
Low income	42	59	79	95	110
Middle income	60	76	92	113	133

Source: van den Berg and Danilenko (2017, p. 22).

Underpricing of urban infrastructure services threatens the financial position of service delivery units, compromises efforts to conserve scarce resources used as inputs in urban service production, and effectively constitutes a hidden subsidy for wealthier, serviced residents. With cost recovery among urban services so low, local governments and private service delivery agencies remain dependent on subsidies from national and higher subnational governments (e.g., states, provinces). For instance, in the municipal solid waste (MSW) management sector, local governments receive transfers or subsidies of between US$4 and US$10 per capita per year (World Bank 2018, 107).

While there is considerable variation in the design of national subsidy programs across urban service sectors, the failure to recalibrate and improve targeting over time leads to an array of unintended consequences. Although subsidy programs are nominally intended to benefit the urban poor, they typically can introduce distortions to decision-making that subvert normative objectives. For instance, in Colombia, there is some evidence that subsidies to urban electricity firms have deterred investments in informal settlements, in part, because firms receive fiscal transfers that surpass the true cost of providing electricity service to areas without networked supply (McRae 2015).

2.1. Decentralisation, governance, informality, and secondary cities: key neglected aspects of the pricing challenge

As noted in the introduction, the importance of small and medium-sized cities in the global South has changed significantly over the past three decades. Although future population growth is expected to be concentrated outside of large metropolitan agglomerations, secondary and intermediary cities are already lagging behind in terms of per capita income (Cities Alliance 2019). Research on the distinct municipal pricing challenges and opportunities faced by municipal authorities in secondary cities, however, remains limited.

National governments face difficult political and administrative challenges when considering how to treat different categories of cities differently in pricing schemes and other financial regulations (Bahl 2012). Not all pricing mechanisms are feasible in small and medium-sized cities. Most national governments rarely distinguish between cities of different sizes in policy frameworks, regulatory guidelines, and subsidy programs (Fedelino and Smoke 2013).

Recent studies of local service delivery highlight that the size of the urban agglomeration matters for determining a viable and practical approach to improving the municipal price system (Boex and Edwards 2014). Geographic location and population size, including heterogeneity of preferences, determine both the magnitude of expenditure requirements and complexity of demand for different services, as well as relative ability to finance the cost of service delivery (Slack 2011). For instance, for charges to finance urban transport, Pojani and Stead (2015) suggest that taxes on fuels are recommended for smaller developing cities, on the grounds that they are easier to administer than alternatives such as congestion pricing. However, what is appropriate for public transport pricing in metropolitan Manila might be inappropriate for the municipality of Magdalena.

A common observation is that small and medium-sized cities in the global South have less human resource capacity compared to primary cities, although the relationship in some country contexts is unlikely to be linear (Global Urban Futures Project 2018). Based on assumptions of lower relative capacity, one

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approach is that only those tariff structures with the smallest monitoring costs should be considered for small and medium-sized cities. An additional consideration is whether the relevant local authorities have the capacity to manage opposition from potential losers (in the short term) after changes in tariff structure hit consumers through changes in price levels (Fjeldstad 2004; Devas and Kelly 2001). New metering and billing technology used by large city governments can be a useful tool to communicate the costs and benefits of service delivery to households and firms connected to the formal utility network. These technologies, however, are not a substitute for the longer-term challenge of fostering financial and technical capacity in small and medium-sized cities and getting the politics of change right.

For example, if procedures for earmarking revenue are not in place to channel revenue from a fuel tax into public transportation and better infrastructure for pedestrians, the administrative simplicity of the fuel tax may not, on balance, make up for the costs of managing opposition to higher fuel prices. At a more general level, lower capacity in small and medium-sized cities tends to produce a set of indirect effects that have far-reaching consequences. For instance, the inability to accurately assess service usage, install metering technologies, and manage billing systems reduces the perceived creditworthiness of smaller localities and can prevent them from accessing private capital at affordable rates (Roberts 2014).

If changes to elements of the tariff structure result in price increases that redistribute real income away from the poor or are perceived as unfair, households and businesses might face affordability problems and take out their frustration on political incumbents in the next election. Favourable economic growth rates present secondary cities with options for offsetting potentially negative distributional impacts of higher prices on the poor through cross-subsidies between residential and commercial consumers. On the other hand, the application of strict efficiency criteria cautions against charging commercial/industrial consumers at higher rates to subsidise residential consumption. If employment and economic growth are based on outputs from a limited number of industrial firms (or firm clusters), high levels of cross-subsidies risk prioritising cost relief in the short term over potential long-term economic stability and benefits. More research is required to understand the factors that influence the extent to which productive and profitable firms in secondary cities can bear the cost burden of cross-subsidies to the residential sector.

The economies of secondary cities, however, are also vulnerable to financial and economic instability and external trade shocks (Cohen 2012a; Cook 2012). If economic growth slows, smaller cities often have limited scope for adjusting prices. Because the literature on municipal pricing in secondary cities in the global South is limited, more research and evidence are required to understand how tariff structures (or even broader local revenue system designs) in secondary cities perform following domestic, regional, or global shocks.

A second issue that has been neglected is the extent to which decentralisation and privatisation have added levels of institutional complexity that exceed the assumptions that have guided more conventional approaches to pricing practice. Compared to earlier periods of centralised, state-led development in the global South, three decades of decentralisation and privatisation reforms mean that pricing decisions by urban governments occur in an environment characterised by significantly higher levels of institutional heterogeneity. Decentralisation theory and policy advice argued that the allocation of expenditure and revenue administration responsibilities should be based on an efficiency model of incentives and comparative advantage between levels of government. This advice was broadly guided by the notion of subsidiarity (Oates 1972): expenditure and pricing responsibility should be transferred to the lowest level capable of efficiently managing them (Ambrosanio and Bordignon 2015). However, evidence from the past 30 years of experiments suggests that the benefits predicted by the standard efficiency model can be obtained only over the long term. In the short term, there are considerable costs to decentralisation that must be managed to prevent unintended and undesirable consequences (Smoke 2015).

As cities grow, large upfront capital costs that are essential to expanding local services for the poor, mitigating the negative consequences of higher densities, and facilitating knowledge spillovers (i.e.,

> As cities grow, large upfront capital costs that are essential to expanding local services for the poor, mitigating the negative consequences of higher densities, and facilitating knowledge spillovers (i.e., productivity growth) are not easy for municipal authorities to finance at the city level, particularly in the global South.

productivity growth) are not easy for municipal authorities to finance at the city level, particularly in the global South. National governments can typically mobilise fiscal resources to investment decisions and the labour market with fewer distortions than can local governments (and prevent harmful inter-jurisdictional tax competition), hence the prevailing justification for retaining the most productive taxes at national levels and financing local service expansion through intergovernmental transfers (see, for example, Boadway 2001). In theory, business taxes and land taxation could be used to finance public goods, but doing so is often difficult in practice.

While decentralisation and privatisation have expanded the range of stakeholders in the delivery of urban infrastructure services and, in many cases, strengthened the capacity of municipal governments to solve problems, data indicates they have not improved the resource mobilisation capacity of local governments. Many of the practical coordination problems and decision trade-offs in pricing policy and practice stem directly from institutional complexity, which tends to increase during the transition from centralised to decentralised provision of urban infrastructure and services (Annez and Buckley, 2009)

For a variety of reasons, decentralisation can make it more difficult for national fiscal policy to adequately incorporate the investment needs of cities. In countries with high levels of external debt, structural adjustment programs often hit hardest in urban areas. For instance, strict cost recovery targets mandated by finance ministries and utility regulators can incentivise inappropriate pricing practices at the local level that bolster or undermine the achievement of normative objectives for urban service pricing (Felgendreher and Lehmann 2016). As local government responsibilities have increased without improvements in their own-source revenue base, efforts at changing municipal pricing policy and improving local practice now also require substantially more vertical coordination to manage political economy factors in the intergovernmental transfer system.

Still, there is ample evidence showing that fiscal decentralisation has incentivised better horizontal coordination between municipal governments, residents, and businesses. For instance, though not widespread, participatory budgeting gives urban governments a mechanism to tailor distinct but essential appeals to different income groups. Examining the case of Porto Alegre, Brazil, Schneider and Baquero (2006) found that participatory budgeting allowed local governments to increase taxes on wealthy households and channel the funds into financing the expansion of services among the poor.

At the local level, the selection and use of normative criteria to guide decisions around raising prices and infrastructure financing are mediated by institutional relationships and financial performance that span a diverse array of "third-party" entities operating in the city. Pricing decisions must necessarily involve these other actors, although they may not always be guided by the same normative criteria. In a study of pro-poor water governance in Bengaluru (Bangalore), India, Connors (2005) mapped how the cost of capital investment for new street-level water infrastructure was inefficiently divided between many different stakeholders. Residents paid upfront materials and labour costs for connections to the network. The water utility received funds ("deposit contributions") for distribution pipes from either the metropolitan development authority (Bangalore Development Authority), the city government, Bruhat Bengaluru Mahanagara Palike (BBMP), or the slum clearance board (KSCB). Finally, land developers paid a one-time tax on the value

of land ("infrastructure cess") to fund new trunk pipes. Under such arrangements which are common in South Asia, no single actor has the relevant mandate to steer this model fully into slum settlements.

Throughout much of the past three decades, privatisation of urban infrastructure and service delivery was advanced in tandem with decentralisation. In the 1990s and early 2000s, for example, new perspectives on urban infrastructure provision that focused on the potential "unbundling" of monopoly services typically provided through networked infrastructure systems effectively advanced much stronger notions of market competition in urban infrastructure policy and practice (Kessides 1993; Graham and Marvin 2001).

In contrast to public agencies and service utilities that were protected through political incumbency, firms in the private sector were thought to have knowledge of the market that would give them an advantage in terms of sensitivity to demand. Neoliberal governments and multilateral organisations expected that the profit motive would create stronger incentives, which would ensure that services were extended to the mass of customers who remained unconnected to services under state-led provisioning. Better accounting practices, along with corporate equity, were predicted to open urban infrastructure provision to domestic and international capital markets, which were thought to be more trusting of private firms that could better manage risks and secure the net positive cash flows that were required to service debt with long maturities.

The promise that the private sector could bring much-needed financing and ensure access to water and sanitation for those in need has not materialised (Lane 2012). Despite initial enthusiasm for the privatisation of utilities, by and large, the approach has failed to serve those populations most in need. In their 2003 study, Budds and McGranahan argued that privatisation had achieved neither the scale nor benefits anticipated in the water and sanitation sector. In a later study, Hall et al. (2011) concurred, noting that the privatisation experiment had failed to generate significant amounts of investment and that there had been considerable public resistance to private companies. This failure was reflected in the significant losses in terms of health, productivity, and loss of human dignity, with a massive disease burden associated with the absence of essential services (Prüss-Ustün et al. 2008; Bartram and Cairncross 2010).

Few empirical studies have documented efficiency gains from privatisation (e.g., Estache et al. 2001). Where there were efficiency gains, for instance in Latin America, they were concentrated in the initial years after regulatory reform, before companies were required through regulation to pass the value of these gains on to customers through tariff reductions, as in later years. Estache et al. (2005) reviewed the literature on productivity improvements from infrastructure sector deregulation and found little evidence for a difference between public and private sector ownership. More importantly, in some sectors, upwards of 75% of contracts had to be renegotiated. Data indicates that the rate of privatisation has been slowing since the late 1990s, due to a combination of underestimated risks and overestimated profits.

Nonetheless, the urban infrastructure sector receives continued encouragement and financial support from multilateral financial institutions. The settlements most in need of improvements in water and sanitation provision tend to be those that are least attractive to private investors and operators, however. This is reflected in distinct regional, national, and sectoral trends that indicate formal private-sector participation is concentrated in wealthier and more populous areas, while low-income areas are avoided (Bakker 2013). Thus, despite the forecasts of some actors in the international development arena, substantial finance mobilised by the private sector for improvements in these low-income areas has not materialised. Furthermore, after an initial wave of activity across the globe, private companies have selectively withdrawn from some regions to focus on higher profit, lower risk regions, countries, cities, and even

The promise that the private sector could bring much-needed financing and ensure access to water and sanitation for those in need has not materialised (Lane 2012).

neighbourhoods (Bakker 2013). Hall et al. (2011) formulated a similar conclusion, noting that private sector investments were heavily skewed away from the areas of need — sub-Saharan Africa and South Asia — while the greatest share of investments have been concentrated in infrastructure sectors other than water and sanitation.

A third issue that has been relatively neglected is urban informality. In some respects, the decentralisation, deregulation, and privatisation dynamics that were influential in the 1980s–90s led to losing sight of complex realities on the ground. McGranahan and Satterthwaite (2006) observed that the strong emphasis of a "binary" choice between either private or public provision diverted attention from what may well be a far more important issue, which they encapsulated in a less ideological and more operational question: "how to ensure that both private and public operators can be made to provide better services to low-income areas, and how to find other means for improving water and sanitation for deprived households" McGranahan and Satterthwaite (2006, p. 7).

Two characteristics of the urban reality in the global South are important to note. First, in many cities in the global South, pricing decisions driven by normative criteria of cost recovery or affordability are made in a local context where over half of the city population does not have access to networked infrastructure. Second, cities in low-income countries have large informal economies that are difficult to tax. The latest figures from the ILO suggest that formal employment is the exception, while informality is the norm in the global South: 76.3% of urban and non-agricultural employment in Africa is informal, 47.4% in Asia and the Pacific, and 35.8% in the Americas (ILO 2018). Overall, 93% of the world's informal employment is in the global South (ILO 2018).

Informality in urban land and labour markets, often perceived as a natural outcome of accommodating rapid population and economic growth, undermines a myriad of elements of traditional local finance, including land taxation, recorded real estate transactions, and transparent market-based land valuations (Annez and Buckley 2009). For some sectors like SWM, however, many municipal authorities also exploit informal labour markets and informal workers to reduce the costs of municipal service provision (World Bank 2018). The presence of informal service providers provides a lever for local governments to foster more inclusive employment growth and regulation, but only if the intention to do so exists by mayors and local elected officials.

Some cities have found that small-scale, community-based technologies are more effective in meeting needs than more capital-intensive major extensions of networked infrastructure.

The rapid and widespread expansion of municipal service providers operating in the informal sector is driven by complex factors. As the urban infrastructure backlog has built up over time, planning and engineering challenges of delivering supply to high-density informal settlements have become more complicated. Some cities have found that small-scale, community-based technologies are more effective in meeting needs than more capital-intensive major extensions of networked infrastructure. For instance, due to intermittent service, low-income households in Cochabamba, Bolivia, satisfy their water consumption through both public and also small-scale private or cooperative providers (Rocha-Melogno et al. 2018).

While there have been some successes around increasing the viability of different small provider business models in the informal sector, the failure of urban utilities to invest in service expansion into slum settlements has inevitably led to high-cost, low-quality service delivery environments. For instance, in the residential water sector in Nairobi, Mombasa, and Kakamega, Kenya, Gulyani et al. (2005) found that the standard prescription to "price water and create water markets" is, in itself, insufficient to improve service delivery. They note that without appropriate institutional arrangements, technical solutions do not succeed in delivering an affordable service to the poor. They also show that tariffs are limited and are only a partial tool for influencing service delivery. Furthermore, charging cost recovery-level tariffs does not automatically result in financially solvent utilities that deliver

a good service. Gulyani et al. (2005) reported that even when utilities delivered water at a highly subsidised tariff to kiosks used by the poor, this did not translate into low purchase prices for the poor.

In this environment, the lines between public and private provision are blurred through the multiplicity of actors (national operators, local governments, formal-informal private sector, community groups) operating within the provision of one particular service. More importantly, in practice, levels of competition in water, sanitation, and SWM observed (but rarely documented) in cities in the global South complicate the core propositions used to justify guidance on the role of the public sector: market failure, lumpy investment requirements, and spillover effects on non-users. In a review of 45 water utilities from 23 countries in Africa, Banerjee et al. (2010) found considerable activity in secondary "resale markets," with informal water providers drawing supply from public stand posts and selling at much higher rates than those paid by small residential customers connected to the formal network.

On the other hand, competition in service delivery systems is not neatly divided between elected local governments, utilities, and private providers. In the case of low-income cities that urbanise rapidly, much of service delivery and price setting occurs through complex mechanisms that often do not only involve formal contracts, but also a series of "handshake agreements" between households and small-scale informal providers. What are the implications of such competitive dynamics in local service delivery environments for the use of pricing measures to reach the urban poor? With urban water supply, for example, where some quantity of water is delivered through resale markets, such arrangements might subvert the equity objectives strongly associated with increasing block tariffs.

While the presence of resale markets suggests a perceived profit-making opportunity, some empirical studies document a range of motives held by resellers beyond profit maximisation. From a survey of 200 water resellers in Maputo, Mozambique, Zuin et al. (2014) reported motivations ranging from satisfying appeals from neighbours without water connections to strengthening reciprocal communal ties in anticipation of receiving help in the future. On the other hand, in cities that use an increasing block tariff and where water reselling helps close a large proportion of the supply gap, resellers would likely capture the subsidy in the IBT intended to secure the affordability of the service for the poorest residents. Because of data limitations, it is not possible to quantify the extent of inequality from pricing that arises under such conditions. Nevertheless, these conditions are extensive in many African cities. All else being equal, residential end-users receiving supply from water resellers would continue to pay higher unit prices for water than would those households connected directly to the utility network.

2.2. Assessing options for changing municipal pricing

There is no universal, one-size-fits-all approach to a pricing policy that simultaneously achieves the objectives of ensuring economic efficiency, social equity, and cost recovery. Whether decisions are primarily under the purview of national ministries, service utilities, elected municipal governments, private infrastructure operators, or some combination of each, certain approaches to pricing policy make more sense than others. As a starting point, assessment of the various options for changing price levels, tariff structures, exemptions, and subsidies must be narrowed in line with relevant features of the local context.

A summary of lessons from the last 30 years of research might include the following observations:

- There exist many opportunities to improve the application of basic economic principles and practices to municipal pricing, but many factors at the community and inter-municipal scales make such efforts a challenging and complex endeavour.
- While economic theory envisages that municipal prices *should* function as an influential management tool, in practice they only do so under very specific

conditions, which often are not present in cities in the global South.

- Because these ideal conditions are not present, there are sometimes obvious and sometimes hidden trade-offs between the normative objectives (cost recovery, efficiency, equity, and administrative simplicity) of pricing schemes and tariff structures.
- Changes in tariff structures and price levels based on normative objectives always generate effects on the household income distribution and the profitability of prevailing business models in the local economy.
- Distributional effects with an urban economy depend on a variety of factors, including (but not limited to) income levels, demand schedules, location of residents and businesses within the urban agglomeration, the existing capacity of capital facilities and substitution rates between labour/capital in service delivery.
- The more objectives that *simultaneously* guide decisions on pricing changes, the higher the information requirements are for accurately modelling the potential consequences of changes to any specific element of tariff design.
- Municipal governments should, therefore, attempt to collaborate with higher levels of government and influential interest groups in civil society and the private sector when determining which criteria are relevant and feasible to apply to a reform process that involves changing tariff structures and levels.

A good "rule of thumb" for municipal governments in small and medium-sized cities might be a "basics first" approach: take remedial steps to ensure that the inflation-adjusted price charged for a municipal service is never allowed to fall below its full supply cost (i.e., capital charges, operations, and maintenance costs). A basic firsts approach based on raising prices to the full supply cost is backed by global evidence. First, sector assessments at the regional level indicate that the poor pay much higher average unit prices for basic services like water and sanitation. Second, city-level studies tend to refute common assumptions of low price and income elasticities for basic urban services like water supply and sanitation. Therefore, as a basic generalisation, willingness to pay the full supply costs should not be controversial.

The use of relatively simple differentiated tariff structures, for instance by introducing a low initial lifeline charge to cover the first block of service use, can minimise inequitable outcomes as urban utilities and other local service delivery agencies shift to full-cost municipal pricing systems. As the previous section reviewed, however, careful consideration must be given to market structures for formal and informal service providers in order to understand the incidence of subsidies channelled through municipal prices. Still, concerns over the incidence of subsidies should not crowd out debates on the essential requirement of subsidies to the urban infrastructure sector overall. Given the urban demographic trends in the global South, national governments can no longer afford *not to subsidise* the capital costs of urban expansion. No rich country has urbanised without extensive subsidies from national governments, strategically leveraging the revenue authority of national governments, to close urban infrastructure deficits (Spence et al. 2009).

Studies increasingly recognise that municipal pricing policy designed and implemented to achieve objectives of economic efficiency, social equity, and environmental sustainability is a question of urban and national political economy. More importantly, prices are necessary, but not sufficient — perceptions of service quality matter. For residents and firms that have limited or no experience receiving high-quality services in return for payment, large increases in price levels may provoke strong resistance and social mobilisation that can threaten broader service delivery plans and objectives.

3.

EXPERIENCES FROM CITIES IN RAPIDLY URBANISING COUNTRIES

This section examines the experiences and pricing strategies of cities in four countries: Accra (Ghana), Bengaluru (India), Buenos Aires (Argentina), and Cebu (the Philippines). Using quantitative and qualitative data on the supply, demand, and prices of different services, the case studies discuss the pricing of municipal services and their outcomes in detail. Each case focuses on one specific service in order to illustrate the particular complexities associated with price setting and the provision of different services in distinctive institutional settings and geographies.

Municipal service delivery depends on an array of city-specific factors. Population and city size affect the capacity of municipalities to deliver services. Similarly, the level of economic development, the quality of governance, and the level of intergovernmental transfers matter to the ability of municipalities to provide and finance service delivery. In theory, local services are mainly financed through land taxation, based on the existence of clear property rights and transparent transactions. In practice, as seen in the cases of Accra and Cebu, rapidly urbanising cities in low-income countries experience growing informal economies, the absence of clear property rights, and great numbers of unserved households that complicate financing.

In addition, large metropolitan regions are characterised by a heterogeneous population, in terms of socioeconomic attributes, wherein residents compete to enjoy municipal services from the same sources. In the present condition of most metropolitan areas, those sources are scarce, as local revenues are increasingly unable to meet the mounting cost burdens for services (Slack 2011). The administration for delivering municipal services has, therefore, become susceptible to the charge that many persons are being deprived of essential services. Particularly in low-income or ethnic minority neighbourhoods, where there may be little or no access to the powers controlling citywide administration, the conditions exist for discrimination and the resulting inequity in service delivery.

In parallel, large cities tend to have higher economic activity, a broader tax base and ultimately more funds to be invested in municipal services. However, can we assume that municipal services are more equitably provided in wealthier cities or that pricing should function differently? The city of Buenos Aires demonstrates that this is not necessarily the case. An analysis of public expenditures on infrastructure discusses the "five cities of Buenos Aires" and reveals differential levels of investments in and access to services. The spatial distribution of spending is distorted to the point where some of the higher-income districts received more than 30 times the level of investment per capita of lower-income districts (Cohen and Debowicz 2009).

To speak to the challenges of and solutions for cities of different sizes, the cases that follow include both primary and capital cities (Accra and Buenos Aires) and secondary cities (Cebu and Bengaluru). While the importance of secondary cities in the urbanisation process has been acknowledged, limited attention has been paid to the idiosyncratic conditions that these cities face (Bell and Jayne 2009). Particularly in low-income countries, most urban studies focus on primate cities, whereas secondary cities—what Ammann and Sanogo (2017) call the unspectacular middle ground between metropolises and small towns—have largely been neglected. However, recent studies have highlighted the growing gap in levels of socioeconomic development disparities occurring between secondary and primary cities (Roberts 2014).

This is particularly true for sub-Saharan Africa's low-income and rapidly urbanising countries that are characterised by excessive city primacy (Castells-Quintana 2017). Yet even if, in general, conditions in secondary cities are worse, evidence shows that in some cases, lower-income households, particularly slum households in primate cities, are disproportionately affected by the lack of services and higher densities that occur in informal settlements. In some cases, these vulnerable populations experience the loss of the urban health advantage and might face higher mortality risks than populations of rural and smaller cities overall (Montgomery et al. 2003; Bocquier et al. 2011). Even if the evidence is far from conclusive, given the lack of data, particularly for informal settlements, it does raise concerns as to the better conditions generally assumed in larger cities.

A result of the limited resources and attention is the dearth of information on secondary cities, particularly concerning the provision and pricing of services. Data on the financial capacity, infrastructure development, and governance of secondary cities is scarce and a severe impediment for the development of pricing mechanisms that adopt the principles of efficiency and equity. In turn, this severely affects the capacity of municipal governments to plan and manage the development and extension of services and promote efficient and equitable patterns of economic growth. Previous sectoral assessment studies, for example, indicate that in sub-Saharan Africa's secondary cities, the cost of services was more than twice that of large cities. Consequently, affordability concerns in secondary cities — where income levels are on average lower than for the population of primary cities — could be even more pronounced than in primary cities (Foster and Briceño-Garmendia 2010).

In addition to city size, several contextual factors are likely to affect service delivery. To consider such factors in our analysis and to study the links between these factors and pricing mechanisms, we identified a set of contextual city attributes that ought to be considered for developing pricing mechanisms (see Table 2). These attributes

TABLE 2: City attributes for Accra, Bengaluru, Buenos Aires, and Cebu.

Case study	Population	Population growth rate (%)	Density (residents per km^2)	Average income per capita (US$ PPP, constant 2015 prices)	Distribution of income (Gini)	Supply deficit
Accra	4.4 million	2.13%	5,078	26,700	0.37	72% (sanitation)
Bengaluru	10.4 million	4.1%	15,783	50,800	0.51	30% (waste collection)
Buenos Aires Metropolitan Area	14.7 million	2.2% (2016-17)	7,604	42,000	0.42	25% (water)
Metro Cebu	2.9 million	1.7% (2016-17)	15,378	29,000	0.47	60% (water)

Source: Authors based on Oxford Economics, Global Cities data; national household surveys; and local statistics. (2018)

include city size (in population and physical extent), economic resources, levels of informality, and political and administrative structures.

The purpose of the following case studies is to highlight the plethora of possible institutional arrangements and pricing strategies for urban utility services. Importantly, the case studies demonstrate the relevance of contextual factors in relation to pricing mechanisms, underlying the absence of one-size-fits-all solutions in the pricing of local public goods. The cases discuss the advantages and shortcomings of different strategies and the local innovations in price setting that can positively affect service accessibility and ultimately promote more equitable economic growth patterns.

3.1. Sanitation pricing in the context of high informality and low service coverage in Accra (Ghana)

In the past decades, Ghana has experienced rapid urbanisation associated with high rates of growth. Its urban population has more than tripled, rising from 4 million to nearly 14 million people and outpacing rural population growth (Edwards et al. 2015). At the same time, Ghana represents one of the most rapidly growing economies in sub-Saharan Africa. The country has benefited from its natural resources, which account for 80% of its exports, largely as a result of increasing crude oil exports. However, the recent drop in commodities' prices created a large fiscal deficit and slowed economic growth. This has impacted the ability of urban areas to extend utility services and increase coverage access and infrastructure provision at the rate of the population growth and the cities' physical expansion.

3.1.1 Sanitation in Accra: a household responsibility

As in many other rapidly urbanising African cities, Accra is characterised by the growing inability of its urban infrastructure and services to cater to the growing urban population. This is particularly true for critical health infrastructures such as the provision of household sanitation. The vast majority of Accra's poor households are not connected to a main sewerage system.

In the absence of networked sewerage, most households rely on on-site shared technologies. According to Peprah et al. (2015), Ghana has the highest reliance on shared sanitation facilities globally. These shared facilities are either compound toilets (usually shared by three to twelve households) or public toilets (fee-paying and accessible to all). Open defecation, locally known as "free-range" is practised by 8% of urban dwellers, and the poorest quintile is 22 times more likely to practice open defecation than the richest (WSUP 2018).

Clearly, this situation bears significant costs in terms of health, productivity, and human decency. Slow progress in access to improved sanitation is an important contributor to the recent deterioration in Ghana's health indicators.

3.1.2 Past approaches to delivery of services

Initial approaches to the delivery of sanitation infrastructure services concentrated on eliminating supply barriers and dealt with government failures. Scarce funding has been often perceived as one of the major supply constraints. Particularly for household services, there seems to be a consensus that the sanitation sector is seriously under-financed (OECD 2011). More recent approaches have concentrated on demand-side barriers, with a particular focus on affordability. Banerjee and Morella (2011) tested the affordability of utility services across sub-Saharan African countries priced at a level sufficient to allow the utilities to recover their costs. They found that in most countries, between one third and two thirds of the urban population would face difficulties in covering the cost of service.

In terms of intergovernmental transfers, the municipality of Accra makes budget

allocations to sanitation, but this derives almost entirely from central government transfers and development partner support. Particularly in the periphery of Greater Accra, there are currently no local taxes or tariffs contributing to municipal sanitation expenditures (Edwards et al. 2015).

3.1.3 Spatial monopolies in sanitation provision

As Mansour and Esseku (2017) show, regulation over public toilets maintenance is weak. Although data on the profitability of these public toilets is limited, the increased competition for the management of these facilities indicates that they can generate attractive profits. However, their profitability does not ensure the quality of service. Informal reports and the few studies conducted on public toilets point to very poor management and very limited enforcement of environmental regulations. This deteriorating condition of public toilets is evident in the results from the World Bank survey: "Consultative Citizens' Report Card, City of Accra, Ghana." According to the survey, approximately 70% of the citizens who use public facilities report high levels of dissatisfaction with this service (World Bank 2010)

From a price-setting perspective, privately operated public toilets create spatial monopolies. A privately-owned monopoly is not an attractive outcome, particularly in industries providing basic consumer services. This seems particularly true for sanitation, where unregulated private monopolies are likely to have lower output volumes, standards of service, and investment levels than they would under competitive conditions. Prices, moreover, are likely to be higher and discriminate against customers with inelastic incomes. A private operator realising that users are bound by locational considerations (households do not commute to satisfy their sanitation needs) will benefit from the lack of competition and raise the price of the service at levels above the market price or the socially optimal price.

This has two important consequences: first, the crowding out of lower-income households, which are pushed towards less hygienic sanitation options; and, second, the inability to identify the actual demand and willingness-to-pay for different sanitation services.

For the majority of Accra's residents that share sanitation, the cost of an individual household facility is prohibitively expensive. Depending on different technologies, this cost ranges from US$230 to US$1,000. The cheapest technology represents over 125% of the average poor household's income (Mansour and Esseku 2017). The possibility for households to finance this type of investment is severely constrained by a high interest rate of approximately 25%, which prohibits households from extending the capital cost over time. Often, this type of financing is unavailable for lower-income households. At the same time, with a national interest rate of 25%, financial services (which could enable households to spread the costs of their investments over time) are unaffordable for the poor.

3.1.4 Estimating willingness-to-pay for sanitation in Old Fadama, Accra

Estimating access, establishing affordability levels in low-income settings, and getting an indication of willingness-to-pay for different sanitation solutions, particularly for the least-served households, would improve pricing mechanisms and extend access by improving the affordability of service. Data from Old Fadama, one of the largest informal areas in Ghana, is used to showcase how this can be an effective approach for capturing demand levels better. The data, collected under the Know Your City campaign, is based on an extensive survey of 18,106 households (Slum Dwellers International 2018).

The settlement has a population of approximately 80,000 and occupies 31 hectares of government-owned land beside the Odaw River and near the Korle Lagoon. It is situated across from one of Accra's most important markets, the Agbogbloshie market, on land that had previously been largely a lagoon (Farouk and Owusu 2012). Much of the land has been reclaimed from the lagoon and river and has slowly been filled in by structures. An outcome of this reclamation is that the area is prone to flooding, making the

FIGURE 2: Old Fadama pre-evictions in 2014 (red) and post evictions in 2015 (yellow).

Source: Google Earth satellite image (Google 2018) and author's boundaries based on Google Earth's time lapse.

lack of drainage a continuing issue (Farouk and Owusu 2012). Compounding this problem is the fact that people in the settlement have often been under the threat of evictions, and in 2015, massive evictions occurred. Figure 1 shows satellite imagery, before (in red) and after (in yellow) the evictions.

As seen in Table 3, around 80% of households share their sanitation facilities and pay approximately four Ghanaian Cedis (approximately US$0.83) per use. We used the survey data to measure willingness-to-pay for different sanitation solutions.[7] Through this approach, we can estimate the demand for different sanitation options. For instance, an analysis of the survey responses indicates that a unit with a ventilated pit latrine (VIP) toilet earns 47% higher rent and unit with a flush toilet earns 65% higher rent than units without one of these sanitation solutions. Both types of sanitation are of higher quality in comparison to other options found in Old Fadama, notably traditional pit latrines and open defecation. These results provide an indication of some of the behavioural household aspects that might affect overall sanitation service and household spending. Given the high costs of individual household sanitation, it is no surprise that the large majority of households rely on shared sanitation. The results from the survey can help target sanitation subsidies according to the demand formulated through the shadow prices of housing rent, which reveal the underlying preference of different sanitation options as they are valued by households in informal settlements.

[7] *A hedonic equation that focuses on the above characteristics is used. A hedonic price model measures willingness-to-pay for different housing attributes. Hedonic methods are an approach to estimating housing demand by uncovering the implicit or "shadow" prices for housing characteristics; i.e., these methods indicate how much of the value of a particular property is the result of a specific characteristic. For example, how much does a solid floor increase the value of living in a particular unit relative to the value of an unhealthy dirt floor that characterises so many informal housing units?*

TABLE 3: Household data and water and sanitation conditions in Old Fadama.

Household Characteristics	Definition	Average
Female_Dummy	Dummy variable indicating the gender of the respondent	70%
Age	Age of the respondent	27
HH Size	Size of the household	4.9
People_per_Room	Number of people per room	3.9
Water And Sanitation		
Toilet_Cost	Average toilet cost per visit	4 (GHC)
Toilet_Distance	Distance of the dwelling to the nearest toilet facility in minutes	5 min
Toilet_Private	Percentage of households that use a private toilet	16%
Toilet_Shared	Percentage of households that use a shared toilet	79%
Toilet_Type_VIP	Percentage of households using a ventilated pit latrine toilet	6%
Toilet_Type_Flush	Percentage of households using a flush toilet	3%
Distance_to_Water	Distance of the dwelling to the nearest water facility in minutes	4.8 min
Water_Quality_Dummy	Good water quality according to the respondent's perception	3.2%

Source: Know Your City: Slum Dwellers Count, Slum Dwellers International (2018).

3.1.5 Recommendations: overcoming the challenges through targeted incremental investments and socially optimal pricing

Given the challenges associated with sanitation provision and the low affordability of individual services, most households in Accra will continue to share sanitation for the foreseeable future. The limited funding and investments of the central government towards sanitation have characterised previous service provision. An increase in government funding towards sanitation investments is necessary, but these expenditures should be focused on pragmatic ways to improve affordability and access to sanitation according to the specific context.

For instance, the informal development of residential areas in the city makes the expansion of networked service provision difficult. Retrofitting networked infrastructure would be extremely expensive. This would require subsidies larger than the public agencies involved can afford. As McGranahan (2015) notes, the typical result of this approach is for coverage targets to be sacrificed, particularly in informal and low-income settlements, and the limited subsidies to be captured by the relatively well-off, thus compromising equity.

The national government's promotion of "one house, one toilet" and the recommendation towards national and local governments' need to reduce the prevalence of public toilets seem erroneous at this stage. Given that for many Accra households, housing expenditure is less responsive to changes

in income, then a focus on policies that aim at increasing household expenditure on sanitation would probably not be very effective at present.

Perhaps the most egregious failing of this policy is that it will misdirect attention to low-return investments. For instance, a recent, global study on the costs and benefits of water sanitation and hygiene shows that the one house, one toilet policy will encourage sanitation investments that fail a cost-benefit analysis. According to Hutton (2015), the benefit-cost ratio for urban sanitation facilities in sub-Saharan Africa is on the order of 1.2. However, this estimate assumes 2.5 families sharing each facility. If instead of sharing these costs across 2.5 families, these costs were incurred by a single household, as the new policy aims, costs would increase by 150%. With these higher costs, the corresponding benefit-cost ratio for individual units would fall to 0.8. That is, the type of investments that fulfil the policy goal would fail traditional benefit-cost calculations. While this financial assessment does not consider externality costs, it points, however, to the affordability challenge for pricing sanitation services. National and local governments can increase subsidies in order to reduce the benefit-cost ratio, but this can potentially jeopardise the sustainability of the subsidy, given the large number of households that would qualify for these transfers.

Therefore, at least initially, sanitation expenditures should focus on decentralised solutions and the provision of shared sanitation at the neighbourhood level. This type of sharing is already extensive in informal settlements and compound housing in Accra. Gradually, this approach can focus on extending access to basic services and strengthening coordination between land use planning and service provision in order to promote citywide delivery. As incomes increase, this would allow households the opportunity to access houses that are equipped with basic infrastructure and help Accra move towards a better overall quality of sanitation. In these later stages, as incomes increase, it is expected that the income elasticity of sanitation expenditures is likely to gradually rise and make policies that incentivise individual sanitation investments much more effective.

From an institutional perspective, there have been several promising steps. For instance, the 2016 creation of a Ministry of Sanitation and Water Resources is a welcome initiative revealing the increased interest of the national government on the topic. Importantly, the direction of reforms in the sanitation sector consists in ameliorating the operation, management, quality and affordability of these shared services. But this will require a paradigm shift and a focus on the demand side of the provision. The current prevalence of shared sanitation for low-income residents calls for greater attention on whether these shared facilities could provide an acceptable (safe and hygienic) solution and how to improve their management (including through regulatory instruments such as stronger contractual arrangements). Evidently, this would require rethinking the institutional arrangements in the management and operation of sanitation infrastructure.

From an efficiency and equity perspective, focusing on improving these types of shared infrastructure solutions is critical for ameliorating sanitation availability and increasing the options of lower-income households. The first step in this direction is the identification of demand factors for shared services and a better understanding of the relationship between investment costs for households and demand for this type of services. An instrumental issue is how the current household investment levels can be matched by local government investments and increase both the size and the efficiency of those investments. In this case, the socially optimal pricing policy would achieve allocative efficiency through a loss-minimising approach for public provision.

The pricing mechanisms of sanitation services are instrumental in improving access and quality. Incrementally improving affordability and quality of service will require particular attention to the role of unserved communities in decision-making in such investments. Through the Old Fadama case, it became clear that understanding the demand for sanitation in informal areas necessitates much more granular data. Local data can determine some of the necessary signals for setting prices according to the actual demand, affordability levels, and household preferences. However, as McGranahan (2015) notes, standards negotiated collectively in low-income settlements could be supported by local authorities and provide a means of securing more affordable sanitation facilities.

Unlike small-scale private sector provision through the concession of public toilets, as witnessed in Accra, this approach could substantially improve affordability, given the logic of price setting. A private operator, acting as a spatial monopolist, will charge a monopolistic price for shared facilities. This is the case in Accra's public toilets. In a best-case scenario, the private operator's price would be regulated. However, as Mansour and Esseku (2017) note in their analysis, there are several institutional factors influencing the non-enforcement of sanitation by-laws: the lack of funds for the institutions mandated to enforce by-laws, the low incentives for Environmental Health Officers (EHOs) and prosecutors to follow up cases for prosecution, the low numbers of prosecutors, and the lack of capacity among prosecutors, coupled with political interference and lenient penalties, result in an environment where regulations are not enforced (WSUP 2018).

In contrast, subsidies towards community-cooperative operators of shared facilities would set prices at the socially optimal level, as the objective of the community is to offer and expand the social service. As such, the pricing of shared services should be established based on the socially optimal price of the good, particularly once the important externalities associated with sanitation and the herd effects associated with good provision at the communal level are considered. Given cost-recovery constraints, the community might have to raise the price in order to achieve full cost recovery. One can also imagine that the community operators might choose to spend some of the operation's profits on handwashing, hygiene education, and other activities related to member health and well-being. Again, the community incentives for expanding services and reducing externalities at the neighbourhood level ultimately benefit the lower-income households that face the greatest unaffordability challenges. As such, this can improve efficiency, equity, and the sustainability of sanitation service provision in Accra.

3.2. Pricing and financial management challenges to integrating informal waste pickers in municipal solid waste management in Bengaluru (India)

Improvements in municipal solid waste (MSW) management that acknowledge and make room for informal sector waste-picking activities, firms, and market association can support more inclusive economic and social development in cities (Wilson et al. 2006). Waste recycling activities of manual scavengers and waste pickers are labour-intensive alternatives that reduce costs to municipal service providers while providing livelihood opportunities to frequently marginalised residents of cities. In the context of climate change, most informal waste pickers working in MSW have negative total carbon footprints and therefore offset emissions of wealthier individuals and firms (Oates et al. 2018). Municipal governments in India now have wide authority over expanding the position of informal waste pickers in the provision of MSW services in urban areas, although small municipal budgets and weak financial management capacity limit many local government authorities.

As urban economic growth and development have spurred widespread changes in patterns of consumption among individuals, households, and firms, municipal governments in India face daunting challenges for financing basic solid waste collection, transport, treatment, and sanitary disposal services in cities. Among the largest and richest cities in India, the city of Bengaluru has struggled to manage the pressures created by urban economic growth, density, and spatial expansion and their impacts on MSW infrastructure and service delivery. Bengaluru illustrates many of the challenges, opportunities, and pitfalls that accompany efforts to integrate informal waste pickers during the ongoing restructuring of urban waste management systems.

Responding to a waste collection crisis precipitated by the mismanagement and failure of the city's largest private landfill in 2012, municipal and state government authorities introduced policy reforms which

have fostered an enabling environment conducive to more efficient and equitable MSW services. For instance, in addition to banning the use of low-quality plastic bags within city limits, the Bruhat Bengaluru Mahanagara Palike (BBMP) was the first municipal authority in India to register informal sector waste pickers and scrap dealers[8]

While recent policy changes and administrative guidance have helped to fit key stakeholders into an integrated MSW strategy, severe underpricing of household and commercial waste collection and weak financial management performance have relegated the influence of key changes to the margins of an increasingly diversified and complex MSW system.[9] Like other cities in India and the global South, major barriers to scaling up changes at the margins, in order to ensure citywide progress and benefits, include pricing policy and weak cost recovery.

3.2.1 Municipal solid waste in Bengaluru: status of demand and supply

With 10.4 million residents living in 198 wards spread across 709 km^2 of land, Bengaluru is the third most populous city in India. MSW challenges in Bengaluru are similar to those experienced in other large and medium-sized cities. Uncollected waste and building debris on streets and across neighbourhoods clog stormwater drains, magnify flood risks, support the transmission of waterborne and vector-borne diseases, and increase the incidence of diarrhoea and acute respiratory infections. Burning and other forms of improper treatment of waste in landfills, particularly non-recyclable plastics, releases toxic chemicals and can significantly increase greenhouse gas emissions.[10] The city was ranked 194th in the 2019 national cleanliness survey, far below other large urban areas in the country (Table 4).

TABLE 4: City cleanliness rankings, India (2019).

City	Cleanliness Rank	Overall Score (Max 5000)	Population Ranking*
Indore	1	4659	14
New Delhi (NDMC)	5	4191	2
Ghaziabad	13	3877	21
Surat	14	3861	8
Bhopal	19	3794	16
Greater Hyderabad	35	3455	4
Greater Mumbai	49	3277	1
Bengaluru	194	2351	3

**2010 Census.*
Source: Government of India (2019).

[8] *The Bruhat Bengaluru Mahanagara Palike (BBMP) is the urban local body that manages services is formally classified as a municipal corporation.*

[9] *At Living Walls, a condominium building with 3- and 4-bedroom units priced between 1.9 crores (US$282,223) to 2.9 crores (US$409,402), monthly charges for solid waste removal services range from Rs. 4,600-5,000 per month (US$64–US$70) for 56 apartments filled, out of 117 total units. On a per-apartment unit basis, the removal charges come out to approximately US$1.25 per month.*

[10] *At the macro-level, mitigating the contribution of MSW as a driver of global warming is a major local and national challenge. Net annual emissions of the greenhouse gas methane from municipal landfills in India nearly tripled, from 400 to 1084 Gg, between 2000 and 2015 (Singh et al. 2018).*

The city generates between 5,000 and 6,000 tons of waste per day, the fifth-largest amount of MSW annually (Table 5). In terms of processing and treatment, Ahluwalia et al. (2018) report that half of the city's waste is segregated on site and up to 71% is collected door to door. However, estimates of the extent of waste segregation are contested. For instance, from a representative sample of 1,967 households surveyed in 2018, researchers estimated the citywide figure at only 22% (Ramachandra et al. 2018).

Demand for MSW management services has exceeded supply (Table 6) for much of the past two decades. The imbalance between supply and demand has encouraged private operators to explore investment opportunities in the city. Matching funds transferred to municipal authorities through the major national urban development investment schemes, such as the Jawaharlal Nehru Urban Renewal Mission (JnNURM) and the Swachh Bharat Mission, have channelled private finance into more modern processing and disposal facilities. Funding in this flagship

TABLE 5: Waste generation in Bengaluru (tons/day).

Streams	Total	Wet	Dry	Domestic Hazardous	Reject/ Inert
Small residential, commercial and street sweeping	4,278.12	2,669.04	1,175.87	149.03	248.18
Bulk generators	1,480.05	1,018.15	423.03	12.07	66.82
Total waste generation (% of waste stream)	5,758.17 (100%)	3,687.19 (64%)	1,598.90 (28%)	161.10 (3%)	351.00 (6%)

Source: BBMP (2017a).

TABLE 6: Supply of existing municipal solid waste (MSW) facilities and proposed additional facilities needed to meet demand (2017).

MSW Unit	Purpose	Supply Coverage	Existing Units	Proposed Units (Additional units needed)
Dry waste collection centre (DWCC)	Collect, store, and transfer dry waste in neighbourhoods	Ward	166	32
Aggregator	Receive low value waste from DWCC	Zone	1	17
Bio-Methanation Unit (BMU)	Process organic waste segregated from waste stream	Division	11	5
Organic waste converted (OWC)	Decompose solid waste into compost	Sub-division	7	57
Waste processing plant (WPP)	Separate municipal solid waste to allow optimal recycling and energy recovery within the waste stream.	Zone/City	9	5
Sanitary landfill	Final and safe disposal of residual and inert waste with protective infrastructure	Zone	3	N/A

Source: BBMP (2017a).

program, however, has tended to favour expensive capital projects whose upfront costs can only be covered by large domestic and multinational waste management and technology firms.

Continuing fragmentation within both the formal and informal waste management systems has tended to increase coordination costs between the BBMP and the growing number of stakeholders and waste collection, processing, and disposal firms. A major concern is that the proliferation of different SWM business models fuels unregulated and unfair competition while contributing only marginal material improvements in a citywide waste management capacity. Inefficiencies pervade the system, and prices charged for solid waste collection services continue to fall below operational costs (with deficits financed through intergovernmental transfers). These general pricing dynamics have slowed the expansion of the informal sector and reinforced cost-recovery risks for private sector operators.

3.2.2 Origins of an integrated approach to municipal solid waste management in Bengaluru

The period 2010–2012 marked a turning point in MSW in Bengaluru. First, the BBMP council voted to take control over the SWM charge from the private landfill operators in 2010. The city had recently expanded from 100 to 198 wards by amalgamating with 9 city municipal councils, 3 town municipal councils, and 111 villages on the urban periphery. Within a 2-year period, the population served by the BBMP's waste management system nearly doubled. Most of the landfills that had supported the centralised model of MSW management in the city moved from outside to inside the BBMP boundaries.

Second, following advocacy led by the waste-picker membership organisation Hasiru Dala, the BBMP became the first municipal authority to register informal waste pickers in 2011 (Chengappa 2013). At the time, a study led by Hasiru Dala that estimated the contribution of 4,175 waste pickers to the MSW system concluded that they collected 292 tons of waste a day (6.4% of the total), diverted 106,671 tons of waste from municipal landfills each year, and saved the city government nearly Rs. 230 million annually (Chandran et al. 2011).[11] The study made visible the economic and financial contribution of informal waste pickers, spurring the initial effort by the BBMP to register informal waste pickers.

Third, Bengaluru entered a citywide waste management crisis in 2012. The private operator at the Mavallipura landfill had allowed trucks to illegally dump unprocessed waste in areas adjacent to designated control boundaries, negatively impacting the health and well-being of poor residents and small businesses in the vicinity. In response to a directive issued by the Karnataka High Court, the Karnataka State Pollution Control Board initiated a full shutdown of the Mavallipura landfill. As residents and businesses across the city incinerated uncollected waste to cope with the situation, elevated levels of air pollution multiplied the public health impacts.

The Karnataka High Court directives in response to the Mavallipura landfill case laid the groundwork for the integrated SWM strategy that would emerge. The actions also increased the demand for informal waste-picker services and further opened the initial space for incorporating informal waste pickers into the formal system. First, the court ordered waste sorting at the source, pushing some of the cost burden currently falling on landfills back onto households and firms. Second, to increase processing capacity, the court ordered the construction of at least one dry waste collection centre in each of the city's 198 wards. Table 7 lists a timeline of major reforms and directives since 2010.

[11] *Using the mid-year USD-INR exchange rate in 2010 of 46.57:230 million rupees is equivalent to US$4.93 million.*

TABLE 7: Timeline of major reforms and directives in the urban SWM sector in Bengaluru.

Year	Reforms and Directives
2010	BBMP imposes control over administration of SWM charge
2011	Lok Adalat directive/BBMP circular to register informal waste-pickers
2011	Plastic Waste Management Rules
2012	KHC directive, "Segregation at Source a Fundamental Duty" KHC directive, "Decentralised Waste Management"
2015	KHC directive, "Comprehensive order on Duties of Waste Generators and Collection of Solid Waste and other points
2016	Solid Waste Management RulesKHC directive, Comprehensive Overview of Requirements for Effective Waste Management"
2017	Karnataka High Court directive on preparation of ward-level SWM plan

Source: BBMP (2017a).

In line with federal, state, and local government policies, the BBMP currently implements a strategy for MSW services that focuses on three key objectives: (1) decentralising waste processing within city limits; (2) incentivising bulk waste generators to manage their own waste; and (3) encouraging the creation of ward-level plans to manage MSW services at the community level.

By 2018, the city had issued occupational identity cards to approximately 6,000 informal waste pickers and itinerant buyers. The BBMP has also contracted out the operation of 33 dry waste management centres to informal waste pickers, allowing waste pickers with occupational identity cards to engage in door-to-door collections.

More recently, Hasiru Dala updated their estimates of the contribution of informal waste pickers in Bengaluru, focusing on the 33 wards where informal waste pickers operate dry waste management centres.[12] They estimate that 13,460.19 tons of dry waste have been collected and processed from 465,000 households in the 2-year period from March 2017 to February 2019. Importantly, informal waste pickers also prevented 1,134.67 tons of non-recyclable multi-layered plastics from disposal in landfills.

3.2.3 Barriers to further entry: the role of pricing policy and municipal financial management

Despite these positive developments in keeping the MSW system from falling back into crisis, progress in more fully integrating informal sector waste pickers into the MSW system has been slow. Though Bengaluru was the first city to issue occupational identity cards, the BBMP now lags behind other cities, such as Ahmedabad, which have successfully registered more informal waste pickers in a shorter time (Oates et al. 2018). It is important to note that while national and state-level waste management policies mandate the formalisation and integration of informal waste pickers, these policies provide limited guidance on essential organisational and financial questions around regulation to align competing interests between labour-intensive, low-cost, informal waste pickers and capital-intensive, technology-driven private sector firms.

Poor financial management practices further weaken pricing policy as a lever to incentivise

[12] *Hasiru Dala, "All the Dry Waste Collection Centres in Bangalore should be Operated by the Waste-pickers," Global Alliance of Waste Pickers (6 February 2019), https://globalrec.org/2019/02/06/all-the-dry-waste-collection-centres-in-bangalore-should-be-operated-by-the-waste-pickers/.*

necessary behavioural changes among households and firms and meaningfully restructure the MSW system around informal waste pickers and their market associations. Two barriers in Bengaluru are common in other cities too. First, MSW planners do not proactively coordinate with key budget decision-makers to ensure spending is sequenced properly with sufficient cashflow to meet spending obligations. Second, municipal funding decisions are made on a historical basis rather than on future investment needs according to the willingness to pay or to meet objectives around equitable protection from public health risks such as air pollution and contaminated water from MSW.

Under such conditions, initial efforts to integrate informal sector waste pickers by providing occupational registration cards provide some income-generating opportunities for poor informal sector waste pickers. Although, they tend to become a solution that "stands alone" and therefore serves only to prevent the waste collection system from cascading back into crisis. When efforts encounter local political resistance and institutional complexity, they stall and leave informal waste picker health and livelihoods, their households, and their communities in precarious conditions.

Though municipal solid waste management policies set cost-recovery objectives at 100% of the BBMP's operations and maintenance costs, collection rates for the SWM user charge remain extremely low. In an audit of the BBMP over the period 2011–13, budget figures covering the SWM fee indicated 2-year collection totals of 66.54 crores, with annual collection rates fluctuating between 15% and 20% (CAG 2014). The BBMP recently reported in *The Economic Times* that the municipal government collected 155 million rupees (US$7.95 million) from the SWM fee in 2018.[13]

While an efficient collection of the SWM fee has been a challenge, there are broader problems in pricing policy. First, the pricing structure overly subsidises large waste producers. Piggybacking on a previous property tax rate structure, the square footage of the property is the basis for the flat rate charge for solid waste services (Table 8). The charge capped out at Rs. 600/month for commercial facilities with floor areas of 50,000 sq. ft. and above. Second, the SWM charge does not factor in essential costs to expand SWM facilities, such as acquiring new land, for which only 40 crores (US$5.623 million) was budgeted for 2017–18 (Table 9).

TABLE 8: Solid waste management charge (2011-17).

Property Category	Floor Area (sq. ft.)	Monthly Fee (Rs.)
Residential	Up to 1,000	10
Residential	1,001 - 3,000	30
Residential	Above 3,000.	50
Commercial	5,000 and above	200
Industrial	5,000 and above	300
Hotels, Event Halls, Nursing Homes	50,000 and above	600

Source: CAG (2014).

[13] *Akshatha M, "Experts hail BBMP proposal to waive cess on bulk waste," The Economic Times (21 February 2019). https://economictimes.indiatimes.com/news/politics-and-nation/experts-hail-bbmp-proposal-to-waive-cess-on-bulk-waste/articleshow/68091679.cms*

TABLE 9: Select revenues and expenditures in the SWM Budget, 2016-18 (Rs. 100,000).

	2015-16 (actual)	2016-17 (actual)	2017-18 (estimate)	2017-18 (revised estimate
Select Revenues				
SWM Charge	5,738.79	7,734.61	16,500	5,100
Finance Commission Grant	4,690.67	—	4,000	2,000
Government of Karnataka Ward Works Grants	—	—	13,864	12,000
Total BBMP Non-Tax Service Charge Revenue	26,365.36			
Select Expenditures				
Cleaning & transportation of garbage, toilets, and urinals	50,199.87	55,759.94	60,000	90,000
O&M to BBMP Garbage Trucks	—	17.80	500	100
Purchase of Land for SWM	18.77	??	??	??
Tipping Fees	15.90	41.39	617	600
Total Expenditure of SWM Department	53,936.71	57,138.35	91,099	110,709

Source: BBMP Revised Budget Estimates (2017b); BBMP Budget (2018).

What is striking about the Bengaluru case is the extent of underpricing, given the ability to pay, and how small the public expenditure in the SWM sector is relative to the size of the urban economy. With continuous annual increases in per-capita income over the past two decades (Figure 2) and municipal restructuring that nearly doubled the amount of land inside the previous administrative boundaries, SWM should be one of the largest items in the city's budget.

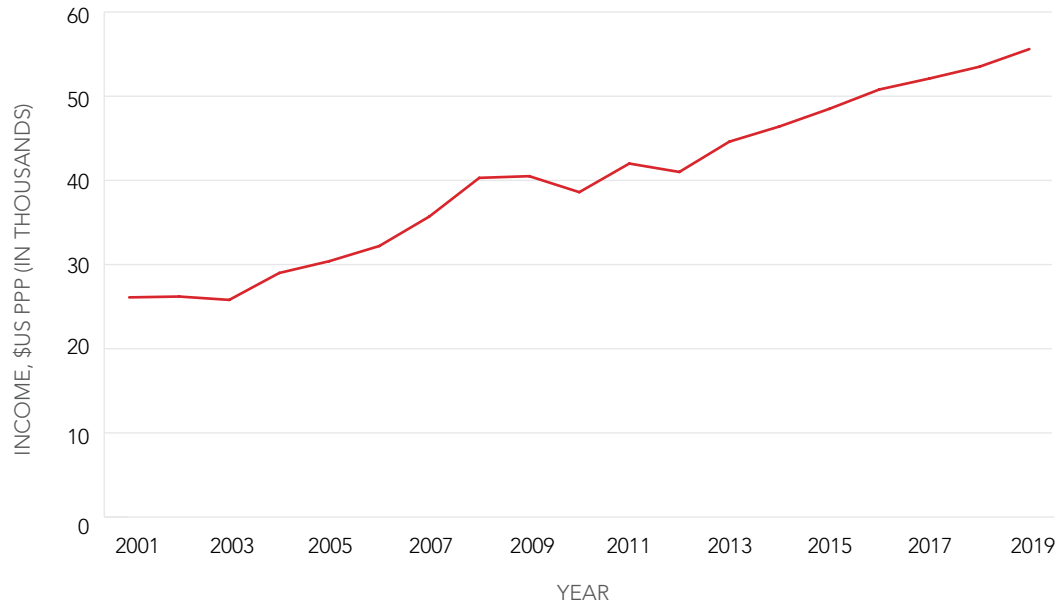
The BBMP council proposed a change to the SWM cess in 2018, which would set the price at 15% of the property tax payment, instead of the three floor-area categories in the existing tax. If collection efficiency increases, such a change to the fee base would generate much higher revenue inflows. However, other tax expenditures threaten to erode the base. Many important exemptions — such as for religious properties that are large waste generators — have not been eliminated. The municipal council is proposing to introduce rebates of up to 50% (or full exemption, in some proposals) from the highest payers (big apartments/hotels) that make qualifying on-site capital investments in large-scale waste processing or composting technology. This rebate is too high, will be costly to enforce, and will unnecessarily erode the tax base. More importantly, the collection of the SWM fee is still linked to the property tax, with which the BBMP also has had persistent administration and collection problems.[14] A change in pricing policy without a change in financial management will not substantively change revenue performance.

Poor design and weak enforcement both hinder the expansion of the informal sector in MSW and pit capital investment

[14] *For instance, households and businesses can pay their property tax bill without paying the SWM fee. Currently, non-compliance comes with the threat of a minor nuisance penalty, which most taxpayers know will not be enforced.*

in competition with informal waste pickers. Both compete for a share of the basic cash flow from the SWM charge to ensure their operations can be sustained over time. As the broader global experience shows, informal waste pickers are at risk of losing out to large domestic and multinational SWM firms in this competition. Without adequate cost recovery, the municipal government cannot increase the number of occupational identity cards issued. Issuing additional cards incurs financial obligations to health, welfare, and other parts of the municipal budget that do not coordinate with SWM. Second, weak collection performance in one fiscal period leads directly to arrears in wages for waste pickers in subsequent fiscal periods. Wage arrears depress the efficiency of registered workers and put their households in precarious financial situations. Third, with flat collection rates, there is no budget for skills upgrading and training for informal waste pickers, both of which are essential to expanding their market share.

FIGURE 3: . Average household disposable income in Bengaluru, India, 2001–2019.



Source: Authors' calculations based on Oxford Global Cities Database.

3.2.4 Conclusion

Demand for solid waste services grows proportionally with population and incomes, making it a capital-intensive and costly municipal service. For cities with strict constraints on budget expansion, registering informal sector waste pickers and supporting them by enforcing regulations can be a viable alternative to more capital intensive and expensive service delivery arrangements. To successfully integrate waste pickers during system-wide transitions, policymakers must connect institutional reforms to pricing policy and better financial management. Such actions hinge on strengthening the collection of user charges and increasing local budget allocations on MSW management. As the case of Bengaluru demonstrates, organizing informal sector waste pickers can alleviate some of the financial burdens and mitigate public health costs of municipal provision (e.g., respiratory conditions, diarrhoea), but still fall short of putting system expansion on a sustainable path.

While weak municipal financial management during high rates of economic growth helps explain some aspects of the recent experience in Bengaluru, it is important to also note the role of national policy, particularly centrally managed investment

programs, and decisions in the court system. Actions at these levels can "ratchet up" the cost of MSW services for poor-performing municipal governments but without providing supplementary resources to strengthen financial management in order to ensure effective and equitable implementation. This multi-level perspective helps to explain why the BBMP has been incapable of implementing full cost recovery of MSW management operations and maintenance costs, as prescribed in the prevailing policy framework.

The city now confronts the challenge of maintaining a delicate balance between further pricing reforms that would increase waste management charges on households and commercial waste generators in order to improve the efficiency of residential waste segregation and removal, while finding creative ways to subsidise public-private sector investments in new waste-processing technologies. Because of the BBMP budget weakness, the city will continue to rely on national and state government transfers to finance new investment costs. From the perspective of waste pickers, the challenge will be to ensure that such a financing strategy does not exclude informal waste pickers, but rather allocates funds to their needs — healthcare, housing, training, and skills development.

3.3. The cost of privatising municipal services and the distributive role of subsidies in Buenos Aires (Argentina)

The ability of private companies to provide adequate and affordable services, especially in the most deprived areas, is highly contested. In Buenos Aires in the 1990s, the belief that private companies represented a successful and equitable model for water provision proved false. The intention of this case is not to argue that privatisation is always destructive, but to show that the benefits of private sector participation depend on the design of the partnership with the private sector and the institutional mechanisms in place to ensure feasibility, accountability, and affordability of the service. The case of Buenos Aires further highlights the role of national subsidies on financing municipal services and the distributional effects they can have.

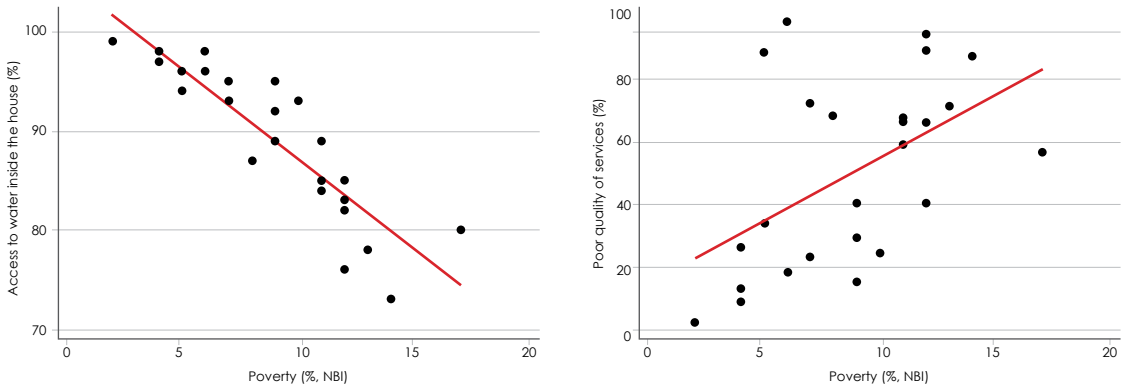
3.3.1 Unequal scenes and the distributional effects of privatisation

The Metropolitan Area of Buenos Aires (AMBA) has a total population of 14.7 million. The 24 municipalities that AMBA comprises are highly heterogeneous and fragmented in terms of living conditions and the quality of service provision (Caceres 2013). Although 75% of AMBA has access to water, averages mask the disparities that exist across and within municipalities (INDEC 2012). For example, the city of Buenos Aires and the municipality of Avellaneda have water coverage levels close to 100%. In contrast, in some municipalities, like Ezeiza or Ituzaingo, less than 20% of households are connected to the public water network (INDEC 2012). Also, water supply is much lower in municipalities that have higher poverty rates, as is depicted in Figure 3, and the dissatisfaction with the quality of municipal services is significantly higher in municipalities that have higher poverty levels.[15]

The fragmentation and inequality in water provision is the result of the history, regulatory framework, the kind of providers, and the characteristics of the metropolitan area. Municipalities differ significantly in terms of the size, population density, speed of urbanisation, nature of water resources, cost of land, and socioeconomic profile. Historically, the water sector in Argentina was managed by one national body, the Obras Sanitarias de la Nación (OSN), which provided water for the entire country. The OSN was created in 1912, and during its operation, Argentina ranked second in Latin America in terms of water coverage rates

[15] *NBI (unsatisfied basic needs) is a proxy indicator used in Argentina to characterise and identify poverty. This multidimensional poverty index measures income, housing, education, and basic service levels to determine poverty.*

FIGURE 4: Average household disposable income in Bengaluru, India, 2001–2019.



Source: Authors, data from Argentina's Permanent Household Survey (EPH).

(Almansi et al. 2010). Between 1950 and 1970, the water sector experienced financial problems and reduced expansion strategies. In 1976, the military government started to withdraw from social policies and the provision of infrastructure and basic services. The water sector was decentralised to provincial governments, with each province being in charge of managing, regulating, expanding, and allocating water (Aspiazu and Forcinito 2003).

As part of the restructuring process, water supply in AMBA then became the responsibility of one official body, the government of the Province of Buenos Aires. Between 1980 and 1993, however, no significant investments were made in the water sector, which Rey (2000) referred to as being in a "state of emergency." The economic crisis affecting the country towards the end of the 1980s spurred the idea that public spending and fiscal deficits not only hurt the economy but also the provision of services. In the 1990s, services were further decentralised, and more responsibilities were transferred from the national government to the provinces. However, the decentralisation of responsibilities was not matched by a transfer of resources (Clemente and Smulovitz 2004). Consequently, services perceived as financially unstable were privatised.

While privatisation occurred in many countries in the 1990s, Argentina provides one of the most dramatic examples because of the scale and speed of its privatisation. During the government of Carlos Menem, more than 20 services were privatised within just 2 years—more than Margaret Thatcher privatised in more than 10 years as Prime Minister of the UK. At that time, international organisations such as the IMF and the World Bank welcomed privatisation because it was regarded as an opportunity to renovate old, poorly maintained, and technologically obsolete infrastructure; promote efficiency; reduce fiscal deficits; increase consumer surplus; and create a competitive environment that would reduce prices and increase access to services. In Argentina, a neoliberal state model was adopted, with strict controls on public expenditure and a cut to policies and resources for low-income households (Cohen 2012b).

The privatisation of water in AMBA was one of the largest worldwide, due to the size of the territory and its population (Vilas 2004). Before the privatisation of water, the OSN maintained over 1.2 million water connections, providing water to 99% of Buenos Aires City's 3 million residents and 55% of the 7 million residents in the metropolitan area. The water system was last expanded and modernised in 1940, however, and the quality of the service dropped dramatically in the mid-1970s due to the lack of government funding (Vilas 2004).

To initiate the privatisation process, the central government allocated concession contracts for up to 30 years. The concession contract for

Buenos Aires was awarded to the consortium Aguas Argentinas S.A. (AASA), led by the French utility company Suez S.A., with the stipulation that AASA would be responsible for the operation and maintenance of the service, investment in its expansion, and the billing and collection of user charges.[16] The concession contract committed to increasing the number of residents served with water to 88%, but no specific goal was set to improve services to low-income households (Loftus and McDonald 2001). Despite the vast differences within and among the municipalities in the Buenos Aires metro area, the contract treated all municipalities as homogeneous, which created difficulties in the provision of services. Low-density and low-income areas posed particular problems, since fewer people per square meter increased the cost per connection and was associated with a high incidence of non-payment (Hardoy et al. 2005).

Moreover, the connection fees were very high, at about $US600 per household (Almansi et al. 2010). To compare, the monthly family income was about $US400 for a family of four. Perhaps the most fundamental shortcoming was that the contract paid no attention to the composition of the demand side, priority areas, and needs. Consequently, water services were extended to the wealthier parts of the city, while low- and middle-income neighbourhoods and municipalities remained unserved. By the end of the contract, AASA had met about half of the investment goals, reaching 79% of residents served, instead of the 88% coverage estimated in the contract. AASA's performance also fell short in improving the quality of the service; low water-pressure problems affected almost 70% of the supply network (ETOSS 2003).

Privatisation also affected the cost of water. During AASA's management, numerous regulatory changes altered the original contractual clauses and authorised tariff increases that exceeded the domestic consumer price index (CPI) for financing investments. Within only 9 years, between 1993 and 2002, water rates increased by 88%, from $US14.56 in May 1993 to about $US27. 40 in January 2002.[17] Furthermore, the high fixed costs disproportionately affected low-income households, making water prices highly regressive. In May 2002, the cost of water represented 1.3% of the income of those in the highest income deciles and 9% of the incomes in the lowest deciles. At the same time, AASA's profitability increased, yielding a return on capital of 20%, which is considerably superior to the 11% estimated in the original contract. In most countries, acceptable limits are much lower; for example, in the United States, acceptable limits are 6.5%–12.5%; in the UK, 6%–7%; and in France, 6% (Phillips 1993). AASA also borrowed internationally, taking advantage of the interest rate differentials between Argentina and international interest rates during most of the 1990s. At the beginning of 2002, the company's debt was about US$650 million, almost 20 times its net equity. Perhaps most disturbingly, the extraordinary profits made by AASA were not invested in infrastructure but were shipped off to stockholders in Europe. This can be largely attributed to the concession's ineffective regulatory architecture and a context of asymmetric information, lack of transparency, and accountability in decision-making (Cohen 2012b).

With the macroeconomic crisis in 2001 and the accompanying political and social turmoil, poverty and inequality increased sharply throughout Argentina. Between 1991 and 2002, the income ratio between the top 20% and the bottom 30% increased from 9.2 to 14.5, and poverty increased from 27.4% to 52.4% (Pirez 2004). The economic and political crisis and the water company's suspension of infrastructure expansion projects led to a cancellation of private contracts in 2006. AASA was soon replaced by Agua y Saneamientos Argentinas S.A. (AySA), a company created by the government. After the provision of water fell back into the hands of the public sector in 2006, the national government made significant investments in expanding basic services, with a particular focus on low-income areas and on metropolitan Buenos Aires. Between 2006 and 2016, more than 3.4 million residents of metropolitan Buenos Aires were incorporated into the water network, and 2.8 million received access to sanitation (AYSA 2019).

[16] *The consortium was composed of Suez (25%), Aguas de Barcelona (12.6%), Meller S.A. (11%), Banco Galicia y Buenos Aires (8%), Companie Generale des Eaux S.A. (7.9%), Anglian Water Plc. (4.5%), and the Stock Ownership Program (10%).*

[17] *During these years, inflation was close to zero or even negative.*

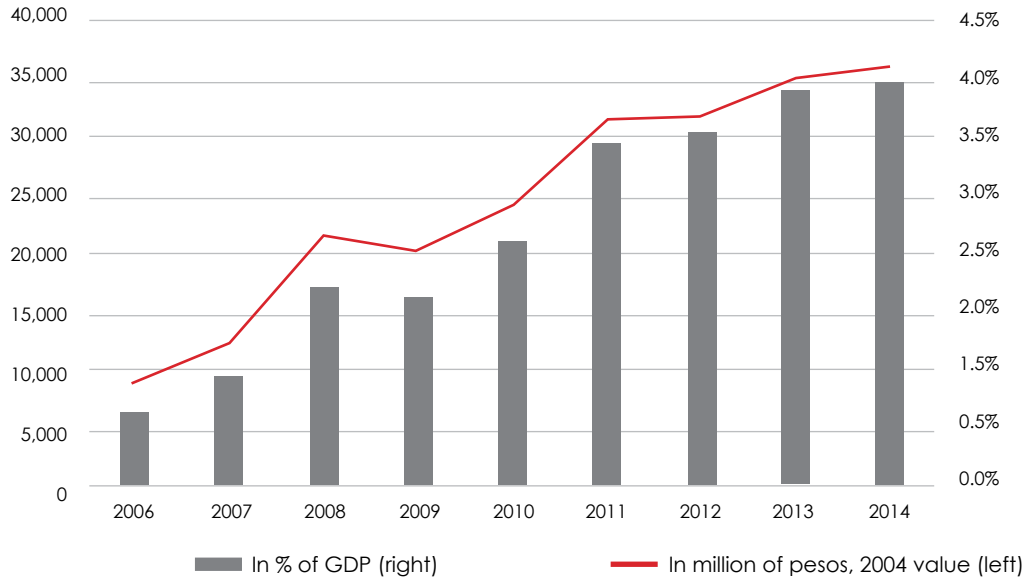
The case of water privatisation in metropolitan Buenos Aires in the 1990s confirms the concern that if market involvement in the public services arena is based on profits above all, it will worsen the inequalities that are already present in large metropolitan areas (Warner and Hefetz 2002). Some scholars also contend that market solutions cannot attend to issues associated with the coordination and equality of basic services without some government intervention to internalise the externalities of uneven fiscal capacity and need (Warner and Hefetz 2002; Lowery 2000).

3.3.2 The distributive character of subsidies in the case of water and electricity

Subsidies to public services in Argentina have increased notably since 2006, to the point of becoming one of the main items within the national public expenditure structure (See Figure 4). Between 2006 and 2014, subsidies increased by about 450% in real terms, concentrating mainly in the energy and transport sectors (which make up close to 90% of all sectors). In 2014, subsidies amounted to 178,600 million ARS (Argentinian pesos); of that, 128,000 million was allocated to the energy sector. A large number of subsidies (88%) are channelled through the two largest companies in charge of creating energy, CAMMESA (Compañía Administradora del Mercado Mayorista Eléctrico) and ENARSA (Energía Argentina Sociedad Anónima). In 2015, the newly elected national government terminated most subsidies established under the previous administration in an attempt to shrink the fiscal deficit. As a result, prices of all services increased substantially; water increased by 680% and electricity increased by about 1,317% between 2015 and 2019 (Davis 2019).

These drastic changes in the subsidy allocation, which affected the cost of all municipal services, raise the question of the impact on the supply, its quality, and accessibility. Most importantly, the effects on income and income distribution are relevant, since subsidies provide services at a lower price. A study by Puig and Salinardi (2015) finds that although subsidies had a progressive nature, most were, in fact, pro-rich, suggesting that the highest income deciles received more subsidies than the lowest deciles. The richest 20% of the population received about 30% of all subsidies, while the poorest 20% accounted for just 12%.

FIGURE 5: Evolution of subsidies in Argentina, 2006–2014.



Source: Puig and Salinardi (2015) (translated).

Figure 5 shows the participation of each decile in the receipt of electricity subsidies (depicted in the grey bars), demonstrating that the rich received more subsidies in absolute terms than the poor, consumption being distributed moderately equally across deciles. The graph further shows that although the electricity subsidy was progressive (solid line), the transfers were distributed across deciles in a more or less uniform way, and were marginally higher for high-income earners.

The allocation of water subsidies was even less progressive than that of electricity. Subsidies for water were more concentrated in higher-income deciles. The nature of the subsidy system is particularly concerning in light of the income distribution in Metropolitan Buenos Aires, where most residents have a monthly income below 20,000 ARS (about US$510), see Figure 6. Incomes in the city of Buenos Aires are more evenly distributed and are much more concentrated in lower deciles in the municipalities of the metropolitan region.

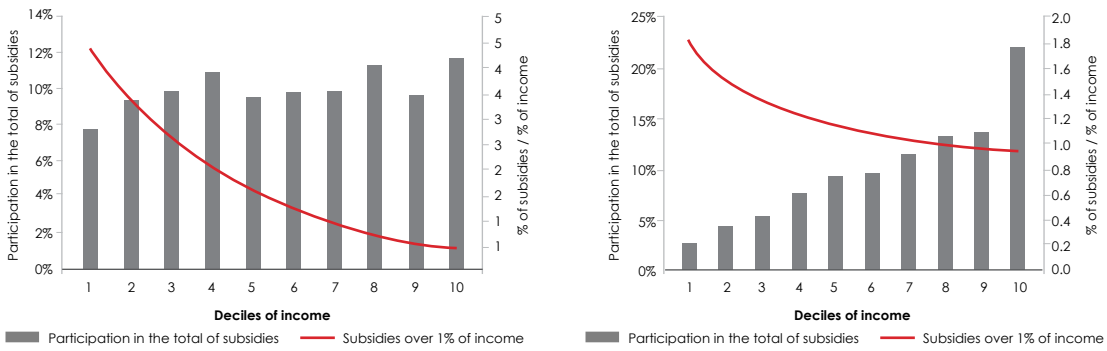
The restructuring of the subsidy system, which occurred in 2015, may thus be justified as a means to redirect transfers to the poor and to establish a more progressive tariff system. However, cuts have disproportionately affected those at the lower end of the income spectrum. Results of a survey of 1,500 households in Metropolitan Buenos Aires by the Centre for Metropolitan Studies (CEM 2018) indicate that 65% of households consider tariffs for all basic services to be too high, and 25% of households cannot afford to pay the increased prices. Electricity prices are particularly challenging; about 37% of households cannot afford the increased costs. Regarding water, 27% of households cannot afford the increased rates.

3.3.3 Takeaways

The experiences of Buenos Aires in the provision, management, and pricing of water and electricity demonstrate that privatisation can harm the efficiency and accessibility of municipal services. At the same time, subsidies by the national government need to prioritise the most vulnerable in order to enhance access to services and contribute to equitable economic development.

Privatisation can harm the most vulnerable because projects have to be financially attractive in the first place. As the case of Buenos Aires shows, to achieve financial goals entails increasing tariffs to bring about a commercial return. By definition, private corporations seek to maximise profit, which does not necessarily translate into the expansion of services, especially in places where the corporations do not expect to see a return on investment and profit. The case of Buenos Aires also demonstrates that partnerships with the private sector need to be carefully designed, and contracts need to specify tariff adjustments, maintenance requirements, and expansion plans. It remains

FIGURE 6: Distribution of subsidies for electricity and water by income deciles (per capita).

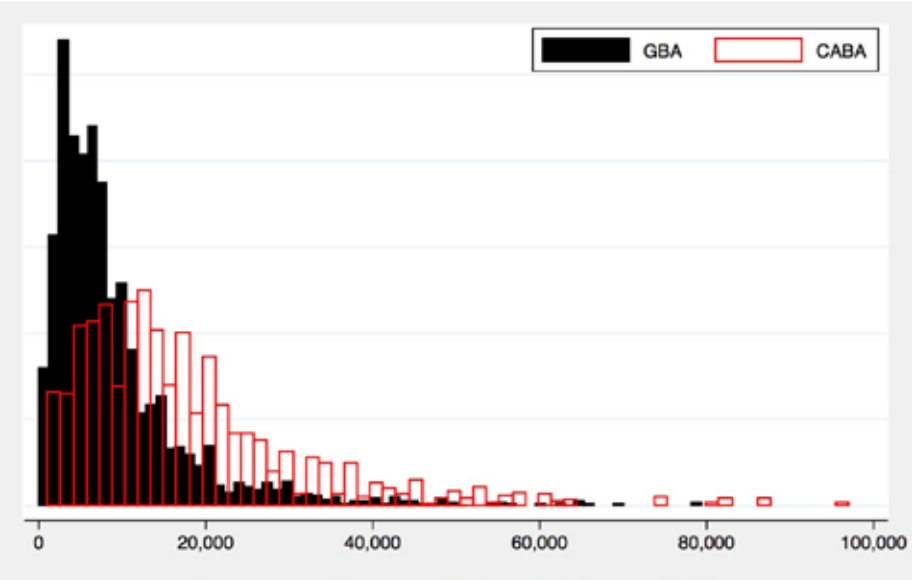


Source: Puig and Salinardi (2015) (translated).

the task of the municipality to ensure that private entities follow contractual obligations and are held accountable.

Although national subsidies to municipal services are crucial to sustaining services and to ensuring accessibility for everyone, it is not desirable if they are pro-rich. The fact that the wealthiest sectors of the population receive most of the subsidies of water and electricity suggests that there is room for better targeting of these policies. The same holds true for the cut in subsidies, which may reduce the pro-poor nature of these subsidies instead of increasing costs for everyone, generating an affordability crisis.

FIGURE 7: Histogram of per capita incomes in the City of Buenos Aires (CABA) and surrounding municipalities (GBA), 2018.



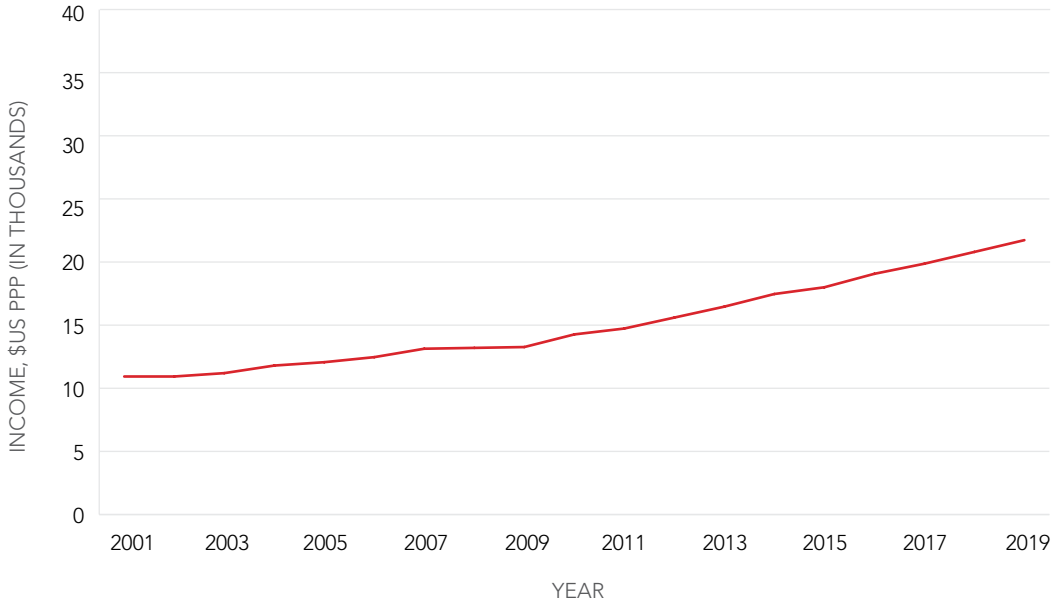
Source: Authors, data from the Household Survey (Encuesta Permanente der Hogares 2018).

3.4. Water management in Metro Cebu (Philippines)

In the Philippines, the government has traditionally taken the leading role in the allocation and management of water, with the objective of attaining equitable, efficient, and sustainable outcomes. In the last two to three decades, the water demand of various sectors—households, manufacturing, and industrial farming/fisheries—has increased. Rising population and rapid urbanisation, higher incomes, and economic development have stressed the water supply enormously. At the same time, the supply and the quality of available water resources have deteriorated due to agricultural practices, the inability to control water pollution, and the failure to regulate water tariffs and resource use across providers.

Consequently, the government's task of managing the water supply has become more complex. The rising scarcity of water and the high cost of creating new water supply sources have prompted questions about the efficiency, financeability, and sustainability of Cebu's water supply system. Although equity in access has long been a challenge, it receives less attention. An essential instrument for more efficient and equitable use of water is the adoption of an appropriate pricing framework. As the case of Cebu demonstrates, current water prices do

FIGURE 8: Average personal disposable income in Metro Cebu, 2001–2010.



Source: Authors' calculations based on the Oxford Global Cities Database.

not reflect the opportunity and scarcity costs of water and the externalities associated with water production and consumption, and, if unaddressed, may cause a water crisis in the next 30 years.

As a fast-growing city in one of Asia's rapidly urbanising countries, Cebu's infrastructure is under increasing pressure. The Metropolitan Area of Cebu (Metro Cebu) grew faster than any other city in the Philippines during the 1980s, with an annual growth rate of 4.1%—although the rate subsequently slowed to 2.3% in 2010–2015, and then to 1.7% in 2015–2017. In 2017, Metro Cebu had a total population of about 2.9 million, making it the country's most populous urban area, after the capital region of Metro Manila. Future projections put Cebu's population at 3.8 million by 2030 (Philippine Statistics Authority 2018a). Metro Cebu is comprised of Cebu City and the neighbouring cities of Carcar, Danao, Lapu-Lapu, Mandaue, Talisay, and Naga, along with six smaller municipalities. The total land area of Cebu Metro is 100,000 ha, just 14% of the total land area of Cebu Province, but it contains nearly 60% of the province's population.

Rapid urbanisation and agglomeration effects have generated new economic opportunities in Cebu, which is the economic centre of the Central Visayas region. In 2017, the region produced 6.5% of the country's GDP, with an annual growth rate of 7.06% between 2015 and 2017 (Philippine Statistics Authority 2018b). This growth is reflected in the steady rise of incomes since the 1990s (see Figure 7). In fact, between 2001 and 2015, average household incomes increased by 65%. On the other hand, rapid urban growth and economic development have resulted in serious challenges, most notably in inadequate infrastructure and widening inequality. Cebu's Gini Coefficient of 0.47 is above the national average (0.44) and is higher than that of Manila (0.39) (Philippine Statistics Authority 2018a). Cebu's water management is another serious concern. The water resources are at risk, access to piped water is limited, and the character of water prices is highly regressive.

3.4.1 The dilemma of water management

The Metropolitan Cebu Water District (MCWD) is in charge of managing the public water provision for the Metro Cebu area. While water districts are responsible for the supply, a national agency — the Local Water Utilities Administration (LWUA) — functions as tariff regulator and institutional development advisor.

In Cebu, water supply coverage has not kept pace with the increasing demand. The MCWD faces financial constraints because tariffs are low and access to

financing is limited, which restricts any capital improvement project. In 2018, MCWD water supply was provided to only 40% of Cebu's households. The service has been plagued by low water pressure and irregular supply. In 2007, the average water supply consisted of 18 hours per day of available water (World Bank 2007), although this amount is thought to have declined considerably, due to leaking pipes and new developments tapping into existing connections (Figure 8). In order to keep up with demand, MCWD implements daily service interruptions in neighbourhoods across the city: even in the city centre and in some of the densest residential areas, water arrives only in the early hours of the day. The unreliability of the service impacts businesses, and it has incentivised wealthier households to look for additional or alternative water sources (MCWD 2018). Moreover, a significant amount of water is lost due to leakages and the tapping of pipes. Some 25% of MCWD water is lost on its way to the consumer. In the downtown area, where the pipes are close to 100 years old, the irregular water pressures cause pipes to crack and break.

Although MCWD's supply has increased since 2010, this has done little to close the demand and supply gap, as depicted in Figure 9. According to projections from the MCWD, the water supply is set to expand notably by 2020, narrowing the demand and supply gap to 60% of the total demand. But by 2030, however, public officials project that water demand in Metro Cebu will double, reaching a total demand of 700,000 m3 of water per day. Unless large investments in new water sources are made, it is difficult to imagine how this rate of supply will be achieved.

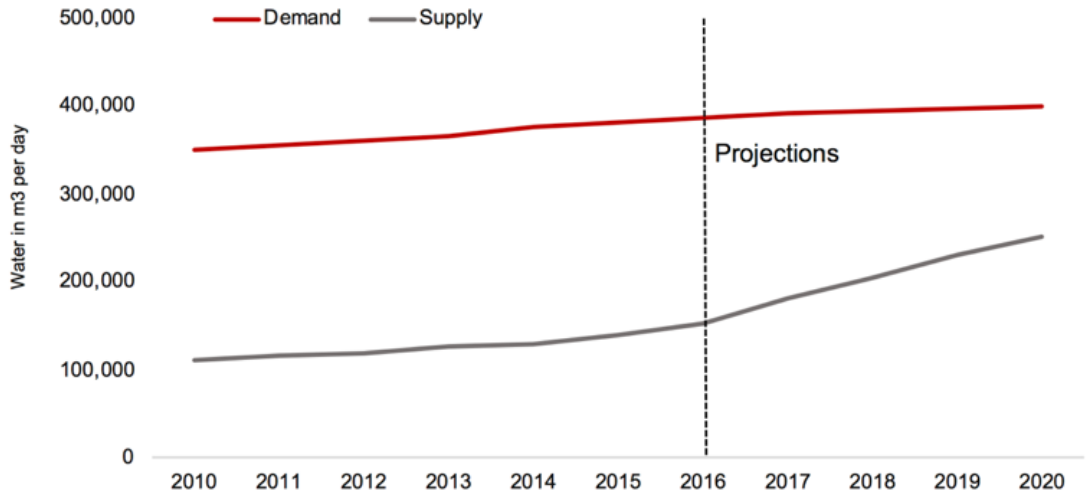
Today, nearly 80% of Cebu's water is tapped from the groundwater, which has negatively affected the natural water balance. Metro Cebu has therefore identified three strategies to avert the impending water crisis. The first strategy is to bring groundwater in from neighbouring municipalities. The complications for this option are the transportation of the water and the charges that would go to other municipalities for the construction of new wells. A second option is to capture surface water with dams, which would allow the extraction of large amounts of water, up to 340,000 m3 per day. However, the costs of constructing new dams are very high. The third and perhaps most innovative option is to invest in desalination plants, which appear particularly appropriate, considering Cebu's geography. However, high energy consumption costs for this option would likely increase the costs of water by at least 90% (MCWD 2018).

Despite the awareness among public officials of the critical state of Cebu's water supply system, low levels of financial liquidity and investment capacity have resulted in inaction. Moreover, planning is severely constrained by the lack of information concerning changes in demand and conflicting information on the existing suppliers. The majority of private water utilities are not registered, and there are no penal provisions for noncompliance with public regulations. Most importantly, there are no standards for tariff levels.

FIGURE 9: MCWD water connections in Cebu, 2018.

Source: Melissa De la Cruz (2018).

FIGURE 10: Total water demand versus MCWD water supply, 2010–2020.



Source: Authors' graph based on data provided by the MCWD (2018).

3.4.2 The cost of water

A key instrument in water resource management is to let the social opportunity or scarcity cost of water reflect water production and consumption decisions. This is in addition to the full financial cost of water supply development and management, including any environmental cost involved in the process of developing and using water resources. Cebu's current water pricing policy has neither sufficiently recognised water as a scarce resource, nor accounted for the externalities involved in the production and consumption of water.

In the Philippines, water districts, such as the MCWD, are financially independent and do not receive subsidies from national or local governments. The district is compelled to generate enough income to cover operating and maintenance costs, debt service, and capital expenditure. In a water sector review, the Asian Development Bank (ADB 2013) found that the limited autonomy of water districts in planning and managing their operations negatively affects their efficiency and sustainability. In addition, increasing water tariffs to cost-recovery levels is politically unpopular. Finally, while user fees are crucial for the delivery of water services, they are less appropriate for large infrastructure investments, because this would mean a large spike in the fees. Limited access to affordable long-term investment capital, thus impedes the ability of water districts to expand and improve services.

In Metro Cebu, the cost of water varies depending on the water source. The lowest average price of water is enjoyed by households connected to the public MCWD system, at a cost of 16.8 PHP (Philippine peso) per m^3.[18] The MCWD system has a minimum service charge of 152 PHP, equivalent to the payment of the first 10 m^3 consumed. In excess of 10 m^3 and up to 30 m^3, consumers pay an average of 18.28 PHP per m^3 (see Table 10). The second option is private water service, which consists of individual home wells. Although current rates of private water services are not available, they tend to be competitive with MCWD rates. Finally, some households rely on purchased water deliveries, for which they pay enormous amounts, compared to MCWD rates, since water needs to be extracted, packaged, and transported. In 2018, a container of delivered water, holding 18 litres, was sold for about 45 PHP. A cubic meter of purchased, delivered water, therefore, costs 4,500 PHP, which is at least 18 times the cost of water distributed by

[18] *One USD equals about 52.36 PHP.*

FIGURE 11: Water delivery in Cebu, 2018.

Source: Melissa De la Cruz (2018).

the MCWD. Since the MCWD rarely covers low-income areas and informal settlements, the poor pay comparatively higher water rates than do middle- and high-income households using private wells or the MCWD system.

The MCWD's tariff structure is based on consumption and the type of connection. As displayed in Table 10 and Table 11, regular residential connections of 1/2 inch meters are priced the lowest. Large consumers, such as industrial producers, face more substantial service fees, up to 41,952 PHP (about 800 USD). In addition to the service fee, prices increase in three rates. For consumption levels below 20 m3, the charge is 16.8 PHP/m^3; this increases to 19.77 PHP/m3 for litre 21-30. After that, the rate increases to 48.4 PHP/m^3 of water.

TABLE 10: Water rate structure of Metro Cebu Water District, 1998 and 2018.

Meter Size, inches	Min Charge 1998, PHP	Min Charge 2018, PHP	1998 Rates, Inflation Adjusted
1/2	90.64	152	188.59
3/4	147	243.2	305.87
1	287	486.4	597.18
1 1/2	735	1216	1529.35
2	1825	3040	3797.38
3	3283	5472	6831.12
4	6566	10944	13662.25
6	9842	18240.00	20478.80
8	-	29184.00	-
10	-	41952.00	-

Source: CAG (2014).

TABLE 11: Commodity charges for all types and sizes of connections.

Consumption Level, m^3	Min Charge 1998, PHP	Min Charge 2018, PHP	1998 Rates, Inflation Adjusted
11-20	10	16.80	20.80
21-30	11.76	19.77	24.47
>30	32.25	48.40	67.10

Sources: Authors' calculations based on data from David et al. 1998 and MCWD 2018, Inflation rate: World Bank 2018.

Researchers and international agencies have long advised the MCWD to increase prices (see David et al. 2000; Gonzales 2004; ADB 2013; OECD 2017). Yet, the MCWD has expressed concerns that private and commercial consumers will opt out of the system if rates are increased: "The people are not ready for large increases in their water bill and will not accept to pay higher prices. If you price water at 70 pesos/m3, the consumers will switch to a private provider, dig their own well, or go informal, which would make the situation even worse. In addition, the MCWD has no control over prices set in the private market (MCWD 2018)."

Considering inflation since the early 2000s, however, 2018 water tariffs are still below 1998 rates. As Table 10 and Table 11 indicate, inflation-adjusted 1998 rates yield water tariffs beyond 2018 rates, and the actual value of tariffs has dropped by 11% between 2000 and 2015. Compared to the rise in incomes over the same period (+65%), real prices have not kept up with other economic trends and the purchasing power of the population. To the extent that the current water pricing policy has prevented the improvement or expansion of the potentially more economical public service, it had perverse effects on efficiency and sustainability, and also on equity, since informal water sources are more expensive.

3.4.3 The need for integrated resource management and pricing

Cebu's massive investment backlog is impeding the upgrading, renewal, and maintenance of water-related infrastructure. As Cebu's population is projected to further increase by 2030, the competition for water is likely to become more severe. If nothing changes, water security will be increasingly at risk. As the case of Cebu indicates, the effective implementation of water responsibilities is threatened by insufficient local revenues. Moreover, the high sectoral fragmentation of water-providers (public, private, and informal sources) challenges the management of water use and limits possible reforms of the pricing structure. While public tariffs have been adjusted in absolute terms, they have decreased when inflation is considered. Consequently, revenue and investment remain low compared to other metro areas.

MCWD's block tariff structure could be revised to apply higher rates to large consumers and those with greater purchasing power or to introduce commercial rates. Such measures can manage demand, reduce consumption, and generate revenues to expand infrastructure and enhance water quality. Furthermore, when expanding the water system, a needs-assessment is essential to identify priority areas. Currently, the most vulnerable citizens are rarely connected to the public system and often pay the highest water rates. The responsibilities and use of financial resources between the national government, local governments, and water districts should be further aligned to achieve common goals. Finally, attracting private investment could be considered for the expansion of the system, especially since foreign direct investment (FDI) inflows have been lower in the Philippines than in other countries of the region (ADB 2013).

The risks of sea-level rise and climate change will put additional pressures on Cebu's water system. Investments are needed for innovative technologies for enhancing productivity, conserving and protecting resources, recycling storm- and wastewater, and developing non-conventional water sources, in addition to seeking opportunities for enhanced water extraction. At the same time, exploring complementary policy strategies, in particular, green infrastructure, demand-side management tools, and smart technologies, can provide greater flexibility and alleviate the demand for water.

4.

CONCLUDING REMARKS AND RECOMMENDATIONS

Municipal services generate substantial benefits for human health, the environment, and the economy overall. For example, access to clean drinking water and sanitation reduces health risks and increases the productivity of the entire labour force. Although difficult to measure, such benefits usually surpass the costs of service provision and provide a strong basis for investing in the utility sectors. Prüss-Ustün et al. (2008) estimate that almost 10% of the burden of disease could be prevented through accelerated and scaled water, sanitation, and hygiene interventions. Meeting global goals in water and sanitation (e.g., SDG 6) could have a benefit to cost ratio of 7 to 1.

In rapidly growing cities, as is the case in all cities discussed in the previous section, extending access to services should remain a key priority. However, the investments needed to deliver services, including the financing required to operate and maintain the existing infrastructure, expand its coverage, and upgrade service delivery to meet current social and environmental expectations, are significant. A 2006 OECD study found that the capital required globally to finance investment in key infrastructure to the year 2030 will amount to about US$75 trillion, with nearly half of it for water and sanitation.

Most systems in cities in the global South, however, are underfunded, with dire consequences for users, especially the most vulnerable. For municipalities and neighbourhoods that experience high levels of poverty, service coverage levels are low, and the quality of services is unsatisfactory. Low-income households often pay higher rates for services, which in turn negatively affects equitable economic development and fuels segregation of cities by socio-economic status. Closing the financing gap will require countries and municipalities to mobilise financing from a variety of sources. Utility services and municipalities will have to take action in several areas to reduce costs, increase revenues, improve the overall efficiency of service delivery, and mobilise project finance from public or private sources. Finding the right balance between all these actions calls for strategic financial planning. As described in the literature review and cases, success in simultaneously mobilising sources of revenue while at the same time reducing costs will depend on navigating a set of context-specific factors.

4.1. Pricing models: lessons from the case studies

Under the right conditions, the pricing of municipal services can be a key instrument in managing social, environmental, and economic externalities. The social opportunity and scarcity cost of services is a relevant reflection of production and consumption decisions. For example, a block tariff can reallocate supply to smaller users who generally value services more than large users do. It also creates incentives to consume less in general — which is desirable from an environmental stance. Changes in pricing schemes and tariff structures hold the potential to change the producer's behaviour, for instance, by signalling more transparent prices and creating a more competitive ecosystem for the procurement of intermediate goods and services.

Where existing supply falls below demand (in quantity or quality), practical experience suggests that the expansion of services will require some form of general budget support, even when financing can be secured on a project recourse basis (e.g., new land). This element is important because part of the

debate today involves the question of who should pay for expanding infrastructure. Looking at historical experiences from cities in the global North, the highly capital-intensive investments in networked infrastructure that often did not provide direct remuneration required important intergovernmental transfers. As Szreter (2004, p. 18) notes, the "evaluation of the historical evidence indicates that without a strongly interventionist role for local government, supported with the resources of the central state, economic growth will seriously compromise population health."

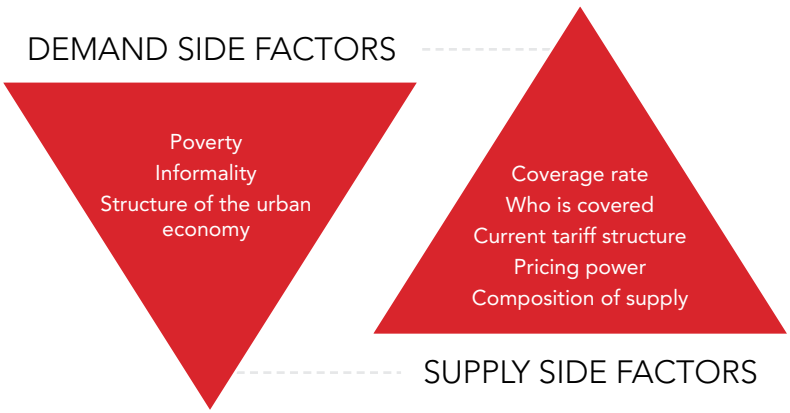
These lessons from history, and the practices from our case studies from Accra, Bengaluru, Buenos Aires, and Cebu make it clear that there are no one-size-fits-all pricing schemes that municipalities should follow. Pricing models that work in one city do not necessarily work in another. For example, a metropolitan area like Buenos Aires, which receives national subsidies and has a relatively strong tax base — and where about 75% of its residents are connected to water services — can price services through different transfer mechanisms. This would be difficult to do in smaller secondary cities with a limited tax base and supply coverage. An appropriate pricing structure thus depends on a variety of elements, including city capacity and a number of demand and supply factors, as depicted in Figure 11.

Throughout the review, it became clear that the classic public finance perspective has not addressed the extent to which pricing schemes and tariff structures influence how poor households and firms make the trade-off between the quality and affordability of publicly provided services in their decisions to access the same service, but from a variety of providers. For instance, due to intermittent service, low-income households often satisfy their consumption through a mix of public services provision, but also small-scale private or cooperative provision (Rocha-Melogno et al. 2018). This reality makes it difficult to generalise lessons about the effects of changes in the municipal price system on household behaviour, especially for cities where the majority of urban land, housing, and the broader city economy remains informal. This affects the financial viability of the main utility provider, as pricing mechanisms can crowd out lower-income households and influence their choices in connecting to the main network.

As the case studies demonstrate, the financing and equitable delivery of existing municipal services are embedded in a complex set of vertical (across levels of government) and horizontal (across sectors) interdependencies, which require substantial coordination among actors to ensure policy alignment and quality outcomes. The vertical dimension focuses on transfer dependency and soft budget constraints. The horizontal dimension focuses on the relationship between general-purpose elected subnational (local) governments and the range of other local public and private service providers (utilities, private firms, both formal and informal).

Financing the expansion of municipal services, therefore, entails intensive engagement across the different levels of

FIGURE 12: Demand and supply-side factors that (should) shape pricing mechanisms.



Source: Melissa De la Cruz (2018).

government and community actors, whereby interactions are not always top-down. While funding most often flows from national to lower-tier governments — and at times even to community groups — local-level actors also need to identify and shape priorities and regularly contribute, where possible, to financing. With the expansion of urban areas, the management of municipal services requires an even more intense horizontal interaction, involving coordination between different jurisdictions and actors (public and private) to collaborate on service provision efforts. In this context, the fragmentation in decision-making among and between influential urban governance institutions poses considerable obstacles to cost-recovery performance, primarily because fragmentation enhances the veto power of different actors and thereby increases the costs of coordinating sustained collective action within multifaceted and multilevel pricing policy and regulatory frameworks.

In reality, however, coordination failure in designing and implementing price mechanisms is the norm, with enormous repercussions for service provision. From an intergovernmental perspective, if local governments must seek approval from higher-level authorities to raise service prices, reform initiatives must consider these costs. In the case of Accra, the limited funding for sanitation infrastructure (compared with other services) results in low levels of provision. Financing sanitation, therefore, remains a household responsibility. The cost burden is particularly penalising for low-income households, which are obliged to make a difficult trade-off between quality and affordability of services, and often realise this trade-off by having to share facilities in unhygienic and overcrowded alternatives.

Similar coordination failures are apparent in the other cases presented in this report. In Metro Cebu, for example, the local government does not have the necessary legislative power to adjust the price of water. Although Cebu's institutions are aware of the consequences of the underpriced service provision, as well as the increasing demand and urgency of the situation, the lack of coordination between government levels has paralysed the efforts for change. Finally, in Buenos Aires, private actors have had drastically different objectives and interests from those of government or local community actors, which has also stalled collaborative efforts and resulted both in little service improvement and a high cost for low-income consumers.

4.2. Service delivery and financing options

The findings of the individual, city-level case studies as well as broader research point to a set of priority policy problems shared to differing degrees by cities in the global South. Table 12 provides an overview of successes and challenges in delivering services in the four studies.

While Figure 13 is not a decision-tree in the classical sense, it demonstrates the financial obligations and potential revenue streams that municipalities have, as well as the additional financing options they might need to use to close the revenue gap that prevails in most cities. As the four case studies indicate, the realities of municipalities — whether large or small, rapidly growing, or economically struggling — are drastically different. Therefore, it seems more appropriate to provide an overview of the factors that need to be taken into consideration when developing a pricing scheme for each municipality, instead of suggesting a stepwise script that municipalities should follow.

As seen in the cases of Accra, Cebu, and Bengaluru, the principle of full cost recovery — which suggests that all supply costs would be covered via tariffs — is unrealistic in cities that have a low tax base, a significant financing gap, an infrastructure deficit, and where affordability is a significant constraint. In these situations, residents that are not connected to formal service providers have no option other than private or community service providers. While these alternative service providers play and will continue to play an essential role in filling the current gap, they compete with public services, which can undermine prices and negatively affect the quality of the service provision.

TABLE 12: Successes and challenges in delivering services in the four case studies.

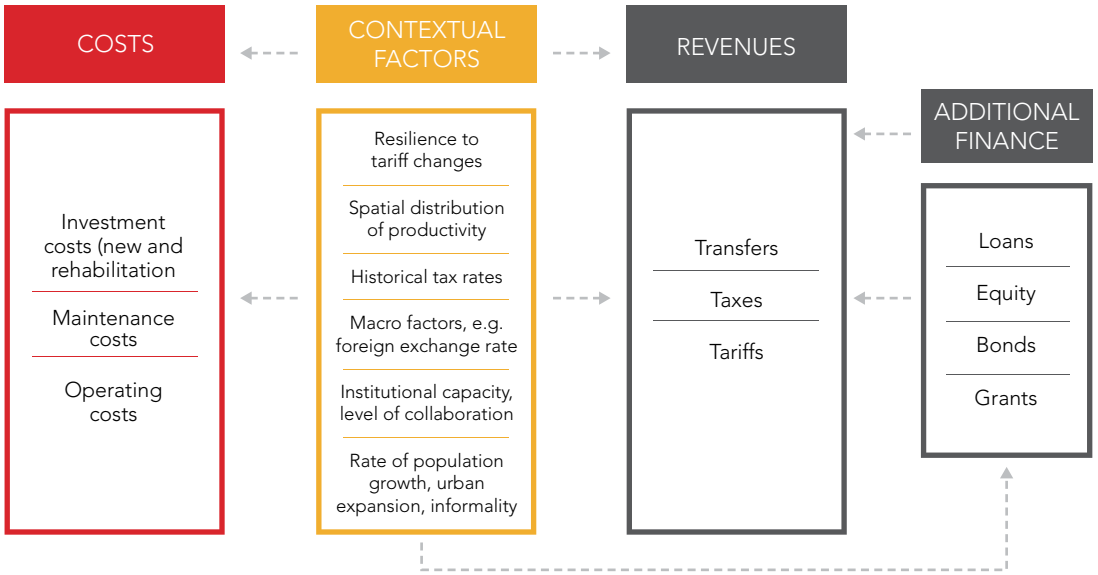
City	Key Successes/Developments	Key Challenges/Constraints
Accra	There is a clear separation of the institutional responsibilities between water and sanitation for urban services. Sanitation services have been decentralised.	While the institutional responsibilities for sanitation services are well defined, the provision of services has been deficient. There is a significant reliance on shared sanitation; individual household sanitation is unaffordable for the urban poor. Negative health and environmental externalities exist, due to overcrowding in informal areas. There are low levels of funding and investments in sanitation infrastructure.
Bengaluru	Initial efforts at registering informal waste pickers have expanded market opportunities for low-income and vulnerable workers. Policy reforms and legal guidance have contributed to an integrated SWM plan that focuses on system expansion, increased investment, and new waste management technologies.	SWM user charge collection remains low, so there is a limited scope for expanding the role and pay levels of sector waste pickers. Investment in new waste treatment facilities with funds transferred through flagship urban investment programs substantially increases future spending obligations on operations and maintenance that cannot be met by current revenue administration systems.
Metro Buenos Aires	Service provision has been expanded over the past decades. The subsidy system seeks to sustain services and to ensure accessibility for everyone.	A poorly designed privatisation scheme harmed the efficiency and accessibility of service delivery. Subsidies did not reach the most vulnerable, but disproportionately supported wealthy users.
Metro Cebu	Rapid growth and agglomeration effects have generated new economic opportunities that allow for higher rates for the provision of services. The local water agency is aware of current and future challenges.	Low-income households pay disproportionally higher rates for water than high-income households. The supply has not met increased demand. The large and unregulated pool of service providers is undermining the quality and pricing structure of public service provision

Source: Authors.

Tariffs can provide an essential source of revenues. However, tariff and price structures are often outdated, while also being challenging to change. The potential for raising tariffs depends on affordability constraints and the local resistance towards tariff increases. Price adjustments have to be approved by several layers of government, which can prove time intensive and burdensome. Tariff and price structures are also characterised by strong path dependency. Adapting and modernising these structures often requires radical policy shifts that obviously entail short-term political costs; however, continuing on the same path will only increase inequities in service provision. Therefore, to mitigate the political costs associated with tariff reform, changes in the pricing system need to be incremental and operationalised under long-term strategies that aim to improve equity and efficiency in service provision.

Public budgets and cross-subsidisation still represent a crucial share of revenue and are likely to play an important role in the future. This is especially true for secondary cities, where per-capita incomes are lower than

FIGURE 13: Costs, revenues, and contextual factors that impact decisions.



Source: Authors.

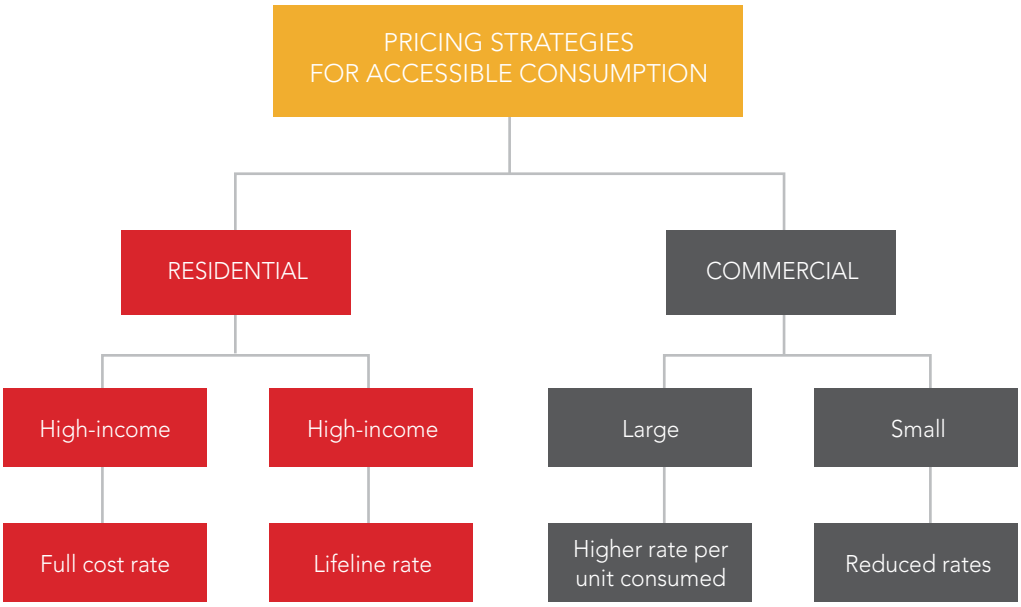
in primary cities, and affordability is an even greater challenge. However, subsidies should be transparent and targeted. While public funds are limited by budgetary constraints and multiple demands from all sectors, municipalities need to allocate public funds according to local priorities. Also, subsidies are not desirable and beneficial if they are regressive and offset costs for those with the highest purchasing power.

As the case of Buenos Aires shows, privatisation is not a panacea for efficient and equitable service delivery. In the absence of transparent and clear contractual principles, higher tariffs do not necessarily translate into enhanced and expanded services, especially in municipalities and neighbourhoods with a higher share of low-income residents, since they do not expect a high return on investment. However, private funding, in the form of debt and equity finance, can offer another tool for financially constrained municipalities that depend on national transfers to close the financing gap and to expand services to meet the demand. In Cebu, for example, private sector investment in renewable energy-based desalination plants can offer a pathway to meet the increasing demand for water that the public sector cannot explore due to limited revenue streams. Financial innovation can play a significant role too, for example, through public-private partnerships. To overcome the lack of financing opportunities at the municipal level, the issuance of municipal bonds can offer new opportunities. Creating project preparation facilities that increase transparency and improve the quality of projects seeking financing is another relevant aspect of and requirement for attracting business and investment.

Each local government, depending on its contextual factors, should adopt a different mix of revenues. Most municipalities have used intergovernmental transfers to fund the development of services, particularly for capital expenditures (see the case of Cebu). However, as cities develop, the revenue mix is expected to shift, for example, towards cash flows from user charges and other tariff measures (e.g., utility surcharges).

Drawing from the different case studies, Figure 14 provides a general diagnostic outlining different approaches to setting municipal tariffs. This representation is schematic, however, and does not include the full set of relevant parameters that affect price levels. In practice, shifting from outdated pricing and tariff structures is more complicated, and it is often associated with political costs that entail winners and losers.

FIGURE 14: Approaches to setting municipal tariffs.



Source: Authors.

4.3. Recommendations for national governments, local governments, academia, and development partners

The following set of recommendations is based on the literature reviewed and lessons from the four case studies included in this report. The recommendations are organised in four tiers: recommendations for national governments and for local governments and metropolitan governance structures, as well as broader recommendations for the wider research community and development agencies.

4.3.1 Recommendations for national governments

Recommendation 1. National governments should adopt a broader and cross-sectoral view of the municipal price system. Instead of taking discrete financial decisions, it is crucial to embrace the set of overlapping policy, planning, and operational domains that affect service provision at the municipal level. In developing pricing mechanisms based on the principles of efficiency, equity, and financial sustain-ability, they should take into consideration the pace and composition of urban demographic change, which complicates the straightforward application of bedrock principles of pricing municipal services, namely the application of marginal costing techniques, and should be explicitly calibrated to address rapid urban growth and expansion.

Recommendation 2. National governments can influence the extent to which municipal governments have been granted sufficient autonomy to use pricing authority beyond basic revenue generation functions. As the cost of information technology continues to decline, national governments can encourage cities to adopt new systems for metering and electronic billing that record service use rates and transactions in real-time.

Recommendation 3. National governments need to be aware of the way intra-urban (i.e., community-level) investment and service delivery needs are incorporated in the national fiscal (e.g., sector budget) system, which is heavily influenced by external financial balances and other macro-prudential considerations.

Recommendation 4. Stable and predictable fiscal transfers can support local governments' planning and investments to infrastructure in order to render these investments more sustainable and cohesive in the long run. The unpredictability of fiscal transfers impedes such long-term planning, forcing local governments towards an ad-hoc, reactive model in service provision, rather than the necessary citywide approaches that can address current and future challenges.

Recommendation 5. The current informal development of residential areas, which often characterise inner-city areas, and the peripheral city growth in lower-income countries makes the expansion of networked service provision difficult and expensive. Retrofitting networked infrastructure in underserved areas can be prohibitively expensive and is typically difficult to undertake. National transfers to local governments that cover capital costs for retrofitting can be increased, but without efforts to adapt delivery and pricing mechanisms, such attempts can fail to reach out areas where services are lacking or are currently provided at very high costs. In these cases, provision and pricing at the neighbourhood level rather than at the individual level can be a first incremental step towards achieving greater coverage.

4.3.2 Recommendations for local governments

Local governments need to respond to three levels of policy questions before identifying a pricing structure. Essential questions include the following:

- What is the general goal of pricing? Is it extending services? Cost recovery? Or?

- What are the normative objectives within the larger goal? Is the focus to generate greater equity in access? Or is it to enhance the productivity of firms?
- What are the operational choices available? What are the delivery mechanisms at hand, what level of subsidy can be expected, and to what degree can targeting be justified?

Various successes, failures, and more experimental efforts in cities in the global South are stimulating efforts at rethinking the basic building blocks for financing and management to achieve interrelated goals of economic efficiency, social equity, and financial sustainability. While these efforts vary significantly in the approaches taken and their outcomes, the elements necessary for rethinking pricing from a pragmatic perspective rely on information that is usually only available at the municipal level. To gather this information requires

a. Measuring and updating information on willingness-to-pay.
b. Lifeline tariffs and stratifying among different consumers.
c. Dynamic pricing models to ration supply and "price-in" environmental externalities.

Based on these elements, following recommendations for local governments are offered:

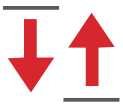
Recommendation 1. Cities with low coverage and weak financial systems should, in the short-term, explore alternative infrastructure provision paradigms and new institutional forms of ownership. This can refer to shared or community-owned systems and public-communal partnerships. Shared provision schemes, however, require an overarching regulatory and pricing mechanism to ensure the quality of the service, reduce environmental externalities, and ensure that prices are not exceeding the socially optimal price.

Recommendation 2. The social targeting of subsidies needs to be carefully evaluated, and tariff structures need to be made transparent. To maximise the reach of limited resources and improve outcomes for low-income families, local governments should focus on the most vulnerable segments of society. Subsidies to better-off families should be restricted, freeing up resources for those most in need. Such efforts could be structured as a means to better target existing resources, rather than as a reduction in subsidies for municipal services altogether. Besides, making data on subsidies (both source and target) more available and transparent will increase support from the public and ensure that subsidies work towards the larger goal of inclusion and equitable service provision.

Recommendation 3. Municipalities need to collect more data on the demand side of service users, as well as the operations and role of alternative service providers. Without such information, prices are set according to arbitrary standards and rarely reflect the population's affordability levels. Better information on service providers, in turn, is needed to create regulatory mechanisms that control for the sustainability, quality, price, and other aspects of service provision. Equally, more information is required on the financing sources available to local governments. Information on financing sources tends to be patchy, which makes it difficult to evaluate the gap reliably between needs and available funding. As the case of Cebu shows, data on private sector investments in water service delivery (ranging from large private operators, informal providers, households, or remittances) is not available and is difficult to collect, although these investments potentially represent an important source of funding for the sector.

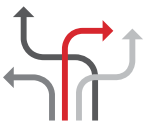
Recommendation 4. Municipalities need to engage community actors in service delivery and the design of expansion plans. In many cities of the global South, public provision of citywide basic services such as sanitation and water will not be a realistic option for many years to come. Thus, more attention should be given to the opportunity of engaging community groups to carry out some of the functions that are crucial to neighbourhood well-being. Certainly, these approaches are difficult to scale-up, particularly without the support and commitment of municipalities; but greater

involvement of local communities creates demands for more accountability and pushes local governments to further improve quality of service by addressing the affordability constraints of the low-income population.



Recommendation 5. Citywide approaches for the delivery, expansion, and long-term investment in capital costs of infrastructure are essential for a more equitable provision and pricing of services. However, this approach cannot simply rely on the expansion of these services for future urban growth. A truly citywide approach needs to incorporate both a long-term top-down planning for future expansion and, simultaneously, bottom-up approaches that deal with current populations and urban areas where provision is currently lacking.

4.3.3 Recommendations for academia



Recommendation 1. While a vast theoretical and empirical literature covers various causal pathways linking infrastructure investment to development outcomes, the causal relationship between pricing schemes and tariff structures and changes in public management performance and local service delivery outcomes for cities in the global South is far less studied. However, as shown in this publication, pricing strategies can play an instrumental role in improving access and performance of services and can guide investments in infrastructure.

Recommendation 2. Conventional public welfare analyses of urban service delivery tend to shy away from how the poor experience the multifaceted social, organisational, cultural, and political realities of service-delivery systems in cities in the global South. More research is necessary in order to get a better understanding of the complex conundrum between urban poverty and service access. Engaging local government officials with other stakeholders present in the delivery and pricing of services, particularly for low-income urban areas, is necessary in order to broaden the understanding of critical notions for pricing services, namely the affordability and adequacy of services provided.

Recommendation 3. Although policymakers and development experts highlight the need to reduce and mitigate the negative externalities caused by inadequate municipal service provision, there exists limited research on how these externalities should be estimated and integrated into social marginal cost calculations and how they should be recovered by user charges or subsidies from different levels of government.

These gaps pose serious challenges for developing a normative framework for assessing municipal government interventions in urban pricing schemes and tariff structures that is salient for city governments in the global South. While it is impossible to fully account for all city-level conditions which shape how changes to pricing schemes and tariff structures are designed and implemented, city-level case studies conclusively demonstrate that grounded social relations within urban service provisioning systems are often far more influential and far less static than what is allowed by conventional analytic approaches.

4.3.4 Recommendations for development partners

Multilateral development agencies and the development community, in general, can greatly contribute to the improvement of service expansion and delivery. While their role in establishing pricing mechanisms is rather limited, they can promote integrated and wider cross-sectoral approaches that can improve the availability of public finance and extend financing through new sources. Their role is particularly relevant for secondary cities, where capacity both in terms of financial and human capital resources may be lacking.

Recommendation 1. Development partners need to adopt a citywide long-term view in designing municipal infrastructure projects. As shown in the case study of Cebu's water supply management, self-provisioning of water by both poor and affluent consumers, combined with urban growth, has created undue pressure on groundwater quantity and quality. Unregulated wastewater disposal

has resulted in serious ground- and surface water pollution. A similar problem is identified in the case study of Bengaluru solid waste management. Because of sizable investment needs, development partners often select one segment of specific municipal service investment (e.g., solid waste transfer station by one development partner and landfill by another). These investments are often undertaken in sectoral silos, without adequate coordination, leading to inefficiency of the system as a whole. Development partners working in the same city and sector should increase their coordination on sector policy and project designs.

Recommendation 2.
Development partners can support integrated approaches to service delivery through the promotion of comprehensive planning and coordinated infrastructure investments. Municipal service investments are an essential step not only in creating healthy, productive, and more equitable cities but in avoiding the negative externalities that could emerge as the urban population of lower-income countries triples over the next generation. Reducing the congestion costs associated with urban development without parallel service and infrastructure development is difficult to achieve. Integrated planning approaches which focus on the future expansion of cities and the preparation of future plans for extending current infrastructure networks can reduce the costs and create economies of scale.

Recommendation 3.
Development partners can further underline the need for closer coordination across government levels for service delivery. While in the past, the issue of decentralisation and local governance has been promoted by the development community, coordination and collaboration in infrastructure investments, especially regarding economic, social, and environmental sustainability, has been lacking. Problems relating to coordination failures in infrastructure delivery have predominantly focused on sectoral analyses that did not sufficiently understand cross-sectoral benefits and spillovers.

Recommendation 4.
Development partners should provide support to expanding human resource capacity and the skills necessary to manage complex urban and financial systems properly. The cross-cutting role of human capital (individually and collectively, as communities and institutions) becomes crucial both as a catalyst and a booster in delivering municipal services that contribute to equitable growth. Indeed, without the proper human resources, it will be impossible to achieve a transformative change in municipal service delivery—one that is cost-efficient, effective, equitable, lasting, and responsive to changes in local demand.

Recommendation 5.
Development partners can support better data at the city and neighbourhood level. This is especially the case in areas where evidence and the broader understanding of pricing mechanisms are currently lacking. So far, in low-income rapidly growing cities, pricing policies are formulated in the absence of critical indicators on coverage levels, affordability levels, household consumption, and preferences. As seen in the case of Ghana, promising efforts such as the Cities Alliance funded Slum/Shack Dwellers International *Know Your City* dataset can provide new, more granular evidence. Through the support of development partners, these efforts can be further scaled and better adapted to service delivery and pricing so that they inform policy planning for a more equitable, efficient, and sustainable access to services.

Bibliography

Ahluwalia, Isher Judge, and Utkarsh Patel (2018). Solid Waste Management in India: An Assessment of Resource Recovery and Environmental Impact. ICRIER Working Paper No. 356. Indian Council for Research on International Economic Relations, New Delhi. Available at https://think-asia.org/bitstream/handle/11540/8143/Working_Paper_356.pdf?sequence=1

Alm, James (2015). Financing urban infrastructure: knowns, unknowns, and a way forward. *Journal of Economic Surveys* 29(2), 230–62.

Almansi, Florencia, Ana Hardoy, and Jorgelina Hardoy (2010). Improving water and sanitation provision in Buenos Aires. What can a research-oriented NGO do? IIED Human Settlements Working Paper Series – Water – 22. Buenos Aires. Available at https://pubs.iied.org/pdfs/10583IIED.pdf

Ambrosanio, Maria Flavia, and Massimo Bordignon (2015). Normative versus Positive Theories of Revenue Assignments in Federations. In *Handbook of Multi-Level Finance, chapter 12*. Edward Elgar Publishing, Cheltenham & Northampton.

Ammann, Carole, and Aïdas Sanogo (2017). An Introduction. In *Secondary Cities: The Urban Middle Ground*. Basel Papers on Political Transformations, No. 11/12, pp. 5–9.

Angel, Shlomo, Alejandro M. Blei, Jason Parent, Patrick Lamson-Hall, Nicolás Galarza Sánchez, Daniel C. Civco, Rachel Qian Lei, and Kevin Thom (2016). *Atlas of Urban Expansion—2016 Edition, Volume 1*: Areas and Densities, New York: New York University, Nairobi: UN Habitat, and Cambridge, MA: Lincoln Institute of Land Policy.

Annez, Patricia, and Robert Buckley (2009). Urbanisation and growth: Setting the context. In *Urbanisation and Growth*. Spence, Michael, Patricia Clarke Annez, and Robert Buckley, eds. Washington, DC: World Bank, pp. 1–45.

Arup and Cities Alliance (2016). Future Proofing Cities: Secondary Cities in Uganda. London, UK: Arup.

Asian Development Bank (ADB) (2013). *Philippines: Water Supply and Sanitation Sector Assessment, Strategy, and Road Map*. Mandaluyong City, the Philippines.

Aspiazu, Daniel, and Karina Forcinito (2003). Privatización del sistema de agua y saneamiento en Buenos Aires. Historia de un fracaso. *Buenos Aires: FLACSO*.

AySA (Agua y Saneamientos Argentinos S.A) (2019). Nuestros Números. Available at https://www.aysa.com.ar /Quienes- Somos/nuestros-numeros. Accessed on June 6, 2019.

Bahl, Roy, and Johannes Linn (1992). *Urban Public Finance in Developing Countries*. Washington, DC: The World Bank.

Bahl, Roy, and Richard Bird (2008). Tax policy in developing countries: Looking back – and forward. *National Tax Journal* 61(2), 279–301.

Bahl, Roy, and Richard Bird (2018). *Fiscal Decentralization and Local Finance in Developing Countries*. Cheltenham, UK: Edward Elgar Publishing.

Bahl, Roy W., Johannes F. Linn, and Deborah L. Wetzel, eds. (2013). *Financing Metropolitan Governments in Developing Countries*. Cambridge, MA: Lincoln Institute of Land Policy.

Bakker, Karen (2013). Neoliberal Versus Post-Neoliberal Water: Geographies of Privatisation and Resistance. *Annals of The Association of American Geographers* 103(2), 253–260.

Bahl, Roy (2012). Metropolitan City Finances in India: Options for a New Fiscal Architecture. *International Center for Public Policy Working Paper 1233*. Atlanta, GA: Andrew Young School of Policy Studies, Georgia State University.

Banerjee, Sudeshna, Vivien Foster, Yvonne Ying, Heather Skilling, and Quentin Wodon (2010). Cost Recovery, Equity, and Efficiency in Water Tariffs: Evidence from African Utilities. *Policy Research Working Paper 5384*. Washington, DC: The World Bank.

Banerjee, Sudeshna Ghosh, and Elvira Morella (2011). Africa's Water and Sanitation Infrastructure Access, Affordability, and Alternatives. In *Directions in Development: Infrastructure*. Foster, Vivien, and Cecilia Briceño-Garmendia, eds. Washington DC: The International Bank for Reconstruction and Development / The World Bank.

Barberán, Ramón, and Fernando Arbués (2009). Equity in domestic water rates design. *Water Resources Management* 23(10), 2101–2118.

Bartram, Jamie, and Sandy Cairncross (2010). Hygiene, sanitation, and water: forgotten foundations of health. *PLoS Medicine* 7 (11): e1000367. Available at https://doi.org/10.1371/journal.pmed.1000367

Bell, David and Mark Jayne (2009). Small Cities? Towards a Research Agenda. Joint Editors and Blackwell Publishing Ltd. Available at https://doi.org/10.1111/j.1468-2427.2009.00886.x

Bruhat Bengaluru Mahanagara Palike (BBMP) (2017a). Bengaluru's SWM Information Manual – Part 1: Overview. Solid Waste Management Department. Available at http://bbmp.gov.in/BBMPSWM/Documents/CleanBengaluru/ SWM%20Information%20Manual%20Part-I_Overview%20(English).pdf.

Bruhat Bengaluru Mahanagara Palike (BBMP) (2017b). Revised Budget Estimates for 2016-17 and Budget Estimates for 2017-18. *BBMP Budget*. Available at http://bbmp.gov.in/budgets.

Bruhat Bengaluru Mahanagara Palike (BBMP) (2018). Revised Budget Estimates for 2017-18 and Budget Estimates for 2018-19. *BBMP Budget.* Available at http://bbmp.gov.in/budgets.

Bird, Richard (2001). User Charges in Local Government Finance. In *The Challenge of Urban Government: Policies and Practices*. Freire, Mila, and Richard Stren, eds. Washington, DC: The World Bank, pp. 171–182.

Bird, Richard, and Thomas Tsiopoulos (1997). User charges for public services: potentials and problems. *Canadian Tax Journal* 45(1), 28–86.

Bird, Richard, and Enid Slack, eds. (2017). *Financing Infrastructure: Who Should Pay?* Montreal: McGill-Queen's University Press.

Black & Veatch (2016). Strategic Directions: Water Industry Report.

Boadway, Robin (2001). Inter-Governmental Fiscal Relations: The Facilitator of Fiscal Decentralization. *Constitutional Political Economy* 12(2), 93–121.

Bocquier, Philippe, Nyovani Janet Madise, and Eliya Msiyaphazi Zulu (2011). Is there an urban advantage in child survival in sub-Saharan Africa? Evidence from 18 countries in the 1990s. *Demography* 48(2), 531–558.

Boex, Jamie and Benjamin Edwards (2014). *Triggering Increased City-Level Public Finance for Pro-Poor Sanitation Improvements: The Role of Political Economy and Fiscal Instruments*. Research Report. Washington, DC: The Urban Institute.

Buckley, Robert, Achilles Kallergis, and Laura Wainer (2016). Addressing the housing challenge: avoiding the Ozymandias syndrome. *Environment and Urbanisation* 28(1), 119–138.

Budds, Jessica, and Gordon McGranahan (2003). Are the debates on water privatisation missing the point? Experiences from Africa, Asia and Latin America. *Environment and Urbanisation* 15(2), 87–113.

Caceres, Veronica (2013). La provisión de agua potable en la periferia del AMBA, Argentina. *Gestión y Ambiente* 16(3), 25–37.

Castells-Quintana, David. (2017). Malthus living in a slum: Urban concentration, infrastructure and economic growth. *Journal of Urban Economics* 98, 158–173.

Centro de Estudios Metropolitanos (CEM) (2018). Monitor Clima Social. Available at estudiosmetropolitanos.com.ar/monitor-clima-social/.

Cities Climate Finance Leadership Alliance (CCFLA) (2015). State of City Climate Finance 2015. New York: Cities Climate Finance Leadership Alliance. Available at https://sustainabledevelopment.un.org/content/documents/2201CCFLA-State-of-City-Climate-Finance-2015.pdf.

Chandran, Pinky, Nalini Shekar, Marwan Abubaker, and Akshay Yadav (2011). Informal Waste Workers Contribution Bangalore. Bengaluru: Hasiru Dala. Available at http://hasirudala.in/wp-content/uploads/2016/08/1.-Full-Paper-Chandran-Informal-Waste-Workers-Contribution-in-Bangalore-1.pdf.

Chengappa, Chaya (2013). Organizing Informal Waste Pickers: A Case Study of Bengaluru, India. Cambridge, MA: Women in Informal Employment: Globalizing and Organizing (WIEGO). Available at http://www.wiego.org/sites/default/files/resources/files/Chengappa-Organizing-Informal-Waste-Pickers-India.pdf.

Cities Alliance (2019). Connecting Systems of Secondary Cities. Brussels: Cities Alliance/UNOPS.

Clemente, Adriana, and Catalina Smulovitz (2004). Descentralización, sociedad civil y gobernabilidad democrática en Argentina. In *Descentralización, políticas sociales, y participación democrática en Argentina*. Clemente, Adriana and Catalina Smulovitz, eds. Buenos Aires: Woodrow Wilson International Centre for Scholars 39–92.

Cohen, Michael (2012a). The city in the global crisis: understanding impacts and strengthening the performance of stimulus packages. In *The Global Economic Crisis in Latin America: Impacts and Responses*. Cohen, Michael, ed. New York: Routledge.

Cohen, Michael (2012b). *Argentina's economic growth and recovery: the economy in a time of default*. London: Routledge.

Cohen, Michael, and Darío Debowicz (2009). The five cities of Buenos Aires: poverty and inequality in urban Argentina. In *UNESCO Encyclopedia of Sustainable Development*. Sassen, Saskia, ed. Paris: UNESCO.

Collier, Paul, and Anthony J. Venables (2013). Housing and Urbanisation in Africa: Unleashing a Formal Market Process. World Bank Policy Research Working Paper 6871. Washington, DC: TheWorld Bank.

Comptroller and Auditor General (CAG) (2014). Report of the Comptroller and Auditor General of India on Local Bodies for the Year Ended March 2013. Government of Karnataka Report No. 5 of the Year 2014. New Delhi: Government of India.

Connors, Genevieve (2005). When Utilities Muddle Through: Pro-Poor Governance in Bangalore's Public Water Sector. *Environment and Urbanisation* 17(1), 201–218.

Cook, Mitchell (2012). Municipal finance and local state performance in the crisis: the experience of Brazil and Mexico. In *The Global Economic Crisis in Latin America: Impacts and Responses*. Cohen, Michael, ed. New York: Routledge.

Cortines, Aser, and Sandra Bondarovsky (2007). Mobilizing Finance for Urban Sanitation Infrastructure in Brazil. In *Financing Cities: Fiscal Responsibility and Urban Infrastructure Finance in Brazil, China, India, Poland and South Africa*. Peterson, George, and Patricia Clarke Annez, eds. New Delhi: Sage Publications.

Crook, Richard (2002). Urban service partnerships, 'street-level bureaucrats' and environmental sanitation in Kumasi and Accra, Ghana: coping with organisational change in the public bureaucracy. Paper presented at the 'Making Services Work For Poor People' WDR 2003/2004 Workshop at Erynsham Hall, Oxford, 4–5 November, 2002.

Largo, Franciso, Arlene B. Inocencio, and Cristina C. David (1998). *Understanding household water demand for Metro Cebu*. No. 1998-41. PIDS Discussion Paper Series.

David, Cristina C., Arlene B. Inocencio, Roberto S. Clemente, R. P. Abracosa, Francisco M (2000). Largo, Guillermo Q. Tabios, and Ed L. Walag. Urban water pricing: the Metro Manila and Metro Cebu cases. PIDS Policy Notes, No. 2000-09.

Davis, Julian (2019). Government Approves Price Increases in Electricity, Gas, Transportation in 2019. *TheBubble*, 4 January. Available at https://www.thebubble.com/government-approves-price-increases-in-electricity-gas-transportation-in-2019

Department of Provincial and Local Government (DPLG) South Africa (2012) National Framework for Municipal Indigent Policies. Pretoria, South Africa: DPLG. Available at https://www.westerncape.gov.za/text/2012/11/national_framework_for_municipal_indigent_policies.pdf

Devas, Nick, and Roy Kelly (2001). Regulation or revenues? An analysis of local business licenses, with a case study of the single business permit reform in Kenya. *Public Administration and Development* 21(5), 381–391.

Downing, Paul (1992). The revenue potential of user charges in municipal finance. *Public Finance Review* 20(4), 512–527.

Du, Gang, Wei Lin, Chuanwang Sun, and Dingzhong Zhang (2015). Residential electricity consumption after the reform of tiered pricing for household electricity in China. *Applied Energy* 157, 276–283.

Eberhard, Anton, Vivien Foster, Cecilia Briceño-Garmendia, Fatimata Ouedraogo, Daniel Camos, and Maria Shkaratan (2008). Underpowered: The State of the Power Sector in Sub-Saharan Africa. Summary of Background Paper 6. Washington, DC: World Bank.

Edwards, Ben, Tanvi Nagpal, Rachel Rose, Abdul Nash Mohammed, André Uandela, Mark Wolfsbauer, and Guy Norman (2015). Municipal finance for sanitation in three African cities. DP#007. WSUP Discussion Paper. Washington, DC: Urban Institute.

Ente Tripartito de Obras y Servicios Sanitarios (ETOSS) (2003). Informe sobre el grado de cumplimiento alcanzado por el contrato de concesión de Aguas Argentinas S.A. Nota

UNIREN, N°73, Buenos Aires. [Report on Argentine Waters Inc.'s contract compliance].

Estache, Antonio, Andres Gomez-Lobo, and Danny Leipziger (2001). Utilities privatisation and the poor: Lessons and evidence from Latin America. *World Development* 29(7), 1179–1198.

Estache, Antonio, Sergio Perelman, and Lourdes Trujillo (2005). Infrastructure Performance and Reform in Developing and Transition Economies: Evidence from a Survey of Productivity Measures. World Bank Policy Research Working Paper 3514. Washington, DC: The World Bank

Etang, Alvin, and Clarence Tsimpo (2017). Beyond Income Poverty Nonmonetary Dimensions of Poverty in Uganda. Policy Research Working Paper 8111. Poverty and Equity Global Practice Group. Washington, DC: The World Bank.

Farouk, Braimah R., and Mensah Owusu (2012). "If in doubt, count": the role of community-driven enumerations in blocking eviction in Old Fadama, Accra. *Environment and Urbanisation* 24(1), 47–57. Available at https://doi.org/10.1177/0956247811434478

Fedelino, Annalisa, and Paul Smoke (2013). Bridging Public Financial Management and Fiscal Decentralization Reforms in Developing Countries. In *Public Financial Management* and Its *Emerging Architecture*. Cangiano, Marco, Teresa Curristine, and Michel Lazare, eds. Washington, DC: International Monetary Fund, pp. 363–388.

Felgendreher, Simon, and Paul Lehmann (2016). Public Choice and Urban Water Tariffs – Analytical Framework and Evidence from Peru. *The Journal of Environment & Development* 25(1), 73–99

Fjeldstad, Odd-Helge (2004). What's Trust Got to Do with It? Non-Payment of Service Charges in Local Authorities in South Africa. *The Journal of Modern African Studies* 42(4), 539–562.

Foster, Vivien, and Cecilia Briceño-Garmendia (2010). Africa's Infrastructure: A Time for Transformation: Africa Development Forum. Washington, DC: The World Bank.

Fuente, David, Josephine Gakii Gatua, Moses Ikiara, Jane Kabubo-Mariara, Mbutu Mwaura, Dale Whittington (2016). Water and sanitation service delivery, pricing, and the poor: An empirical estimate of subsidy incidence in Nairobi, Kenya. *Water Resources Research* 52, 4845–4862.

Gao, Guo Fu (2007). Urban Infrastructure Investment and Financing in Shanghai. In *Financing Cities: Fiscal Responsibility and Urban Infrastructure Finance in Brazil, China, India, Poland and South Africa*. Peterson, George, and Patricia Clarke Annez, eds. New Delhi: Sage Publications.

Glasmeier, Amy, and Susan Christopherson (2015). Thinking about smart cities. *Cambridge Journal of Regions, Economy and Society* 8(1), 3–12.

Global Urban Futures Project (2018). The Habitat Commitment Project: Monitoring & Assessing Progress at the City Level. Progress Report. Available at https://docs.wixstatic.com/ugd/046e21_a88d5b6a993d4eee8e2b38cfc72efc00.pdf.

Global Water Intelligence (GWI) (2018). Global Water Tariff Survey. Available at https://www.globalwaterintel.com/global-water-tariff-survey.

Gonzales, Glenda R (2004). Metro Cebu: A metropolitan area in need of coordinative body. PIDS Discussion Paper Series 2004-49.

Gordon, Robert J. (2012). Is U.S. economic growth over? Faltering innovation confronts the six headwinds. NBER Working Paper Series. Working Paper 18315. Available at https://www.nber.org/papers/w18315

Government of India (2019). *Swachh Survekshan* 2019. New Delhi: Ministry of Housing and Urban Affairs.

Graham, Stephen, and Simon Marvin (2001). *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition*. London: Routledge.

Gulyani, Sumila, Debabrata Talukdar, and R. Mukami Kariuki (2005). Universal (Non)service? Water Markets, Household Demand and the Poor in Urban Kenya. *Urban Studies* 42(8), 1247–1274.

Hall, David, Emanuele Lobina, and Violeta Corral (2011). Trends in water privatisation. PSIRU. Available at http://www. psiru. org/reports/trends-water-privatisation.

Hardoy, Ana, Jorgelina Hardoy, Gustavo Pandiella, and Gastón Urquiza (2005). Governance for water and sanitation services in low-income settlements: experiences with partnership-based management in Moreno, Buenos Aires. *Environment and Urbanisation* 17(1), 183–200.

Hoque, Sonia Ferous, and Dennis Wichelns (2013). State-of-the-Art Review: Designing Urban Water Tariffs to Recover Costs and Promote Wise Use. *International Journal of Water Resources Development* 29(3), 472–491.

Hutton, Guy (2015). Benefits and costs of the water sanitation and hygiene targets for the post-2015 development agenda. Post-2015 Consensus Water Sanitation Assessment. Copenhagen Consensus Center.

International labour Organisation (ILO) (2018). Women and Men in the Informal Economy: A Statistical Picture. Third Edition. Geneva: International Labour Organisation.

Instituto Nacional de Estadística y Censos República Argentina (INDEC) (2012). *Censo Nacional de Población, Hogares y Viviendas 2010*: Censo del Bicentario. Buenos Aires: Instituto Nacional de Estadística y Censos. Available at https://www.indec.gob.ar/ftp/cuadros/poblacion/censo2010_tomo1.pdf

Japan International Cooperation Agency (JICA) (2015). The Roadmap Study for Sustainable Urban Development in Metro Cebu. Available at https://www.jica.go.jp/philippine/english/office/topics/news/c8h0vm00009pqw0q-att/151102_01.pdf

Jenkins, Glenn, Chun-Yan Kuo, and Arnold C. Harberger (2011). *Cost-Benefit Analysis for Investment Decisions*. Kingston: Queen's University.

Kessides, Cristine (1993). Institutional Options for the Provision of Infrastructure. World Bank Discussion Papers 212. Washington, DC: The World Bank.

Lane, Jon (2012). Barriers and Opportunities for Sanitation and Water for All, as Envisaged by the New Delhi Statement. IDS Bulletin 43(2), 13–20. doi: 10.1111/j.1759-5436.2012.00302.x

Loftus, Alexander J., and David A. McDonald (2001). Of liquid dreams: a political ecology of water privatisation in Buenos Aires. *Environment and Urbanisation* 13(2), 179–199.

Lowery, David (2000). "A transactions costs model of metropolitan governance: Allocation versus redistribution in urban America." *Journal of Public Administration Research and Theory* 10(1), 49–78.

Maina, Sylvia Wakiuru, and Toni Sittoni (2012). Ghana loses GHC420 million annually due to poor sanitation (English). Economic impacts of poor sanitation in Africa: Water and sanitation program. Washington, DC: World Bank. http://documents.worldbank.org/curated/en/786701468256742033/Ghana-loses-GHC420-million-annually-due-to-poor-sanitation

Mansour, Goufrane, and Harold Esseku (2017). Situation analysis of the urban sanitation sector in Ghana. Urban Sanitation Research Initiative Ghana. Water & Sanitation for the Urban Poor. Available at https://www.wsup.com/content/uploads/2017/09/Situation-analysis-of-the-urban-sanitation-sector-in-Ghana.pdf

Martinez-Vazquez, Jorge, and Robert McNab (2006). The Interaction of Fiscal Decentralization and Democratic Governance. In *Decentralization in Asia and Latin America: Towards a Comparative Interdisciplinary Perspective*. Smoke, Paul, Eduardo J. Gomez, and George Peterson, eds. Cheltenham: Edward

Marvin, Simon, Heather Chappells, and Simon Guy (1999). Pathways of smart metering development: shaping environmental innovation. *Computers, Environment and Urban Systems* 23(2), 109–126.

McGranahan, Gordon (2015). Realising the Right to Sanitation in Deprived Urban Communities:

Meeting the Challenges of Collective Action, Coproduction, Affordability, and Housing Tenure. *World Development* 68, 242–253.

McGranahan, Gordon, and David Satterthwaite (2006). Governance and getting the private sector to provide better water and sanitation services to the urban poor. Human Settlements and Discussion Paper Series. Theme: Water-2. London: International Institute for Environment and Development (IIED). Available at https://pubs.iied.org/pdfs/10528IIED.pdf

McRae, Shaun (2015). Infrastructure Quality and the Subsidy Trap. *American Economic Review* 105(1), 35–66.

Metropolitan Cebu Water District (MCWD) (2018). Interviews with Lemuel A. Canastra and Emmanuel "Bong" Espina (Dec 2018) from MCWD, Environment and Water resource department.

Montgomery, Mark R., Richard Stren, Barney Cohen, Holly E. Reed, eds. (2003). *Cities Transformed: Demographic Change and Its Implications in the Developing World*. Washington D.C.: National Academies Press.

Musgrave, Richard (1959). *The Theory of Public Finance: A Study in Public Economy*. New York: McGraw-Hill.

Nauges, Celine, and Dale Whittington (2017). Evaluating the performance of alternative municipal water tariff designs: quantifying the tradeoffs between equity, economic efficiency, and cost recovery." *World Development* 91, 125–143.

Oates, Wallace (1972). *Fiscal Federalism*. New York: Harcourt Brace Jovanovich.

Oates, Lucy, Andrew Sudmant, Andy Gouldson, and Ross Gillard (2018). Reduced Waste and Improved Livelihoods for All: Lessons on Waste Management from Ahmedabad, India. London and Washington, DC: Coalition for Urban Transitions.

Organisation for Economic Co-operation and Development (OECD) (2006). *Keeping Water Safe to Drink*. OECD Policy Brief, March 2006. Paris: OECD Publishing.

Organisation for Economic Co-operation and Development (OECD) (2011). *Benefits of Investing in Water and Sanitation*. Paris: OECD Publishing.

Organisation for Economic Co-operation and Development (OECD) (2016). *Subnational Governments around the World: Structure and Finance*. Paris: OECD Publishing.

Organisation for Economic Co-operation and Development (OECD) (2017). OECD Green Growth Studies: Green Growth in Cebu, Philippines. Paris: OECD Publishing.

Peprah, Dorothy, Kelly K. Baker, Christine Moe, Katharine Robb, Nii Wellington, Habib Yakubu, and Clair Null (2015). Public toilets and their customers in low-income Accra, Ghana. *Environment and Urbanisation* 27(2), 589–604

Phillips, Charles Franklin, and Robert G. Brown (1993). The Regulation of Public Utilities: Theory and Practice. Arlington, VA: Public Utilities Reports, Inc.

Philippine Statistics Authority (2018a). GRDP Tables. Available at https://psa.gov.ph/regional-accounts/grdp/dataand-charts.

Philippine Statistics Authority (2018b). The Countryside in Figures: Statistical Profile of the Province of Cebu 2000–2015. Available at http://nap.psa.gov.ph/countryside/#.

Pírez, Pedro (2004). La configuración metropolitana de Buenos Aires: expansión, privatización y fragmentación. Realidad Económica 208, 111–134.

Pojani, Dorina, and Dominic Stead (2015). Sustainable Urban Transport in the Developing World: Beyond Megacities. *Sustainability* 7(6), 7784–7805.

Prud'Homme, Remy (2005). Infrastructure and Development. In *Lessons of Experience: Proceedings of the 2004 Annual Bank Conference on Development Economics*. Bourguignon, Francois, and Boris Pleskovic, eds. Washington, DC: The World Bank, pp. 153–81.

Prüss-Ustün, Annette, Robert Bos, Fiona Gore, and Jamie Bartram (2008). Safer water, better health: costs, benefits and sustainability of interventions to protect and promote health. World Health Organisation. Available at https://apps.who.int/iris/bitstream/handle/10665/43840/9789241596435_eng.pdf;jsessionid=FDE94635042647B69FA0B5496224F75C?sequence=1

Puig, Jorge Pablo, and Leandro Hipólito Arnoldo Salinardi (2015). Argentina y los subsidios a los servicios públicos: un estudio de incidencia distributiva. Working Paper No. 183. Centro De Estudios Destributivos, Laborales y Sociales (CEDLAS), Universidad de La Plata, La Plata, Argentina.

Ramachandra, T.V., H. Aithal Barath, Gouri Kulkarni, and Sun Sheng Han (2018). Municipal solid waste: Generation, composition, and GHG emissions in Bangalore, India. *Renewable and Sustainable Energy Reviews* 82(1), 1122–1136.

Rey, Osvaldo (2000). *Saneamiento en el área metropolitana: desde el virreinato a 1993*. Buenos Aires: Aguas Argentinas.

Roberts, Brian (2014). *Managing Systems of Secondary Cities*. Brussels: Cities Alliance/UNOPS.

Rocha-Melogno, Lucas, Rebecca Yoo, Osvaldo Broesicke, , Achilles Kallergis, José Garcia, Estela Herbas, Annelisse Torrez-Daza, Ann Johnson, Daniel Boey, Victoria Beard, Seth H. Frisbie, Susan Murcott, and Joe Brown (2018). Rapid drinking water safety estimation in cities: piloting a globally scalable method in Cochabamba, Bolivia. *Science of the Total Environment* 654, 1132–1145.

Rogers, Peter, Radhika De Silva, and Ramesh Bhatia (2002). Water as an economic good: How to use prices to promote equity, efficiency, and sustainability. *Water Policy* 4(1), 1–17.

Schneider, Aaron, and Marcelo Baquero (2006). Get What You Want, Give What You Can: Embedded Public Finance in Porto Alegre. Working Paper 263. Brighton: Institute for Development Studies.

Singh, Chander K., Anand Kumar, and Soumendu S. Roy (2018). Quantitative Analysis of the Methane Gas Emissions from Municipal Solid Waste in India. *Scientific Reports* 8, 1–8.

Slack, Enid (2011). Financing Large Cities and Metropolitan Areas. IMFG Papers on Municipal Finance and Governance. Toronto: Institute on Municipal Finance and Governance.

Slum Dwellers International (2018). *Know Your City: Slum Dwellers Count*. Slum/Shack Dwellers International. Cape Town, South Africa. Available at https://knowyourcity.info/wp-content/uploads/2018/02/SDI_StateofSlums_LOW_FINAL.pdf

Smoke, Paul (2008). Local Revenues under Fiscal Decentralization in Developing Countries: Linking Policy Reform, Governance, and Capacity. In *Fiscal Decentralization and Land Policies*. Ingram, Gregory, and and Yu-Hung Hong, eds. Cambridge, MA: Lincoln Institute of Land Policy, pp. 38–68.

Smoke, Paul (2014). Why Theory and Practice Are Different: The Gap Between Principles and Reality in Subnational Revenue Systems. In *Taxation and Development: The Weakest Link?: Essays in Honor of Roy Bahl*. Bird, Richard, and Jorge Martinez-Vazquez, eds. Studies in Fiscal Federalism and State-Local Finance. Cheltenham, UK: Edward Elgar, pp. 287–325.

Smoke, Paul (2015). Managing Public Sector Decentralization in Developing Countries: Moving Beyond Conventional Recipes. *Public Administration and Development* 35(4), 250–262.

Spence, Michael, Patricia Clarke Annez, and Robert M Buckley, eds. (2009). *Urbanization and Growth*. Washington, DC: Commission on Growth and Development, World Bank

Su, Ming, and Quanhou Zhou (2007). China: Fiscal Framework and Urban Infrastructure Finance. *In Financing Cities: Fiscal Responsibility and Urban Infrastructure Finance in Brazil, China, India, Poland and South Africa*. Peterson, George, and Patricia Clarke Annez, eds. New Delhi: Sage Publications.

Szreter, Simon (2004). Debating mortality trends in 19th century Britain. *International Journal of Epidemiology* 33(4), 705–709.

Thompson, Wilbur (1968). The city as a distorted price system. *Psychology Today* 2(3), 28–33.

Tumwesigye, Robert, Paul Twebaze, Nathan Makuregye, Ellady Muyambi (2011). Key issues in Uganda's energy sector: Pro-Biodiversity Conservationists in Uganda (PROBICOU). International Institute for Environment and Development: London

van den Berg, Caroline, and Alexander Danilenko (2017). Performance of Water Utilities in Africa. World Bank: Washington, DC.

Vilas, Carlos (2004). Water Privatisation in Buenos Aires. *NACLA Report on the Americas* 38(1), 34–42

United Nations Population Division (2018). Revision of World Urbanisation Prospects. Available at https://www.un.org/development/desa/publications/2018-revision-of-world-urbanization-prospects.html

Warner, Mildred, and Amir Hefetz (2002). Applying market solutions to public services: An assessment of efficiency, equity, and voice. *Urban Affairs Review* 38(1), 70–89.

Water and Sanitation Program for the Urban Poor (WSUP) (2018). Increasing municipal finance for sanitation: support for property tax collection in Ga West. Practice Note #023. Available at https://www.wsup.com/content/uploads/2017/08/PN023-Increasing-municipal-finance-for-sanitation-support-for-property-tax-collection-in-Ga-West.pd

Whittington, Dale, Celine Nauges, David Fuente, and Xun Wu (2016). A diagnostic tool for estimating the incidence of subsidies delivered by water utilities in low- and medium-income countries, with illustrative simulations. *Utilities Policy* 34, 70–81.

Wilson, David, Costas Velis, and Chris Cheeseman (2006). Role of informal sector recycling in waste management in developing countries. *Habitat International* 30(4), 797–808.

World Bank (2007). Philippines environment monitor 2006 (English). Washington, DC: World Bank. Available at http://documents.worldbank.org/curated/en/588621468333585945/Philippines-environment-monitor-2006

World Bank (2010). City of Accra, Ghana: Consultative Citizen's Report Card. Report #55117-GH, The International Bank for Reconstruction and Development/The World Bank. Available at http://documents.worldbank.org/curated/en/540521468249314253/pdf/551170ESW0P1131Citizens0Report0Card.pdf

World Bank (2012). *Economic impacts of poor sanitation in Africa*. Washington, DC: The World Bank.

World Bank (2018). *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050*. Washington, DC: The World Bank.

World Health Organisation (WHO) and the United Nations Children's Fund (UNICEF) (2017). *Progress on drinking water, sanitation and hygiene: 2017 update and SDG baselines*. Geneva, Switzerland: World Health Organisation (WHO) and the United Nations Children's Fund (UNICEF)

Zhang, Shanshan, and Lin Boqiang (2018). Impact of tiered pricing system on China's urban residential electricity consumption: Survey evidences from 14 cities in Guangxi Province. *Journal of Cleaner Production* 170, 1404–1412.

Zuin, Valentina, Leonard Ortolano and Jennifer Davis (2014). The entrepreneurship myth in small-scale service provision: Water resale in Maputo, Mozambique. *Journal of Water, Sanitation and Hygiene for Development* 4(2), 281–292.

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