

Citywide Inclusive Water Supply

Role of Supplementary Urban Water Service Providers

Smita Misra and Bill Kingdom

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This study builds on the earlier report on *City-Wide Inclusive Water Supply: Refocusing on Off-Grid Solutions for Addressing Sustainable Development Goal 6.1* (Misra and Kingdom 2019). This study provides further insights, analysis, and solutions, drawing on case study examples on how safely managed nonutility services can contribute to attaining the ambitious Sustainable Development Goal (SDG) 6.1 universal coverage targets. The study is inspired by the empirical evidence and insights on informal markets by Richard Damania, which synthesizes evidence from applied research and policy reports to summarize the state of knowledge and gaps regarding informal markets for water services.

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Case Studies

The analysis in this report is supported by several case studies, as detailed in table CS.1.

TABLE CS.1. Case Studies Used in This Report

Location	Description	Reference
Bangladesh	PPP model that allows various operators to provide fecal sludge management services.	Box 2.20, page 49
Cox's Bazar, Bangladesh	Water supplied by multiple humanitarian agencies to refugees from Myanmar, characterized by unclear long-term ownership and planning.	Appendix A, page 82
Benin	Responsibility of water services is delegated to communes who delegate provision to private operators through bipartite contracts.	Box 2.15, page 31
Cochabamba, Bolivia	Established independent operators of small piped networks outside the formal system are difficult to integrate into a utility-rebuilding program.	Box 2.5, page 17
Burkina Faso	Private operators are contracted through performance-based service contracts.	Box 2.19, page 46
Colombia	Government modernized the water sector to expand services in low-income areas by encouraging private sector utilities to supply water.	Box 2.1, page 12
Colombia	Regulation is differentiated by the size of the SSIPs, with small providers subject to lower levels of regulation.	Box 2.17, page 35
Abidjan, Côte d'Ivoire	The utility's attempt to regulate resellers failed because of a lack of incentives for operators to convert to licensed resellers.	Box 2.9, page 24
Côte d'Ivoire	Water resellers established an umbrella association in an attempt to gain formal recognition from the utility.	Box 2.11, page 26
Gambella, Ethiopia	Water supplied to refugee camp by humanitarian agencies, with later attempts to convert these to a new public utility.	Appendix A, page 82
Ghana	Government's sector development plan recognizes the role of private operators, including developing guidelines to facilitate tanker operations.	Box 2.6, page 18
Ghana	Safe Water Network's collaboration with District Assemblies through BOOT agreements to establish microuilities.	Box 2.14, page 30
Jordan	Water supplied to refugee camps has become more established, but transfer to the government of Jordan appears unlikely, owing to significant operating costs.	Appendix A, page 82
Mumbai, India	Informal slums have been disproportionately affected by COVID-19. This is partly because of limited access to water.	Box 1.1, page 2
Mumbai, India	Private water vending is discouraged by government agencies, leading to vendors operating without a legal remit.	Figure 2.3, page 16
India	Safe Water Network's collaboration with local governments, municipal corporations, and village panchayats to launch new water kiosks.	Box 2.14, page 30
Indonesia	Responsibility of water supply is devolved to local governments, who are accountable to the national government in ensuring targets are met.	Box 2.7, page 21
Nairobi, Kenya	Residents of the largest slum have created a network of handwashing stations to help combat COVID-19.	Box 1.1, page 2

table continues next page

TABLE CS.1. continued

Location	Description	Reference
Nairobi, Kenya	Illegal cutting of pipes meant the pressure in pipes was insufficient to fill water ATMs designed to served urban slums.	Box 2.10, page 25
Nairobi, Kenya	Kenyan regulator issued guidelines to incorporate vendors in the regulatory framework through licensing.	Box 2.13, page 29
Maputo, Mozambique	A lack of legal recognition of off-utility services prevents regulation of SSIPs.	Box 2.4, page 15
Nepal	Water supplied to refugee camps has gradually been made permanent, with ownership and operations transferred to local authorities.	Appendix A, page 82
Paraguay	Private operators typically serve unserved areas but lack a legal understanding and are not recognized by the public utilities.	Box 2.8, page 23
Paraguay	World Bank initiative to attract private operators to serve unserved rural areas and small towns through results-based finance subsidy.	Box 2.18, page 37
Manila, Philippines	Private concessions that allowed concessionaires to use third parties to provide piped services in areas more difficult to access.	Box 3.3, page 57
eThekweni, South Africa	Strong political will and successful public utility leadership have led to innovative solutions, which provide almost universal water access.	Box 2.3, page 14
Sub-Saharan Africa	Development of electricity mini-grids by private operators across East Africa and Nigeria.	Box 4.1, page 70
Mwanza, Tanzania	Additional handwashing stations and water standpipes are being provided in informal settlements and vulnerable communities because of the COVID-19 pandemic.	Box 1.1, page 2
Vietnam	Design-lease contracts established by the World Bank's PPIAF were implemented in two towns, which saw private operators expand and operate piped systems before handing them over to the utility.	Box 3.5, page 60
Republic of Yemen	Limited oversight of water tanker trucks. Water-quality testing conducted on private well but no private tankers.	Box 2.12, page 28; box 2.16, page 33

Note: ATM = automated teller machine; BOOT = build-own-operate-transfer; PPIAF = Public-Private Infrastructure Advisory Facility; PPP = public-private partnership; SSIP = small-scale independent provider.

Executive Summary

This report builds on the earlier World Bank study on citywide inclusive water supply (Misra and Kingdom 2019), which identified the large and growing number of people without access to safely managed water supplies, especially the poor; how policies and regulations need to be changed to allow services to be formally provided to this group; and that new models of service provision are needed to address this challenge. The current report provides further insights, analysis, and solutions, drawing on case study examples on how safely managed off-utility services can contribute to attaining the ambitious Sustainable Development Goal (SDG) 6.1 universal coverage target.

Supplementary service provider (SSP) has been adopted in this report as an umbrella descriptor to cover the full range of situations in which water services are not directly supplied by the formal, pipe-based utility in any city, state, or country. These SSPs may offer a range of services (from standposts, through manual or mechanical household delivery, to piped networks); they may be completely independent or contracted by the utility or by local government; and they may be regulated or unregulated. Whatever the precise arrangement, they all supplement the services provided by the formal utility through its piped system.

Providing water services to those not connected to formal utility systems in the urban and periurban areas has been the focus of various studies over the past three decades. Such “off-utility”¹ services are provided by so called small-scale independent providers (SSIPs) who operate at the community level in cities all over the developing world, filling a vacuum because of the inability of formal utilities to provide universal access to piped supplies. The COVID-19 pandemic has made the need for universal water access more urgent, and funding more restricted, exacerbating the challenge and reemphasizing the need for innovative SDG 6.1 compliant solutions. As the world emerges from the pandemic, it is likely that developing countries will find public investment more constrained; thus, the numbers without access to safely managed supplies will likely increase.

The global lack of access to safely managed water supplies was estimated at 676 million in 2015 (Misra and Kingdom 2019). This number is projected to ***increase to one billion by 2030***, based on the revealed inability of utilities to keep up with rapid urban growth since the turn of the century. Most of these people will live in African and Asian cities, and more than two-thirds will be in the two lowest wealth quintiles. Many will be in informal settlements, including periurban areas, that are often overlooked by authorities and utilities. This is clearly an international challenge given its magnitude and the fact that it predominantly affects the poorest and most vulnerable in society. Unfortunately, however, ***there is no international consensus to give priority to supplementary service provision***, nor how countries should go about tackling the scale-up that is needed. These two aspects are interlinked: The development of practical, implementable, and scalable solutions would enable a higher priority—and more resources—to be assigned by governments and development partners.

Although less discussed, the lack of access to safely managed water supplies is prevalent in the global challenge to provide water supply for displaced people (for example, refugees and internally

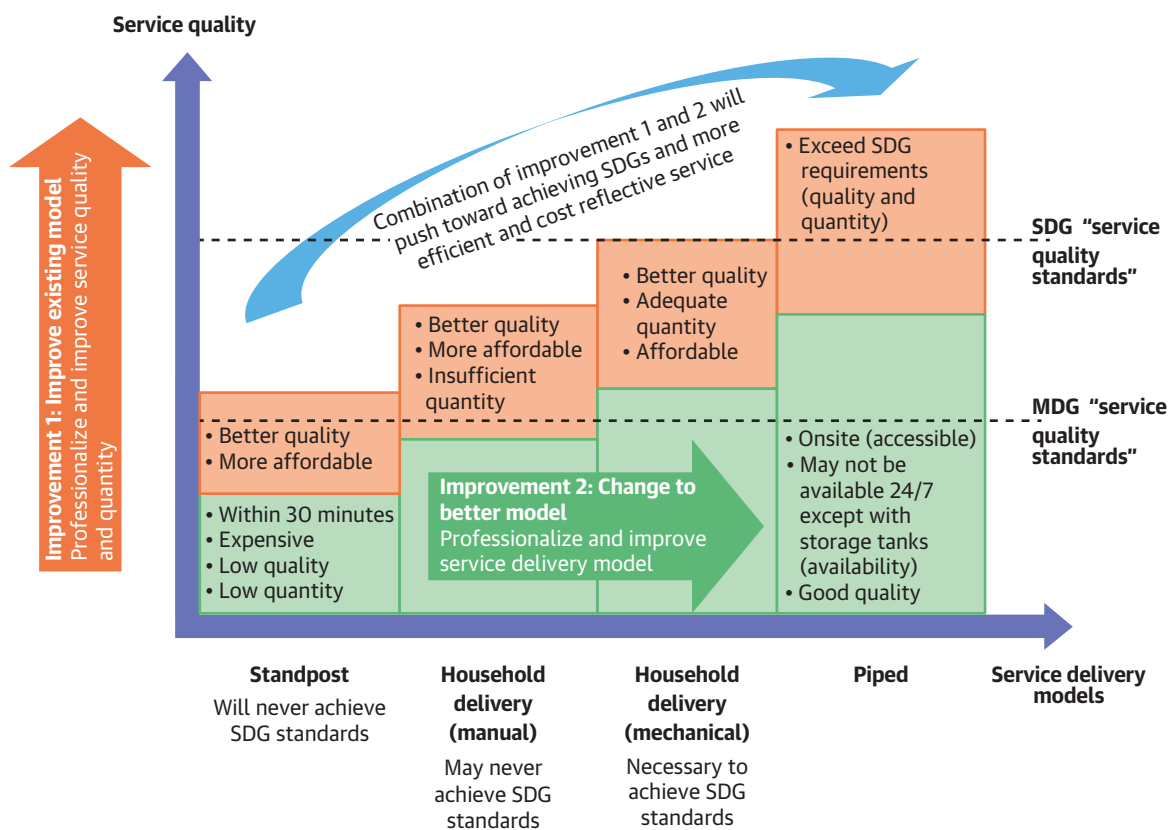
displaced people). Appendix A discusses this and gives examples of how four countries have approached providing water to refugee camps.

Based on the findings of this report, there are significant opportunities for existing SSPs to be enhanced and for increasing numbers of customers to move to a higher quality of service in the urban and periurban areas:

- Informing the facilitating environment that would allow better SSPs to be delivered
- Developing new models to deliver such services cost-effectively and professionally
- Operationalizing such models for subsequent replication at scale

Core to the study are proposals in which existing SSPs might be improved, either by enhancing the quality of existing service delivery arrangements or moving to a higher quality of service delivery. This is captured in figure ES.1, with the aim to facilitate service provision improvements that move up *and* to the right of the diagram.

FIGURE ES.1. Improving Off-Grid Water Services



Source: Authors.

Note: MDG = Millennium Development Goal; SDG = Sustainable Development Goal.

Although success stories are rare, case studies point to actions that can lead to large-scale solutions.

This study looks at thirty-four off-utility case studies to see what actions facilitated or blocked the ability of SSPs to provide better services. It identifies three key actions that governments, donor partners, and sector professionals need to take for a successful international response to the challenge:

- **Accept responsibility for providing service to nonutility customers.** Acknowledge that current arrangements are inadequate and that governments, utilities, and donors need to collaborate to improve the quality and affordability of such services.
- **Create a conducive operating environment for supplementary service provision.** Inform the supportive framework at the national and/or city level to reduce SSP business risks, improve affordability for better services, and create incentives to deliver better services to the nonutility households.
- **Implement demonstration models at scale.** This will simplify transactions and oversight costs for cities, utilities, and donors; deliver professional services with better quality and affordability; and be replicable internationally.

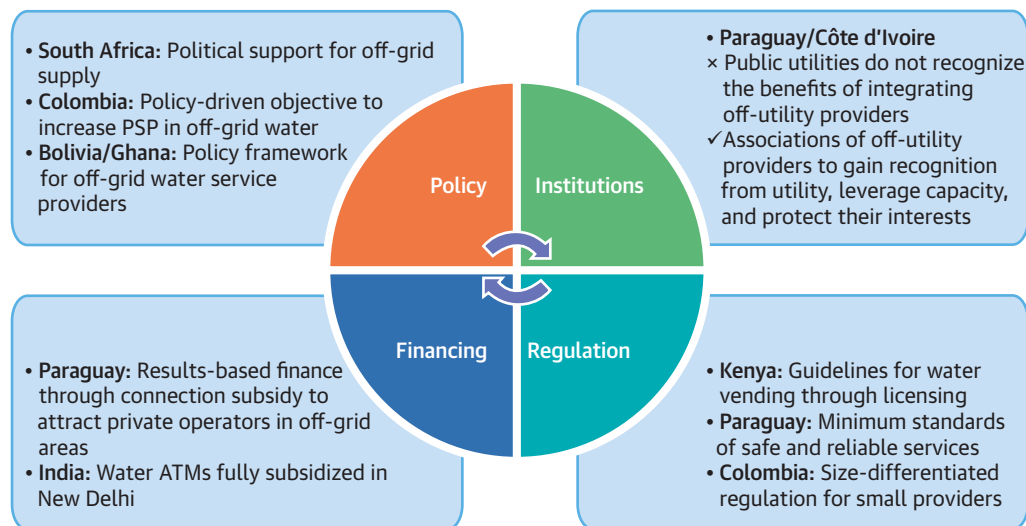
Obligations to serve all citizens must be translated into actionable, measurable, reportable, enforceable objectives for increasing access to safe, affordable water. The **first step** in realizing the potential of the SSP sector is to create an acceptance that key stakeholders have a responsibility to ensure safe, affordable water is provided to all citizens and not just those connected to the utility network. This foundational action is perhaps the most difficult step as it challenges so many entrenched attitudes to the provision of urban water services. The example of Perusahaan Daerah Air Minum in Indonesia illustrates how responsibility for water provision was devolved to local governments, who then had the authority to delegate this to private providers and community-based organizations.²

“Water service” is unfortunately routinely interpreted only as the provision of a piped water supply into people’s homes through formal utilities. This pipe-centric and utility-centric mindset appeals to investment-hungry politicians and technically-driven utility engineers. It is also relatively simple and manageable to implement and thus attractive to donors. However, it comes at the expense of the unconnected, who are also the poorest and most vulnerable.

The operating environment must be aligned to the needs of off-utility service provision. This is the **second step**. The case studies in this report were reviewed through the lens of the World Bank’s policy, institutions, regulation, and financing (PIRF) framework (see figure ES.2)

If the PIRF framework is not aligned with the provision of SSPs, then the business risks associated with such arrangements will force the sector toward the unsatisfactory arrangements we have today, which may be described as a low-level equilibrium trap. SSPs are unlikely to invest in new equipment, facilities, or capacity building if they lack the guarantee that they will be considered legitimate businesses that can expect to recover those costs over a reasonable time frame. SSPs will not provide better-quality services if they are too expensive for their customers, who are usually among the poorest yet typically do not

FIGURE ES.2. Case Study Application of PIRF Framework to Identify Facilitative Environments



Source: Authors.

Note: ATM = automated teller machine; PIRF = policy, institutions, regulation, and financing; PSP = private sector participation.

receive any of the significant subsidy that is provided to public utilities and their piped service customers.³ The case studies highlight many actions that can be taken to address the PIRF framework at the national or city levels.

The PIRF framework identifies the specific actions needed to create a formal environment supportive of SSPs. However, any changes to the PIRF framework, and its subsequent operationalization, will happen only if the political economy in any situation is conducive to that change. This means working diligently with all stakeholders to explain the basis for reform, the proposed models, the opportunities that will arise, and the benefits that will flow to the many stakeholders. This will require an investment in outreach and in assessing the reform impact on a variety of stakeholders. With the aim being the expansion, professionalization, and legitimization of the SSP market, there should be sufficient benefits to outweigh perceived disadvantages. With COVID-19 exacerbating inequalities and demonstrating the need to provide adequate water services to all, there may now be better chances of successful reform.

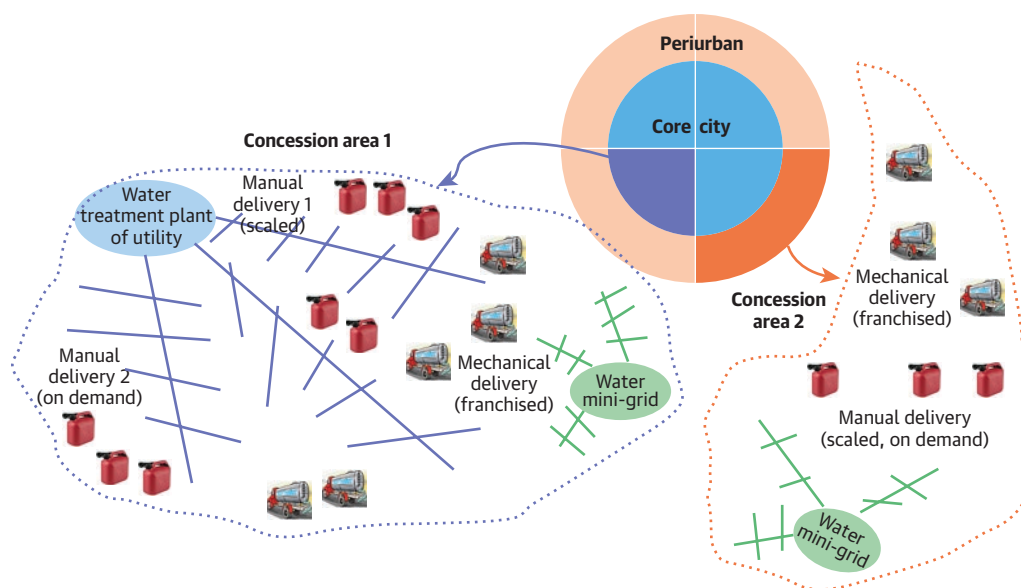
Concessioning of areas to private operators, with obligations for universal service, provides a model to induce scale economies, opportunities for professionalization, and reduces transaction and oversight costs in supplementary service provision. For the **third step**, this study proposes that the core of a future model would be the use of geographic concessions to provide supplementary services to parts of a city and/or its periurban areas. Such concessions would delineate the boundaries of service areas, specify the levels of service to be provided, and clarify the periods over which the concession is granted. Both the level of service and the period of the concession may vary by subareas within the overall concession contract. For example, some subareas may require short-term arrangements before implementation of a planned piped network by the utility, whereas others may be long-term arrangements pending the development of such plans.

Figure ES.3 presents an example of how concessioning could involve core and/or periurban parts of a city, to be served by a range of service delivery models.

Core to this model is the concept of a single point of responsibility for delivery of the off-utility services, with the concessionaire managing the service quality improvements, investments, capacity building, and payment arrangements for its staff and subcontractors.⁴ Attempts have been made to undertake similar arrangements at the utility level. The Office National de l'Eau et de l'Assainissement, the single water utility in Burkina Faso, contracted private operators for water supply provision, including services apart from the piped network.⁵ In Bangladesh, a lease public-private partnership model allowed multiple small and medium enterprises to operate under the same framework administered by the city and/or the utility in a competitive environment, providing safe and reliable sanitation services to customers.⁶ However, these are transaction-heavy and oversight-heavy for the utility and/or city. The approach proposed in this report builds on recommendations from Misra and Kingdom (2019) and streamlines these examples by **bundling the detailed implementation arrangements within one package to be managed by the concessionaire.**

Bundling the SSP arrangements into bigger packages, with low transaction costs and a large number of beneficiaries, makes them more attractive to governments and development partners. Reduced costs arise both in terms of securing the services of SSPs (through a single tender for a substantial concession area) and in terms of subsequent oversight (with “regulation” of quality and price of service delivered through the contract). Critically this bundling approach also enhances effectiveness. A single concession for an SSP in a large defined geographic area brings with it simpler procurement (one package as

FIGURE ES.3. Possible Approach to Private Concessioning of Core and Periurban City Areas



Source: Authors.

opposed to many small ones), larger investments (with many small investments bundled together into one package), and delivery of service improvements to many more beneficiaries. This approach therefore eliminates one of the biggest challenges that acts as a barrier to donor and government engagement in the SSP sector—that is, having to otherwise manage multiple small-scale contracts, investments, and providers to have any impact at scale. If workable models can be demonstrated to deliver results at scale, then a virtuous cycle of donor/government engagement will begin.

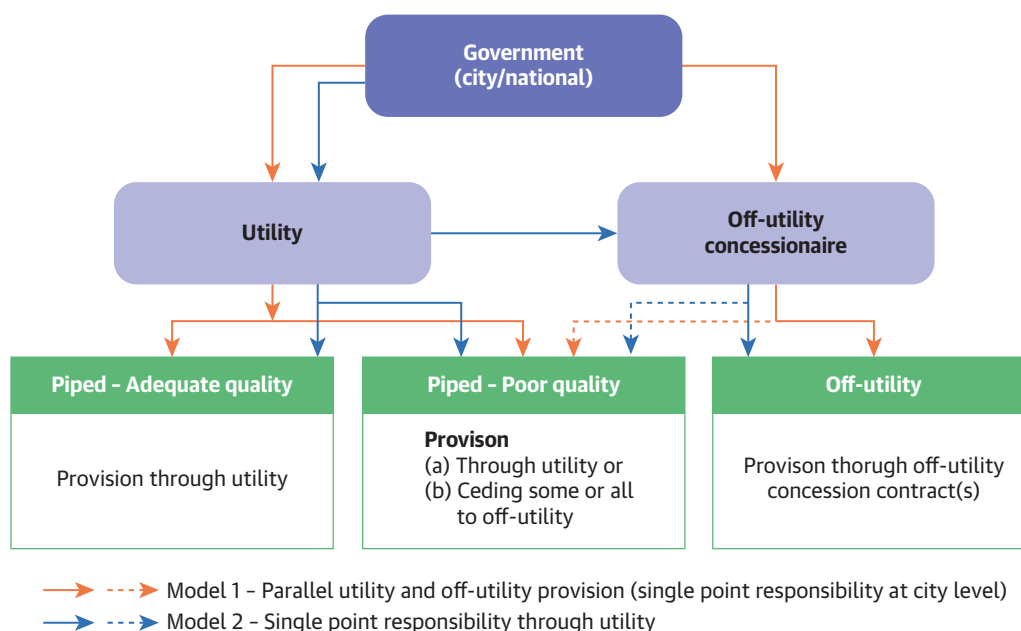
Although not precluding the city as the concessioning authority, the approach proposed in this report is to manage such concessions through the utility, given

- The many interfaces that will naturally occur between the utility and the off-utility concessionaires;
- Their ability to manage public funds for provision of water supply;
- The need for close coordination for planning of new schemes; and
- The opportunity for local governments to have one point of responsibility for providing water services across their jurisdiction, using a mix of different modes of delivery.

Concessions may include areas currently poorly served by the utility through a piped network. In many cases the existence of a utility pipe does not mean the provision of an adequate service. The report argues that fixing performance of utilities to deliver improved service in such areas should be addressed through utility improvement initiatives. However, it would be feasible to include such low-service areas within the off-utility concession if the city/utility is willing to cede that part of the system to the concessionaire(s). The possible contracting arrangements and scope of service for the off-utility service delivery are summarized in figure ES.4. In addition to the concession model, other approaches to SSP water provision that have potential for expansion through taking advantage of economies of scale or scope include water mini-grids, water tanker cooperatives, on-demand water supply, and complementary services to water delivery (such as solid waste removal or the delivery of groceries). These models may also be components of the mix of service delivery options a concessionaire deploys to meet the service obligations in the concession agreement. In each case, the design of the concession will include consideration of how the different arrangements will be managed at the end of the concession period. This might include continuing with the concession (for example, through manual or mechanical bulk delivery) or by the utility taking back responsibility (for example, piped networks).

This proposed approach is supportive of the World Bank concept of a Utility of the Future,⁷ which seeks to deliver more efficient, resilient, and customer-responsive water provision beyond what is being achieved or even considered today. In this case, the Utility of the Future-based model would deliver water services to all, acknowledging financial, institutional, and technical issues that imply different service levels and delivery methods will be required across a city area.

FIGURE ES.4. Off-Utility Concessionaire Service Area and Relationship with Utility and Government



Source: Authors.

Planning and implementation of at-scale demonstration projects require country and donor leadership, supportive champions, and start-up funding. This report lays out a process for this, which will require

- Clarity in roles, responsibilities, and accountability of participating institutions;
- A conducive environment in which a demonstration project will have a chance to succeed and showcase the new approach;
- Identification of champion cities/mayors and country/project leaders; and
- Start-up **funding** from forward-looking supporters of the approach, particularly relevant trust funds and bilateral donors.

An at-scale demonstration project approach is proposed because the lack of viable SSP models that operate at scale is at the heart of the challenge. Although the case studies in this report show many promising approaches, none have been able to move to scale. One reason is that they are constrained by lack of finance, and another is they typically lack substantial backing from development partners and governments. These, together, form a chicken-and-egg challenge for the sector. Today’s small-scale initiatives are transaction heavy—requiring intense support, multiple procurements and oversights of small providers, small investment packages, and low numbers of beneficiaries. **Development partners and governments prefer the exact opposite:** small numbers of large procurement packages that deliver

results at scale. If new models can be demonstrated that meet the preferences of development partners and governments, then a new partnership can develop in the SSP sector.

This report also highlights that the concept of off-grid electricity supplies was considered innovative a decade ago. However, after piloting by forward-looking countries and agencies, it is now widespread and accepted as one part of the power service delivery mix. If similar actions can be initiated in the water sector today, then tomorrow's water professionals may find themselves equally comfortable with SSP delivery arrangements. The overarching message from this study is the need for governments (at the national and city levels) and donors to come together and take concrete steps to address the needs of those people, predominantly the poor, without access to piped utility water supplies.

Although it is appropriate to focus on how policy, institutions, regulation, and financing will facilitate the creation of more formal, professional, and scaled-up supplementary service provision—as this report does—it is also important to remind readers how this work fits into the broader development agenda. The transition to a formal, professionalized, and scaled-up SSP sector will also strongly support the World Bank's approach to partner with its client countries to create jobs within a green, resilient, and inclusive development framework—as part of the global response to the effects of the COVID-19 pandemic. These benefits, which supplement those from the core activity of delivering improved water services, are as follows:

- Addressing water supply needs of the unconnected, especially the poor and the vulnerable
- Improving resource management, efficiency, and sustainability of water supply services
- Building community resilience to a range of future shocks—whether from pandemics, endemic health challenges, climate change, or natural disasters
- Providing improved access to water at the household level and narrowing the gap in basic services
- Generating new employment opportunities for construction and/or operation of SSP systems

Key Messages⁸

The following can be used as media messages:

- Hundreds of millions of households in the global South receive water supply services from SSPs, and the number is growing. Improving the quality of services provided by such SSIPs is an important interim step in meeting the SDG 6.1 for water supply.
- Water utilities in the global South should adopt a public service and accountability approach, accepting the responsibility to provide high-quality services to all households in an urban area, including households currently supplied by SSIPs.
- Formalizing the role of SSPs in the provision of water supply services can lower costs, expand coverage, and improve water quality. SSPs need to be incorporated into the operations of the formal utility and regulated to ensure that prices are fair and not based on monopoly power; services are

affordable to all households without a connection to the piped network; and quality of water provided is safe. Formalizing the role played by SSPs will expand both the population served and increase jobs.

- The water utility should consider granting exclusivity to an SSP to serve a specified geographic area to permit the SSP to capture economies of scale, promote professionalization of its workforce, and lower the prices charged. In some cases, an SSIP granted exclusivity to serve a specific geographic area may need to be subsidized to keep services affordable to poor households and to promote equity with households with private connections who received subsidized services.
- Adopting a public service and accountability approach in which SSPs are formally incorporated into the operations of the water utility is consistent with the recent call for “transformational WASH” (water, sanitation, and hygiene) services that improve the health of all households in an urban area. The COVID-19 pandemic has highlighted the importance of adopting a comprehensive public health focus that includes all citizens in an urban area.

Notes

1. *Off-utility* implies not directly supplied by a piped connection or other forms of service delivery arrangements from the formal utility. This could include a range of supply arrangements by SSIPs using utility bulk water or other bulk supplies to deliver services via standpipes or hand- or motorized-delivery of water to the household, or even a small piped supply. However, the term also covers larger enterprises because not all off-utility provision is via a SSIP. As noted, this report will use the term *supplementary service providers* (SSPs) going forward.
2. This example is discussed further in box 2.7.
3. Governments typically provide financing for capital expenditure equivalent to an annualized subsidy of US\$25.60 per person for capital investment in addition to US\$16.60 per capita in operating expenditure subsidies. The piped water subsidy therefore amounts to US\$17.60 per household per month for a family of five, compared to no or negligible subsidies for the unconnected household (Misra and Kingdom 2019; see table 2.6).
4. It is anticipated that concessionaires’ staff or subcontractors will draw extensively on the SSIPs currently operating in the concession area.
5. This example is discussed further in box 2.19.
6. This example is discussed further in box 2.20.
7. The World Bank Water Global Practice’s Utility of the Future initiative supports the establishment of efficient, reliable, transparent, and inclusive utilities. The incentives help utilities transition toward a sustainable business model that enables them to build more resilient water supply and sanitation services for all.
8. These can be used as media messages.

Abbreviations

AdeM	Águas De Mocambique
AFD	Agence Française de Développement
AfDB	African Development Bank
AREQUAP-CI	Association of Water Resellers in Precarious Areas of Côte d'Ivoire
ATM	automated teller machine
BOOT	build-own-operate-transfer
CCC	Chittagong City Corporation (Bangladesh)
CRA	Conselho de Regulacao do Abastecimento de Agua/Council for Regulation of Water Supply (Mozambique)
CSP	complementary service providers
CSR	corporate social responsibility
CSS	Chittagong Sheba Sangstha (Bangladesh)
CWASA	Chittagong Water and Sewer Authority (Bangladesh)
DMM	delegated management model
DWASA	Dhaka Water and Sewer Authority
ECA	Economic Consulting Associates
EIB	European Investment Bank
EWS	eThekwin Municipality Water and Sanitation (South Africa)
FIPAG	O Fundo de Investimento e Património do Abastecimento de Água/Water Supply Investment and Assets Fund (Mozambique)
FSM	fecal sludge management
GRID	green, resilient, and inclusive development
JMP	Joint Monitoring Programme
KfW	Kreditanstalt Für Wiederaufbau (German Development Bank)
KIWASCO	Kisumu Water and Sanitation Company (Kenya)
LIA	low-income areas

MDG	Millennium Development Goal
MO	master operator
NCWSC	Nairobi City Water and Sewer Company
NGO	nongovernmental organization
NRW	non revenue water
NWRA	National Water Resources Authority
NWSC	National Water and Sewer Corporation (Uganda)
ONEA	Office National de l'Eau et de l'Assainissement (Burkina Faso)
OTB	territorial base organization (Bolivia)
PDAM	Perusahaan Daerah Air Minum (Indonesia)
PIRF	policy, institutions, regulation, and financing
PPIAF	Public-Private Infrastructure Advisory Facility
PPP	public-private partnership
PSP	private sector participation
RBF	results-based finance
SDG	Sustainable Development Goal
SEMAPA	Servicio Municipal de Agua Potable y Alcantarillado (Bolivia)
SME	small and medium enterprises
SODECI	La Société de Distribution d'Eau de la Côte d'Ivoire
SSIP	small-scale independent provider
SSP	supplementary service provider
SSPD	Superintendencia de Servicios Públicos Domiciliarios/Superintendency of Public Services (Colombia)
SWNG	Safe Water Network Ghana
SWNI	Safe Water Network India
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund

WASH	water, sanitation, and hygiene
WASREB	Water Services Regulatory Board of Kenya
WHO	World Health Organization
WSS	water and sanitation services
WSSDP	Water Sector Strategic Development Plan
WSUP	Water and Sanitation for the Urban Poor
WUA	water user association

Chapter 1

Introduction

Supplementary Service Provision Provides a Response to Climate Change, the COVID-19 Pandemic, and the Need to Create Economic Opportunity

“Water service” is routinely interpreted as the provision of a piped water supply into people’s homes by a formal utility. This pipe-centric and utility-centric mindset appeals to investment-focused politicians and technically-driven utility engineers. However, as demonstrated in this chapter of the report, it comes at the expense of the unconnected, who are also the poorest and most vulnerable; opportunities to create new jobs; resilience to future disasters (including pandemics); and opportunities to better manage the environment.

The global climate change crisis is inextricably linked to water. Climate change is increasing variability in the water cycle, thus inducing extreme weather events, reducing the predictability of water availability, decreasing water quality, and threatening sustainable development of safe drinking water and sanitation worldwide. National and regional climate policy and planning must take an integrated approach to climate change and water management. If a sustainable future is to be created, continuing along a “business-as-usual” pathway is no longer an option and water management needs to be scrutinized through a climate-resilience lens. Increased investment is needed in improving institutions and governance, capacity development, risk assessment, and knowledge sharing. Policies need to ensure the representation, participation, behavioral change, and accountability of all stakeholders, including the private sector and civil society. Adaptation plans need to incorporate targeted strategies that assist lower-income populations—those who are disproportionately affected by climate change impacts—to navigate new conditions.

Formalizing, professionalizing, and scaling up the supplementary service provider (SSP) sector provides many partnership opportunities for the World Bank and client countries to address the key challenges of the GRID (green, resilient, and inclusive development) framework and jobs, as summarized in table 1.1.

Why Is There a Pressing Need for SSP Water Provision?

Across the globe, a significant share of households does not have access to an adequate, safe water supply. The rapid growth of urban areas across the developing world and the sluggish pace of

TABLE 1.1. Improving SSP Provision: Impact on GRID and Jobs

Dimension of development	Addressing water supply needs of the unconnected, especially the poor and the vulnerable
Green	Improving resource management, efficiency, and sustainability of water supply services
Resilience	Building community resilience to a range of future shocks, whether from pandemics, endemic health challenges, climate change, or natural disasters
Inclusive development	Providing improved access to water at the household level and narrowing gap in basic services
Jobs	Generating new employment opportunities for construction and/or operation of off-utility systems

Note: SSP = supplementary service provider.

expanding piped networks by incumbent utilities implies that the number of households who rely on SSPs for their water supply will continue to increase. By 2030, it is likely that nearly one billion people will come to rely on SSP water supplies that do not meet the Joint Monitoring Programme definition of “safely managed” (Misra and Kingdom 2019). Most of these people will live in African and Asian cities, and more than two-thirds will be in the two lowest wealth quintiles. Many will be in informal settlements that are often overlooked by authorities and utilities. Thus, any program that seeks to support socially inclusive development must consider provision of SSP water provision as part of its toolbox of interventions.

The need to ensure that *all* households have access to a safe, adequate, and affordable water supply is more important than ever. The COVID-19 pandemic has provided a sobering illustration of the real consequences of failing to ensure a citywide inclusive water supply. Box 1.1 highlights how the

BOX 1.1. COVID-19: Underlining the Importance of Universal, Safe Water Supplies, Mumbai/India and Kenya

COVID-19 has highlighted the importance of a universal, safe water supply. The World Health Organization (WHO) notes that frequent, regular hand hygiene is one the most important measures to reduce the risk of catching and transmitting the virus. Research has suggested that countries with weak handwashing culture are more exposed to COVID-19 (Pogrebna and Kharlamov 2020). The United Nations Children’s Fund (UNICEF) estimates that only three in every five people worldwide have access to basic handwashing facilities. In India, the National Family Health Survey found that most low-income households could not afford to regularly wash their hands (IIPS 2017). Stay-at-home orders and the fall in income experienced by households have further emphasized the importance of a safe, affordable water supply for all households.

The impact of a lack of water is particularly pronounced in dense, urban slums that do not have adequate access to basic services, preventing households from being able to follow basic hand hygiene recommendations. Early evidence suggests that slums in Mumbai are more vulnerable to COVID-19 outbreaks than other areas (Patranabis and Tandel 2020). A five-person family in a Mumbai slum that receives less than 60 liters of water a day would use more than 40 percent of their supply just washing hands if they did it ten times a day for twenty seconds, following UNICEF and WHO recommendations (Pani Haq Samiti and Center for Promoting Democracy 2020). The limited water supply means that many households will prioritize drinking and cooking over hygiene and other essential measures to curb the spread of COVID-19.

In Kenya, residents of Kibera, Nairobi’s largest slum, created a network of handwashing stations (World Bank 2020). In Tanzania, the utility, supported by United Nations (UN)-Habitat and the European Investment Bank, will provide fourteen handwashing stations in informal settlements in the northern Mwanza region. The utility is also installing one hundred additional standpipes in vulnerable communities and has, like other utilities, suspended disconnections during the pandemic (World Bank 2020).

pandemic has increased the urgency of the requirement for safe water supplies, including in informal settlements.

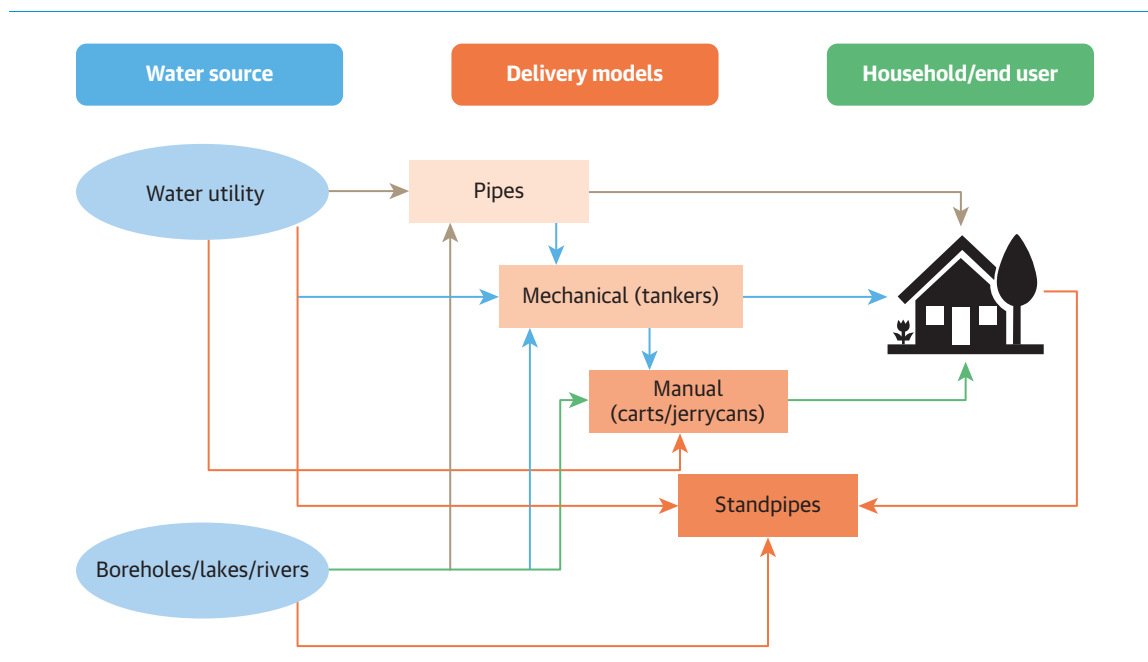
Box 1.1 highlights the need for improved water supplies to provide resilience to COVID-19, and in the absence of piped/utility supplies, improving SSP provision will play a key role. However, a broader resilience can also be derived from improved off-utility provision—for example, in providing alternative sources of water supplies should other sources become unviable in the event of unforeseen shocks. Expanding and professionalizing the off-utility sector will also provide economic opportunities through employment. This might be in the form of capital-intensive infrastructure improvements related to pipe laying in dense urban areas where use of heavy machinery is difficult. Or it may imply a move away from standposts to the delivery of water directly to homes by teams of motorized or manual haulers. Any new grouping of formal and professional SSPs will also have a keen interest to manage their resources prudently, and this can only benefit the environment. In the short term, this may focus on issues related to sustainability (quality and quantity) of water sources, but in the longer term, this might mean business expansion to include the collection, reuse, and recycling of sanitation products.

As cities and countries across the globe seek to “build back better,” this study illustrates how the global crisis resulting from COVID-19 offers an unprecedented opportunity to accelerate the widespread scale-up of high-quality water supplies with an emphasis on SSP water supply. The severe economic and social impacts of the crisis underline the need to pursue projects that combine providing short-term economic gains with developing long-term resilience to future pandemics and other shocks: the GRID and jobs agenda. This study also illustrates why governments have committed to meeting the Sustainable Development Goals (SDGs) by 2030. This includes SDG 6.1, which states, “By 2030, achieve universal and equitable access to safe and affordable drinking water for all.”

The high costs of providing piped networks and institutional bottlenecks implies that SDG 6.1 cannot be met solely through a reliance on piped water supplied by traditional utilities. As a result, there is an urgent need to engage with the SSP sector to improve the quality and affordability of its water and scale up these provisions to facilitate formal, professional, citywide inclusive water supply. The focus of authorities, policy makers, and international donors on expanding access to piped services has meant that the typically informal SSP sector has often been overlooked. SSP water provision can take various forms, ranging from standpipes and kiosks, in which households collect water from a fixed location; to household delivery, either through jerrycans and bottles, which can be replaced, or trucks, which fill onsite storage; and through piped mini-grids.

An overview of how the models operate is presented in figure 1.1, and the key features of these models is provided in table 1.2. Although some may be able to deliver a higher service quality than others, there is no one “ideal” SSP delivery model because not all are suited to every location. For example, if financial resources are constrained, models requiring significant capital investments, such as piped mini-grids, may not be possible. Similarly, it is infeasible to deliver water by truck to informal settlements with narrow passageways.

FIGURE 1.1. Off-Utility Service Delivery Supply Chain



Source: Authors.

TABLE 1.2. Overview of Dominant SSP Service Delivery Models

Model	Key features	Example
Public standpipes	<ul style="list-style-type: none"> Located in communal areas Single operator or unattended with electronic touchpads 	<ul style="list-style-type: none"> Water ATMs in New Delhi, India Communal ablution blocks in eThekweni, South Africa Public standpipes in Ghana
Household delivery—manual	<ul style="list-style-type: none"> Small transport—for example, bicycles and carts Jerrycans and bottles brought to the door Can be swapped for empty vessels 	<ul style="list-style-type: none"> Water vendors (pushcarts) in Nairobi, Kenya
Household delivery—mechanical	<ul style="list-style-type: none"> Larger tankers bring large volumes to a property Require onsite tanks for storage 	<ul style="list-style-type: none"> Private tanker trucks in Cochabamba, Bolivia, or Barranquilla, Colombia
Piped	<ul style="list-style-type: none"> Provision to household (either to house or yard) directly via pipes Mini-grids, which serve a certain, potentially isolated, area; these may be supplied via an interconnection with the main network or from a dedicated source 	<ul style="list-style-type: none"> Communitarian systems in Cochabamba, Bolivia Private piped network in Manila, Philippines

Source: Authors.

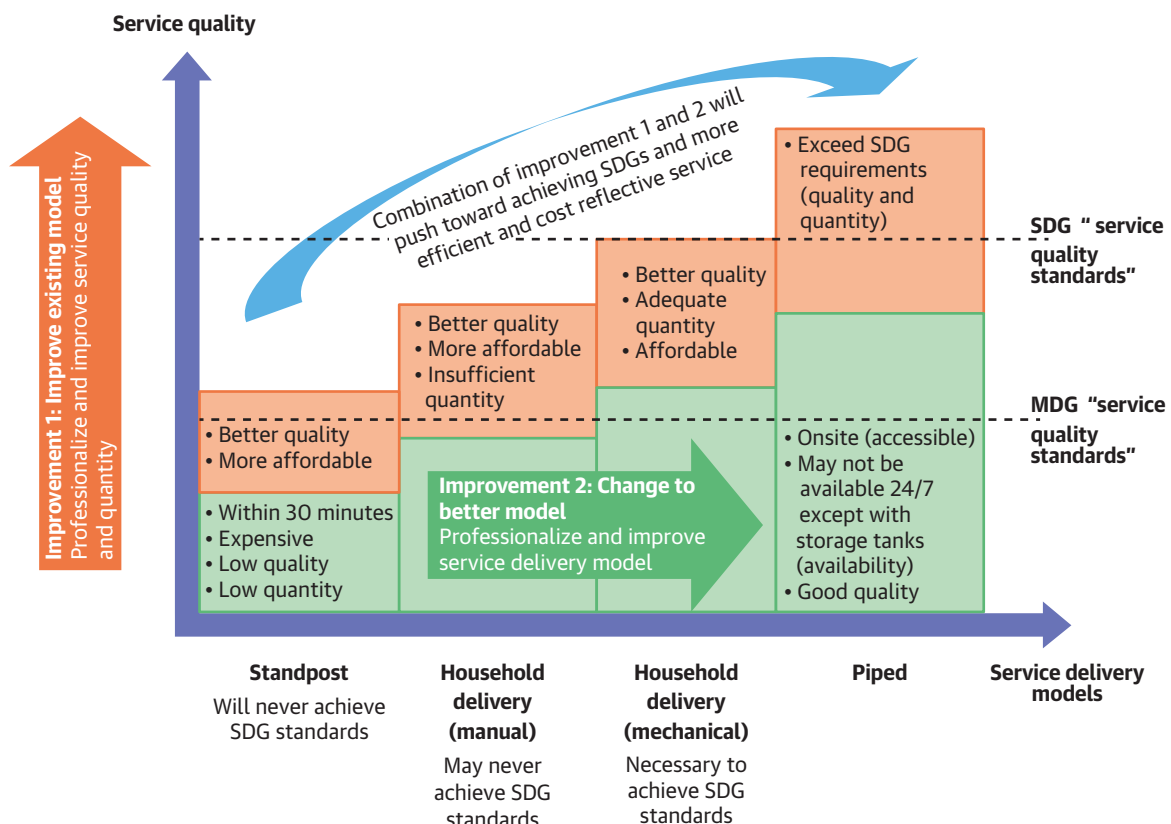
Note: ATM = automated teller machine; SSP = supplementary service provider.

Need for Formalizing, Scaling Up, and Professionalizing SSP Services

SSP water suppliers typically operate informally and are not regulated. Consequently, the quality of the water provided can be below safe drinking water standards, and service delivery and reliability often fail to meet minimum standards. SSP water supply also tends to be more expensive than piped supply. Tariffs for piped water customers tend to range from 0.5 to 3 percent of household income; for SSP customers, the range is from 5 to 25 percent (Misra and Kingdom 2019). This reflects the higher operating costs of the service delivery models, the lack of scale economies achieved by these SSPs, and the absence of the subsidies often received by households connected to the piped system. The informal nature of SSPs also means that they often lack the scale and capacity to expand their service to provide water to more households.

Figure 1.2 illustrates the potential for improving SSP water supply along two distinct dimensions. First, existing service delivery models can progress (moving up the chart) by taking actions to professionalize existing service delivery models and facilitating necessary investments. This may include providing higher-quality water, increasing the quantity that can be supplied, or ensuring affordability. Second, investments can upgrade to other delivery models (moving to the right in the chart). Such a shift

FIGURE 1.2. Improving Supplementary Service Provision Arrangements



Source: Authors.

primarily increases accessibility and the quantity that can be delivered. It is this combination that improves the quality of SSP water provision and makes progress toward achieving SDG targets and standards. This reflects the reality that, in many cases, it is impossible to move straight to the “ideal” model, with feasible options depending on the local context and constraints. Shifts upward and/or to the right in service provision should not be dismissed simply because they do not meet an SDG or other goal. Rather, they can be seen as intermediate steps toward these targets that still provide beneficial returns to large populations.

Enhancing the provision of SSP water provision, either by improving the quality of existing service delivery or moving to better delivery models as outlined in figure 1.2, will require substantial investments—whether they concern the quantity and quality of capital, human capital and managerial capacity, or technology. A summary of the general types of investments needed to improve each of these broad types of service delivery model is provided in table 1.3. The specifics will vary from case to case, depending on the quality of the existing model, the level of service quality to be achieved, and the local context.

TABLE 1.3. Overview of Necessary Improvements to Supplementary Service Provision

	Standpost	Household delivery— manual	Household delivery— mechanical	Piped
Key constraints and limitations of existing model	<ul style="list-style-type: none"> • Considerable time required to access water • Expensive because of the absence of scale economies • Limited ability to access large quantities of water • Quality of water may be low 	<ul style="list-style-type: none"> • Labor-intensive • High costs and unaffordable • Limited ability to access large quantities of water • Quality of water can vary and be poor 	<ul style="list-style-type: none"> • Mechanical delivery modes cannot access all areas • Limited by ability of households to store water • Quality of water can vary and be poor • Informal nature of market means prices are often high 	<ul style="list-style-type: none"> • Availability can be intermittent • High capital costs • Difficult to serve households in informal settlements
Requirements to improve quality/service delivery model	<ul style="list-style-type: none"> • Increase the network of standposts to improved access • Provide subsidies to ensure affordability • Improve the quality by switching to higher-quality sources or investing in treatment 	<ul style="list-style-type: none"> • Improved technology to provide larger quantities • Provide subsidies to ensure affordability • Improve the quality by switching to higher-quality sources or investing in treatment 	<ul style="list-style-type: none"> • Improved technology to deliver higher-quality and larger quantities • Increase household storage • Subsidies or regulation to ensure affordability • Improve the quality by switching to higher-quality sources or investing in treatment 	<ul style="list-style-type: none"> • Improve reliability by managing and improving supply of water • Increase ability to implement at scale to reduce average cost of developing network

Source: Authors.

The required investments often entail a large upfront cost, which must be recovered over time. There are significant risks if the SSP has no certainty about the period over which it can recover those costs, no protection from the entrance of low-cost/low-quality competitors, and the threat of the market being usurped by the formal utility. Ambiguity over future operational and maintenance expenditures adds to the range of business risks SSPs face. The informal nature of the sector and its limited capacity to manage the risks explains why the sector has been reluctant to engage in large-scale investments needed to improve service provision and scale-up.

Various challenges, such as the lack of finance or clear policy and regulatory frameworks, may appear to be only a minor impediment when operating at a small scale. However, they may be major barriers to SSPs achieving scale and improving the quality of the service provided. Facilitating improvements and scale-up in the SSP sector requires committed engagement with the sector, starting with an understanding of how it functions. It cannot and should not be assumed that the same frameworks that apply to the utility sector will also be effective in the SSP sector. Practitioners and policy makers need to focus on the internal and external factors that play a role in such models. These include, but are not limited to, policy, institutions, governance, financing arrangements, and technical and contractual solutions.

Overview of the Report

This report outlines a proactive vision of how development of the SSP water sector can promote city-wide inclusive water supply, ensure rapid progress is made in achieving SDG 6.1, and deliver on the GRID and jobs development agenda. Using case studies from around the world, it analyzes the potential of off-utility provision of water and develops a framework focused on what is needed to formalize, professionalize, and scale up these services. It also presents potential models for high-quality SSP water delivery and outlines how these can be implemented. This report mainly considers the provision of SSP service in those areas that do not have a piped water supply. Figure 1.3 illustrates the structure of this report.

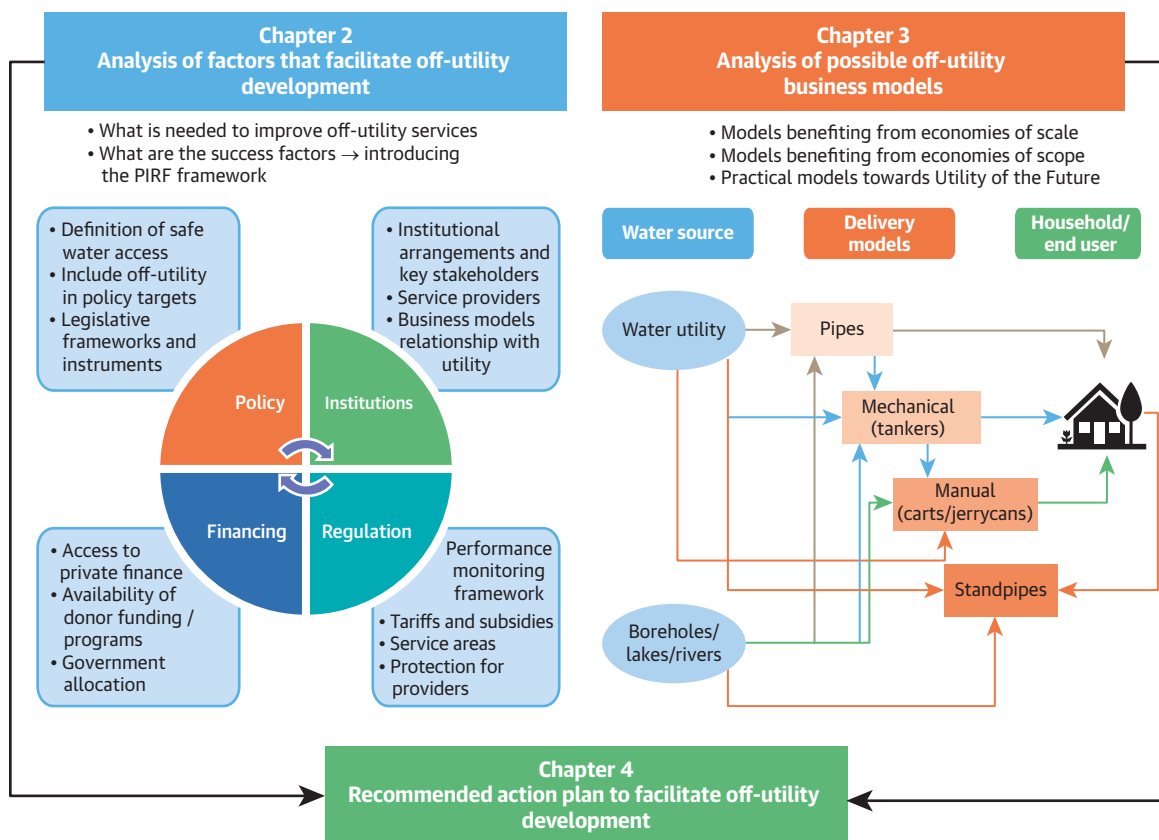
Chapter 2 analyzes what is needed to facilitate high-quality SSP water provision that will support the GRID and jobs agenda. Drawing on various case studies and a policy, institutions, regulation, and financing framework, it examines the factors that are crucial to securing the investments necessary to improve and scale up SSP water provision.

Chapter 3 provides an overview of feasible models that can deliver professional SSP water provision, at scale, that is green, resilient, inclusive, and affordable.

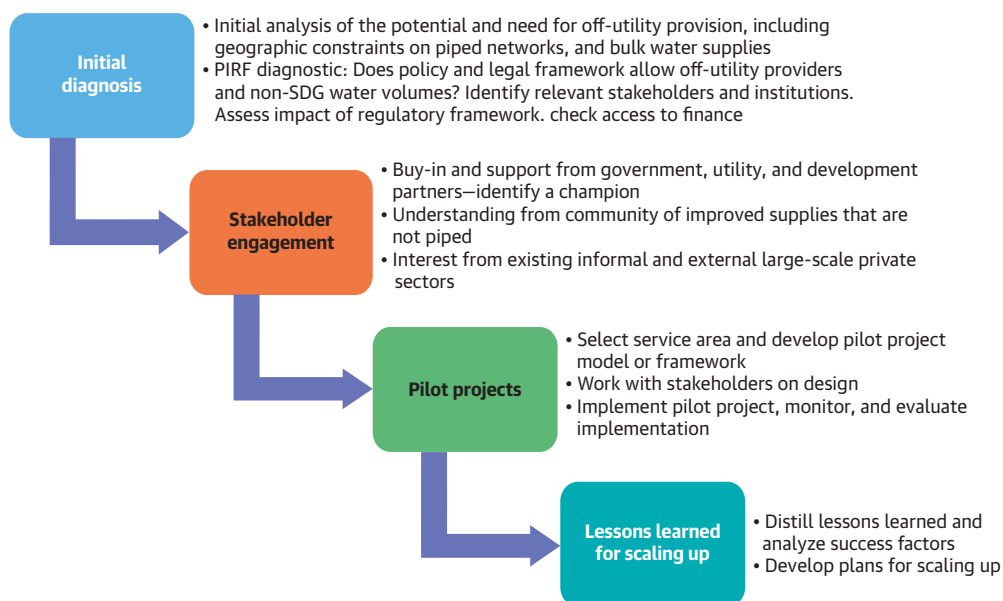
Chapter 4 discusses how such models can be implemented and what practical actions and steps need to be taken to ensure that such models can help achieve citywide inclusive water supply.

Chapter 5 provides concluding remarks.

FIGURE 1.3. Overview of the Structure of This Report



- What needs to be done to facility and encourage off-utility water service development and scale up



Source: Authors.

Note: PIRF = policy, institutions, regulation, and financing; SDG = Sustainable Development Goal.

Chapter 2

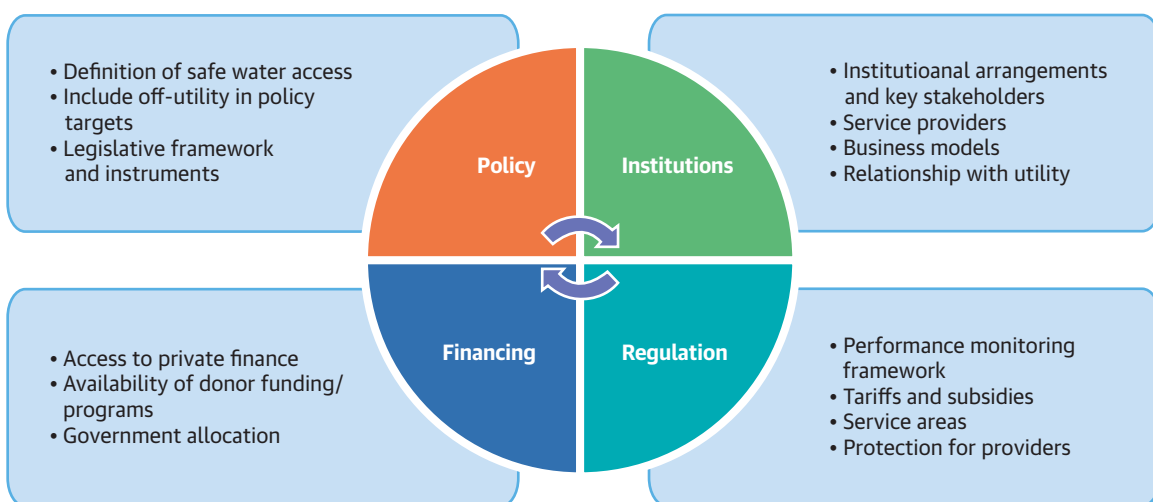
Facilitating High-Quality Supplementary (Nonutility) Water Provision

The key factors required to improve off-utility water provision include scaling up investment in successful models, enhancing capacity, reevaluating current approaches to sector subsidies, and developing and using new technologies. Facilitating this paradigm shift requires a conducive policy, institutions, regulation, and financing (PIRF) environment.

Despite the large number of households relying on off-utility water provision, examples of professional, at-scale service provision are rare. Moving up or to the right of figure 1.2 will require the **formalization** of the sector to deliver professional, at-scale, service. This necessitates significant investment, either to scale up existing models to allow households to move right in the diagram and/or invest in new technologies to move upward in the diagram. The PIRF framework, as illustrated in figure 2.1, can be used to diagnose and improve the enabling environment to facilitate such investment.

If the PIRF framework is not aligned with the provision of off-utility services, then the business risks associated with such arrangements will force the sector toward the unsatisfactory arrangements, which may be described as a **low-level equilibrium trap**. Small-scale independent providers (SSIPs)¹ are unlikely to invest in new equipment, facilities, or capacity building if they lack the guarantee that they will be considered legitimate businesses that can expect to recover those costs over a reasonable time frame. SSIPs will also not provide better-quality services if they are too expensive for the customers, who are usually among the poorest yet typically do not receive any of the significant subsidy provided to public utilities, and their piped service customers.

FIGURE 2.1. Framework of Factors Crucial to Scaling up Off-Utility Water Businesses



Source: Authors.

In this chapter we outline the success factors in each of the four PIRF components, outlining why they are critical to scaling up off-utility water provision and how this can be achieved. Given the absence of professional SSIPs operating at scale, we substantiate the analysis through case studies that illustrate how a certain factor has supported SSIPs or acted as a barrier to them. These cases are drawn from the off-utility water sector and SSIPs in other sectors.

Clear Policy Framework

Including off-utility delivery models in the water policy framework and targets signals government's commitment to the subsector, allowing SSIPs to plan for investments with lower business risk.

Facilitating the scale-up of off-utility water businesses requires a clear, well-defined policy framework with established targets and definitions and the genuine engagement of policy makers with the sector. The key success factors are summarized in table 2.1.

Political Will

Given the infancy of *formal off-utility service provision*, it is essential to have policy makers willing to champion it. This can also help smooth the other barriers faced by SSIPs while increasing acceptance of the service by households. At the national level, strong political will can drive the development of national policy that includes the off-utility subsector. This in turn can mobilize subnational-level governments to include off-utilities in their water sector development strategies and plans. It will also allow budget allocation for the subsector.

Complementarily, a bottom-up process can encourage political will at the local and subnational levels. For example, local private firms and/or community-based organizations that are successfully providing off-utility water supply to communities can motivate local governments to replicate

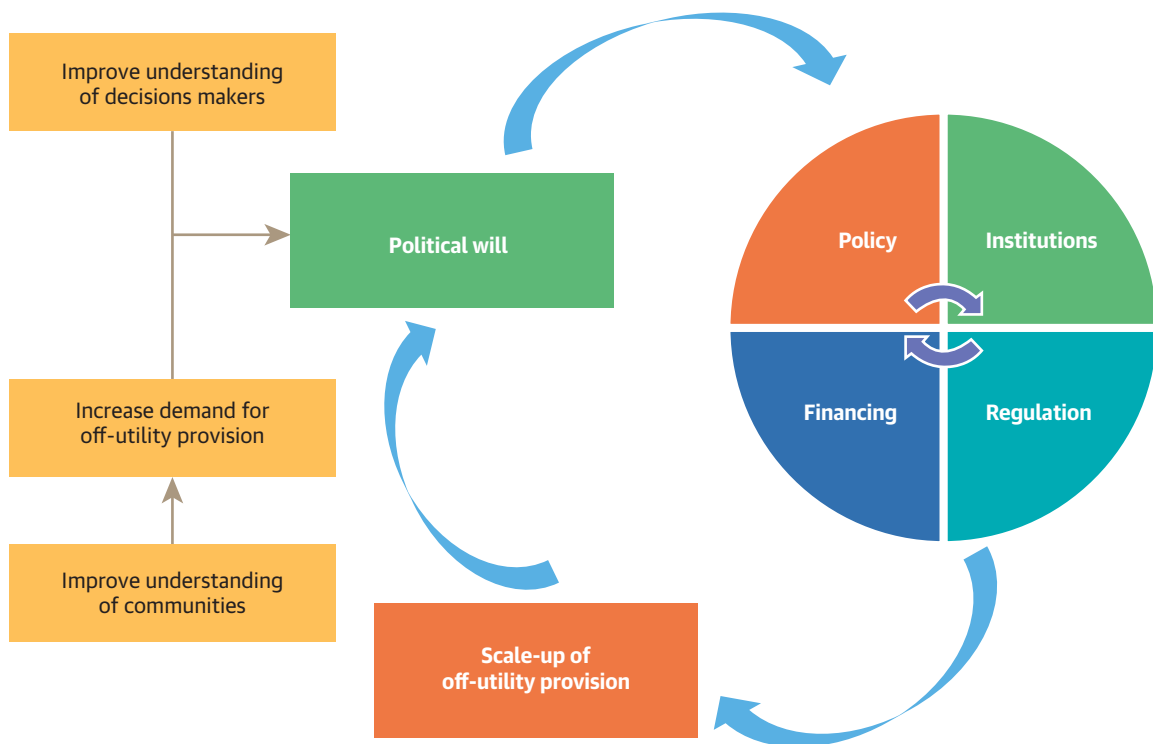
TABLE 2.1. Success Factors: Policy

Success factor	What needs to be achieved?	How it can be achieved?	Examples
Political will	<ul style="list-style-type: none"> Ensuring buy-in from authorities Willingness of policy makers to champion the provision of off-utility water 	<ul style="list-style-type: none"> Stakeholder engagement Underlining the importance of providing citywide inclusive water supply Increasing demand by improving community understanding 	<ul style="list-style-type: none"> Ghana South Africa
Clear definitions and targets	<ul style="list-style-type: none"> Clear definitions of safe water access and legal framework to validate off-utility service delivery models Targets on expanding water access and achieving universal coverage 	<ul style="list-style-type: none"> Development of specific guidelines and adaptation of existing guidelines (JMP, SDG) to the off-utility sector Supporting cities in setting targets to increase coverage 	<ul style="list-style-type: none"> Bolivia Colombia Ghana

Source: Authors.

Note: JMP = Joint Monitoring Programme; SDG = Sustainable Development Goal.

FIGURE 2.2. Importance of Political Will in Driving PIRF for Off-Utility Development



Source: Authors.

Note: PIRF = policy, institutions, regulation, and financing.

their success. Successful local government and municipality initiatives developing and supporting off-utility water provision can encourage a national government to consider and allocate more resources in the subsector. The political will can drive the development of the rest of the PIRF factors to allow and facilitate further development of off-utility provision in a virtuous circle, as illustrated in figure 2.2.

Box 2.1 illustrates how decision makers' understanding of the need for private sector participation in the water sector creates the initial political will to develop supportive policy, which in turn encourages successful private sector water provision, leading to scale-up and replication of the private provision.

Box 2.2, using the example of Blantyre, Malawi, shows how partnerships between local governments and SSIPs can lead to improved water supplies (and other associated services) for poorer periurban communities. The example illustrates how improved management models of existing services that involve community members can increase the financial sustainability of water services.

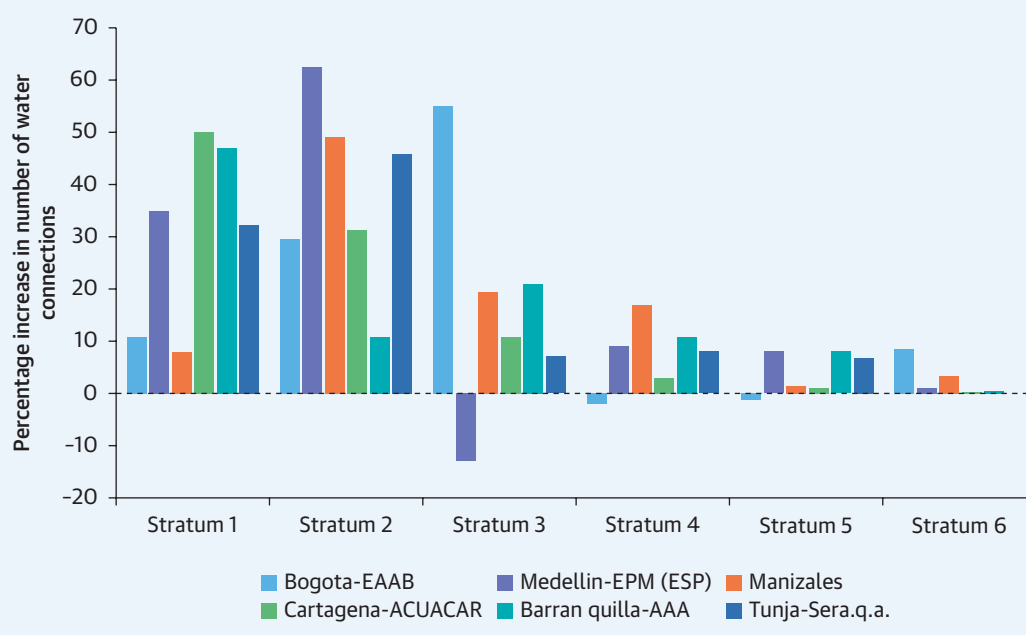
BOX 2.1. Policy-Driven Development in Colombia's Water Sector

Colombia is one of the most active countries in Latin America in encouraging private sector participation in water supply services. The government embarked on a water sector modernization program to expand service provision among low-income areas through private water utilities. For this purpose, a study was carried out to compare private and public service provision in terms of service expansion to the poor.

Private providers operating in Barranquilla, Cartagena, and Tunja were selected and their performances compared with the most-efficient public utilities serving Bogota, Manizales, and Medellin. The study found that both public and private service providers focused their efforts of low-income groups (strata 1 to 3, illustrated in figure B2.1.1). Private water utilities contributed substantially to improved coverage rates and continuity of supply, with positive effects on low-income households in the poorest and least-well-covered areas.

These results provided the rationale for increasing domestic private sector participation through large private utilities operating in large urban centers. In addition, the National 2010-14 Development Plan specifically highlighted the need to promote private service provision in smaller urban and periurban areas. A corporate modernization program was carried out to encourage private operation and service provision and develop new organizational structures for small towns and rural areas. Key sector regulations were also introduced to facilitate small-scale independent providers (SSIPs) in off-grid areas. These are discussed in box 2.17.

FIGURE B2.1.1. Improved Services by Private Utilities Benefiting Low-Income Households



Source: ECA 2016; Sotomayor 2003.

BOX 2.2. Water User Associations Improve Kiosk Operation with Local Government Support in Blantyre, Malawi

Since 2011, Water For People has implemented the Everyone Forever model—a system-strengthening approach to water, sanitation, and hygiene (WASH) implemented at the district level with strategic influence to scale nationally. The Everyone Forever model encompasses all WASH services within specific geographic (district) boundaries.

In 2009, Water For People engaged in a pilot project in Blantyre, the commercial capital of Malawi, to get the periurban areas back online and out of debt with the utility, the Blantyre Water Board. That pilot project was funded by the World Bank and expanded to a multiyear program funded by the European Investment Bank. Water For People worked with community leaders, water users, the Blantyre Water Board, and the Blantyre City Assembly to establish high-functioning water user associations (WUAs) as an intermediate management model for water kiosks across low-income areas (LIAs). Since 2012, it has established full coverage of the twenty-one LIAs with consistent access to high-quality water services.

Not only were the WUAs able to repay the arrears of US\$10,500 in 2012, but they have also consistently employed community members as water sellers and set the norm for service delivery through political will and system management to keep the kiosks functioning with a reliable level of service. The community water point level of service increased from 87 percent with an intermediate or high level of service in 2017 to 96 percent in 2019. Over the same period, intermediate and high levels of service in schools and clinics increased from 55 to 90 percent and in households from 70 to 84 percent. The increases are even greater if basic levels of service are included.

The success of this work relies upon ongoing engagement between the Blantyre Water Board and the WUAs; clear expectations of the roles and responsibilities of all stakeholders, including community members, water sellers, and the WUAs; and political will of leaders in the community to support the work. The approach includes more than just the infrastructure to deliver water; it is a holistic, systemic approach that includes governance, tariffs and financial flows, and monitoring of services. After eight years, the LIAs in Blantyre benefit from high levels of service, and communities are committed to sustaining the progress of these systems.

Source: Water For People.

Box 2.3 illustrates a similar example, showing how the political will to ensure that all poor households have access to affordable water can help facilitate innovative solutions to provide off-grid water. Although this case does not relate to an independent operator, it illustrates how political will and support, including for innovative solutions, can help expand access to poor households.

BOX 2.3. Political Support for Utility Off-Grid Supply in eThekweni, South Africa

eThekweni, South Africa, provides one of the few, and most successful, cases of professional off-grid provision. The utility eThekweni Municipality Water and Sanitation (EWS) provides water and sanitation services (WSS) across the city of Durban and its surroundings. Although a quarter of settlements are informal and only 74 percent of households have access to piped water, total access to water is 97 percent.

The high access rates have been enabled by a stable political context in which the public utility has been allowed to operate in a semiautonomous manner, ringfenced from other municipal activities. The utility management enjoyed the full support of city leaders to experiment and try new strategies to expand access. The local authority also maintains incentives and performance targets that encourage the utility to provide high-quality service to poor households. The combination of political support, freedom to pursue new routes, and incentives led to the utility using its resources to expand access while driving costs down through new technologies.

Many poor households receive their water through communal ablution blocks, which provide water and sanitation to about fifty to seventy-five households within a 200-meter radius. The utility has begun providing full-pressured metered connections to a local offtake for a group of about fifteen households. This extends to 200-liter ground tanks in each house through inexpensive high-density polyethylene (HDPE) pipes. Electronic bailiff units ensure that the tank is filled automatically overnight. The combination of these provisions allows the utility to extend the free allowance of 6,000 liters per month to low-income households who are not connected to the grid.

Source: Eales 2018; Misra and Kingdom 2019; World Bank 2016.

Policy Definitions and Targets

SSIPs need to operate in an environment that will lower their risks, particularly investment risk, and allow them to scale up and expand their businesses. Clear policy definition, direction, and targets can create this necessary environment:

- Including off-utility provision in national water policy will legitimize SSIPs' businesses, presenting the opportunity to expand.
- Clear definition(s) of off-utility services will help raise community awareness of these services and create demand, which will motivate more SSIPs to offer the services.
- Including off-utility provision in water policy and strategies allows public budget and other resources to be allocated to develop the subsector.
- Government commitment to the off-utility subsector through inclusion in national policy will, in turn, reassure investors and/or banks when providing financing to SSIPs.

Policy is typically then implemented through legal frameworks that clearly allocate the responsibilities to appropriate institutions (discussed further in Supplementary Institutional Relationships) and a regulatory framework (as discussed in Regulations to Protect and Create Incentives). Having clear definitions of off-utility services in policy and legal frameworks provides this much-needed legal recognition. The example in box 2.4 from Mozambique shows that if off-utility services are not legally recognized, they cannot be regulated, and hence customers cannot be protected from low-quality water and/or services.

BOX 2.4. Informal Water Provision in Maputo, Mozambique

Since 1999, the city of Maputo has been served through a lease contract signed between the private operator Águas de Moçambique (AdeM) and the Water Supply Investment and Assets Fund (FIPAG), with the Council for Regulation of Water Supply (CRA) in charge of regulating the contract. Although service quality has largely increased since then, the low access rate in the outer neighborhoods of Maputo led to the emergence of alternative service providers, including small-scale independent providers (SSIPs). Although standpipe management models are legally recognized and subject to some degree of regulation, the activity of SSIPs and domestic resellers is currently unregulated, as shown in table B2.4.1.

Subsequent studies of water service provision in Maputo have also highlighted that the existing policy and regulatory framework inadequately addresses the improvement of service delivery in areas unserved by the formal utility. Although SSIPs have been recognized as temporary alternatives to formal utility provision through ad hoc measures, these seem designed to increase control over SSIPs rather than support their professionalization.

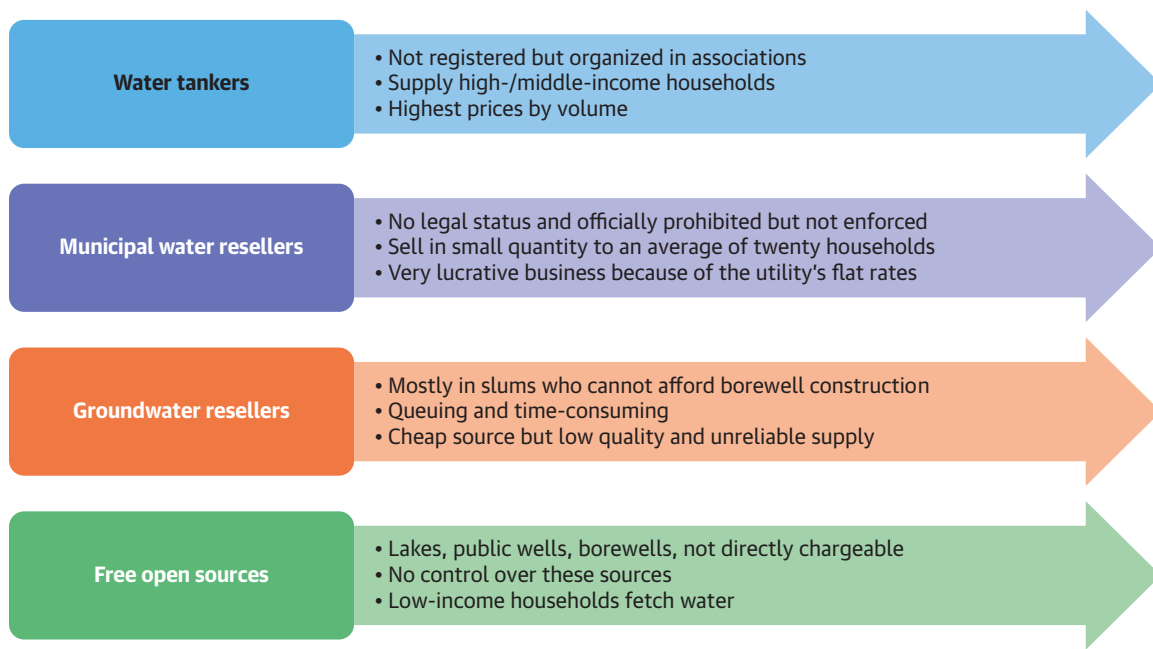
TABLE B2.4.1. Unregulated SSIPs and Domestic Resellers in Maputo

Service provider	Price regulation	Service quality regulation	Competition regulation	Customer protection
AdeM	CRA in charge of tariff review and approval	CRA/FIPAG for enforcing penalties and performance standards	Bidding process	CRA for ensuring compliance with codes of practice
SSIPs	✗	✗	✗	✗
Standpipe assistants	Water committees/municipality	Water committee/AdeM/municipality	Selection by water committee	Water committee/local authority/municipality
Water resale	✗	✗	✗	✗

Note: AdeM = Águas de Moçambique; CRA = Council for Regulation of Water Supply; FIPAG = Water Supply Investment and Assets Fund; SSIP = small-scale independent provider.

Source: Ahlers et al. 2013; Matsinhe et al. 2008.

FIGURE 2.3. Informal Water Service Delivery in Mumbai



Source: Angueletou-Marteau 2008.

Similarly, in Nairobi (Kenya), the only categories of formally licensed providers are the utility and SSIPs supplying more than twenty households or 25 cubic meters per day for domestic consumption. A significant proportion of the population without access to networked water services rely on smaller informal mobile vendors that are largely unregulated. Regulations to Protect and Create Incentives discusses more on regulation.

Another example is Mumbai (India), where a wide range of informal household delivery models provide water supply services, summarized in figure 2.3. Although water vending is actively discouraged as government agencies are often inclined to suppress informal SSIPs, vendors provide an important service but lack proper legal standing and continue largely to operate at the margins of established frameworks.

A similar example showing the challenge of integrating established SSIPs without a clear policy framework is discussed in box 2.5 for Bolivia.

This case study highlights how the lack of clear roles and responsibilities for SSIPs, particularly regarding their relationships with utilities and other sector stakeholders, can lead to suboptimal outcomes for the promotion of citywide water supply solutions. The example of Ghana, presented in box 2.6, shows how recognition of the role of private provision can be made effective through incorporation in sector plans and guidelines.

BOX 2.5. The Challenge of Integrating Independent Water Networks in Cochabamba, Bolivia

For the past thirty to forty years, many citizens of Cochabamba, Bolivia, have had their water supplied either by the municipal water company (Servicio Municipal de Agua Potable y Alcantarillado [SEMAPA]) or by small independent system operators. Poor availability of bulk water limited SEMAPA's ability to expand its network, providing an opportunity for the small operators to establish themselves to meet demand without any official recognition through policies or regulatory oversight.

Water supply in Cochabamba today apart from SEMAPA is managed through 189 independent systems ranging from water committees (46 percent), water associations (20 percent), territorial base organizations (OTBs; 15 percent), and cooperatives (11 percent). These small operators source water from boreholes, natural springs, truck deliveries, and interconnections with SEMAPA's network and distribute through local neighborhoods, sometimes in areas of just one or two blocks.

Although several cooperatives, water associations, and OTBs have legally recognized identities, the other entities do not. Despite their lack of regulatory oversight for quality, quantity, or price of water delivery, some operators provide a higher-quality service, at a lower price, than SEMAPA.

In 2017, the Misicuni Dam, located about 35 kilometers from Cochabamba, began supplying much larger and more reliable volumes of water to SEMAPA. This greater supply gave new impetus to SEMAPA to restart its network expansion but has left the challenge of expanding into areas supplied by the small providers, with their varying degrees of legal recognition. Without such a clearly identified formal role in citywide water supply, it is difficult for SEMAPA to establish formal relationships (even though some of the operators receive bulk water from SEMAPA). However, introducing formality through regulation is likely to be resisted by suppliers, who have formed strong and enduring relationships with their customers, because of the likely ensuing cost increases.

Similarly, taking a strong-arm approach to expand in spite of the small operators is also a complicated option. Cochabamba's path to integrated supplementary water service providers is overshadowed by the legacy of its troubled history—the promotion of private water companies and the private concessioning of water supplies in the 1990s led to a Water War from 1999 to 2000. Resistance to this war was led, in part, by the small operators and the communities they supplied. After the privatization was reversed, SEMAPA was returned to public ownership and some of the small operators received legal recognition (as community organizations, rather than private entities).

This history suggests that careful negotiation with the small operators and the communities they supply will be needed to develop an integrated water system that combines the new bulk water supply, SEMAPA, and the established small independent operators. Although technical solutions exist, such as the inclusion of the small operators in citywide plans and the gradual provision of regulatory oversight that protects their supply areas, ongoing political challenges limit Cochabamba's ability to establish a single water supply approach that combines both small operators and the public utility.

Source: Luis Alfonso Alvestegui (senior water and sanitation specialist, World Bank), in discussion with the author; WatJust n.d.

BOX 2.6. Accepting the Role of Private Operators in Water Sector Policy, Ghana

The government of Ghana recognized the need to extend water service provision to periurban and low-income communities through private operators in the Water Sector Strategic Development Plan (WSSDP) of 2014. The WSSDP specifically recognizes the role of water tankers and mobile vendors and makes provisions for designated tanker service points to allow the legal withdrawal of water for sale in the main cities of Accra and Kumasi.

Service guidelines have been developed to facilitate water tanker operations and to promote collaboration between tankers and other sector stakeholders (Metropolitan, Municipal, and District Assemblies and Ghana Water Company, among others) to enforce these guidelines and ensure safe and reliable water supply services. In addition, the government has developed a private sector engagement framework to encourage private participation in rural areas and small towns.

Source: WSSDP 2014.

Supplementary Institutional Relationships

Specifying clear roles, responsibilities, and relationships with other institutions (regulator, ministries, and existing utility) for the off-utility sector will ensure institutional collaboration and strengthen the accountability of the off-utility subsector.

A prerequisite for the scale-up of SSIPs is clarity surrounding the institutions and stakeholders involved in the sector. Table 2.2 shows what this involves, with the relationship of SSIPs to the utility particularly important.

Clear Roles, Responsibilities, Accountability, and Relationships among Stakeholders

Setting clear roles, responsibilities, and accountability for the SSIPs and their relationships with different stakeholders requires formalizing the sector and is crucial to ensuring its sound governance.

Although inspiration can be taken from the division of responsibilities for existing utilities, such as those among government ministries and regulators, they should be adapted to meet the unique needs of the off-utility sector. Table 2.3 provides an example of stakeholder mapping of the off-utility sector.

Accountability

The multiplicity of stakeholders in the water sector, often with conflicting interests, reinforces the need for clear accountability mechanisms and a clear single point of responsibility if off-utility service provision is to be formalized, scaled up, and professionalized. The World Bank World Development Report (2004) provides an analytical framework for accountability in the utility sector, as in figure 2.4.

TABLE 2.2. Success Factors: Institutions

Success factor	What needs to be achieved?	How can it be achieved?	Examples
Clear roles, responsibilities, accountability, and relationships among stakeholders	<ul style="list-style-type: none"> • Specification of clear roles and responsibilities for different stakeholders • Ensuring buy-in of the utility to the concept of the SSIP serving areas to which it does not provide piped water • Incentives to fulfill responsibility and deliver services • Effective and transparent contract enforcement between the utility and SSIPs 	<ul style="list-style-type: none"> • Clear regulations specifying the responsibilities • Facilitating regulators and other stakeholders to encompass and consider the off-utility sector • Clear division of responsibilities • Regulations and policies to provide room and scope for both utility and SSIPs • Giving voice to customers • Developing clear, effective contracts among stakeholders 	<ul style="list-style-type: none"> • Côte d'Ivoire • Indonesia • Kenya • Paraguay
Supporting institutions to increase capacity of SSIP	<ul style="list-style-type: none"> • Ensure SSIP has sufficient, high-quality internal capacity to scale up • Develop entrepreneurial spirit and managerial capacity of SSIP 	<ul style="list-style-type: none"> • Capacity building of SSIP staff • Engaging international stakeholders (donors, NGOs, and private sector) to provide capacity building and knowledge transfer 	<ul style="list-style-type: none"> • Côte d'Ivoire • Paraguay

Source: Authors.

Note: NGO = nongovernmental organization; SSP = small-scale independent provider.

The accountability framework can be adapted and applied to the off-utility sector:

- Ensuring that customers of SSIPs can exercise their voice:
 - To demand water supply services and influence policy makers and politicians to allow and/or encourage off-utility provision (first part of the long route of accountability)
 - To give feedback to the SSIPs as to what they want in terms of service quality (short route of accountability)
- Strengthening relationships/compacts among policy makers and politicians and formalized SSIPs (second part of the long route of accountability):
 - To legalize or provide formal mandate to SSIPs to provide water supply services as demanded
 - To provide incentive-based contracts to SSIPs that improve the outputs of service provision
 - To allow performance monitoring of the SSIPs

For the accountability framework's success, it is important to start by identifying the entity responsible for ensuring that all citizens receive safe water supply, which can then engage with SSIPs. To this end, it is important to ensure that the framework and policy also encompasses informal settlements, such as urban slums and settings for displaced people, which may be overlooked.

TABLE 2.3. Stakeholder Mapping for Off-Utility Provision

Type of institution	Common roles and responsibilities	Formalizing relationship with SSIPs
National government—line ministry responsible for WSS development	<ul style="list-style-type: none"> • Policy development • Technical support • Financing large capital investment 	<ul style="list-style-type: none"> • Including off-utility in policy definition and targets • Create incentives for technology development
National government—ministry of finance or national planning	<ul style="list-style-type: none"> • Financing WSS investments through budget allocations • Planning of WSS investments 	<ul style="list-style-type: none"> • Could provide budget allocation to off-utility subsector development
Subnational governments	<ul style="list-style-type: none"> • Local WSS policy development • Service providers • Contracting agency to public or private utility • Some regulatory functions: tariff approvals and performance monitoring 	<ul style="list-style-type: none"> • Contract with SSIP, including through incentive-based programs • Approve tariffs or customer charges • Monitor performance of SSIPs
Regulator—separate entity or part of the line ministry	<ul style="list-style-type: none"> • Licensing • Tariff regulation • Performance monitoring • Customer protection 	<ul style="list-style-type: none"> • Issue licenses • Regulate tariffs • Regulate service and water quality standards • Monitor performance of SSIPs
Water utility	<ul style="list-style-type: none"> • Provide water supply services via piped or nonpiped network • Contract out parts of the service areas 	<ul style="list-style-type: none"> • Bulk water providers • Contract out parts of service area to SSIPs
Customers	<ul style="list-style-type: none"> • Consume and pay for water • Provide feedback on services to either regulator or to service providers 	<ul style="list-style-type: none"> • Create demand for off-utility services • Generate revenue via purchases of water
Private sector	<ul style="list-style-type: none"> • Invest in off-utility technologies and systems • Operate off-utility systems 	<ul style="list-style-type: none"> • Investor • Operator
Donor/development partners	<ul style="list-style-type: none"> • Financial support • Technical support • Introducing reforms 	<ul style="list-style-type: none"> • Finance off-utility program • Assist in stakeholder engagement • Incentivize new technology

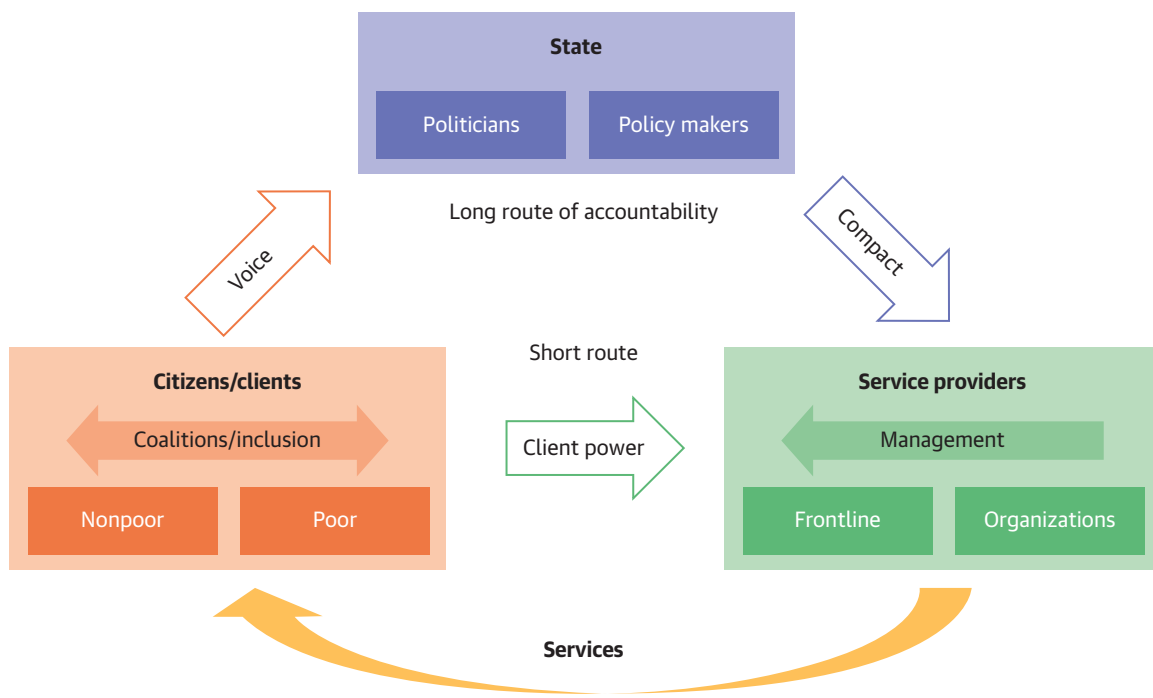
Source: Adapted from Mumssen, Saltiel, and Kingdom 2018.

Note: SSIP = small-scale independent provider; WSS = water and sanitation services.

In the Indonesia example in box 2.7, the local government has the responsibility and is accountable to the national government to meet the target of providing access to safe water supply. This structure creates incentives for the local government to not only rely on the utility but also to seek alternatives that can fill the gap in supply of water and sanitation services (WSS). These incentives can be passed on to the SSIPs through incentive-based contracts that align the interests of the local governments and SSIPs, helping the latter both improve their service provision and shift toward more-efficient service delivery models.

Off-utility provision is treated differently in other countries. In Uganda, for example, the national utility, National Water and Sewer Corporation (NWSC), is mandated to provide water supply to certain areas,

FIGURE 2.4. Accountability Framework



Source: World Bank 2004.

BOX 2.7. Accountability Frameworks in Indonesia's Water Sector

The Following nationwide decentralization from 1999 to 2000, responsibility for providing water supply services in Indonesia was devolved to local governments. Through various decrees and regulation issued after the decentralization, the local governments were given a choice of how they could provide water supply services:

- By establishing a local government-owned water utility (Perusahaan Daerah Air Minum [PDAM]) and delegating the responsibility to provide water supply services to PDAM
- By providing the water supply services themselves, usually by creating a unit within the local government structure that would operate and maintain the infrastructure and provide the water supply services
- By contracting water supply services to private sector operators—although private operators are restricted to providing only bulk water supply, distribution still must be undertaken by PDAMs or local government units
- By engaging community-based organizations to operate and maintain the infrastructure and provide water supply services

Source: Authors.

whereas the national government is responsible for engaging providers for the other areas. Clearly identifying the single entity responsible for the provision of water supply allows for the creation of a more robust accountability mechanism:

- The entity responsible for water supply is usually mandated by law to provide water supply services and is therefore accountable to all people.
- Service providers, including SSIPs, are accountable to the entity responsible to provide water services per their licenses or contracts (depending on the business model).

Although settings for displaced people (for example, refugees and internally displaced people) can provide a potentially dense customer base that could be served by SSIPs, they present unique accountability difficulties. Appendix A discusses these and gives examples of how four countries have approached them. The challenge is exacerbated by weaker PIRF frameworks and financial health of recipient countries, even more so when the numbers of displaced people requiring services is enormous. Such conditions only increase the difficult objective of more robust PIRF arrangements for sustainable SSIPs to provide off-utility water supplies, and the cases show little opportunity for their involvement.

Relationship with Existing Utility

Although SSIPs may source water from boreholes or local surface water sources and treat it themselves, they may also obtain water directly from the utility and focus on distributing it in areas that are not served by the utility. Under such arrangements, it is crucial that a good relationship is maintained and that the utility buys into the process. This requires the utility to engage with and provide consent to SSIPs to provide services in areas in which the utility does not provide piped water. This consent is not always sufficiently guaranteed, as shown in box 2.8 for aguateros (SSIPs) operating in Paraguay.

Another example highlighting the importance of creating a strong relationship with the public utility is illustrated in box 2.9 for Côte d'Ivoire. This case study shows the utility's attempt to regulate domestic water resellers failed because of the lack of incentives for illegal operators to convert into licensed resellers. This would have required incurring substantial investment costs and being subject to higher tariffs. As a result, domestic resellers continued to operate outside established legal and regulatory frameworks.

Currently, SSIPs often operate in parallel with the utility, providing a complement to or substitute for utility water for households who are dissatisfied with the quality or reliability of water utility provision. To maximize connection rates to high-quality water supplies—be this from a large utility or SSIP—both providers should be healthy, and it is preferable that boundaries are set regarding the responsibility and roles of each. An example is the institutional arrangement between the utility and water tankers for water automated teller machines (ATMs) in urban slums of Nairobi (Kenya), where water tanks are currently filled up by tankers sent from the public utility. This is discussed in box 2.10.

BOX 2.8. Aguateros in Paraguay

The Small-scale independent providers (SSIPs) in Paraguay, also known as aguateros, have progressively increased investments in water supply systems, starting from water carters, moving to tanker trucks and wells, and finally to owning wells and distribution networks designed for a ten- to twenty-year life span. These more-sophisticated systems developed as water carters and truckers found ways to build cheap but reliable piped systems and took advantages of new well-drilling technologies to serve customers at reasonable costs living in areas not readily accessible to the public water utilities.

Aguateros typically identify an area with potential customers and launch their operations only if the neighborhood is not covered by a public utility or alternative SSIP. They then usually buy a plot of land in or near the neighborhood receiving their services to establish a well and pump house to serve the first wave of households. Customers are initially charged a flat rate, and as the customer base reaches 150 to 200 households, aguateros decide whether to install meters and charge volumetric tariffs.

In practice, their supply network expands until it reaches another area served by public water companies or other SSIPs. Therefore, aguateros must act quickly before others claim an area because, once established, their exclusive right to operate within a given area is generally respected. The existence of areas “on the end of and between” business zones of different SSIPs protects customers from monopolistic pricing and ensures that aguateros do not gain unfair advantages.

Although they follow a set of regulations monitored by central governments and municipalities (that is, registering their business, obtaining permission for drilling wells and building the distribution network, and obtaining semiannual water quality certification), aguateros lack a strong legal standing within the water sector regulatory framework. This is because the public water companies have failed to recognize the benefits of integrating SSIPs into the national policy to expand coverage and improve service quality.

Despite efforts by the public utilities to reach low-income neighborhoods, aguateros have expanded to serve poor households and communities that would not otherwise have adequate water services. They continue to provide water services to a significant share of the population in Paraguay and other countries in Latin America.

Source: Loach, Melgarejo, and Lombardo 2000; World Bank 2001.

Supporting Institutions to Improve Capacity of SSIPs

Scaling up SSIPs requires that they have the necessary capacity and know-how to run an effective and efficient operation on a large scale. Such capacity is often lacking in the main utility, which also needs capacity building: Numerous case studies from piped utilities have highlighted the adverse consequences of poor management capacity.

BOX 2.9. Domestic Resale in Abidjan, Côte d'Ivoire

The water utility in Abidjan (La Société de Distribution d'Eau de la Côte d'Ivoire [SODECI]) recognized the need to formalize domestic water resale, acknowledging the role that household resellers played in meeting the demand of many users not reached by the utility and without other access to a water supply. In the 1980s, SODECI and the national government agreed to address the rise of unauthorized resale, mostly obtained through illegal connections, by providing resellers with a permit to sell water after applying to the utility and converting to a formal connection. In 1983, SODECI launched a campaign for legal vending points, with the main objective of reducing illegal activity and improving revenue collection. However, the impact of this campaign was limited. As shown in table B2.9.1, the total volume of water distributed by approved resellers remained low, accounting for less than 5 percent of the total population.

TABLE B2.9.1. Volume of Water distributed by Approved Resellers is Low in Abidjan

Number of approved resellers	1,034	933	869
<i>Volumes billed ('000 m³)</i>	648	505	465
<i>Average per reseller</i>	627	542	536
<i>Total volumes billed ('000 m³)</i>	60,603	80,436	86,303
<i>Percent billed to approved resellers (%)</i>	1.1	0.6	0.5
<i>Percent of total population (%)</i>	4.8	3.6	3.2

The low turnover was primarily explained by the lack of incentives for authorized resellers, who were required to invest heavily in the cost of extending the network between the meter and vending point and subject to higher prices than illegal resellers not billed by the utility. Approved resellers were charged a progressively increasing block tariff, severely penalizing the high-water consumption stemming from domestic resale and resulting in high unit rates that ultimately affected customers. This failed attempt highlighted the need to establish contracts between utilities and private resellers to review tariffs applied to domestic resellers through a bulk water rate, to formalize service delivery and reduce risks associated with domestic resale, and to promote communication among utilities and municipalities.

The resale of water from household connections is still widespread in Côte d'Ivoire. A recent study assessing the barriers to improved water supply in periurban settlements of Abidjan shows that resale remains one of the main sources of water, accounting for approximately 40 percent of water supply.

Source: Angoua et al. 2018; World Bank 2010; WUP 2003.

BOX 2.10. Water ATMs in Nairobi Slum, Kenya

According to the National Water Services Strategy for 2007–15, approximately 60 percent of residents in Nairobi live in slums and informal settlements, lacking access to safe and affordable drinking water. In line with achieving Sustainable Development Goal (SDG) 6 and ensuring access to affordable and reliable water to the unserved urban poor, water automated teller machines (ATMs) were introduced in 2015 for the first time in urban Kenya in the Mathare slum of Nairobi through a public-private partnership (PPP) with the Danish engineering company Grundfos. Water ATMs are coin-operated or smart card-operated (water cards) standpipes dispensing a given amount of water and considered a better alternative to standpipes and water taps—in which there is a high risk of misappropriation of funds by kiosk managers or standpipe attendants—while also providing availability and cost advantages to customers. Water ATMs were initially designed to obtain water from the utility network. However, because of illegal cutting of water pipes, the pressure was not sufficiently high for the water to reach the tanks, which are currently filled up by tankers sent from the public utility, Nairobi City Water and Sewer Company (NCWSC).

Water cards cost K Sh 300 (US\$3) and can be topped off at a kiosk or through a mobile app. Water is priced at half a Kenyan shilling (half a U.S. cent) for 20 liters, and payments per unit volume are fixed and processed through the cards, without the need for ATM managers. Because tariffs are fixed, ATMs have been shown to provide water at lower costs than standpipes and water vendors, selling water for fifty to one hundred times the price of ATM water. Table B2.10.1 compares tariffs for various sources of water available in the Mathare slum. ATM managers were also given a master ATM card with 40 percent water credit fee of cost as profit.

TABLE B2.10.1. Tariffs for Various Sources of Water in Mathare Slum

Water source	Tariff per 20-liter jerrycan
Water ATMs	50 cents (US\$0.005)
Water standpipes	K Sh 2–10 (US\$0.02–\$0.10)
Water vendors	K Sh 2–50 (US\$0.02–\$0.50)

Source: Sarkar 2019.

What is needed is to enhance the human capital embedded in the SSIP (and utility), both to provide efficient services using established approaches and to encourage the entrepreneurial spirit to explore new, novel technologies and models, which can help improve service delivery. It is beneficial for SSIPs to come together to share their capabilities and experience and have a common voice in tackling barriers to scaling up off-grid utility provision. For example, in Côte d’Ivoire, water resellers created an umbrella association that leveraged their capacity and strength to gain formal recognition from the utility (box 2.11).

BOX 2.11. Umbrella Body of Authorized Vendors in Côte d'Ivoire

The umbrella body of authorized vendors in Côte d'Ivoire (Association of Water Resellers in Precarious Areas of Côte d'Ivoire (AREQUAP-CI)) was created in 1998 to obtain recognition from the water utility, La Société de Distribution d'Eau de la Côte d'Ivoire (SODECI), and lobby for the establishment of an appropriate tariff system based on a bulk rate for resellers, shorter billing periods, and protection from unfair competition from illegal water resellers. The association brings together water resellers and allows them to negotiate with SODECI and the municipal authorities. Some of its key achievements include

- Reduction in water tariffs paid by licensed resellers to the same rate applied to standpipes;
- Creation of a guarantee fund to finance initial installation expenditures; and
- Education and informational campaigns to raise awareness on the association

Source: World Bank 2010; WUP 2003.

In Paraguay, the SSIPs called aguateros (discussed in box 2.8) have formed the Aguateros Association, which helps in mitigating competition and conflicts among SSIPs, protecting their interests, standardizing service quality and tariffs, and preventing government attempts to drive them out of business.

International stakeholders, such as donors, nongovernmental organizations (NGOs), and international firms, engaged in the off-utility sector can play a pivotal role in helping develop local capacity. It is crucial that capacity building be emphasized in the design of off-utility support programs.

Regulations to Protect and Create Incentives

Regulation for SSIPs must be light-handed, requiring minimum service standards governed by license or contracts in return for geographic exclusivity of provision for a given period.

A professional off-utility sector will require regulations that govern the performance of SSIPs and set minimum standards. These regulations can also develop incentives for SSIPs to expand and be able to recover their investment costs.

Competition is a central feature of a market for service provision. A distinction is made between competition *in* the market and competition *for* the market. Currently, off-grid water provision is largely characterized by competition in the market. In the absence of a single off-grid monopolistic service provider, different private operators compete for households' business. This means that there may be different operators serving the same geographic area and providing similar products or services to households. Competition for the market is when a specific market is identified as best served by a single provider (as is typical for piped networks). Providers compete for the exclusive right to serve this market, usually through a competitive procurement process.

Evidence across a range of informal water market suggests that it is possible to see competition among SSIPs in informal markets in which barriers to entry are low, economies of scale are limited, operators have a small effect on prices, and consumer pressure leads to improved service quality (Damania 2021). Therefore, it is not possible to state that a lack of formality in SSIP markets will always lead to high prices, or that higher prices in informal markets are always because of a lack of regulation or competition—in fact, lack of formality can lead to uncompetitive behavior (see table 2.4). In a survey of SSIPs in Nairobi, Kenya (UNDP 2011), one-third of cart vendors indicated they also set prices using a cost markup, suggesting collusion among vendors. As a result, low-income households who rely on pushcart vendors pay more than 30 times the tariff charged by the utility for a piped connection.

Protection through Licensing or Contracting

Regulation of SSIPs rarely extends beyond simple registration (for example, for tanker trucks), and wherever regulatory rules exist, they are often ignored because of the lack of enforcement capacity. For instance, in the Republic of Yemen, little oversight is exercised over the provision of tanker services—it is mainly limited to registration of tankers and the development of a database with contact information, data on water tank capacity and areas of operation, compliance with standards, and water quality testing. The National Water Regulatory Agency and the United Nations Children’s Fund (UNICEF) are mostly carrying out this oversight through a World Bank-financed program. However, regulation remains limited and focused on mitigating the risk of spreading cholera and managing the country’s scarce water resources. Box 2.12 discusses the regulation of private water tankers in the Republic of Yemen.

TABLE 2.4. Success Factors: Regulations

Success factor	What needs to be achieved?	How can it be achieved?	Examples
Protection of SSIP from illegal competition through licensing or contracting	<ul style="list-style-type: none"> Ensure that SSIPs are protected from illegal service providers who may undercut the formal provider (especially if this is done by lowering quality standards) Protect the SSIP from usurpation by the utility to ensure it has incentives to recover its fixed costs Provide temporal, geographic exclusivity to SSIPs 	<ul style="list-style-type: none"> Developing regulations outlining who can provide water Licensing and associated enforcement to regulate SSIPs License provided through a competitive procurement process 	<ul style="list-style-type: none"> Benin Bolivia Kenya Paraguay Republic of Yemen
Setting standards and monitoring performance	<ul style="list-style-type: none"> Ensure SSIPs meet minimum standard requirements Ensure raw water meets minimum health standards 	<ul style="list-style-type: none"> Developing minimum quality standards Enforcing standards Developing regulations that provide incentives to exceed minimum standards Defining minimum water quality standards in line with international guidelines 	<ul style="list-style-type: none"> Colombia Kenya Paraguay Republic of Yemen

Source: Authors.

Note: SSIP = small-scale independent provider.

BOX 2.12. Regulation of Water Tankers in Yemen

The ongoing conflict and humanitarian crisis in the Republic of Yemen have led to a collapse in basic services, a series of cholera outbreaks, and displacement of millions of people. The collapse has also posed serious challenges for the provision of water and sanitation services and left a considerable gap in the urban water supply sector. With much of the public water network not operational, the vacuum in water service delivery has been largely filled by private tanker trucks. Although the increasing role of private water tankers has improved the availability of water services, it also raised concerns over water quality and the impact on low-income households.

The water sector in Yemen is governed by two primary regulations—the Water Law (ratified in 2002) and the National Water Sector Strategy and Investment Program—aimed to ensure coordination among water sector stakeholders, consistency across water and national policies, and sustainable financing to achieve sector objectives. Although the Water Law requires water tankers to be inspected and registered, several districts do not undertake any registration activities for tankers, as in the city of Aden.

To address these challenges, the World Bank-financed project between the United Nations Children's Fund (UNICEF) and the National Water Resources Authority (NWRA) supported the implementation of a tanker registration pilot in the city of Sana'a. Before the project, water tankers were not registered or regulated in any way. As part of the project, the NWRA was able to identify and verify the occupation of tanker drivers, obtain their contact details, and invite them to take part in the registration pilot in exchange for free rehabilitation, inspection, and painting of their trucks. The NWRA database collects the various categories of information listed below.

Tanker owner contact details	Tanker driver contact details	Water tanker type and color	Plate and tanker chassis number	Water tank capacity
Area of service delivery activity	Water source (well name and location)	Water use (drinking agriculture, and so on)	Notes on evaluation of water tank	Date of evaluation

Tanker trucks were therefore registered and granted a six-month temporary license that could be renewed after reinspection if meeting the NWRA criteria. As a result of the pilot, 1,878 trucks were also rehabilitated and registered in the districts of Ma'aen and Bani Alhareth. However, there seem to be insufficient incentives for drivers to renew their registration after taking part in the initial pilot. Similarly, tankers failing the second inspection after six months are required to pay a fine under the current temporary license, which deters noncompliant trucks from participating.

Source: Global Development Solutions 2019; World Bank 2018.

To create incentives to scale up their service and make the investments necessary to improve the quality of service, SSIPs need to be granted some form of service provision exclusivity. If this is not the case and the off-utility sector is effectively a completely free market, it is unlikely that SSIPs will make the necessary investments to achieve substantial improvements given the business risks from these investments would be large for a small firm.

Providing a license to SSIPs for the exclusive provision of water in a defined area for a fixed period can provide the SSIP with a level of certainty about the revenues it can expect while also allowing authorities to define and enforce certain service standards. Exclusivity can also promote more efficient use of scarce water resources so that boreholes and fossil groundwater are not abstracted too quickly, threatening the resilience of an area to future shocks to the water supply. The extent of exclusivity can be related to the service standards enforced; if the service to be achieved requires a high level of upfront investments, there is a rationale to provide a license covering a larger market and/or a larger time frame. Box 2.13 illustrates an example of licensing of an SSIP initiative in Kenya.

In this Kenyan example, licenses are provided by the water utility on application by the proposed SSIP. Wherever a market is clearly defined, licenses can be allocated through a competitive process in which all interested firms can bid. This process could be administered either by the utility or the local government, depending on how responsibilities are defined and the capacity of the utility or government to

BOX 2.13. Water Vending License in Kenya

The In 2019, the Water Services Regulatory Board of Kenya (WASREB) published guidelines for water vending, which is defined as a “formal or informal reselling or onward distribution of water from other sources by small-scale vendors for domestic use.” The purpose of the guidelines is to include water vendors in the regulatory framework, through licensing, to regulate and monitor water and service quality provided to customers.

In terms of licensing, the guidelines assert that: “All vendors should be licenced by both the water utility and the public health unit before they start vending water. Any person wishing to carry out water vending should first make an application to the water utility clearly stating the type of water vending, the water sources and area of operation. The person will also then apply to the public health unit for a permit. The latter will carry out an inspection of the premises and equipment to ensure all hygiene requirements are in place. The license should only be given once the vendor has put in place all the requisite provisions needed to ensure water safety to the satisfaction of both the water utility and the public health unit. The license should be renewed annually subject to an inspection of the vendor’s water sources, premises, transport, storage containers, equipment and water handling practices.”

Source: WASREB 2019.

BOX 2.14. Concession and BOOT Agreements with Local Authorities in India and Ghana

The Safe Water Network India (SWNI) enters into concessionaire agreements with local governments, municipal corporations, and village panchayats to launch new water stations. Local governments provide the infrastructure (that is, land, raw water, and electricity source), and SWNI provides and owns the multistage water purification plant. SWNI engages and trains social entrepreneur Slum Level Federation or women-led Self Help Group to operate and maintain the plant on daily basis. This social entrepreneur or group also provides a portion of upfront investment. The remainder of start-up and capital expenditures are financed through grants. This process results in a water treatment kiosk equipped with remote monitoring and 24/7 automatic water-dispensing (water ATM [automated teller machine]) systems that use smart cards for payment. Treated water meets water quality standards for safe drinking water under the Bureau of Indian Standards. Consumers can purchase water at the station in 1-liter and 20-liter volumes, priced at US\$0.07 cents per 20 liters. High reliability is supported by design; stations are geographically clustered to receive ongoing, affordable maintenance and repair services from a professional field service entity, which was launched by SWNI but is now independent.

With start-up and capital expenditures largely financed through grants, Safe Water Network Ghana (SWNG) enters into twenty-year build-own-operate-transfer (BOOT) agreements with district assemblies, during which new stations are owned by SWNG and managed as a business portfolio. Following the end of the BOOT term, ownership transfers to the district assemblies in trust for the community. SWNG works with district assemblies to set up and train up a local water and sanitation management team, identify and train operators, set pricing, and implement community mobilization and consumer activation activities. The result is a microutility with a piped network of conveniently located community standpipes—and direct connections to institutions and households—that incorporate prepaid metering. Treated water meets Ghana national standards and is priced at US\$0.02 per 20 liters. Stations are geographically clustered to receive maintenance and repair services through a field services capability currently incubated within SWNG.

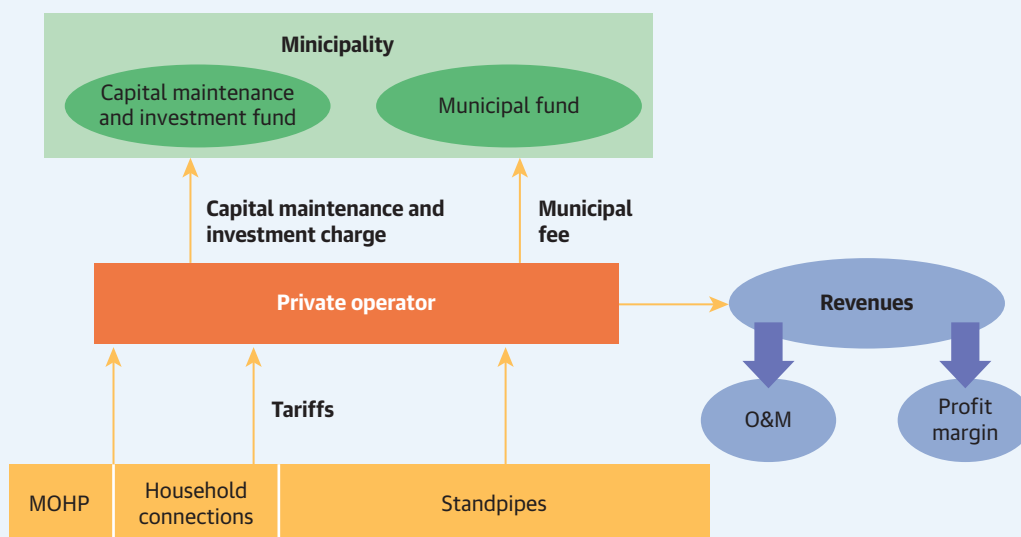
Source: Safe Water Network 2020.

deliver such a procurement process. Examples of such agreements being granted by local authorities is shown from the Safe Water Network programs in India and Ghana, illustrated in box 2.14.

Off-utility providers could also be regulated through contracts, with either the utility or the municipality or local government, or even with the local community, as shown for Benin in box 2.15. Guidelines or other regulations can provide market rules to promote competition for such contracts, thereby ensuring that the cost of provision remains at efficient levels. In Latin America, the piped water and other sectors, such as off-grid electricity and solid waste management, have shown that contracts and licenses can spur competition from local and international firms.

BOX 2.15. Affermage Contract in Rural and Small Towns in Benin

Following decentralization of water services in 1999, responsibility for water service delivery in Benin was transferred to the communes (districts). The legal framework requires the communes to delegate the provision of water services through water posts with or without a connection to the network to small-scale independent providers (SSIPs) or water user associations (WUAs). One of the most common types of management models is a bipartite affermage contract between the commune and private operator. Under this contract, the municipality retains ownership of the assets, whereas private operators oversee the piped water scheme and receive revenues from the sales of water based on the tariffs agreed upon with the municipality. The financial flows under the affermage contract are illustrated in the diagram. Private operators pay the municipality a municipal fee to cover the costs of service monitoring, in addition to a capital maintenance and investment charge.



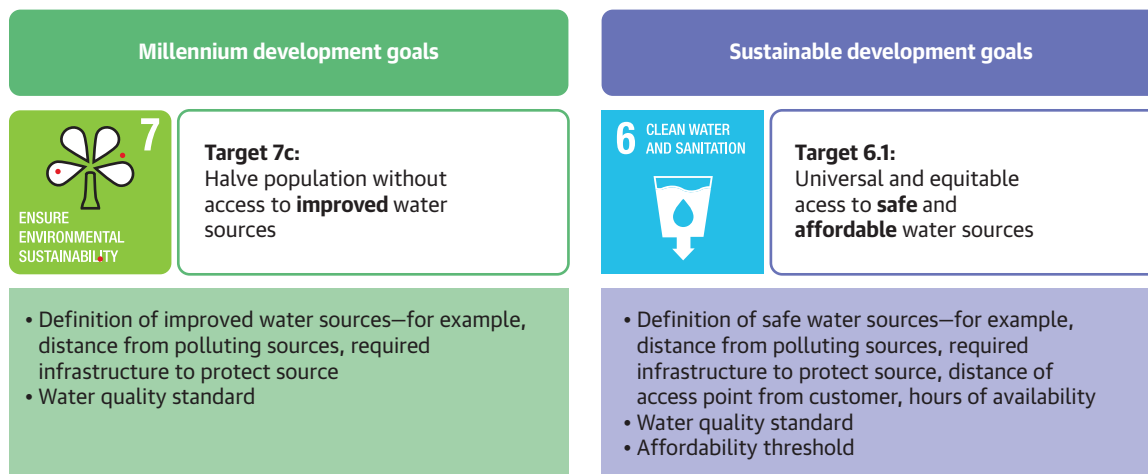
Source: Migan 2015.

Note: MOHP = manually operated hand pump; O&M = operation and maintenance.

Setting Standards and Monitoring Performance

Defining standards is a crucial step in professionalizing the off-utility sector. As outlined initially in figure 1.2, off-utility service provision is unlikely to meet the same standards as piped water but may nonetheless meet Millennium Development Goal (MDG) or Sustainable Development Goal (SDG) requirements, dependent on the delivery model and the level of investment undertaken to improve the model. These requirements provide the general targets that policy makers and regulators can use to set standards adopted in the specific countries, considering political economy and geographical factors. An illustrative example of what this could look like is provided in figure 2.5.

FIGURE 2.5. Examples of Standards Based on MDG and SDG



Source: un.org.

Note: MDG = Millennium Development Goal; SDG = Sustainable Development Goal.

The provision of off-utility water is largely substandard. In many cases, the quality of the water provided does not meet minimum standards outlined in national policy and/or international standards, such as MDG or SDG. The reliability of the service can also be poor, with intermittent or sporadic availability. Despite this, it is often expensive, especially when compared with subsidized piped water. As mentioned in the “Need for Formalizing, Scaling Up, and Professionalizing SSP Services” section, tariffs for households connected to the piped network on average range from 0.5 to 3 percent of household income, whereas for those relying on nonnetwork sources, the cost can range from 5 to 25 percent (Misra and Kingdom 2019).

Additionally, in many cases there are no criteria for minimum standards and/or no monitoring framework for SSIPs, leaving customers vulnerable to low-quality water and service. Many households struggle to afford the service itself and end up spending an excessive share of income on substandard service. An example is discussed in box 2.16 for water tankers in the Republic of Yemen. Although private wells are regularly monitored to ensure compliance with public health and safety standards, none of the water tankers surveyed are subject to water quality testing of any kind.

In Kenya (box 2.13), licensing SSIPs also have the purpose of setting and monitoring water and service quality. In the World Bank-funded results-based financing (RBF) pilot implemented in Paraguay to attract SSIPs (aguateros) to rural areas and small towns, minimum standards of safe and reliable service were met by requiring them to build water networks inclusive of boreholes, systems for disinfection, elevated or pressurized storage tanks, and distribution networks. The contract between SSIPs and communities also sets out specific standards for water quality, pressure, and service continuity. More details on the RBF pilot initiative are provided in box 2.18. Although no regulatory framework at all is not satisfactory, adopting highly stringent regulations might drive many informal SSIPs out of

BOX 2.16. Water Quality Testing in Yemen

Tanker trucks in Yemen are generally unaware of water quality and public health standards, which leads to low compliance rates and lack of enforcement across districts.

In Sana'a, the National Water Resources Authority (NWRA) carries out tanker inspection, relying on trained inspectors with experience in water testing, a water quality testing laboratory, and information technology (IT) specialists for database management. As mentioned in box 2.12 tankers failing inspection are fined and potentially banned from operation. NWRA is offering to pay for rehabilitation of drivers' trucks to incentivize compliance with public health and safety standards. In practice, however, these rules are not enforced. All water quality testing in Sana'a is currently conducted on private wells, but there is no regular testing for tankers.

Similarly, various entities are involved in water quality testing in Aden, but none of the water tankers surveyed by the World Bank as part of its initial value chain analysis of private water tankers in Yemen (2018) are subject to water testing of any kind, as illustrated in table B2.16.1.

TABLE B2.16.1. Absence of Regulation for Private Water Tankers in Yemen

	Ministry of Public Health and Population	Local Water and Sanitation Corporation of Aden	National Water Resource Authority	Ministry of Public Works and Highways
Private wells			✓	
Public wells	✓	✓		
Water treatment centers				✓
Tankers				

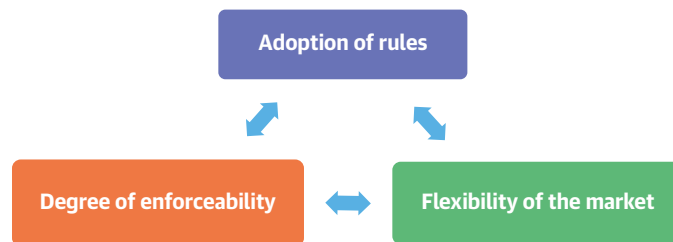
World Bank 2018.

Local stakeholders expect the Ministry of Public Health to take the lead in promoting inspection of water tankers, in partnership with the Local Water and Sanitation Corporation of Aden Central Laboratory. The study also shows that these entities have the necessary equipment and capacity to test water tankers, but additional donor funding and awareness campaigns are required to educate drivers on the need to adhere to safety standards and how they can bring their services to compliance.

Source: Global Development Solutions 2019.

business and deprive informal dwellers of access in a context in which the main utility may not be able to fill that gap. Introducing universal regulations and standards for informal SSIPs entails a trade-off between the implementation of rules, their enforceability, and the flexibility of the market, as illustrated in figure 2.6.

FIGURE 2.6. Trade-offs in Regulating Off-Grid Service Provision



Source: Authors.

Regulations should ensure that incentives exist to encourage the SSIP to exceed minimum service standards and provide innovative solutions. Regulations and incentives should not limit the flexibility of operators and thereby **prevent** the development of a piped network if this is the first best solution to achieving SDG 6.1. Rather, efficient incentives should, for example, encourage the SSIP to develop water supply solutions that might be replaced by isolated piped networks, which can, in turn, later be integrated into the larger single network, such as in Bolivia.

Light-handed and output-based regulation is a means to address this trade-off through appropriate service quality standards and coverage targets to ease access of the poorest and prioritize unconnected areas.

The approach adopted in Colombia, illustrated in box 2.17, provides an example whereby regulation is differentiated between formal and informal SSIPs, reflecting the challenges of servicing financially constrained households living in off-utility areas.

Availability of Finance

Enabling policy, institutional arrangements, and regulatory frameworks need to be supported by different sources of finance to ensure SSIP sustainability and ability to scale up and improve service quality. As outlined in the “Need for Formalizing, Scaling Up and Professionalizing SSPs” section, both require considerable upfront investments (see table 2.5).

Public Finance

Although existing examples are rare, public funds can be used to finance off-utility water provision, either through providing support for initial capital expenditure or subsidizing operational costs. If public funds are currently used to subsidize the provision of piped water, there is a strong argument to be made for such funds to be allocated, or indeed reallocated, to the off-utility sector—given that off-utility water provision tends to target poorer households who cannot afford a piped connection.

There is also scope for international donors to work in this space and provide capital loans or grants for the investments necessary to fund the improvements, which can help the off-utility sector achieve city-wide inclusive water supply and make progress toward meeting SDG 6.1.

BOX 2.17. Size-Differentiated Regulation for SSIPs in Colombia

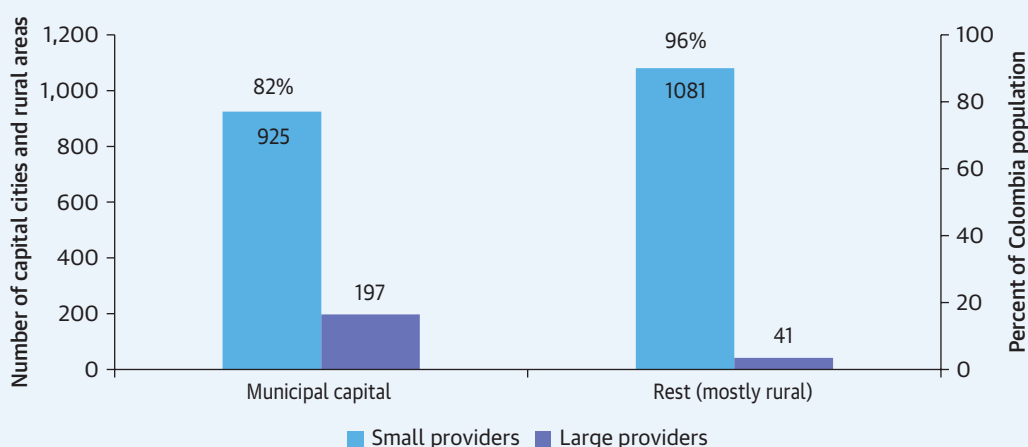
In the 1990s, Colombia introduced a policy of decentralization to privatize water and sanitation service (WSS) provision (typically managed at the municipal level) and increase the involvement of the private sector in public service delivery. As discussed in box 2.1, the latter resulted in improved continuity of service indicators and higher coverage rates among low-income areas.

There are several different delivery models available for WSS provision in Colombia. Service providers that wish to be considered public service providers have to follow a registration procedure at Superintendencia de Servicios Públicos Domiciliarios (Superintendency of Public Services [SSPD]), which monitors and enforces the performance of WSS small-scale independent providers (SSIPs). Nevertheless, the population outside small towns is too dispersed to make a centralized water supply economically viable, and many organizations still provide WSS services informally without having registered at the SSPD.

To address the issues of informal service provision and minimize the number of nonregistered providers, SSPD defined the procedures for subscription, update, and cancellation of WSS providers in the national register, splitting service providers between

- **Large providers**, defined as serving more than 2,500 subscribers. These organizations are subject to regulation and may therefore charge only regulated tariffs for the provision of WSS services; and
- **Small providers**, defined as serving fewer than 2,500 subscribers. These are subject to a different tariff methodology, as of 2014. They can be registered with the SSPD or unregistered. In the latter case, they are considered informal providers because they do not follow the legislation or the normative related to the provision of WSS services.

FIGURE B2.17.1. Share of Population Served by SSIPs in Capital Cities and Rural Areas in Colombia



Source: ECA 2016.

The importance of SSIPs is illustrated in figure B2.17.1, showing the share of the population served by SSIPs in municipal capital cities and rural areas, based on a survey carried out in 2005 by the regulatory authority.

Source: ECA 2016.

TABLE 2.5. Success Factors: Finance

Success factor	What needs to be achieved?	How can it be achieved?	Examples
Public finance	<ul style="list-style-type: none"> Budget allocation Direct or indirect subsidies 	<ul style="list-style-type: none"> Budget can be allocated for capital investments Support can be provided to SSIPs through output-based subsidies to households in the form of vouchers or to the utility providing bulk water to SSIP through lower bulk water tariffs 	<ul style="list-style-type: none"> Colombia India Paraguay
Private finance	<ul style="list-style-type: none"> Banks or other lending institutions Private firms/investors Private firms through CSR initiatives 	<ul style="list-style-type: none"> Ensuring that a sound regulatory framework is in place and the off-utility sector is formalized Leveraging results-based finance facilities Considering blended finance opportunities to reduce capital costs to SSIPs Seeking to engage social financing channels to provide patient capital to support increasing access to water 	

Source: Authors.

Note: CSR = corporate social responsibility; SSIP = small-scale independent provider.

Capital Investment

National and/or subnational governments, or even the public utility, can allocate capital budget resources to build the infrastructure for off-utility systems, which will then be operated by private or community-based organizations. This, after all, is how most integrated piped networks are financed in developing countries. Another way to provide capital investment is through subsidizing connection charges, which covers part of the capital investment. This can be administered through results-based schemes, as shown in box 2.18.

Operating Cost Subsidies

To ensure the sustainability of SSIPs, it is critical that they can recover costs. This can be done through a combination of customer charges and, if needed, subsidies.

Piped water supplies are commonly priced below full cost, with the difference provided by a mix of capital and operational subsidies. This ensures that water is affordable to households. Given that SSIPs disproportionately serve poorer households, there is a strong rationale to ensure that subsidies are also available to SSIPs. However, this is rarely the case. One example is Delhi, India, where water ATMs are subsidized to ensure that poor households have access to an affordable water supply. Subsidies should be designed to ensure the financial sustainability of the SSIP and affordability for all households.

This could be done in different ways, depending on the institutional arrangements and the aim of policies:

- Vouchers that subsidize the cost of water or provide a free allocation could be provided to the poorest households. This could allow subsidies to be targeted at specific households, although there is an extra administrative burden involved.

BOX 2.18. Results-Based Finance to Aguateros in Paraguay

The As discussed in box 2.8, small-scale independent providers (SSIPs) account for an important segment of the water sector in Paraguay. Aguateros initially operated in urban areas where they could meet the needs of customers with sufficient ability to pay for the full costs of service.

Given the constraints of the public water company, it was agreed that SSIPs would be the best means to expand service into unserved communities and increase rural coverage. A World Bank-funded initiative attempted to attract aguateros to unserved rural areas and small towns with a results-based finance (RBF) subsidy awarded through competitive bidding, the first initiative of this kind for investment in rural and small-town water supply. In the first phase of the pilot, a connection subsidy was designed to attract private operators while remaining well below the traditional cost of rural water supply systems and the subsidy paid by the state water utility in some communities.

Aguateros were invited to bid on the fee they would apply to connect customers to their system, and the winner was selected based on technical requirements and connection charges. The lowest bid from the first round of competition was extremely competitive, allowing the construction of water systems in four towns at the cost of US\$200–\$217 per connection. To facilitate payment among low-income households, aguateros allowed customers to pay the connection fee in instalments at a “social” interest rate.

The success of the first bidding round highlighted the presence of sufficient competition to build water systems and encourage private service provision. The pilot also received positive responses from the communities that have received access to water services through this initiative.

Source: World Bank 2005.

- Lump-sum subsidy to the SSIP in exchange for providing water to households at a lower price.
- Bulk water tariff subsidies paid to the utility providing bulk water, which would allow lower bulk water charges being incurred by the SSIP.

Although some government strategies include off-utility services, subsidies are primarily targeted at networked utility services, benefitting wealthier customers (that is, those who already have access to service or living within the utility’s service area) at the expense of sustainable service provision.

Misra and Kingdom (2019) estimate that piped users receive an average subsidy of US\$42.2 per person per year,² and unconnected households relying on nonnetworked service provision do not get any subsidy. The piped water subsidy amounts to US\$17.6 per household per month for a family of five.

If the same level of subsidy were to be applied to off-grid customers, the burden of monthly water bill on these vulnerable households would be significantly reduced, as shown in table 2.6 for selected case studies.

TABLE 2.6. Estimated Affordability with and without Subsidies

Case study	Monthly household income of lowest quintile (US\$)	Without subsidy		With subsidy	
		Monthly cost for household of five (US\$ per 40 lpcpd)	Water bill as percent of income (%)	Monthly cost for household of five after US\$17.6 subsidy	Water bill as percent of income after subsidy (%)
Tanker trucks in Nairobi (Kenya)	190	42	22.1	24.42	13
Private kiosks in Port-au-Prince (Haiti)	175	24	13.7	6.42	4
Kiosks in Bangalore (India)	225	21	9.3	3.42	2
Private tankers in Cordoba (Argentina)	100	15	15.0	0	0

Source: Misra and Kingdom 2019.

Note: lpcpd = liters per capita per day.

Private Finance

Finance can be provided by private investors, banks, and microfinance organizations through traditional commercial loans and other financing arrangements. For such funds to be available, it is crucial that the sector is formalized and an efficient regulatory framework is in place to allow SSIPs to apply for these types of private financing. Other more innovative sources of private finance can also be explored, such as corporate social responsibility (CSR) initiatives.

The Importance of Scale

Scale provides opportunities for SSIPs to raise money, professionalize, invest in new technologies, and so on. It reduces the transaction costs of regulatory oversight, contractual interfaces with the public utility, and channeling of public subsidies. Many of the proposals contained in this chapter will make scaling up easier, but the question is whether such measures should be left to the market through bottom-up, organic growth or whether it should be driven from above through policy directives.

This is a central question to the challenge addressed in this report and for which there is no guidance from existing arrangements. On balance, however, driving the market through a top-down policy-based approach seems more likely to deliver better and quicker results. Leaving scale-up to the market will require forward-looking entrepreneurial SSIPs willing to take risks, take time and effort to bring all stakeholders on board, and be open to pushback and backsliding when faced with obstacles—ones that a small and growing concern cannot overcome but a large-scale provider could. Competitive off-utility markets with a lack of regulation have not delivered professional, at-scale water service provision. A top-down approach that delivers the adequate framework for a professional off-utility sector can subsequently create opportunities for competition and, in this market, allow customer demand to drive improved service provision.

Summary of Lessons Learned and Their Benefits to SSIPs

The case studies discussed in the preceding sections highlight key success factors for improving off-utility water provision by enhancing the quality of existing arrangements or moving to a higher quality of service delivery. This is captured in Figure 1.2 as shifting upward or to the right of the diagram.

The preceding sections highlight a range of individual actions that will make a more SSIP-friendly environment to encourage better, more professional services to those without access to a house connection to the utility piped network. However, whether individually or implemented in a scattergun approach, they may not deliver the desired results. As each of the case studies has addressed different constraints, a recommended approach for each country will also differ depending on its circumstances. However, a selection of consistent critical success factors may be observed. Table 2.7³ highlights what these factors appear to be in delivering better nonutility services (that is, moving up and to the right in the outputs of their water service provision), referencing those case studies that illustrate them best.

Light blue-shaded cells highlight case studies in which PIRF elements have successfully encouraged nonutility service provision, and examples in which these have been found to be lacking are highlighted in orange. The last two columns illustrate whether a movement to the right (moving to a higher quality of service model) or upward (improving the quality of existing models) has been achieved in different case studies, with reference to the diagram introduced in 1.

Each of the case studies shows elements of how a robust PIRF framework can reduce business risks and improve financeability of SSIPs. From the SSIPs' perspective, the application of each framework component would do the following:

- A robust **policy framework** would give assurance from the highest level that SSIPs are acknowledged formally as part of the solution to increase water access (for example, Colombia, Ghana, and Manila), regulatory tools developed to assist SSIPs fit within the broader framework and should be applied consistently, and SSIPs can be acknowledged also by donors and financiers with the blessing of the policy makers (for example, Bangladesh and Malawi).
- Identifying the **institutions** responsible for water supply provision (such as national or local governments) is a start to be able to encourage SSIPs. Support for these institutions directly assists SSIPs in their own development (for example, Cote d'Ivoire and Paraguay) and can assure them that the institutions they interact with will also understand the various policy, regulatory, and financial tools that have been designed to support them (for example, Ghana and Indonesia).
- Clear and consistent **regulations** set out the rules that support SSIP investment and operations, including certainty that an operating area will not be encroached upon by competitors or the large utility (for example, Nairobi), transparency over performance by all formal SSIPs in a market

TABLE 2.7. Summary of Case Studies

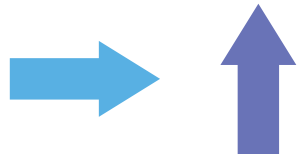
Case study	Policy	Institutions	Regulation	Financing	Improvement	
Key success factors	<ul style="list-style-type: none"> • Incorporate off-utility service and SSIPs in national plans • Develop clear lines of responsibility between targets and implementers 	<ul style="list-style-type: none"> • Each entity in the supply chain familiar with and capacitated for its role(s) • Align incentives between different entities 	<ul style="list-style-type: none"> • Transparent, robust, enforced regulations • Clear delineation of service areas and periods • Cost-recovery tariffs allowed 	<ul style="list-style-type: none"> • Subsidies to support initial investments • Scale can support access to more cost-effective financing 		
Chittagong, Dhaka, Bangladesh	Clarifying national policy and legal framework for PPP model reduced entrepreneurs' business risk through lower start-up costs and returns on investment	Stimulating buy-in from the utility and private entrepreneurs increased stakeholder willingness take part in the PPP model			✓	✓
Benin	The framework required the communes to delegate the provision of water services through water posts to SSIPs or WUAs		Approach to regulate SSIPs through contracts , with municipality retaining ownership of assets/ setting tariffs and SSIP overseeing operations			
Cochabamba, Bolivia	The lack of a unified policy for integrated, citywide water service delivery can lead to difficult relationships among SSIPs and utilities	Supportive institutional frameworks needed to improve and maintain relationships with existing water organizations and the community	A specific framework for CSP participation can be introduced through a system of concessions and licenses over specific areas		✓	✓

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TABLE 2.7. continued







Case study	Policy	Institutions	Regulation	Financing	Improvement	
Burkina Faso	The government did not interfere with utility but showed strong political will in promoting private sector participation to increase efficiency and cost recovery	The PPP model incentivized the private sector to improve service quality and expand access in poor areas through a performance-based contract	Tariffs are regulated and set directly by the utility based on cost recovery targets, with a social tariff applied to its poorer customer through cross-subsidies	Substantial investments to improve service quality, efficiency, and financial performance were achieved through donor funding		
Colombia	National development plans should include specific provisions for off-utility service delivery and create a favorable policy context	Differentiated provisions for large providers subject to regulation and informal SSIPs serving most of the urban and rural population and following separate legislation	Light-handed/differentiated regulation should be adopted by relaxing service quality standards and coverage targets			
Abidjan, Cote d'Ivoire		SSIPs created an umbrella association that leveraged their capacity to gain formal recognition from the utility		Umbrella association allowed resellers to negotiate the creation of a guarantee fund to finance initial installation expenditures		
Ghana	Government has recognized the role of SSIPs in the WSS development plan , making provisions for designated tanker service points to legally withdraw water, facilitating operations of water tankers and vendors	Specific engagement framework promoted collaboration between SSIP and utility, clarifying stakeholder roles within the overall institutional framework	Collusion among tankers and mobile vendors highlights the need for regulations to provide incentives for SSIPs to ensure affordable tariffs and quality of service			

table continues next page

TABLE 2.7. continued








Case study	Policy	Institutions	Regulation	Financing	Improvement
		NGO microuilities enter into twenty-year BOOT agreements with district assemblies , after which ownership transfers to district assemblies in trust for the communities			 
Mumbai, Delhi, India	Wide range of informal SSIPs (water tankers, water resellers, groundwater resellers) lack a strong legal standing and operate at the margin of legal frameworks	Government agencies are often inclined to suppress informal SSIPs , despite the role they play in filling the utility's service coverage gap	Differentiated service levels with high- and middle-income households receiving tanker services and groundwater resellers serving slums	Water ATMs fully subsidized provide great advantages to low-income households who cannot afford and/or do not need large quantities of water in one purchase	
India		NGO water stations enter concessionaire agreements with local governments, municipal corporations, and village panchayats to launch new water stations			 
Indonesia	Targets for nonpiped water services are included in national government policy	Clear allocation of responsibility to local government for providing water services	Clear regulation on the types of service provision the local government can choose to provide		 
Nairobi, Kenya		Lack of competition in the market leads to deteriorating service quality and makes services less affordable when cartels are formed, placing a disproportionate burden on low-income households	Rationale to provide a license to SSIPs is to reduce business risk and guarantee a degree of certainty and stability in their revenues		





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TABLE 2.7. continued

Case study	Policy	Institutions	Regulation	Financing	Improvement	
Kisumu, Kenya		Delegated management to master operators to operate concessions for the main utility has led to reduced NRW and greater reliability of supply			✓	✓
Blantyre, Malawi		Collaboration among local government and SSIPs allows for improved management of public water service facilities in urban and periurban areas				✓
Maputo, Mozambique		Standpipe water provision is regulated, but roles are shared among various committees, undermining the implementation and expansion of the model	SSIPs are largely unregulated, and customers are not protected from low service quality	SSIPs operating illegally within the utility's jurisdiction also negatively affects their access to finance and professionalization	✓	
Paraguay	Stakeholders failed to recognize the benefits of integrating SSIPs into the national policy to expand coverage and improve service quality	SSIPs formed an association , which helped mitigate conflicts, protect their interest, and standardize tariffs and service quality	Although lacking a strong legal standing, once SSIPs reach an unserved area, their exclusive right to operate within it is generally respected	Subsidizing connection charges through a results-based scheme covers part of the capital investment required to finance SSIP infrastructure	✓	✓
Manila, Philippines	Private concessions included nonpiped solutions as "access" and empowered SSIPs in addition to larger utilities	Awarding of concessions was opaque and not robust; SSIPs were not empowered to negotiate with utilities on an equal footing	Inadequate regulations prevented necessary security for SSIP network operators, leading to high prices and unstable market operations	It was hard for third parties to access finance without security ; some donor finance supported lower tariffs for some SSIPs	✓	✓

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TABLE 2.7. continued

Case study	Policy	Institutions	Regulation	Financing	Improvement
eThekweni, South Africa	Political will ensuring that all poor households have access to affordable water can help facilitate innovative solutions to provide off-grid water	Political will is expressed through a stable political context and the right support to increase access to services without interfering with utility management			 
Vietnam	Allowance for private operators to design and build private networks and lease them back from the utility to operate them for a fixed period	Local stakeholders collaborated in the process , with communities and authorities developing the scope and managing the procurement process	Clear rules on asset ownership and financing, with operation of the network being assumed by the utility after ten years	Utilities can provide financing to private operators in exchange for lease payments and ownership of the assets	
Republic of Yemen	The Water Law promotes consistency across water and national policies and stakeholder coordination, requiring water tankers to be inspected and registered	There are currently neither formal nor informal channels of communication across well owners, network operators, tankers, and regulatory entities); options are being explored to improve coordination across the entire water supply chain	Despite the current requirement for tankers to be inspected and registered, tankers do not have sufficient incentives to renew their registration and risk being fined or banned from operation upon failing the second inspection	Additional donor funding is required to promote compliance with water quality standards and raise awareness among private water tankers	

Note: BOOT = build-own-operate-transfer; CSP = complementary service provider; NGO = nongovernmental organization; NRW = non revenue water PPP = public-private partnership; SSIP = small-scale independent provider; WSS = water supply and sanitation; WUA = water user association.

through regular reporting, and an assurance that investment costs can be recovered over time through formally approved tariffs (for example, Burkina Faso) and compensation mechanisms if the public utility integrates the networks and purchases the assets.

- The provision of **financing**, which depends on the other components, including budget allocations from government and grants from the donor community, is likely to be lower cost, long term, and in greater supply, thereby lowering costs to serve customers. Such cost and tariff decreases may decrease the volatility of volumes consumed, which can decrease the risk and increase the viability of investments (for example, Cote d'Ivoire, India, and Paraguay).

Application of the PIRF Framework

The analysis presented in this section shows that a robust PIRF framework is needed to facilitate and scale up off-utility water provision. Table 2.8 summarizes what can be done to create an enabling PIRF for scaling up off-utility provision, and chapter 4 outlines the action plan to scale up off-utility provision.

TABLE 2.8. What Needs to Be Done to Create an Enabling PIRF Framework?

Actor	Policy	Institutions	Regulation	Financing
National government	Include off-utility and SSIPs in national water policy Set targets for off-utility provision Encourage off-utility and SSIP approaches that function at scale	Develop capacity building for SSIPs Raise community awareness	Establish an independent regulator and ensure its independence	Allocate budget Allow private investment in water sector
Subnational government	Include off-utility and SSIPs in water sector development plans	Raise community awareness	Contract with SSIPs Monitor performance of SSIPs	Allocate budget for operational subsidies
Regulator	Not applicable	Develop capacity building for SSIPs Raise community awareness	Develop regulatory framework Issue licenses to SSIPs Monitor performance of SSIPs Protect SSIPs from illegal competition and usurpation	Create a stable environment to lower business risks and allow private investment
Utility	Not applicable	Build capacity through knowledge sharing with SSIPs	Contract with SSIPs Monitor performance of SSIPs	Not applicable
Donor community	Assist national and subnational governments in developing policy for off-utility sector	Assist in building technical capacity of all stakeholders	Develop guidelines and templates as regulatory tools	Provide financing for pilot projects and/or scaling up of existing scheme

Source: The Role of Non-utility Urban Water Service Providers, Draft, 2021.

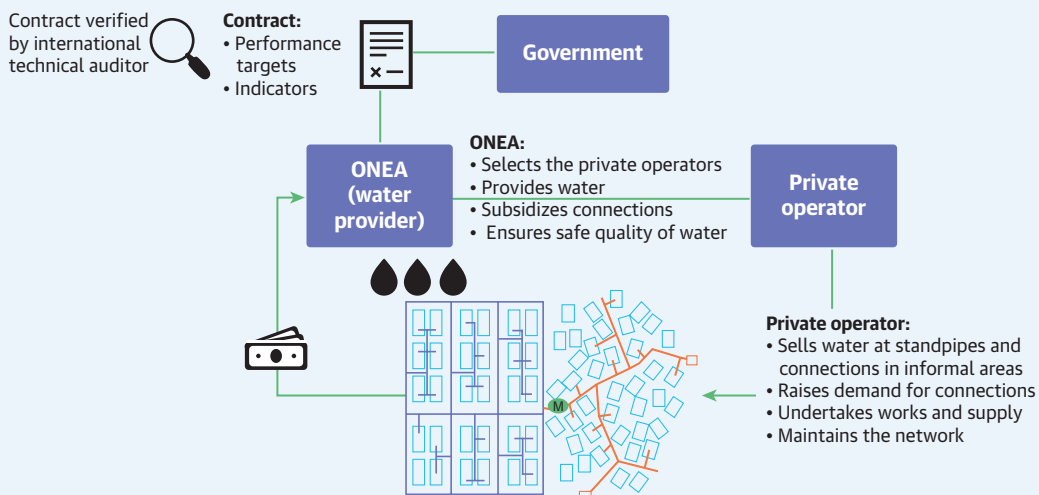
Note: PIRF = policy, institutions, regular, and financing; SSIP = small-scale independent provider.

An example of the application of the PIRF framework is Burkina Faso, where the mix of enabling policy environment and political will, supplementary institutional relationships, pro-poor tariff regulation, and continued donor support successfully expanded access to household and standpipe connections through performance-based contracts with private operators. This is elaborated in more detail in box 2.19.

BOX 2.19. PIRF through Performance-Based Service Contracts in Burkina Faso

The provision of urban water supply services in Burkina Faso is the responsibility of the Office National de l'Eau et de l'Assainissement (ONEA), transformed from a quasipublic agency to a state-owned limited liability company in 1994. Despite the successful achievements of the first decade of corporatization, ONEA remained a small utility, serving fewer than 700,000 people nationwide (that is, the wealthiest segments of the urban population) with piped water, and had 1,600 standpipes serving half a million people.

As pressure on water resources continued to grow in Ouagadougou, requiring further costly investments in water supply, and given the already high tariffs, a public-private partnership (PPP) model was implemented to achieve the required gains in operational efficiency and increase access to standpipes and household connections. A private operator was contracted based on the innovative approach of performance-based services. The model has been successful, and approximately 20 percent of all villages are now served by private service providers. Operators received a fixed monthly fee for management services through a system of rewards or penalties based on their performance against contractual targets and fixed price for each specified output, which created strong incentives for service providers to improve efficiency and performance. See diagram below.



Note: ONEA = Office National de l'Eau et de l'Assainissement.

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BOX 2.19. continued

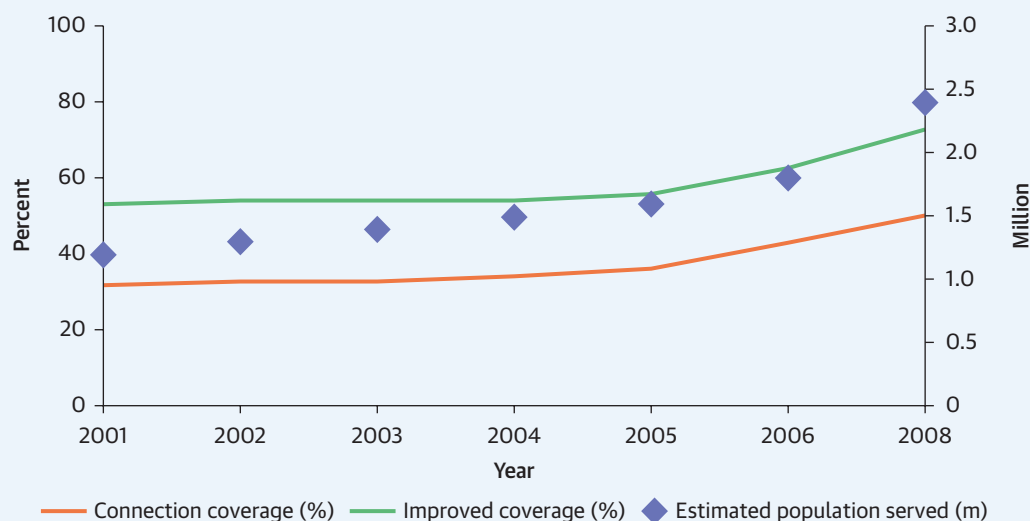
The contract also made provisions for private operators to rely on an operating investment fund (US\$3 million) and received support from a pool of development partners (Agence Française de Développement [AFD], African Development Bank [AfDB], European Investment Bank [EIB], and the German Development Bank [KfW]) providing about €200 million (approximately USD225 million) to finance the expansion of the distribution network in Ouagadougou, doubling the number of household connection and installing an additional 280 standpipes in poor neighborhoods.

Thanks to improvements in operational efficiency, NRW remained stable and ONEA's financial situation improved substantially with an increase in revenues of 50 percent. Efficiency gains were gradually passed onto customers through an 8 percent decrease in average tariffs and remained sustainable throughout the years. These improvements, illustrated in figure B2.19.2, were reinforced by the government's commitment to rely on private sector participation with increased transparency and accountability and continued support from donors to scale up the subsidized connection program and increase piped water coverage.

The success of the urban water reform in Burkina Faso stems from the combination of different policy, institutional, regulatory, and financing components:

- **Policy** – The government refrained from interfering with ONEA's utility management and decreasing tariffs to reap short-term political gains but focused on increasing efficiency and achieving cost recovery through private sector participation, highlighting the role of political will and commitment to create the conditions for private operators to deliver.

FIGURE B2.19.2. Improvements through Private Sector Participation in Burkina Faso



Sources: IBA 2014; PPIAF 2010.

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BOX 2.19. continued

- **Institutions** – The PPP model allowed the private sector to contribute more effectively toward improving service quality and expanding access in poor areas. The performance-based contract was provided appropriate incentives for private operators, and ONEA proved open to test this innovative management approach.
- **Regulation** – Tariffs are regulated by decree and set directly by ONEA based on cost recovery targets, with a social tariff applied to its poorer customer groups through cross-subsidies from large-consumption users. The current price-setting mechanism forms a solid base for success in reaching more customers at an equitable rate.
- **Financing** – A key success factor for the water reform in Burkina Faso was the substantial investments to achieve improvements in service quality, efficiency, and financial performance through private operators. An essential component to access donor funding was establishing credibility among development partners.

Source: IBA 2014; PPIAF 2010.

The successful approach to derisking private service delivery in Bangladesh through a program SWEEP (a public private partnership for fecal sludge management) provides another example from the sanitation sector. It is an innovative market-based solution providing inclusive, pro-poor sanitation services through partnerships between private operators and public authorities. The first of its kind in Bangladesh, SWEEP has proved successful in enabling private enterprises to make a profit while targeting inclusion of low-income customers. The application of this model is illustrated in box 2.20 for Dhaka and Chittagong.

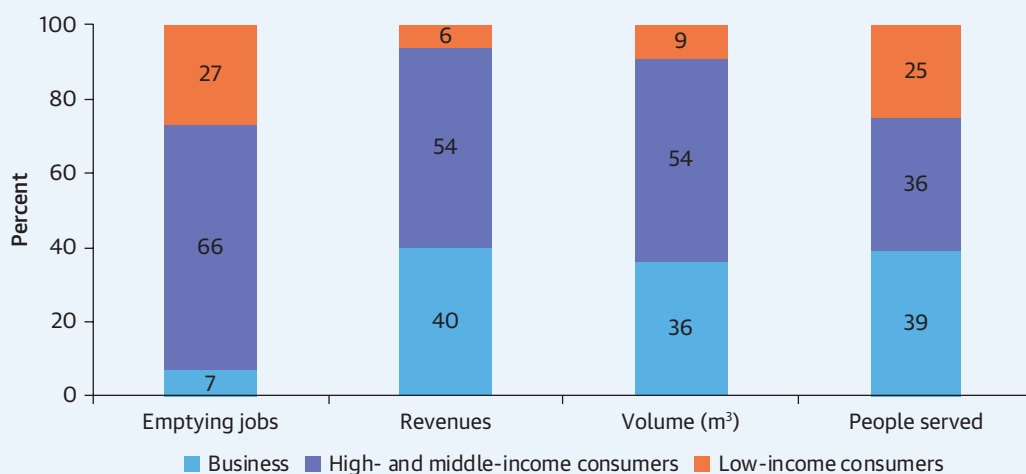
It is worth closing this chapter by reiterating the point made in the first section: Any reforms to improve the delivery of supplementary services requires political will. Although the PIRF framework identifies the specific actions needed to create a formal environment supportive of supplementary service providers (SSPs), its subsequent operationalization will happen only if the political economy in any situation is conducive to that change. This means working diligently with all stakeholders to explain the basis for reform, the proposed models, the opportunities that will arise, and the benefits that will flow to the many stakeholders. This will require an investment in outreach and in assessing the reform impact on a variety of stakeholders. With the aim being the expansion, professionalization, and legitimization of the SSP market, there should be sufficient benefits to outweigh perceived disadvantages. With COVID-19 exacerbating inequalities and demonstrating the need to provide adequate water services to all, there may now be better chances of successful reform.

BOX 2.20. SWEEP in Bangladesh

In 2015, Water and Sanitation for the Urban Poor (WSUP) Bangladesh developed an innovative fecal sludge management (FSM) service delivery model called SWEEP. This approach is based on a public-private partnership (PPP) model allowing multiple small and medium enterprises (SMEs) to operate under the same framework in a competitive environment, providing safe and reliable services to customers.

SWEEP was first established in Dhaka, where a lease agreement was signed between a private operator providing vacuum tanker-based fecal sludge emptying and disposal services and the utility, Dhaka Water and Sewer Authority (DWASA), with responsibility for providing treatment facilities for private operators to discharge waste. WSUP's role entailed gaining buy-in from relevant stakeholders, supporting SMEs to reach scale, and assisting public authorities to design a tender to select suitable private operators and draft a PPP agreement. SWEEP initially targeted mid- to higher-income customers and institutions willing to pay more for desludging services. The initial focus on large customers allowed private operators to cover their operational costs and become profitable, with SWEEP reaching more than 100,000 people in Dhaka by October 2016.

Following this success, WSUP replicated the model in Chittagong, building on sustained engagement with Chittagong City Corporation (CCC) and Chittagong Water and Sewer Authority (CWASA). WSUP had also supported CCC in preparing an onsite sanitation strategy before the introduction of the national institutional and regulatory frameworks for FSM. The PPP arrangement in Chittagong involved CCC, WSUP, and Chittagong Sheba Sangstha (CSS), a medical waste management company. The agreement with CSS specified a target to deliver citywide improved sanitation services among 30 percent of poor households. The breakdown of SWEEP Chittagong's customer base in 2017 is illustrated in the figure below.



This example shows how innovative management approaches can provide services to lower-income customers without jeopardizing private operator finances. Some of the key drivers of change and success factors in the SWEEP management model include:

BOX 2.20. continued

- Stimulating **buy-in from the utility and private entrepreneurs** to ensure that all stakeholders involved in the PPP commit to the process;
- Identifying households who are willing to engage with new service providers to assess the business potential for SWEEP and **building customer demand** through service quality and marketing activities to promote referrals and increase revenues;
- **Reducing entrepreneurs' risk** of entering the market by incurring lower start-up costs, reaping attractive returns on investment, and operating under a legal framework through the structure of the PPP; and
- **Clarifying national policy** to strengthen the enabling environment for sanitation service delivery and obtaining sufficient financial support to **scale up** through effective **targeting of low-income customers**.

Source: WSUP 2017, 2018, 2020.

Notes

1. Historically the term Small-Scale Independent Provider (SSIP) has been used in the sector. Generally, in this document, the authors have introduced the term Supplementary Service Provider (SSP) as an improved descriptor. However, for now at least, the two terms can be considered interchangeably.
2. The calculation assumes a capital cost subsidy of US\$25.6 per capita per annum over fifteen years (assuming a capital cost of US\$265.6 per capita) and an operating cost subsidy of US\$16.6 per capita per annum (approximately 65 percent of operation and maintenance costs).
3. Although some of the case studies in table 2.7 are presented later in this report, they are included in this summary to highlight the lessons learned.

Chapter 3

Models for Scalable Off-Utility Water Provision in the Utility of the Future

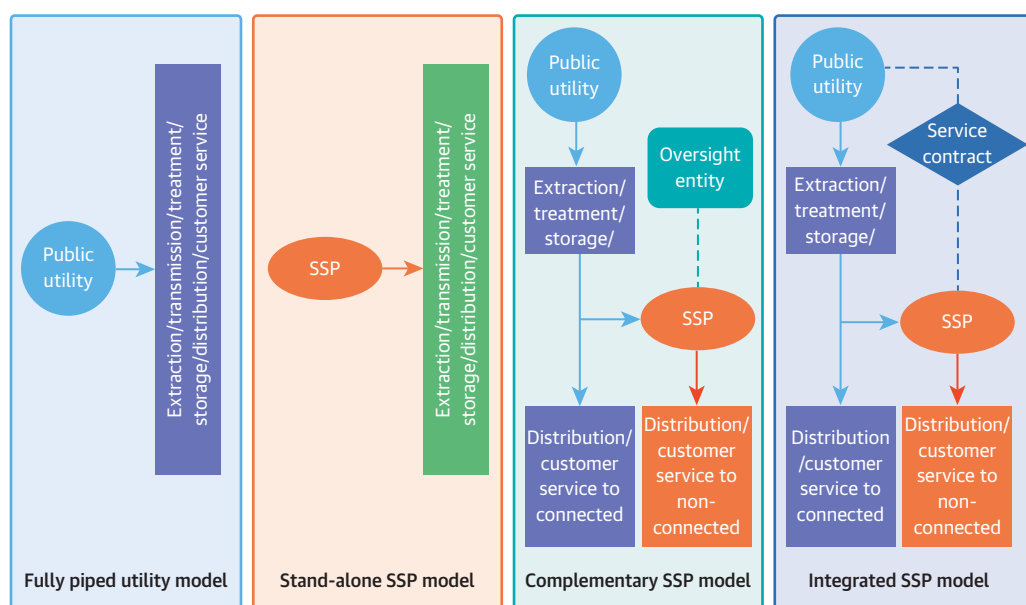
To scale up off-utility provision, business models must deliver economies of scale and/or scope. Having off-utility business models that can complement and/or integrate with utility provision can ensure sustainability of both and create the Utility of the Future.

Although chapter 2 outlines various elements of the policy, institutions, regulation, and financing (PIRF) framework that can be implemented at the national level and that will create a conducive enabling environment for off-utility provision, this chapter provides a citywide service delivery approach to providing water. This includes consideration of different delivery models.

We consider how the Utility of the Future might look when the limits of the “traditional” integrated public utility service delivery model are unable to meet the needs of a city’s population. The transition toward a sustainable business model that enables local authorities and utilities to build more resilient water supply and sanitation services for all can encompass delivery models beyond the single utility and its piped network.

We begin by outlining citywide service delivery approaches to providing water before discussing a range of more specific and innovative off-utility service delivery options that might fit within the broader, citywide approach—from wider contracting arrangements to business choices for individual Supplementary Service Providers (SSPs). The range of citywide service delivery models for water provision are presented in figure 3.1.

FIGURE 3.1. Alternative Citywide Service Delivery Models



Source: Misra and Kingdom 2019.

Note: SSP = small-scale independent provider.

The model on the left-hand end—the fully piped utility model—represents the traditional approach, in which services are provided by a single, vertically integrated public utility responsible for all activities across the service delivery chain. Until now, such an approach has typically been the ultimate objective for any city. The model second from left—the stand-alone SSIP model—has a similar approach to the first but is for a smaller integrated system. Such systems can be commonly found in rural areas or, in some cases, on city fringes (such as those in Cochabamba, Bolivia [see box 2.5]).

The two models on the right-hand side of the diagram suggest alternative approaches that represent the sustainability and resiliency of water supply (and sanitation) objectives of the Utility of the Future, bringing a more collaborative approach between the large-scale, integrated public utility and SSIPs, without necessarily being part of a contiguous network. Here, the public utility and SSIPs both are part of the citywide service delivery model. The two models differ by the interrelationship between the two types of providers. In the complementary SSP model, the SSP is a bulk customer of the utility overseen by a separate entity, which then distributes water to its customers, whereas the integrated SSP model involves the SSP being contractually bound to the utility as part of its service obligations.

The degree to which the utility and SSP are integrated depends on the different factors discussed in the section below on Models That Benefit from Economies of Scale. In the integrated SSIP model, a single entity remains responsible for water delivery in a city, avoiding parallel systems and coordinating a greater arsenal of water service delivery options that can meet a city's needs. Such approaches can harness the entrepreneurial spirit and technological change that is present in many of these cities. In addition to the benefits of improved water supply, innovative business models can address some of the risks associated with COVID-19, as discussed in box 3.1.

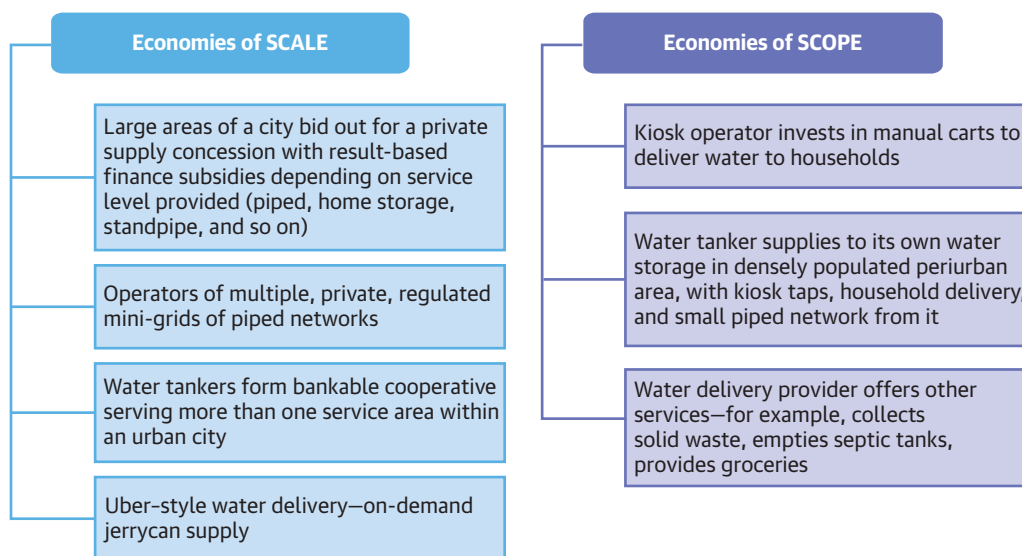
BOX 3.1. Building Resilience to COVID-19 into Service Delivery Models

The COVID-19 pandemic has identified many risks from what was previously considered “normal” daily behavior for many people: chatting with friends, greeting people with a hug or kiss, exchanging goods, and payment from hand to hand. Innovative off-utility service delivery models can reduce the risk of COVID-19 transmission. Examples of this include:

- Reduced crowding around informal water sources, replaced by organized supplies that provide water from taps
- Smart kiosks that reduce personal interaction with kiosk attendants, instead relying on touchpads (although these carry contact risk)
- Less face-to-face contact through delivery of jerrycans, bottles, or bulk water supplies
- More organized cleaning of vessels to carry water, enforced by formal safety standards

Source: Authors.

FIGURE 3.2. Examples of Business Models



Source: Authors.

The innovative ways in which operators may use emerging technologies, such as smart water metering, new digital technologies, advances in sensors, software, and artificial intelligence, to improve the management of water resource and supply high-quality water and sanitation services (WSS) to households are part of the building blocks of the Utility of the Future and are discussed in the remainder of this chapter. The models presented suggest new ways of thinking about water services, unconstrained by traditional approaches. Rather than strictly comparable delivery models, they encompass approaches to service delivery that may be complementary. Although not all models are suitable for every city, many could work together in the same business.

The critical driver of the different models is scale and the question, “What models can be delivered at scale?” The models benefit from reduced costs or more resilient financing through economies of scale and economies of scope. Figure 3.2 presents examples of service delivery models that might allow for financing at scale.

In the following two sections the models set out in figure 3.2 are explored in more detail. For most, a diagram is provided based on that presented in figure 1.1. Each diagram has been modified to highlight the innovative private business model; bold red lines show key water service flows, solid lines of other colors show lines that remain important for the business model but are not necessarily part of the innovative business’ operations, and the dotted lines are not related to the business model.

Models That Benefit from Economies of Scale

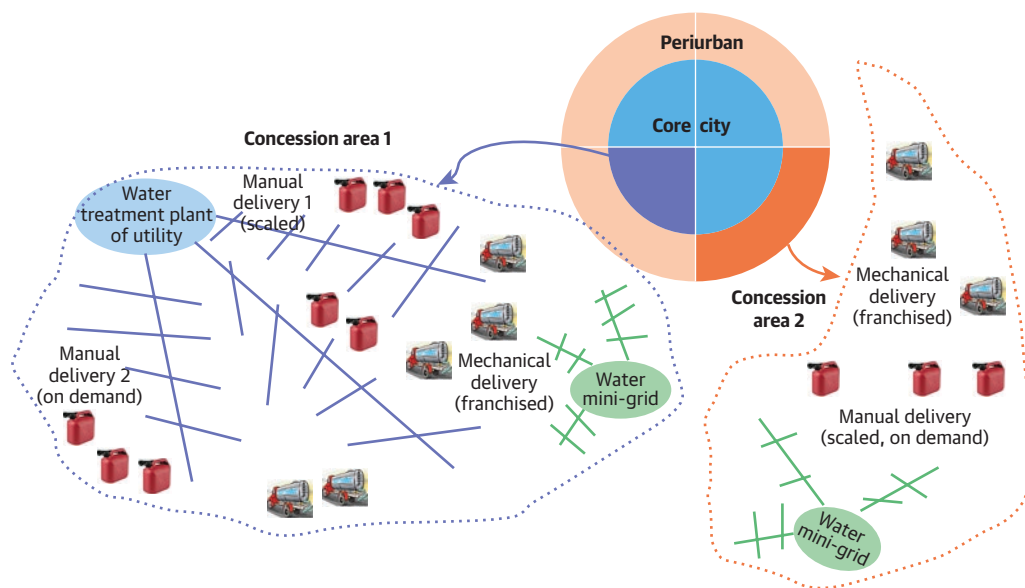
Economies of scale provide opportunities for SSPs to expand their business and cover larger service areas, making the business more cost-effective by allocating fixed costs across a wider customer base.

Large-Scale Concessions for Off-Utility Service Provision

Under this concept, delivering services to unserved or underserved populations in a large section of a city, or a whole city, is tendered to a private company through a competitive process. Figure 3.3 demonstrates how this could be applied to core and periurban areas of a city. Core to the model is the concept of a **single point of responsibility** for delivery of the off-utility services, with the concessionaire managing the service quality improvements, investments, capacity building, and payment arrangements for its staff and subcontractors.¹

Although not a direct replica of this model, there are examples in which a limited bundling of services has taken place to reduce the transaction costs of working with multiple small-scale providers. This can be observed in initiatives supported by Water and Sanitation for the Urban Poor (WSUP) through their master operator (MO) model, applied in Kisumu and Naivasha, Kenya, as explained in box 3.2.

FIGURE 3.3. Possible Approach to Private Concessioneering of Core and Periurban City Areas



Source: Authors.

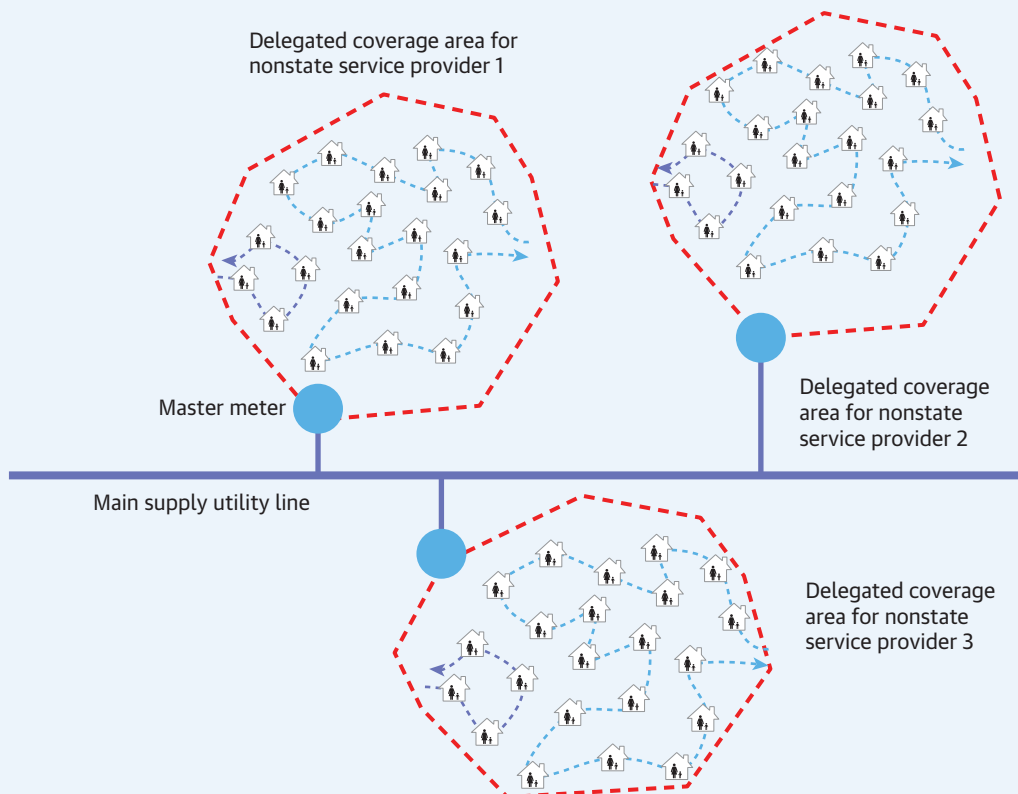
BOX 3.2. Master Operator Model for Water Concessions in Kisumu, Kenya

To cover the inadequacy of access to improved water in low-income areas (LIAs) of the city of Kisumu, Kenya, the Kisumu Water and Sanitation Company (KIWASCO) has implemented a delegated management model (DMM), which uses a public-private partnership (PPP) and decentralization concept. KIWASCO partners with nonutility water operators, known collectively as master operators (MOs)—who are either community-based organizations, groups, or individual entrepreneurs—to deliver affordable and good-quality water and sanitation services to unserved and previously underserved areas of Kisumu's informal settlement. KIWASCO identifies the MOs through competitive tendering processes.

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BOX 3.2. continued

Each of these MOs has clear designated areas of operations and clear reporting structures. This is a contractual partnership with clear deliverables for both parties. The MOs are required to supply water, bill customers, collect revenue, and perform minor maintenance. The arrangement is shown in the figure below



Simba Kogello Water and Development Group is one such MO managing a water supply in Nyalenda, one of Kisumu's informal settlements. With more than 600 customers (both domestic and kiosks), Simba Kogello is responsible for marketing, last-mile connections beyond the master meter, billing, collection, and operation and maintenance of service lines within its jurisdiction. KIWASCO provides support through capacity building and technical guidance to the MO and its employees. KIWASCO sells water to Simba Kogello, at a subsidized rate of 25 M³/K Sh, which in turn sells water to individual consumers and kiosk operators. Kiosks are charged 35 M³/K Sh and the rest on a graduating tariff of

- 0–6 M³ K Sh 180;
- 7–20 M³ +K Sh 35; and
- >21 M³ +K Sh 50 for domestic consumers.

This allows the MO a profit margin of between 5 and 10 percent, depending on efficiency of operations.

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BOX 3.2. continued

Despite DMM being one of the best models in water service provision within the LIAs, it has had its own share of challenges:

- Unregulated developments of commercial and residential properties
- Water infrastructure damage because of the ongoing city development projects—that is, road constructions and expansions
- Lack of adequate infrastructure and existence of old dilapidated infrastructure for water supply
- Continued and unplanned nature of informal settlements leading to lack of wayleaves
- Resistance by pockets of community members prone to illegal connections
- Limited capacity of MO to hire and retain qualified staff

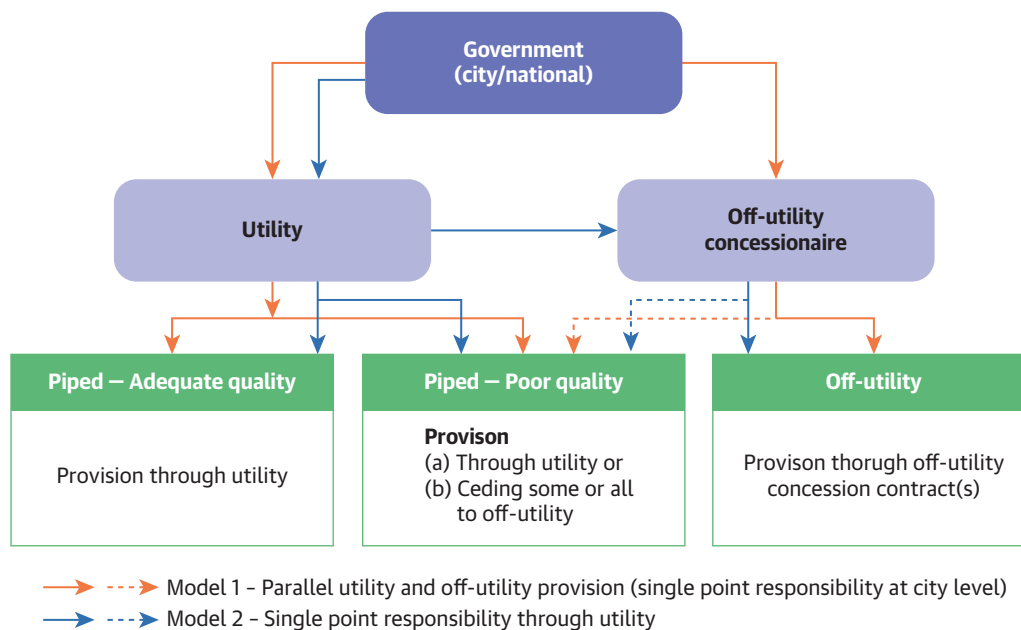
Sources: Origa Otieno 2021; WSP 2009.

Including in a private concession part of an existing utility's service area that is currently underserved (with poor quality connections and/or customers not connected to an available piped network) can combine new connections with improved service for existing customers. Figure 3.4 illustrates how a concession area of a city may encompass both unserved and underserved population groups through two ways of combining utility and off-utility provision—the first model being one in which the single point of responsibility for service provision is at the city level, the second being when the utility concedes the off-utility provider.

Under either model, the concessionaire will have the obligation to supply water services to the population under its concession. Price will form a component of the competitive process through which the concession is awarded. For the winning bidder, subsidies may be available to ensure services are affordable (see box 2.18) for an example of results-based finance [RBF] per connection made in Paraguay). Customers need not receive a piped connection, but the value of the subsidy could depend on the service connection—for example, a piped connection receives the greatest subsidy, access to a standpipe the lowest. Structured correctly, such a subsidy should offer the right incentives for the greatest total return (that is, economic and social) to the investment made. It should also provide the maximum potential for inclusive development, whereby all customers have the greatest opportunity to be connected, not simply those who can more easily be connected to a piped network.

Box 3.3 describes an example in the Philippines of private concessions in Manila. The case shows that private providers can successfully be given an incentive through a performance-based contract to both operate existing piped networks and increase access, including hard-to-reach communities, through third-party SSIPs and alternative approaches, such as public standpipes. However, it also shows that inadequate regulation of the arrangements among the utility and the SSPs can lead to considerably higher prices charged (typically to the poorest households) and add unnecessary business risks for the SSPs.

FIGURE 3.4. Off-Utility Concessionaire Service Area and Utility and Government Relationships



Source: Authors.

BOX 3.3. Private Concessions and SSIP Integration in Manila

Metro Manila, in the Philippines, privatized its water services provision in 1997 with the creation of two concessions, Maynilad Water Services and Manila Water, through a competitive procurement process. Each company entered performance-based contracts that included output standards for pressure, reliability, quality, and coverage, though neither a universal service obligation nor specific pro-poor incentive. The contracts also gave flexibility for the service delivery models, including public standpipes and third-party provision if the activity was licensed and the concessionaire gave its consent.

Part of Manila Water's expansion was through its Tubig Para sa Barangay (Water for the Poor) initiative that included three service delivery models:

- Bulk water supply to the edge of a community, beyond which a small-scale independent provider (SSIP) would supply the community
- Taps serving two to five households on a single meter
- Individual household meters located on a public road, rather than at the household

The supply of bulk water to SSIPs transferred responsibility for payment from the individual households to the SSIP, which was better placed to liaise with customers who might otherwise have been difficult to reach. Although Manila Water was not directly responsible for these

box continues next page

BOX 3.3. continued

customers, it was able to claim the communities as served in its aggregate coverage reports. There were an estimated ninety SSIPs operating in this way with Manila Water in Taguig City in 2007, each serving between forty and 400 households.

In contrast, Maynilad did not immediately engage SSIPs to assist with service to customer premises but focused on individual metering of customers. Retaining responsibility for monitoring theft and leakage, Maynilad struggled financially until in 2009 it instituted a program resembling Tubig Para sa Barangay, called Samahang Tubig Maynilad (Water Association of Maynilad), where it engaged with SSIPs, leading to increased coverage.

The sale of bulk water to SSIPs, though approved, was not without difficulty. The larger utilities charged commercial tariffs for bulk water so that after the SSIP added its own costs to the price, the tariff charged to households (typically poor), though cheaper than alternative informal SSIPs, was as much as eight times higher than those charged by the larger utility for an equivalent household connected to its own network. Similarly, an unbalanced and opaque relationship among SSIPs and the larger utility meant SSIPs lacked certainty about the security of their arrangements and faced the risk of being terminated prematurely or having the utility construct over the top of their networks. As a result, they charged tariffs that allowed them to recover capital costs within four years rather than risk not being paid compensation for their network investments.

Sources: Capistrano and Gerlach 2005; Cheng 2014; Dumol 2000; Rosenthal 2001.

The scale of the proposed concession will induce economies of scale in service provision, leading to lower prices for customers and/or lower subsidy amounts for sponsors, while at the same time providing opportunities to professionalize the service provision arrangements. The scale of the investment required will attract both lower-cost and more-sophisticated financiers than those currently serving the market, as well as national and international bidders with significant operational capability—not just those operating at the city level.

The competitive element of the tendering process and contractual relationship under which the concessionaire will operate allows for the inclusion of various nonprice scoring conditions:

- The role of technological innovation in service delivery
- The collaboration with existing informal SSIPs
- The provision of supplementary community services—for example, health advice

Private Water Mini-Grids

If geography allows for small, piped networks to be developed yet the incumbent utility is unable to construct them for financial, political, or other reasons, alternative piped water providers can be viable. Small, private, piped networks can operate either independently from or integrated with larger

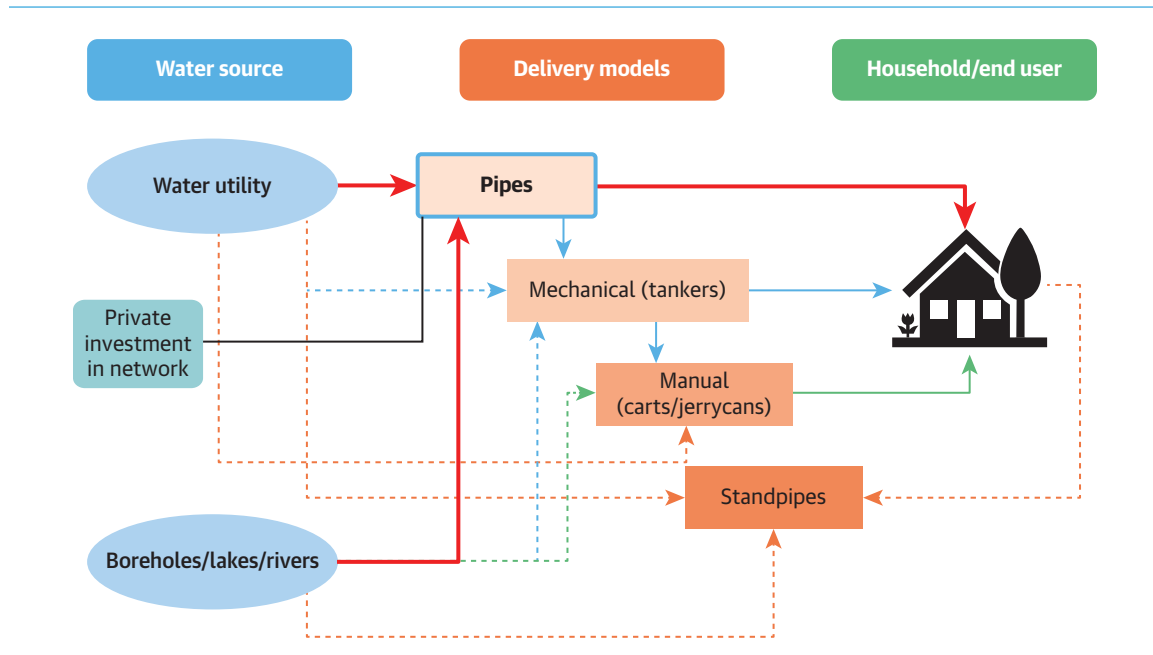
utility-owned water networks, supplying water directly to households, mechanical or manual delivery agents, or standpipes, as demonstrated in figure 3.5.

In Cochabamba, Bolivia, small water mini-grids receive water in three ways: from the municipal system, from their own source, or delivered by tankers. The mini-grids operate with varying degrees of formal recognition by the legal system (see box 2.5), even if they are well organized and supported by nongovernmental organizations (NGOs) and religious organizations. Beyond this, there is no specific regulatory framework covering issues, such as price, water quality, or technical design standards.

With an appropriate regulatory framework, a piped water mini-grid SSIP can be granted an exclusive right to serve a defined area for a given period, thus giving confidence that investment costs can be recovered and that the SSIP's market will not be usurped by other providers, both illegal and legal (for example, the utility). Such exclusivity is discussed in the section Supplementary Institutional Relationships. Tariffs can be calculated in the same way as for a large utility, apportioning the reasonable costs of service (operating, capital, and financial) over assumed consumption. Technical standards guide the design of the piped network, based on required service quality targets.

There are obvious economies of scale. An SSP of one piped water mini-grid will have many of the same fixed overhead costs as an SSP of multiple sites but not the ability to spread them across the sites. The SSP of multiple sites should have access to cheaper sources of capital by virtue of the scale of their capital investment requirements. A larger operator may also be able to make better use of technologies, such as remote customer monitoring and billing systems.

FIGURE 3.5. Private Water Mini-Grids as a Delivery Model



Source: Authors.

Box 3.4 briefly touches on how a similar innovation in private service delivery of electricity has become a part of national electrification strategies. A further discussion of the evolution of the private electricity mini-grid model is given in box 4.1.

Private water mini-grids could form part of the concessions as discussed in the section Models that Benefit from Economies of Scale , allowing for progress to be made toward a fully piped connection while ensuring a high-quality water service in the interim. An example of a potential arrangement in which SSPs construct piped networks with financing provided by the utility, who also maintain ownership of the assets, is provided in box 3.5.

BOX 3.4. Private Electricity Mini-Grids as an Alternative to Public Utility Service Provision

In many countries across the world, and particularly in Africa, private electricity mini-grids are increasingly becoming a key component of national electrification strategies. Having been included in national electricity policies, dedicated regulatory frameworks have been developed that give both private mini-grid developers/investors and customers certainty that a private operator of a small, isolated electricity system can deliver electricity of a high quality, safely, at an affordable price. Increasingly, mini-grids are being seen as a complementary solution to national grids, and frameworks provide accommodation for future integration of the two networks with adequate compensation paid for operators who choose to sell their assets to the national grid operator.

Source: Authors.

BOX 3.5. Development of Private Piped Water Networks in Vietnam

In 2002, the World Bank's Public-Private Infrastructure Advisory Facility (PPIAF) piloted design-build-lease contracts in two small Vietnamese towns. This arrangement brings together different local stakeholders, including the local community, local authorities, and the utility, to identify potential schemes and procure SSIPs through a competitive bidding process. The successful private SSIP designs and constructs the piped system, with financing provided by the utility. The utility owns the assets and receives a lease payment for ten years, during which the private SSIP operates the system. The utility assumes operation after this period.

In Lim Town, this scheme saw a rapid increase in the number of piped connections—from 1,792 to 2,336, which exceeded what was originally anticipated. It also became evident that households were willing to pay a premium to receive high-quality piped water soon, as opposed to waiting for a piped utility connection.

Sources: Adank 2013; Kingdom 2005.

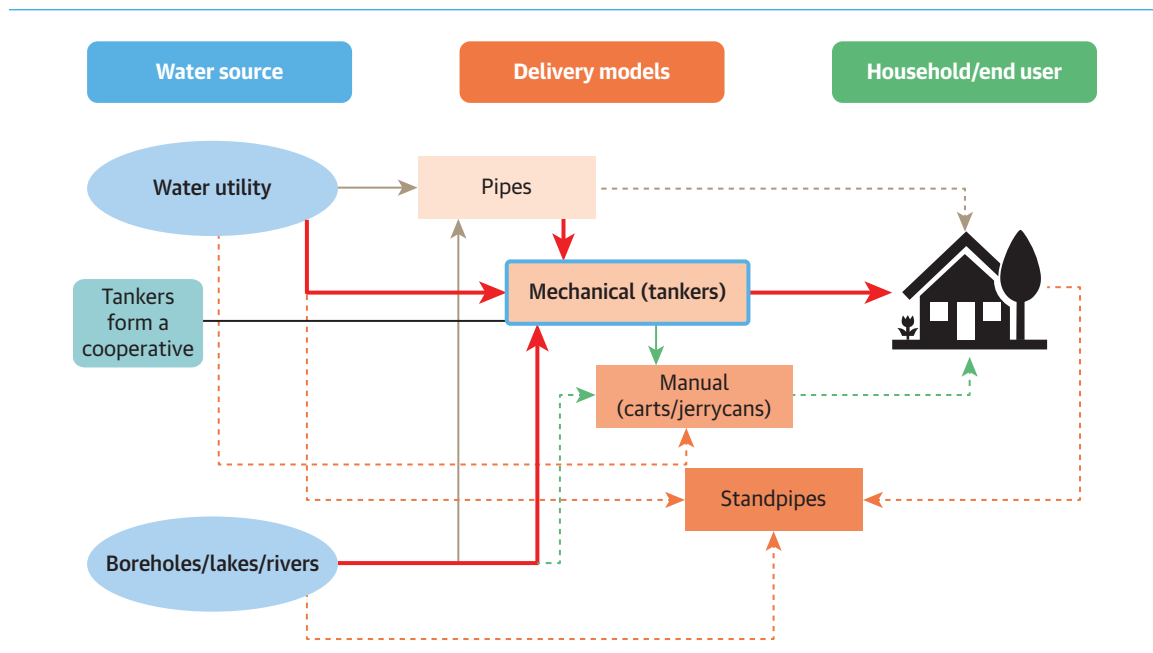
Water Tanker Cooperatives

In cities with multiple water tanker SSIPs, any one single mechanical tanker supplying water to customers has limited access to capital and technology, as well as limited bargaining power with bulk water suppliers. By forming an association, such as a cooperative² as shown in figure 3.6, SSPs can align their interests and be better positioned to benefit from economies of scale.

A larger entity comprising multiple tanker SSPs allows for various scale benefits:

- It can access more sources of finance, at cheaper rates, necessary for acquiring and maintaining vehicles—this could be extended to acquiring newer and cleaner vehicles, thereby enhancing the green contribution of water service delivery.
- It can coordinate capacity building across SSIPs to ensure skills are developed, leading to more inclusive development of service providers.
- It can introduce supplementary activities to support beneficiary communities, providing links with other businesses and providing more inclusive development for other people in an area.
- It is better able to coordinate activities to meet changing levels of demand, avoiding oversupply or undersupply of water in any given area, or accommodating mechanical interruptions by reallocating supply at short notice—such an approach can manage water resources more efficiently and optimize the scheduled deliveries of tankers, thereby increasing their green contribution.
- The necessary security as an offtaker to develop new water supplies and/or treatment works.

FIGURE 3.6. Water Tanker Cooperatives Allowing Scale Economies for SSPs



Source: Authors.

- It may negotiate more favorable bulk supply prices and utilize water resources more efficiently and sustainably.
- It can have a greater ability to increase supply at short notice, based on existing channels to market, thereby increasing the resilience of a service delivery area to shocks to the water supply.

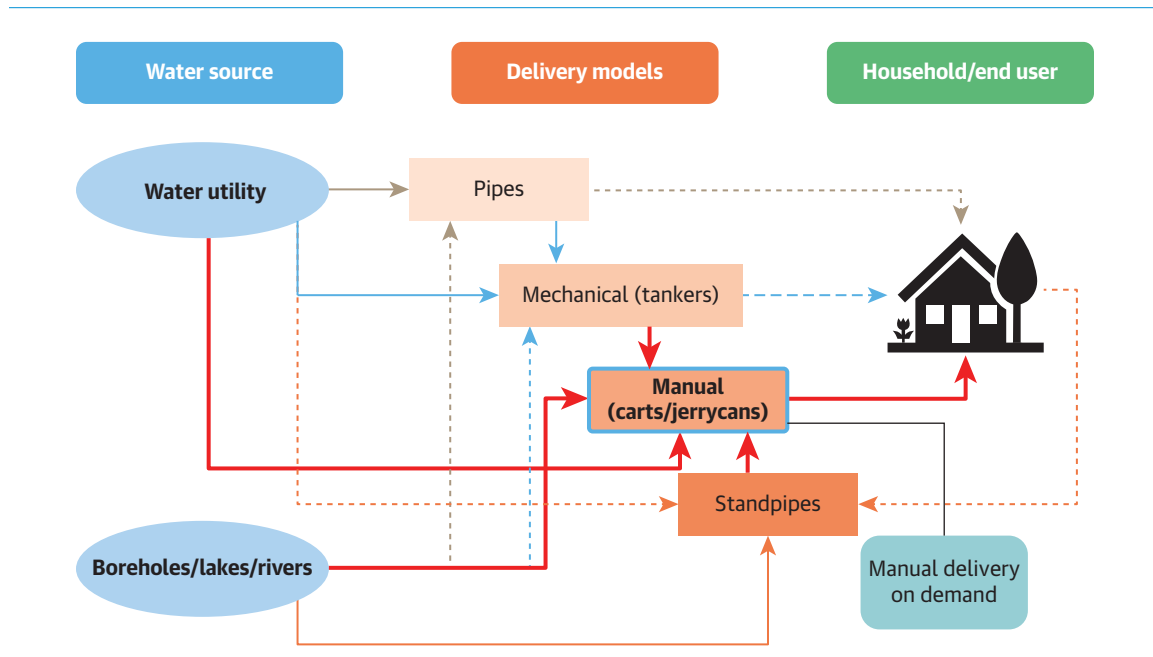
However, such an association also has the potential for negative outcomes, such as cartel behavior, which leads to overpricing of services or predatory pricing to remove competitors. Therefore, new forms of regulation may be required to ensure the balance between SSP and customer interests.

Many of the benefits outlined earlier can apply to a single SSP rather than a cooperative. The choice of a cooperative model applies best when there are existing suppliers who lack scale, whereas a larger single operator with multiple vehicles may be more advantageous when there are few existing SSPs. Either model could be utilized under the large-scale concession discussed in the section Large-Scale Concessions for Off-Utility Service Provision.

On-Demand Water Supply

The development of on-demand service provision is a major development across many sectors in both developed and developing countries. Through a single mobile device, people can request transportation, hot food deliveries, groceries, and just about anything from operators who are not employed by the provider of the goods or service but are independent operators in the “gig economy.” Figure 3.7 highlights the manual deliverer of jerrycans or bottled water.

FIGURE 3.7. Illustration of On-Demand Water Supply as a Delivery Model



Source: Authors.

The model itself is not new, but new technologies create new opportunities for manual SSPs. Using a dedicated app, a customer could request a water delivery of any volume for the following week, the following day, the following hour, or as soon as it can be delivered. The app then goes to the “market” for manual SSPs, who can choose to accept the customer’s request and supply water, charging a price for the sale. The customer can rate the SSIP based on the service delivered and report any problems—for example, poor quality water. There could be variations in how the SSP sources the water—for example, their own source, mechanical tankers, standpipes, a third party, or from the app operator.

An app owner sits behind the operation, developing the technology, determining pricing, building their network of manual SSPs, and marketing their business to customers. All these activities incur costs, many of which are fixed, so the larger the SSP becomes, the more these costs can be apportioned across multiple customers. Financing will help an SSP cover the high start-up costs. An on-demand supply model could be adopted within any of the business models discussed in this chapter.

Such technologies introduce greater efficiencies—for example, in leak reporting and in scheduling of service delivery. When optimized (as can easily be done through software and applications), this should lead to reduced costs and lower aggregate emissions from service vehicles, thus enhancing the green contribution of water service delivery. Similarly, when such models drive operators to find multiple water supply sources, the service delivery model will be more resilient to shocks that might affect a single utility model more significantly.

Models That Benefit from Economies of Scope

Economies of scope allows SSPs to add additional services to their business while serving the same area, taking advantage of existing customer base, area knowledge, and operational synergies.

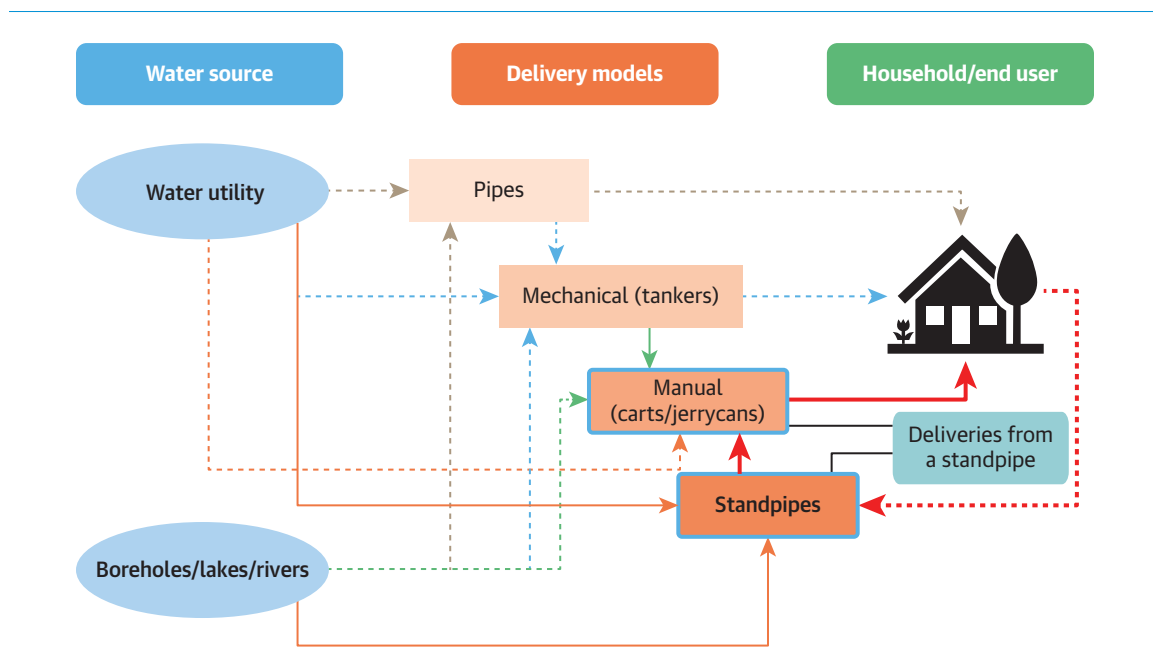
Deliveries from Standpipes

Standpipe SSPs can get to know their customers well, becoming familiar with their water consumption patterns. Some customers may find the journey to the standpipe problematic for many reasons—for example, distance, time, and increased volume to carry. Entrepreneurial standpipe SSIPs who understand their customers’ requirements could invest in manual delivery mechanisms for supplying jerry-cans or bottled water from their standpipes to households, as shown in figure 3.8.

There are a range of benefits and opportunities for a standpipe SSIP from engaging delivery services:

- It may strengthen the relationship with existing customers, increasing revenue security.
- Customers may demand more water, increasing sales volumes and revenues.
- Customers may demand the delivery of additional goods, creating links beyond water and enhancing the business opportunities of other goods providers, leading to more inclusive development.
- “Upgrading” customers can lead to reduced risk for COVID-19 transmission as customers no longer need to visit standpipes and the delivery service provider can ensure their own protective measures.

FIGURE 3.8. Standpipe SSIPs Investing in Manual Delivery



Source: Authors.

- A broader business model, with asset purchases, will require finance, but the larger, more secure business will have greater access to finance, as discussed in the section on Availability of Finance

Tanker Investing in Storage and Local Delivery

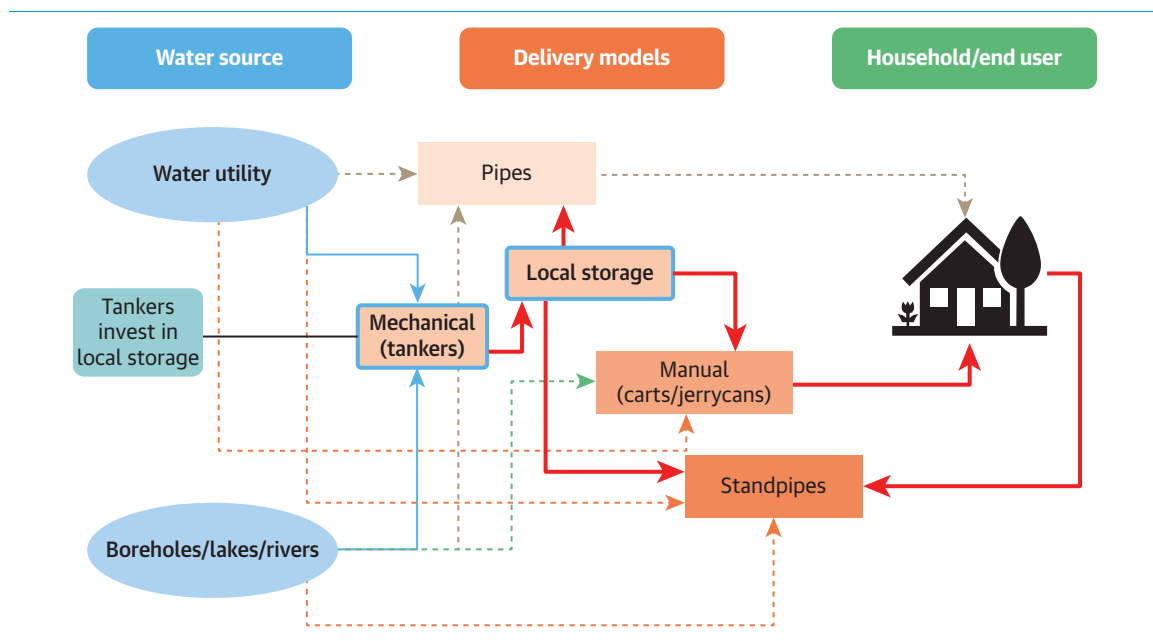
Mechanical tanker SSIPs can bring water from a bulk supply source into a community. However, they are able to supply customers with the capacity to store only large volumes of water on or close to their property. For many customers, this is impossible because of a lack of finance or insufficient space.

If the tanker SSIP can find a site close to unserved or underserved communities to develop water storage, which they can supply with water, they could diversify their supply options and customer base into alternative models that can reach other customer categories. This approach is presented in figure 3.9.

A diversified service delivery model that encompasses localized storage feeding different service delivery options is not unique in rural areas. NGOs, including Water Mission,³ provide such integrated service delivery options, depending on customer needs. Similarly, in the community of Central San Miguel, Cochabamba, Bolivia (discussed further in the section above on Private Water Mini-Grids), households are served by a virtual network, in which bulk water is supplied by tanker trucks before being fed into a local piped network. These needs can change over time as they become more accustomed to the supply options and demand greater quantities of water, or through an increased ability to pay for different service options.

Although the sources of clean water may differ between a rural provider and a mechanical tanker, the benefits and opportunities that the increased diversity of service delivery options provides can include:

FIGURE 3.9. Mechanical Tanker Diversifying into Local Storage and Additional Delivery Models



Source: Authors.

- all those listed for the standpipe SSP providing deliveries
- the potential for results-based funding for customers to invest in onsite water storage (for example, \$x per household for the installation of water storage), or
- for tanker SSIPs with multiple sites, to fund larger storage systems with similar funding.

Such arrangements should also reduce the requirement for regular tanker visits, and thus the carbon impact of previous models; and onsite storage should increase the resilience of customers to shocks.

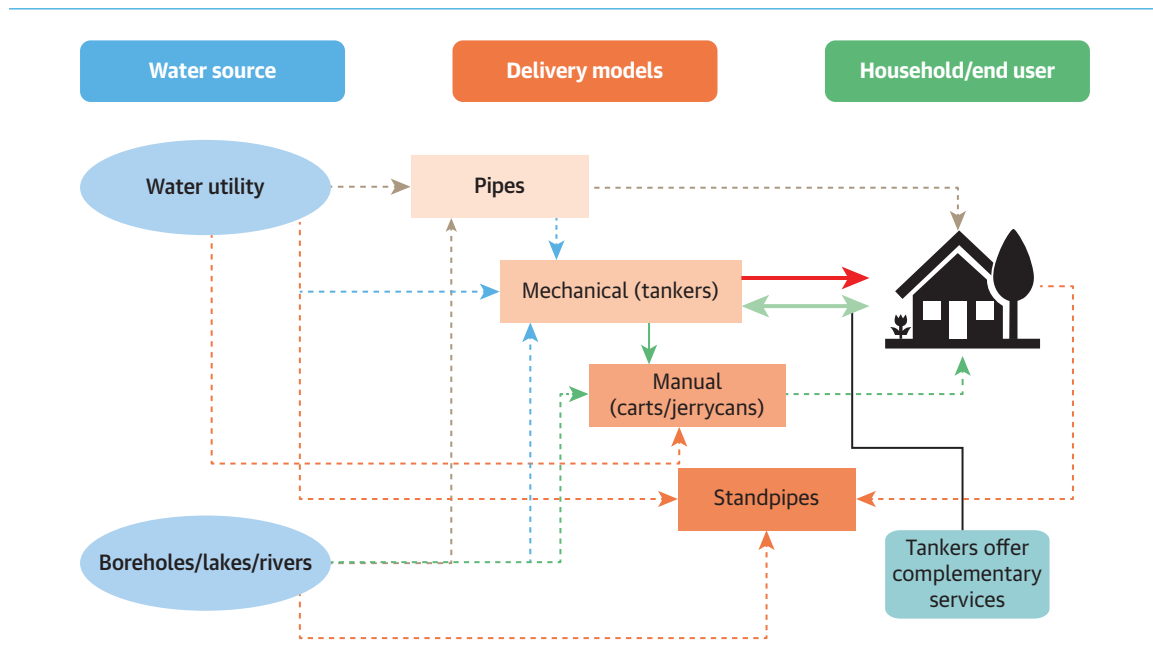
Tanker Providing Supplementary Services

Water tankers establish channels to market and customer bases for water delivery that could be utilized for supplementary services, such as grocery delivery or sewer and solid waste removal. Although these replace services by other providers that might have used different forms of transport, the more-efficient delivery models can reduce transport costs and emissions from vehicles, thus making a green contribution via the delivery model (see figure 3.10).

Although the logistics of using the same vehicles for backhaul are likely to be complicated, an SSP can benefit from familiarity with vehicle operations, neighborhoods for navigation, customer trust, customer databases, and so on.

As with the previous two models, diversified mechanical tankers can broaden and deepen their customer bases (reducing revenue volatility and increasing sales) and increase funding opportunities, including through results-based funding at the customer level. Diversified operations can allow economies of scale in maintenance of their vehicles, and similar benefits can accrue in regulatory licensing procedures, both for the SSP and any entity with regulatory oversight of its activities.

FIGURE 3.10. Mechanical Tankers Diversifying into Complementary Services



Source: Authors.

Practical Models for Scale-Up

This chapter has demonstrated that supplying water through supplementary service provider (SSP) models can deliver scale benefits, which would reduce risks for the businesses and their investors and ultimately reduce costs for customers while providing improved services. In addition, the greater professionalization of formalized SSPs would provide the basis for investing in newer technologies, such as on-demand water supply. To increase their value offering, SSPs will need to continually think outside the box.

Notwithstanding this conclusion, to date the application of innovative approaches to SSP models at scale has been limited, as evidenced by the paucity of strong examples of their successful application. Customers without piped supplies and the informal SSPs trying to serve them face a complex mix of different legal, administrative, social, economic, and technical challenges in the pursuit of better water supplies. To overcome the initial inertia that radical change so often faces, a practical model is one that is likely to be composed of a coordinated approach to deliver a mix of SSP services to a wide geographic area.

The lack of viable SSP models that operate at scale is at the heart of the challenge. Although the case studies have shown many promising approaches, none have been able to move to scale. One reason is that they are constrained by lack of finance; the other is they typically lack substantial backing from development partners and governments. These, together, form a chicken-and-egg challenge for the sector. Today's small-scale initiatives are transaction heavy—requiring intense support, multiple procurements and oversights of small providers, small investment packages, and low numbers of beneficiaries. **Development partners and governments prefer the exact opposite:** small numbers of large procurement

packages that deliver results at scale. If new models can be demonstrated that meet the preferences of development partners and governments, then a new virtuous partnership can develop in the SSP sector. Such an approach is presented in the next chapter.

Notes

1. It is anticipated that concessionaires' staff or subcontractors will draw extensively on the SSIPs currently operating in the concession area.
2. See also the case study of the umbrella body of authorized vendors in Côte d'Ivoire in box 2.11
3. For more information, visit their website at watermission.org.

Chapter 4

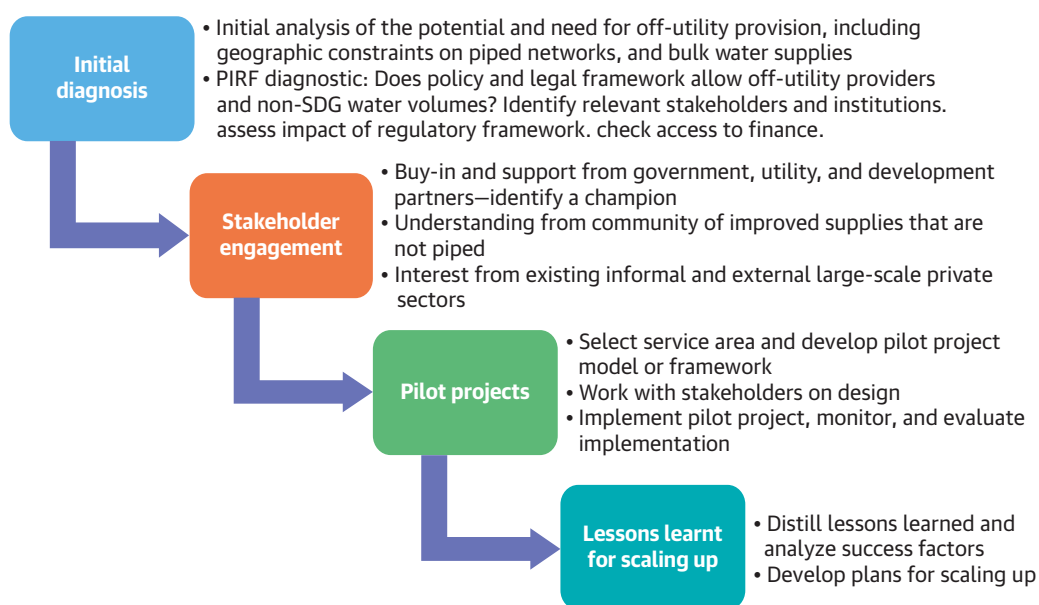
Action Plan to Mainstream Supplementary Water Service Provision

A well-constructed action plan combines the necessity of having an adequately conducive policy, institutions, regulation, and financing (PIRF) enabling environment with creating opportunities for business models to benefit from economies of scale and/or scope.

Moving toward achieving Sustainable Development Goal (SDG) 6.1 and facilitating universal water access necessitate engagement with the supplementary service provider (SSP) sector and enabling SSPs to professionalize and scale up their service in areas that are not served by piped utility water. In particular, it needs the demonstration of models that will work at scale, with low transaction costs and high numbers of beneficiaries, and thus be attractive to development partners and governments.

This section outlines how SSP delivery models could successfully be implemented at scale. An overview of the approach is provided in figure 4.1. Table 4.1 expands on this figure by providing additional details as to which entities may be responsible for each step and an indicative timeline. However, it is important to note that this is a general and high-level indication only, as the exact responsibilities and time frames must be tailored to the specific context. Given the absence of professional, at-scale SSP models, we recommend piloting the delivery in a single or small number of cities to gain deeper insights before distilling these into a more general, scalable approach.

FIGURE 4.1. Roadmap for Implementing Demonstration SSP Model at Scale



Source: Authors.

Note: PIRF = policy, institutions, regulation, and financing; SDG = Sustainable Development Goal; SSP = supplementary service provider.

TABLE 4.1. Responsibilities and Timeline for the Roadmap to Implement Demonstration SSP Model at Scale

Stage	Task	Responsibility	Indicative level of effort and timeline
Initial diagnosis	Analysis of potential candidate cities	National or subnational entity with responsibility for water provision, with support from donors and/or international development agencies	For the demonstration to be successful, it is essential a suitable location is chosen that has adequate potential and a necessary threshold of PIRF success factors in place. This analysis will take two to four months.
	PIRF diagnostic		
Stakeholder engagement	Generate buy-in from key stakeholders	Local government	This process should occur throughout and can begin immediately. In addition to more informal stakeholder engagement and dialogue that will develop buy-in, this task will require workshops spread over a longer time period.
	Community/customer engagement	Local government	
	Develop interest of providers	Responsible entities, utility, and international development agencies	
Demonstration projects	Select service area and develop demonstration model/framework	Subnational entities, in close collaboration with the utility, donors, and other levels of government	This will be based on the work from the initial diagnostic.
	Design demonstration project	Subnational entity, in collaboration with local stakeholders and potential providers	This is estimated to take nine to twelve months, as it will require an analysis of potential options and assessment of how they can be implemented in a technically feasible manner.
	Implement demonstration project	Subnational entity, utility, and potential providers, in collaboration with donors	The demonstration project will take as many as twelve months to procure, followed by an implementation period of, say, five years.
	Monitor project	Subnational entity and donor	Ongoing throughout the demonstration project.
	Evaluate implementation	Donor, development agencies, and industry stakeholders/providers	Ongoing throughout the demonstration project, augmented with regular workshops. Given the potential benefits from the model, a midterm evaluation would be worthwhile.
Lessons learned for scaling up	Distill lessons learned and analyze success factor	Donors and development agencies	This should occur throughout, with increasing effort as the demonstration project matures and effects begin to be seen.
	Develop plans for scaling up	Donors and development agencies for international scale-up plans, along with national authorities for national plans and local entities for a local scale-up	Once sufficient lessons can be learned from the demonstration, donors and development agencies should work on developing and formalizing the frameworks and expanding scale-up projects to more cities. Furthermore, national, and subnational authorities may want to develop plans to scale up the SSP approach.

Source: Authors.

Note: PIRF = policy, institutions, regulation, and financing; SSP = supplementary service provider.

Box 4.1 summarizes the brief history of the development of electricity mini-grids to the scalable model that we observe today. The key features, which the water sector can adapt and adopt, include

- Identification of a country, and notably a champion within that country, in which to pilot the approach;
- Development of a robust and transparent policy and regulatory framework (which continues to evolve as the market develops); and
- Support for early market innovators with seed and innovation funding until models are sustainable, scalable, and able to benefit from more catalytic funding.

BOX 4.1. The Mainstreaming of Private Electricity Mini-Grids in Africa

Ten to fifteen years ago, electricity access was still largely the domain of national utilities, which, in many cases, were not proving particularly successful. There was little private investment in reaching the poorest communities. Some utilities operated isolated systems, but these were typically treated as isolated parts of their own systems, with the same tariffs and funding available as the main grid networks.

From 2008, the World Bank began supporting Tanzania in the development of regulations to support small power projects, which became known as mini-grids. Few projects were developed as technologies were untested, licensing was a slow and opaque process, financing was unavailable, and the developmental returns were minimal. Some donor funds emerged around 2014 to 2015 but still struggled to fund projects as policy makers and regulators remained skeptical of private investment in electricity supply to poor customers. Small private developers, particularly in East Africa, began to develop portfolios of five to ten mini-grid sites.

Donor support increased for technical assistance to develop policies and regulations, and private mini-grids became an accepted component of national electrification strategies, filling a niche between grid extensions and the growing off-grid solar market. In Nigeria, a champion emerged within the federal government who was able to catalyze the political will, under conditions in which privatized utilities had little interest in operating, to support the development of a coherent policy and regulatory framework, built on the foundations of frameworks developed elsewhere in Africa. The combination of political will and a robust framework gave confidence to donors to provide significantly more results-based funding; the World Bank and African Development Bank have each committed more than US\$200 million in results-based grant finance to private mini-grid developers in Nigeria.

Other countries have followed suit, with frameworks and significant funding. The small private companies previously operating only in East Africa are now developing portfolios across the continent, and tens of thousands of customers are being connected to electricity for the first time. More policy and regulatory frameworks are being delivered, multicountry funding facilities are being delivered, and the price of electricity supplied continues to fall.

Source: Authors.

The remainder of this chapter details the four stages outlined in figure 4.1. Although many possible models could be demonstrated (see the section on Models That Benefit from Economies of Scale) , it is the large-scale concession that is considered most appropriate at this time. It captures the various challenges faced in the SSP sector, it can incorporate a wide range of possible service delivery arrangements (from standposts to mini-grids), and, if successful, it offers the greatest opportunities for replication around the globe.

As noted already in this report, there are no off-the-shelf models of professional, at-scale SSP arrangements. This chapter therefore looks at the steps that would be needed to develop such a model. Given the innovative nature of what is being proposed, it will be necessary to mobilize technical assistance funding from a range of bilateral, trust fund and internal sources to take this critical initiative forward.

Initial Diagnosis

Knowing where things stand currently provides the basis for developing an action plan and, in turn, for developing the necessary PIRF environment and business models that are suitable and applicable in the specific country and city.

An essential first step will be to conduct an evaluation and diagnostic of a city that is a potential candidate for the demonstration project. This diagnostic needs to encompass different aspects, including

- An **analysis of current water** provision in the city, considering the current levels and quality of water supply and examining the status quo of the SSP market;
- An **evaluation of which SSP service delivery models are feasible** given the technical, geographic, and social constraints in a given environment;
- A **diagnosis of the PIRF framework** outlined in chapter 2 to gain an understanding on the feasibility of implementing SSP provision and examine which interventions need to be taken into the enabling environment to facilitate this; and
- Identification of **champions** who are supportive of the concept and its subsequent operationalization.

This initial diagnostic is crucial to examine what is in place and gain an understanding of whether SSP provision, in a demonstration model, is feasible. This will avoid investing significant resources in an environment in which the barriers that need to be overcome turn out to be too large—or support is too limited.

Stakeholder Engagement

Understanding who the key stakeholders are and ensuring their buy-in and support for SSP provision is one of the key success factors for the demonstration approach.

Implementing successful SSP water provision will require buy-in from stakeholders spanning the public sector, utilities, the private sector (including financiers), and communities. Given the novel nature of these models, this is crucial to address the concerns of vested interests both for and against this paradigm shift. To succeed in scaling up SSP water provision to support many of the poorest households, there is a need for all actors to buy into the concept and work together. An overview of these stakeholders is provided in figure 4.2.

Public Sector

Any intervention that involves the private sector requires public sector buy-in. This encompasses the national government (especially if the scale of intervention is significant), the regulator (if any), and subnational government. As each country and city is unique, the level of buy-in needed from each entity can differ across them, depending on how responsibilities are allocated. The ideal form of buy-in is to identify and support a champion within the relevant public sector entity, be that the president or, at the institutional level, the ministry or regulator or parastatal authority taking on the role of champion.

FIGURE 4.2. Stakeholders Involved in Facilitating Off-Utility Water Provision



Source: Authors.

Buy-in is also essential to identify the body with responsibility for providing access and understanding the definition of its mandate. If no such mandate exists, one could be created. For example, it could be either the local government or the utility with responsibility for water provision; engaging with the correct one to discuss SSP provision is essential.

Engagement of the public sector extends beyond simple buy-in and must consider capacity to implement. PIRF approaches need to be targeted to the capacity of the institutions that are implementing them, and the entities governed by them, without becoming overly ambitious and creating additional costly hurdles that restrict water access rather than improve it. Enforcement needs to be feasible and politically tenable (the example of Cochabamba in box 2.5 illustrates some of the challenges of introducing regulations to established and socially accepted informal providers). If first best solutions are unlikely to be implementable, alternatives may be considered that “nudge” improved services by suppliers, such as improving information provided on prices, service providers, and quality; promoting consumer associations to counter market power of sellers, lowering barriers to entry; or improving communication channels between customers and service providers (Damania 2021).

Existing Utility

Regardless of the location of the champion, it is critical to engage with the existing utility. The challenge of the utility relationship is discussed further in the section Supplementary Institutional Relationships. When it comes to working with a utility, various approaches may arise:

- A strong utility may provide a competent and willing counterpart, supportive of the initiatives that are proposed.
- A weak utility may lack the capacity to participate in discussions and pose no threat to any proposed interventions but could potentially undermine it through being a weak counterpart.
- A medium-strength utility may see the proposed interventions as a threat and should be incorporated carefully in stakeholder engagement.

Ideally the utility should be willing to recognize and support the proposed role of the SSPs. This can include the provision of treated, potable bulk water to the utility but also support the public sector and development partners in the implementation of the scheme. The utility can also play a central role in the implementation of the process, managing contracts and the procurement process with the SSP as outlined in figure 3.1. The extent to which this is feasible is dependent on the capacity of the utility.

Customers and Local Communities

To ensure the success of off-utility water provision, it is important to mobilize local communities and the households to be served by the SSP behind the project. This can help ensure that the service is accepted by households, which is particularly important if these households are currently accustomed to sourcing water themselves or from other SSPs with substandard schemes.

Community leaders and local community champions can help in efforts to publicize the benefits of the safe water provided by the SSP. They can also help play a crucial role in informing households on how they are able to access subsidy vouchers or procure equipment, such as tanks, which are necessary to receive the service. The role of engaging local communities is particularly important in informal settlements in which typical public communication channels have little reach.

Private Sector

The private sector, who will bid for or identify opportunities to provide SSP water, along with those in the supply chain, needs to buy into the concept to develop appropriate technical solutions, source finance, and pursue opportunities in this field. This encompasses both local and international companies with the necessary expertise and capacity to provide such a service. The private sector needs to be engaged from an early stage to consult on potential technical solutions and facilitate collaborations with their suppliers to develop appropriate technologies. Early engagement is also critical to help understand the requirements of both the private SSPs and (potentially) private finance providers to ensure the proposed model is financially feasible. Such testing of the market can help guarantee that there is healthy competition for the market once the procurement stage is reached.

Care should be taken to confirm that a new SSP concessionaire does not simply displace existing informal SSPs. This may lead to a lower acceptance of the provider and the approach in general and affect the livelihoods of those who make a living from working in the sector. Instead, incentives should be provided for the concessionaire to understand and engage with existing SSPs and provide necessary capacity building. Incorporating their expertise can be beneficial because they are likely to know the area and customer base to be served. Nongovernmental organizations (NGOs) may play a role in assisting the private sector to incorporate informal SSPs into new formal models.

Development Partners

Development partners and international donors have a significant role in facilitating the scale-up of SSP water provision. They can finance initial demonstration projects and provide technical assistance in developing feasibility studies and draft bidding documents; and in the future they will lead in the simplification and standardization of standard documentation to scale up implementation of successful approach(es).

To ensure success, development partners need to collaborate, which enables an exchange of knowledge and findings from previous projects, and engage with the local community and the institutional ecosystem to facilitate approaches and solutions tailored to the local context.

Developing a Demonstration Project for an “At-Scale” SSP Concession

Having a successful example of SSP provision is a powerful tool to encourage further development and scaling up.

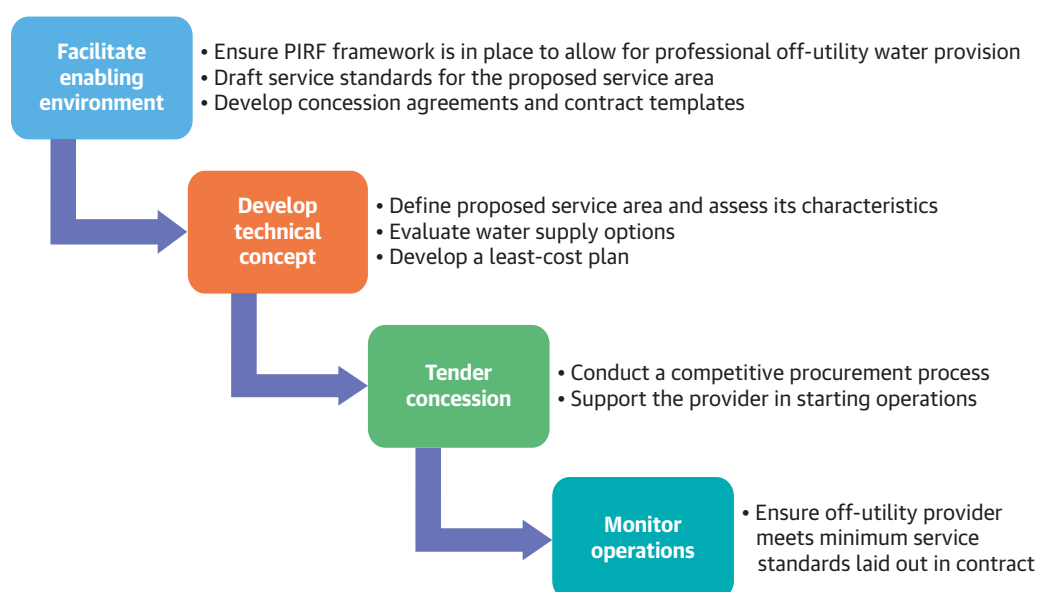
Once a location has been identified, and support obtained, an approach should be used to demonstrate a business case and obtain lessons that can be improved upon. Ideally such demonstrations could be

conducted in two to three cities across different geographies to examine and highlight the potential of this approach in different contexts. The initial diagnosis outlined above will be a decisive step in considering which cities are suitable for such an initial pilot.

Here we outline how such demonstration projects could be developed for the concession model presented in chapter 3. Although the exact process for delivering such a model in a specific city will require further consideration, this report provides an overview of the general, broad steps that need to be taken to develop and implement a pilot project.

This approach does not dictate specific service delivery arrangements. Instead, the concession holder may choose to use a single model, or a mix of models, to deliver a service that meets pre-defined service standards. This could also allow room for a differentiated service, based on the needs of different households. For example, the concession agreement may dictate that a clean, affordable supply of at least 30 liters per capita per day is to be delivered to households, but if this not possible (for example, because of physical constraints or a lack of household storage facilities), a supply of 10 liters per capita per day is to be provided to standposts within 100 meters of households. **It is assumed that some form of subsidy will be required to guarantee affordable service—as happens in the piped utility sector—but the level of subsidy can be based on the exact service level provided.** The concession could also provide incentives for innovations to ensure that providers provide a cost-efficient, effective solution, facilitating the transition toward a fully piped network while ensuring a high-quality intermediate service.

FIGURE 4.3. Steps to Implement a Demonstration SSP Concession at Scale



Source: Authors.

Note: PIRF = policy, institutions, regulation, and financing.

Implementing such a demonstration project requires interventions in the enabling environment as outlined in chapter 2, developing a technical plan and tendering out the concession. It will also require continual evaluation and support while operational in a pilot phase. Figure 4.3 provides an overview of the steps needed to carry out such a pilot. Table 4.2 expands on this, with an indication of responsible entities and level of effort required for each step. The exact allocations will, however, be dependent on factors related to context.

TABLE 4.2. Responsibilities and Timeline for Implementing Demonstration SSP Concession at Scale

Stage	Task	Responsibility	Indicative level of effort and timeline
Facilitate enabling environment	Ensure adequate PIRF framework is in place	Donor, development agency, and/or local/regional authorities. Wherever there are significant gaps in the framework, assistance should be provided to the local entities to help close them.	The required actions depend on the PIRF assessment and will take three to six months to define and resolve but will ultimately depend on the local context. This step should not be rushed because it is important to ensure the PIRF framework is adequately in place to allow for a successful demonstration project.
	Draft service standards	Entity responsible for water provisions (for example, local government or utility) and their customers, and in collaboration with donors and development agencies.	These tasks will require collaboration among institutions and, consequently, take as long as three months.
	Develop concession agreements and contract template	Entity responsible for water provisions (for example, local government or utility), in collaborations with donors and development agencies.	This will be a new contractual arrangement, so it might take nine to twelve months to design.
Develop technical concept	Define proposed service area and assess its characteristics	Entity responsible for water provision in collaboration with subnational governments. Technical assistance may be provided by donors and/or international providers.	The required level of effort will depend on the scale and local context. As a demonstration project, extra effort will be required to evaluate potentially novel options and their technical feasibility. Allow nine to twelve months in parallel with the preceding activity.
	Evaluate water supply options		
	Develop a least-cost plan		
Tender concession	Conduct competitive procurement process	Entity responsible for water provision, with support from donors if necessary.	A competitive procurement process will take nine to twelve months from start to finish, including the request for proposals, evaluation, and contract negotiations.
	Support provider in starting operation	Contracting entity, utility, and local authorities. External technical assistance may be provided if necessary.	Provide intensive assistance in the initial phase of operation, with effort reducing as operations ease into normality.
Monitor operations	Ensure minimum service standards are adhered to	Entity responsible for water provision, regulatory agency (if applicable), or responsible authorities.	Ongoing throughout the operation.

Source: Authors.

Note: PIRF = policy, institutions, regulation, and financing.

Facilitate the Enabling Environment

After selecting a city and area in which to demonstrate this model, the city and utility should begin developing the concept and tailoring it to the needs of the city. To begin, focus needs to be laid on the PIRF factors discussed in chapter 2. The necessary framework must be in place to enable the tendering process and implementation of an at-scale SSP concession. In particular, the aspects set out in table 4.3 need to be addressed.

Develop a Technical Concept

A technical concept needs to be developed, working with the city and utility, ahead of putting the concession to tender. This concept should encompass the following aspects:

- **Define the proposed service area boundaries** - By engaging with the local community and assessing current levels of water provision and demand, draft the area that is to be tended out in the concession.
- **Assess the characteristics of the service area** - Consider the geography and demographics of the proposed service area. This will allow for an assessment of which technical solutions are feasible and, by evaluating the willingness to pay, identify the specific financing needs of the project.
- **Evaluate potential water supply options** - Assess potential technologies to supply water to the concession area. In the demonstration phase, this will require working with suppliers to understand what appropriate, feasible technical solutions are suitable.

TABLE 4.3. PIRF Framework for Piloting SSP Concession at Scale

Aspect	Steps to be taken to develop the concept
Policy	<ul style="list-style-type: none">• Define clear targets of what is to be achieved, specifically acceptable levels of water supply• Update policies to allow for the proposed model, which will include concessions and private SSPs
Institutions	<ul style="list-style-type: none">• Decide which entities should be involved in the demonstration project• Clearly define the role of the different entities and agree how they should be engaged• If applicable, ensure the utility has sufficient capacity to procure and manage the procurement process
Regulations	<ul style="list-style-type: none">• Assess which existing frameworks need to be adapted• Draft service standards for the SSP service area provision• Draft concession agreements and contracts
Finance	<ul style="list-style-type: none">• Market sounding for cost and financing estimates• Consider the aggregate willingness to pay and develop tariffs• Examine the availability and role of commercial finance• Source funding from central and local governments• Meet the shortfall through external donor subsidies, including by means of RBF and trust funds

Source: Authors.

Note: PIRF = policy, institutions, regulation, and financing; RBF = results-based finance; SSP = supplementary service provider.

- **Develop a least-cost plan** - Based on the potential water supply options, develop a least-cost plan for serving the area. Using this, estimate the cost of servicing the area. Depending on the nature of the concession agreement, there may be incentives for the provider to choose the most-efficient, least-cost solution.
- **Assess the availability and suitability of existing bulk water supplies** - Evaluate the options for the utility to provide bulk water to the concession holder. This should also take climatic considerations and their effects on water supply into account.
- **Develop a high-level set of prices** - Based on customers' willingness to pay, constraints, and the costs to serve, develop a set of prices that can guide the assessment of bid prices and the potential funding gap needed to be covered through subsidies.

Because this is a demonstration project, potential SSPs and contractors should be consulted throughout the development of the technical concept to ensure its feasibility.

Tender the Concession and Monitor Its Operation

Implementing the demonstration will require drafting procurement documents following government and/or donor guidelines. If the concession is to be administered by the utility, it is essential to ensure that the utility is supported with the capacity and know-how to conduct a thorough competitive and transparent procurement process. Lessons learned from the Water War in Cochabamba, referenced in box 2.5, that arose from the complications associated with large private concessions and other case studies should be considered in the design of the tender.

Under the concession approach, the SSP is given scope to decide how to provide water. The tender sets out the target levels of supply and can provide scope and incentives for innovation. It is desirable to also encourage developed country utilities to bid to allow for these concessions to help mature the sector. However, contracts should incorporate requirements to engage with existing informal SSPs and help embed them in the new formal provision. As part of the concession, the contract can also include specific performance targets that provide incentives to deliver a higher-quality service beyond the minimum standards specified. As with any contract of this nature, special consideration should be paid to the design of the incentives and bid evaluation criteria to ensure they align clearly across all parties and with the final outcome that is being sought.

An important part of the concession will be clarifying how services will be managed at the end of the contract period. At one end of the spectrum, all the activities of the concessionaire could be transferred back to the utility. At the other end, the concession could be updated and rebid. Expect that some elements will have been subsumed back into the utility during the life of the concession as the utility expands its piped network into currently unserved areas.

Scaling up

Lessons learned from the demonstration project need to be distilled and used in developing tools that will support the scale-up, such as guidelines and templates.

Demonstration projects significantly improve the evidence base pertaining to SSP water provision and provide a valuable basis from which to develop further the models, analytical tools, and templates that support the scale-up of the SSP approach. To ensure this, it is crucial that the implementation of demonstration projects be carefully followed by development partners and other experts to help analyze findings, refine the framework and models, and distill them to help mainstream SSP water provision at scale.

Key steps that need to be taken to scaling up this approach include the following:

- **Provide a toolkit of standardized technical assistance.** This can include standardized SSP concession contracts, licenses, bidding documents, pricing models, and regulatory principles. However, they must be adapted to the local context and support development partner and government staff in implementing SSP provision at scale.
- **Deliver ongoing technical assistance.** To ensure the success of the SSP approach, continued assistance should be provided to SSPs, policy makers, regulators, and utilities.
- **Increase funding available for SSP provision.** Source new funding channels, such as challenge and innovation funds, results-based finance (RBF), trust funds, and catalytic funds to reach additional cities and expand water access to more areas.
- **Drive and pass on efficiency gains.** As SSPs scale up and gain experience, they will likely to be able to lower their costs. This can help reduce the subsidy component. As the sector matures, procurement may also become more competitive, leading to further efficiency gains.

Challenges Posed by Existing Markets in Operationalizing the Concession Model

There are almost no examples of public utilities that have fully integrated SSPs into the delivery of water supply services. Large-scale demonstration projects, as described earlier, are needed to learn how best to design and implement this new approach. Selecting the right location for the demonstration projects will be important—particularly in relation to the existing market. Two extremes highlight this point:

- If there is a competitive water vending system in place already, with many independent vendors providing a variety of water supply services at prices close to supply costs, then professionalizing the vending system and making a single concessionaire serve a specified geographic area may not be appropriate—at least in the short term. In this case, the model is working, even if it is likely to be suboptimal compared with what is feasible or what is desired by customers.
- The state or utility may have no desire to lower prices and improve services, especially if there are substantial rent-seeking opportunities in retaining the status quo.

The proposed model may not be viable in the short term in either of these two extremes. It will therefore be important to find situations in which the existing vendors are small and inefficient, provide poor quality service, and neglect to serve many residents in the area (likely to be poor households).

Chapter 5

Concluding Remarks

As highlighted in this report, an estimated 676 million residents (Misra and Kingdom 2019) in cities across the globe rely on supplementary service provider (SSP) water provision, a number that is continuing to grow—it is projected to reach one billion people by 2030. Most of these people will live in African and Asian cities, and more than two-thirds will be in the two lowest wealth quintiles. Many of these people will be in informal settlements that are often overlooked by authorities and utilities. This is clearly an international challenge given its magnitude and the fact that it predominantly affects the poorest and most vulnerable in society.

In fact, if public expenditures in developing countries are adversely affected by the economic consequences of COVID-19, then these figures are likely to be underestimates. Despite these large and growing numbers, the sector has largely been overlooked in the efforts to achieve citywide inclusive water supply and make progress toward meeting Sustainable Development Goal (SDG) 6.1. The COVID-19 pandemic has provided an alarming illustration of the importance of ensuring a universal supply of safe, affordable water that considers environments, such as urban slums and refugee camps, while also underlining the need to “build back better” from the crisis with cost-efficient solutions that help build resilience.

In the past, the SSP sector has been informal and highly fragmented, often delivering inadequate and expensive supply. It has been stuck in a low-level equilibrium trap consequent on an uncondusive or sometimes hostile policy, institutional, regulatory, and financial (PIRF) environment. Through policy makers recognizing and committing to the SSP sector, its potential to contribute to providing safe, affordable water to the world’s poorest households and helping make rapid progress toward SDG 6.1 can be realized. For a successful international response to the SSP challenges, this study identifies three key actions:

- **Accept responsibility for providing service to nonutility customers.** Acknowledge that current arrangements are inadequate and that governments, utilities, and donors need to cooperate and collaborate to proactively improve the quality and affordability of such services.
- **Create a conducive operating environment for off-utility provision.** Amend the supportive framework at the national and/or city level to reduce SSP business risks, improve affordability for better services, and create incentives to deliver better services to the nonutility households.
- **Develop and demonstrate models at scale.** This will simplify transactions and oversight costs for cities, utilities, governments, and development partners; deliver professional services with better quality and affordability; and be replicable at scale.

Once the right enabling environment is in place, and the political will for change has been mobilized, there is potential to build on alternative, entrepreneurial solutions to deliver affordable, high-quality

water to all households. New models exploiting economies of scale and scope in the SSP sector, when supported by evolving regulatory and policy frameworks and financing, can complement the provision of water by utilities to ensure that all households have access to a clean and affordable water supply. This is critical: Development partners and governments want models that don't have heavy transaction costs, can be substantial in size, and will deliver large numbers of beneficiaries. If such a model can be successfully demonstrated, then the SSP sector will become a viable part of the water service delivery mix in urban areas.

The study highlights the importance of, and processes to, improve SSP services at scale. However, the technical delivery of services cannot be seen in isolation from the global development perspective. In this regard, the improvement of SSP services also supports the broader development agenda regarding jobs and green, resilient, inclusive development (GRID)—areas in which the World Bank, development partners, and clients can collaborate to deliver more benefits than those that flow just from improved off-utility water services.

Appendix A

The Accountability Challenge for Engaging SSIPs in Displacement Settings

Source: Day, Forster, and Schweitzer 2020.

The size of populations in settings for displaced people is unpredictable, with large numbers remaining in such settings for decades. When many are not citizens of a country, responsibility from national governments already trying to achieve access for their own citizens becomes increasingly challenging. Services instead are often provided by humanitarian agencies (for example, the United Nations High Commissioner for Refugees [UNHCR]) and charitable organizations, not just in the emergency situations but for many years to come.

The accountability challenge extends to the service delivery model. In an emergency, there is often little time to install robust, permanent infrastructure. Sustainable solutions require

- Full engagement with, and support from, host governments;
- Coordinated planning by humanitarian agencies, especially for the transition from emergency and postemergency activities;
- Transition plans for handing over ownership, management, and oversight of assets to national entities;
- Support to national government institutions to support ongoing management;
- Deeper understanding of costs to serve, willingness to pay, and long-term funding options; and
- The engagement of recipients, including host communities, in planning and decision making.

In eastern Bangladesh, there is no single coordinated plan to provide water in the enormous camps containing about one million refugees from Myanmar. Dozens of humanitarian agencies, including international and national nongovernmental organizations (NGOs), United Nations agencies, and local authorities have installed thousands of boreholes and dozens of water supply systems using different technologies. There are attempts to rationalize the number of operators (some have contracted private companies). It is unclear how these systems will transfer from emergency to postemergency operation, and the role of local and national institutions is unknown.

In Gambella, Ethiopia, the more than 300,000 refugees from South Sudan who started arriving in 2014 were initially supplied by water tankers, organized by many international NGOs. The ensuing high costs led to a new approach involving the upgrading of the water supply of nearby Itang Town to extend to the camps. Water is pumped from boreholes into reservoirs in and around the camps. Although the supply of 15 liters per person per day is below the UNHCR's postemergency standard of 20 liters, it exceeds that

available in Gambella to the resident Ethiopian population. A new Itang water utility was tasked with managing the system as humanitarian agencies stepped back, with planning and financing handed to the Ministry of Water, Irrigation, and Energy. Perhaps unsurprisingly for a new utility, the transition has not been without problems. Funding is difficult, salaries were much lower than those provided by international NGOs, and training was inadequate for the low initial capacity. This has resulted in much reduced water quantities and quality. Furthermore, relationships among customers, the utility, and the newly established local regulatory authority (Ethiopia has a highly decentralized regulatory system) were weak and resulted in mistrust.

Zaatari Camp, in northern Jordan, hosts more than 76,000 of the estimated 745,000 Syrian refugees in the country. Various humanitarian organizations and NGOs have collaborated in the supply of water services, moving from emergency to postemergency responses. Mobile water tankers initially supplied water tanks, but these are now supplied by boreholes that supply a water supply network that includes private tanks. High demand from refugees has led to a more centralized system coordinated by the United Nations Children's Fund (UNICEF), in collaboration with the government of Jordan, that focuses more on the household level rather than communal services. Virtually all households are connected to the piped network. Water supply is free, which means operations remain fully subsidized. Without a right to work in Jordan, the inability to earn an income makes charging customers difficult. Jordan's geography makes water supply a challenge, so UNICEF has required NGOs and refugee-owned businesses to pay for water delivered by tankers and introduced water conservation programs. Although the Ministry of Water and Irrigation and other government entities are the regulating authorities, and the network is operated by a private contractor, the government has appeared reluctant to take overall control of the water supply system from UNICEF. This is understandable because of the drain on financial resources. UNICEF and other NGOs are still called upon to address issues.

Eastern Nepal has hosted communities of refugees from Bhutan since the late 1980s, supported by the government of Nepal. Over time, resettlement programs have significantly reduced the populations to less than 10,000. Water supply networks have been expanded to include boreholes, storage tanks, distribution networks, and community access points. The Water Resource Act 1992 and Drinking Water Regulation 1998 allow private operators and water user committees to operate water supply networks, setting delivery standards and allowing the collection of tariffs. Water user committees, comprising representatives of households (refugees are not citizens and therefore have no voting rights in decision making), manage systems in three refugee camps and employ a small number of technicians. All assets have been transferred from UNHCR to the local municipality, which has the mandate to supply water to the refugee and host communities. The two entities agreed on a memorandum of understanding, setting out the responsibilities and requirements for service sustainability.

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