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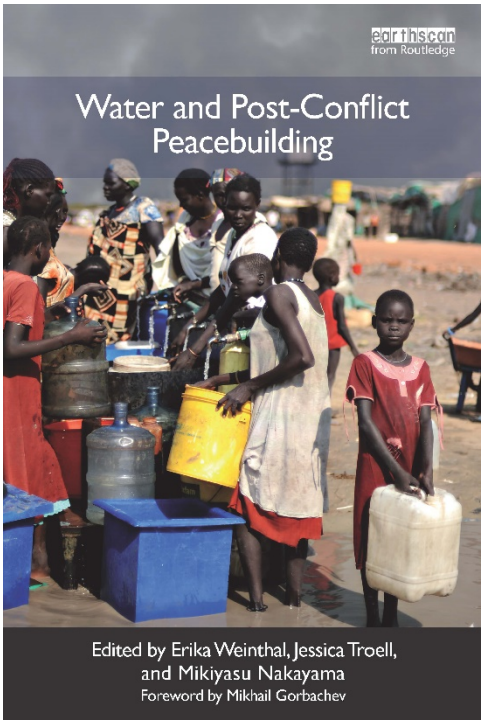

Conflict and collaboration for water resources in Angola's post-war cities

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Conflict and collaboration for water resources in Angola's post-war cities

Allan Cain

Since 2002, Angola has been recovering from four decades of civil war. The conflict resulted in mass displacement of people, destruction of infrastructure, and diversion of investments away from maintenance and infrastructure development, producing chronic public health problems for the population at large. Social exclusion, inequality, and poverty—problems that originally seeded the conflict—are still problems in the post-war era. Access to water mirrors the biased distribution pattern of other resources in Angola. The majority of low-income, urban communities still have no access to affordable potable water and are mainly served by informal water vendors.

In Development Workshop's twenty years of implementing practical projects in Angola, it has gathered knowledge on the functioning of the informal water economy that continues to provide the bulk of water services to Luanda's population. Development Workshop estimates that the annual value of this informal water economy grew over a period of twelve years from about US$60 million during the civil war to almost US$250 million in 2009 (Development Workshop 2009).[1]

Allan Cain is the director of Development Workshop and has worked for nearly thirty years in Angola, implementing projects for community water supply, school building and planning, environmental sanitation, land rights, and public participation. This chapter draws on research carried out by Development Workshop Angola, which is supported by the International Development Research Centre's regional office for eastern and southern Africa in Nairobi, Kenya, under the project Post-Conflict Transformation in Angola's Informal Economy. The chapter also is partly abstracted from the International Institute for Environment and Development monograph by Allan Cain and Martin Mulenga (Cain and Mulenga 2009).

[1] Development Workshop was contracted by the World Bank in 1995, 1998, and 2008 to carry out water surveys, with the objectives of describing the water distribution system in the peri-urban areas of Luanda and other provincial cities, identifying the stakeholders, investigating the extent of their involvement, assessing water consumption and prices, and understanding consumers' priorities for improvement (Development Workshop 1995, 1998, 2008).

In this environment of uneven and inequitable access to scarce urban water resources, conflict born of competition for access to water is inevitable. However, poor communities in Angola's capital city, Luanda, have found collective solutions and have built on neighborhood cooperation and social solidarity to improve their access to water. These experiences demonstrate the important role that community water management can play in promoting a more equitable distribution of water resources at affordable prices in the poor peri-urban *musseques* (informal settlements) of Luanda.

This chapter begins by outlining the structure of water services in Angola after more than forty years of conflict and then, focusing on Luanda in particular, discusses the importance of the informal water market, the main water provider for most of the urban poor. Based on the knowledge gathered by the Development Workshop, the chapter examines Luanda's peri-urban water value chain and uses value chain analysis to assess Luanda's water economy. Several factors affecting success in promoting post-conflict access to water are highlighted, including the need for cooperation with informal water service providers, addressing unresolved issues with those providers, and the importance of social capital in the informal water sector. The chapter examines key elements of community-based water management, particularly robust and low-cost technology, sustainability strategies, and water committees and associations, and concludes with recommendations for national post-war strategies.

WATER SERVICES IN POST-CONFLICT ANGOLA

Angola won independence from Portugal in 1975 after waging a war of independence that lasted almost fourteen years. At that time, Luanda had a population of about 500,000 people, many of whom were Portuguese settlers and urbanized Angolans. After independence and the flight of many Portuguese nationals, the country was immediately plunged into a brutal and protracted civil war that ended only in early 2002. The last decade of conflict was punctuated by a series of ceasefires that invariably broke down and were followed by a return to conflict.

These cease fires were lost opportunities to build peace by making politically divided communities and national economic actors into stakeholders in social reconstruction. The government of Angola did not implement the expected economic and administrative reforms that were considered to be preconditions for major local and international investment. The nascent national private sector, which was born out of the previously socialist state apparatus, emerged very slowly because the government failed to carry out the promised monetary, banking, and legal restructuring, which would have stimulated local small- and medium-scale private-sector development. Local entrepreneurs lacked confidence due to the slow movement of the peace process and the failure to guarantee the free movement of people and commodities around the country and between the cities and rural areas.

Peace was achieved only following the death of Jonas Savimbi, the president of the insurgent liberation movement UNITA (União Nacional para a Independência Total de Angola): in April 2002 a definitive cease fire was signed between the rebel army and the government of Angola. The peace agreement corrected some of the errors of earlier accords, which had not adequately demobilized the opposition's military forces. The 2002 Luena Memorandum of Understanding,

an addendum to the previously concluded Lusaka Protocol, treated the former rebels with magnanimity, allowing UNITA to operate as a parliamentary political party and offering former combatants a dignified decommissioning and the opportunity to reintegrate into their former communities. However, reintegration into rural settlements that had been devastated during decades of conflict was only partially successful. Many former combatants, some of whom had perpetrated acts of terror in their areas of origin, joined a new wave of migration to the capital region in search of employment.

As control of the rural areas fell to one or the other contesting party during the civil war, government in those areas was nearly absent. There were massive shifts in population as people in rural areas sought refuge from the fighting and fled to the relative safety of the cities. Most of the internally displaced persons concentrated in Luanda. After forty years of conflict, Angola's landscape was heavily mined; its infrastructure had been neglected, sabotaged, or destroyed; state administration was weak; about 4 million persons were internally displaced; and the economy was barely functioning and had little productive capacity.

By the end of the conflict, only about 17 percent of households in the country reported having adequate access to water, and only 10 percent of total households had in-home connections. Of the households with a tap in their residence, only half received water every day; 35 percent received water most days; and 14 percent received water only once or twice per week (Pinto and Ribeiro 1998). A 1998 Development Workshop survey of peri-urban Luanda revealed that one-third of households with domestic water connections did not receive water through them. Only 5 percent of households reported that their connections provided water at least two or three times a week, and just three of the forty-three zones in the survey had more that 20 percent of households reporting domestic connections that provided water at least two or three times a week (Development Workshop 1998; see table 1).

In Luanda the water network was originally built for a colonial population of a half-million people. At independence, poor neighborhoods (musseques) in Luanda were served by about 300 standposts connected to the treated-water network. These standposts were distributed so that water could be fetched in buckets and jerry cans and carted or head-loaded back home. Water carting was traditionally the burden of women and children. During the conflict years, many standposts fell into disrepair; however, a number of nongovernmental organizations and international donors working with the state-owned water service corporation Luanda Provincial Water Company (Empresa de Aguas de Luanda, or EPAL) promoted standpost construction as a strategy to provide at least a basic supply of water to the musseques. By the end of the war, the network was stretched to its breaking point, with piped water reaching only a quarter of the city's households. Most of Luanda's population rely on water purchased from tanker trucks, with prices varying from the equivalent of US$4 per cubic meter

Table 1. Household water sources in Luanda, Angola

	1996		*2002*
	Main water source %	***Secondary water source %***	***Main water source %***
Tap in residence linked to network	6.0	1.1	6.2
Tap in building or neighbor's building	16.3	9.3	14.3
Tap in yard or garden	NA	NA	5.1
Public standpost	12.2	8.2	16.4
Borehole with pump	3.5	2.5	6.9
Spring or well	22.3	17.9	29.9
Surface water	1.3	3.5	0
River water	16.4	19.9	12.2
Lorry or tanker	11.2	25.2	6.5
Other	10.8	12.4	2.5

Sources: UNICEF (1997, 2002).

in an area close to a water company distribution tank to US$20 in an area distant from the river and from any piped water connection. (Table 2 shows distance of water source from Luanda households.)

One of the important challenges of post-war reconstruction is to provide more and better-quality basic services, including access to water. Attempts during the conflict years to improve peri-urban water supply were hampered by the government's lack of capacity to maintain the infrastructure that already existed, much less upgrade these systems or build and manage new ones.

Since the conflict, projects aimed at upgrading the main water supply systems to accommodate peri-urban areas have been overwhelmed by explosive population growth in Angola's major cities. The amount and quality of water available in most areas (and especially in peri-urban areas) is significantly below recommended levels. It appears that Angola will have difficulty in reaching the Millennium Development Goal (MDG) targets related to water and sanitation.

Table 2. Distance to main water source for households in Luanda, Angola

	1996 %	***2002 %***
Tap in residence	5.7	7.2
Less than 100 meters from residence	47.3	51.0
100 to 500 meters from residence	30.3	28.6
500 to 1,000 meters from residence	12.2	7.7
More than 1,000 meters from residence	4.4	5.5

Sources: UNICEF (1997, 2002).

Water is costly and of poor quality, representing both a significant household expenditure for the urban poor and a growing health hazard, as evidenced by several post-war outbreaks of highly communicable diseases, including cholera, whose incidence is known to correlate with poor water quality and restricted access. In 2006, there were over 50,000 cholera cases in Angola and over 5,000 deaths from the illness. Cholera remains endemic in Luanda and several other urban centers.

The MDGs map out the ambitious target of reducing by half the number of people who lack minimal access to potable water by 2015. The government of Angola has incorporated the MDGs into its short- and medium-term plans for the water sector, and it has worked with bilateral and multilateral donors to draft large-scale plans for increasing water supply to Luanda and other cities through increased pumping and pipeline capacity. In 2008 the government launched the Agua para Todos, or Water for All, program. At its launch, the national water director made a public commitment to provide water to communities "wherever they are," signaling a new, more inclusive government policy to bring water to poor, previously excluded communities.

Official attitudes favor the participation of an organized private sector in water provision. However, the existing private sector is disorganized and needs to develop in its capacity to be a reliable partner with the government in the provision of essential services, including water. Provincial water authorities in both Luanda and Benguela have shown interest in franchising standposts to private-sector operators, but in the few cases where private operators have taken up franchises, they have proved unreliable and unable to guarantee the maintenance of those water systems (Development Workshop 1997).

In the meantime, the overwhelming majority of Angola's peri-urban population continues to rely for its water supplies on an informal system of water sellers and transporters that was developed by poor people who had been displaced from rural areas affected by the conflict. Residents of Luanda typically purchase water from tank owners, who have bought their water from lorry owners, who have transported water from the nearest river or have filled up at official or unofficial stations where water comes from the piped supply.

The mechanisms that poor people in Luanda use to access water are not merely economic arrangements. In the aftermath of conflict, it is important for neighborhoods to build social solidarity, especially in communities where social capital was severely eroded during the conflict. Rather than provoking competition, water scarcity has nurtured cooperation among neighbors in many of Luanda's *bairros*, or neighborhoods.

The informal sector has demonstrated its capacity to fill the service gap left by an under-capacitated government, but it lacks the regulatory controls necessary to ensure the provision of sustainable and safe supplies of water to a population in need. Therefore, Development Workshop partnered with local communities to develop the Community Management Model for water delivery—a model that promotes both sustainable enterprise and social solidarity between

consumer-stakeholders. The Angolan government has incorporated these principles of community management into a national strategy under the banner of the national Water for All program.

IMPORTANCE OF THE INFORMAL WATER MARKET

The national post-war rehabilitation program in Luanda and other cities has included the rebuilding and extension of formal water systems. However, these programs are still at an early stage. It will take time to rebuild the core of systems that have not been maintained sufficiently for over thirty years or that were sabotaged during the conflict. It will also take time to develop new extensions to the formal water system. It is expected that the rehabilitated systems will supply piped water to households in the urbanized districts of the cities, but government planners envisioned that the peri-urban peripheries will still be supplied by community standpost water points.

The public utility, EPAL, manages water production and the distribution cycle through a vertically integrated monopoly. During the years of conflict, the growth of EPAL's water distribution system and the maintenance of the existing infrastructure did not keep pace with the growth of the urban population. Since the end of the civil war, EPAL has benefited from access to new Chinese and Brazilian loans and lines of credit, which have been used to install a new plant and other infrastructure. However, EPAL still suffers from weak management capacity and draws technical assistance and management advice from Portuguese firms that are familiar with the colonial-era systems left over from before independence but do not necessarily bring knowledge and experience appropriate to developing-country contexts where innovative solutions are required to meet the urgent needs of the urban poor.

Large areas in Angolan cities are likely to continue relying on informal water suppliers for some time. The government has tended to regard informal providers as economic opportunists who are filling the supply gap while the government develops its full capacity. Some people argue that small-scale water service providers give poor service to consumers, failing to meet both technological and quality standards. Recently, however, these suppliers have gained recognition as a viable alternative for communities that are not connected to the water grid, though this recognition has not yet translated into a legal or institutional framework within which informal service providers can operate.

Those government officials in charge of water distribution who recognize the important role of informal suppliers acknowledge that the informal sector is the main water supplier for most of the urban poor and that this segment of the population would go unserved if small-scale water service providers stop working. They also know that the provincial government's plan to extend the water supply system to all of the new and informal settlements is unattainable in the immediate future. (The extent of Luanda's informal settlements is shown in figure 1.) Finally, there is a growing recognition that urban water management in Luanda is not

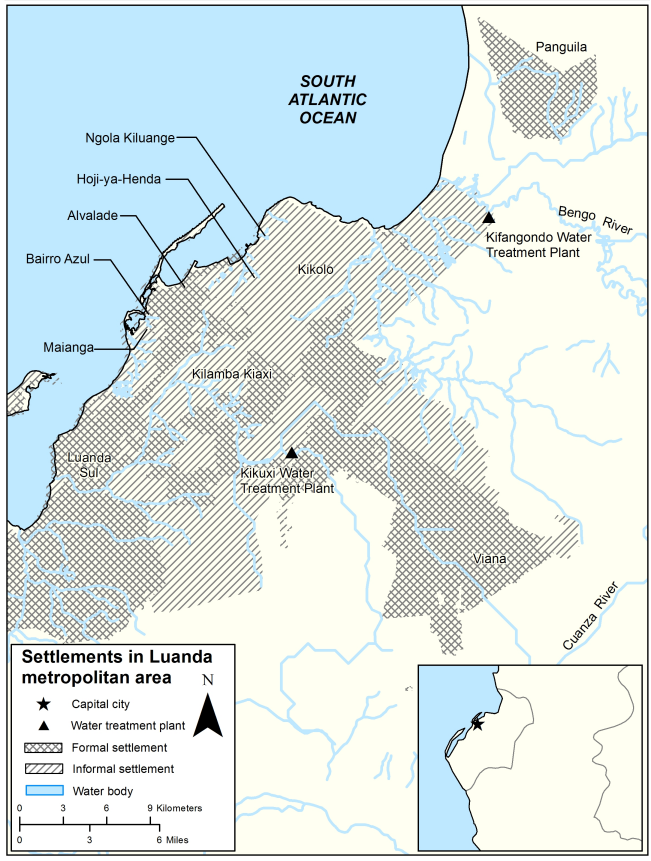

Figure 1. Formal and informal settlements in the greater metropolitan area of Luanda, Angola
Source: Created by Mathieu Cain for Development Workshop.

solely a government mandate and that its successful functioning is supported by a strong interaction of formal and informal activities.

LUANDA'S PERI-URBAN WATER VALUE CHAIN

Development Workshop has used various value chain tools to obtain a clearer picture of Luanda's informal peri-urban water market, which turns over more than US$250 million annually and provides almost twenty liters of water per person per day to almost 4 million people at a price of US$0.01 per liter. It has asked questions about the market itself (What is the main source of supply? Where is value added? Where is money made?), about market chain participants (What are the relationships between the formal and informal institutions involved? Where do they fit in the process of delivery?), and about consumer end points (What are the levels of access, satisfaction, affordability, and willingness to pay?).

Value chain analysis is a tool that involves the mapping of sequential commodity transactions. It has proved to be particularly useful for assessing the water economy in Luanda, where water services can be unbundled, with various components of the distribution chain operated by different entities (see figure 2). In the informal market, most water is supplied through a simple vertical structure:

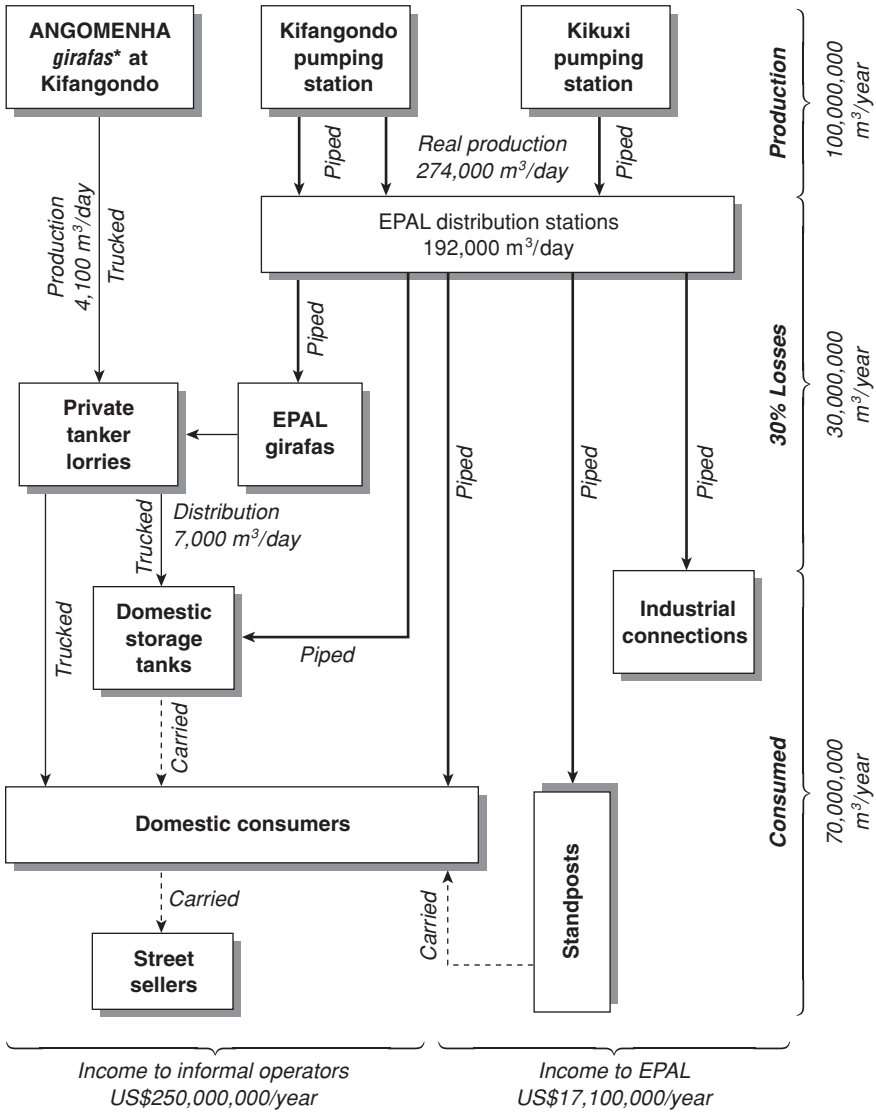

Figure 2. Value chain model of the water supply system in Luanda, Angola
Source: Development Workshop (2008).
Notes: EPAL is the state-owned water service corporation Empresa de Aguas de Luanda.
* Water truck filling stations

water is pumped from the river, transported by tanker trucks, treated, stored in tanks, and distributed by street vendors. In contrast to the formal water supply system in which water is treated at riverside pumping and treatment stations, in the informal system water is treated later in the process, if at all. In the informal system, treatment involves introducing chlorine into tanked water being transported by tanker truck drivers. Public health officials encourage people who buy water from informal suppliers to disinfect the water before consuming it.

The key actors within the informal water supply market chain include the government of Angola, represented by the National Directorate for Water Supply and Sanitation; EPAL, the public company responsible for the production and distribution of water in Luanda; ANGOMENHA, an association of operators who pump river water for their tanker truck–driver members and transport it with tanker trucks to the informal supply network; water truck operators; home tank owners; and finally, consumers. The tanker truck operators are responsible for transporting water to unconnected consumers, and the home tank owners sell water at retail from underground tanks.

EPAL, the formal-sector water service provider, has a facility in place to produce 255,000 cubic meters of water per day, but it is currently operating at 35 percent below capacity (at 165,500 cubic meters per day) as a result of leakages in the distribution system and other technical and managerial constraints, such as weak consumer tracking and billing and a lack of authority to set economic tariffs. If it were operating at full capacity, in 2008 EPAL could have provided Luanda residents an average 57 liters of water per person per day, but given its reduced capacity, the amount of water per person is only 37 liters per day. Highly unequal distribution exacerbates this scarcity for many residents: most citizens who are not connected to the network receive nothing, while the fortunate few receive an unlimited supply. The amount of water that reaches connected consumers has been estimated at only 64,000 cubic meters per day; the remaining 101,500 cubic meters are distributed to unconnected consumers through standposts, water truck operators, and home tank owners (Cain and Mulenga 2009).[2]

As a short-term solution to the water distribution problem, EPAL had planned, on the basis of recommendations made by Development Workshop in its 1995 report, to build water truck filling stations *(girafas)* at sites on the periphery of the city where an underground pipe network did not exist (Development Workshop

[2] The amount of water that reaches connected and unconnected consumers cannot be determined with certainty because there are many illegal connections to the pipeline in bairros that lack a secondary network distribution system to the households. In addition, because water supply to households with connections is intermittent, those households also buy water from the informal distributors at various times during the year. Unconnected households close to the better served urbanized bairros, like Alvalade, Maianga, and Bairro Azul, can access piped water via clandestine connections to officially served households.

1995). Water truck operators would be able to buy water at the filling stations and resell it to unconnected households. However, EPAL constructed most of the filling stations adjacent to the EPAL water treatment centers within the city, where water pressure was higher and EPAL believed that the girafas could be more easily controlled. Underserved households are still ten to twenty kilometers away from the filling stations, and the farther a household is from a filling station, the more it pays for water. This is the case even if the price of water at the filling station is set at a low, subsidized level.

New water systems that are funded with foreign loans and serve individual households have only been built to serve the commercial, high-income, low-density areas in the southern extension of the city (Luanda Sul). These new systems often bypass high-density, low-income neighborhoods en route between the water source and the distribution point. Water provision to the newly developed subdivisions greatly enhances the value of land plots there, and it therefore benefits commercial developers, but it brings little income to EPAL. Yet EPAL still sells water at the official subsidized price to the relatively small number of consumers living in these low-density residential areas.

FACTORS AFFECTING SUCCESS IN PROMOTING POST-CONFLICT ACCESS TO WATER

Several factors affect the likelihood of success in promoting post-conflict access to water, including cooperation with informal water service providers, unresolved issues with those providers, and the role of social capital in the informal sector.

Cooperation with informal water service providers

Because the formal water service sector has been unable to meet the water needs of so many of Luanda's residents, officials have been obliged to accept the role of informal-sector water truck operators. The difference between the formal and informal water sectors is not clearly defined. The informal sector is often regarded as an extension of the formal because it fills a critical gap in the formal sector's capacity to extend services beyond the official network of household connections. Informal water service operators, some of whom are military officers or relatives of government functionaries, see themselves as partners of the government, and they seek government officials' recognition of the important service they provide. However, they are often identified as black marketeers and exploiters of the poor because of the high costs of transport, which they are obliged to pass on to consumers.

One of the official filling stations in Luanda is owned by water truck operators who have organized themselves into the association called ANGOMENHA. The association interacts with EPAL and the provincial government on behalf of its members. The ANGOMENHA filling station, located adjacent to the Bengo River, is the main source of water sold by trucks in Luanda. It serves about 550 trucks per day, each of which has a capacity of between five and twenty-five

cubic meters (Development Workshop 2009). Because ANGOMENHA has the most efficient filling system, drivers at its station do not need to wait in long queues (see figure 3).

Each pump owner and water truck operator who is a member of ANGOMENHA is expected to contribute toward a monthly maintenance fee and to pay a 1 percent monthly tax on revenue to the Ministry of Finance. An additional fee that covers maintenance of the road leading to the station is paid on ad hoc basis.

Although ANGOMENHA's members are informal operators, the creation of the association is a clear attempt to formalize and rationalize their role and to establish themselves as a legitimate part of the market chain. The informal operators' willingness to pay taxes and water fees is a demonstration of their acceptance of some degree of regulation. Recognition of these operators, then licensing and regulation by the state, would reduce the risks they face by giving them some protection from (sometimes off-duty) law enforcement officers who seek illicit fees by providing operators with official business licenses.

Unresolved issues with informal services providers

Water vending is exceptionally profitable for operators who pump water from the river. They can earn a return on investment in two years or less. Profits are

Figure 3. Tanker trucks filling up from the River Bengo at the ANGOMENHA filling station at Kifangondo, Angola
Photo: T. Hetherington (2005).

lower for truck operators, for whom high fuel and labor costs are exacerbated by traffic congestion on Luanda's overcrowded roadways. The most significant cost is depreciation of vehicles, which is estimated to consume over half of an operator's margin. The reason for the high price of water delivered by tanker trucks is not unreasonable profits for truck owners, but the cost of the vehicles and their operation.

Another problem in the informal sector is unsafe drinking water. The water sold at the ANGOMENHA filling station is untreated at the source and therefore poses serious health risks to consumers. All drivers are expected to stop at a small nearby station for chlorine treatment, which costs only US$0.12 per cubic meter, but there is no system of enforcement to ensure that the water has been successfully treated. Most of the time no one verifies whether the driver has added chlorine to the tank.[3] During one cholera epidemic, Development Workshop piloted a community-based water-testing program (Development Workshop 1994). It trained community volunteers and equipped them with simple chlorine test kits. Volunteers targeted tank owners and water resellers in bairros where the cholera risk was high. The program raised the awareness of intermediary sellers about the need for water treatment and provoked them to boycott negligent water truckers who failed to avail themselves of the free water chlorination stations set up by the public health service during the crisis.

The role of social capital in the informal sector

Water selling in its various forms is probably the largest subsector of Luanda's extensive informal economy, and the interface between transporters and retailers is central to the informal water supply system. The retail price of water is set by household-based resellers. When they can buy bulk water cheaply, they normally pass these savings on to consumers. Focus groups organized by Development Workshop reported that vendors do not sell for profit at all, but rather to cover their own water-consumption costs. Only rarely did groups say that they felt exploited by the water vendors in their neighborhoods (Development Workshop 1995).

Neighborhood water access and prices are not determined solely by commercial factors. Social relationships and community solidarity play an important role. Householders who possess a water tank are in a position to choose not only the price but also the neighbors to whom they wish to sell. The price of water often varies, depending on the relationship between the owner of the tank and the water buyer. The owners of water tanks often sell water for a lower price to people with whom they have built a relationship or mutual solidarity (Lindblom 2010).

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[3] EPAL takes weekly samples of water to its labs for chlorine analysis, but only from the cisterns of trucks that have voluntarily stopped for chlorination.

Home tank owners often do not have sufficient capital on hand to buy a truckload of water every time their tank becomes empty. Until they can accumulate a lump sum to purchase a complete load of water, they may become consumers of water from other tank owners in the neighborhood. Social networks evolve locally among neighbors who may be buyers and sellers at different times. It thus becomes essential for each water consumer in a poor, unserviced musseque to maintain amicable social relationships with a range of water suppliers within walking distance of their homes.

A secondary level of retailing within the informal market is sometimes practiced by street vendors who sell water in small containers or plastic bags (see figure 4). These vendors usually receive their water from home tanks and standposts and sell in units of half liters for US$0.06 to US$0.12 each. These ambulant traders are considered to be at one of the lowest rungs of the water market, and they make very small profits. For the poor and for women and youth, street vending is often seen as an entry point into the informal market that requires little capital or skill.

Water carrying by women and children is rarely factored into the price of water after it is delivered by truck to the neighborhood reseller or by pipe to the standpost. Significant time and therefore value is added by women and girls who head-carry jerry cans, basins, and buckets of water sometimes hundreds of meters

Figure 4. Street vendors reselling water in plastic bags in Luanda, Angola
Photo: T. Hetherington (2005).

Table 3. Carriers of water in urban areas, Angola

Carriers of water in urban areas	*%*
Women, age 18 and up	62.2
Female youth, age 12–17	16.6
Children, age 5–11	5.9
Male youth, age 12–17	5.3
Men, age 18 and up	4.7
Unspecified	5.3

Source: UNICEF (2002).

to their homes, and by children who haul water carts often weighing forty to fifty kilograms for even longer distances (see table 3).

A NEW PARADIGM: COMMUNITY-BASED WATER MANAGEMENT

With support from the Luanda Urban Poverty Programme (LUPP),[4] Development Workshop's Sustainable Community Service Project was developed to build partnerships with the provincial and national water authorities to develop robust systems for community-based water management in a city with rapid population growth, high levels of poverty, numerous informal settlements, and weak local government.

It was clear from Development Workshop's research, including its affordability and willingness-to-pay studies, that low-income households were prepared to pay for a public water supply service if they received reliable service and the price was less than that charged by private water vendors. A model was therefore developed to provide such a service at a price affordable to consumers. The costs of the water as well as standpost maintenance would be covered, and revenues for EPAL, the water company, would encourage it to provide a continuous supply to the standposts.

Water committees were formed to operate the standposts, collect revenue, oversee operations and maintenance, monitor and register the number of days of water flow, and ensure that records of all payments and expenses were kept. This meant developing community organizations that were accountable to residents, something for which there was little precedent. The new community organizations also had to manage finances and deal with conflict, including conflict related to enforcement of the prohibition against illegal connections.

Associations were developed through which committees involved in managing standposts could share their experiences and work together in seeking better services from EPAL and from local authorities. EPAL also recognized that it did not have the capacity to manage water supply at the community level and that it should concentrate on improving bulk water supply—that is, improving the

[4] LUPP is a consortium of nongovernmental organizations (NGOs) supported by the United Kingdom's Department for International Development. Participating NGOs include Development Workshop, CARE, Save the Children, and One World Action.

process of extracting water from the river, treating it, and distributing it through water mains. The Sustainable Community Service Project is thus building local institutions from the bottom up and seeking to create trust and working partnerships between community organizations, local governments, and EPAL, in which each has defined roles and performance standards.

This type of long-term, local institutional development is not something that most international funding agencies support. Their support is more often for capital investments in time-bound projects. Many external agencies also promote privatization as the solution, but privatization would be inappropriate for Luanda. Angola's national private sector is weak, its public institutions are not strong enough to regulate privatization, and Luanda's large population has incomes too low to be attractive to private enterprises.

Key elements of sustainable basic service models

Development Workshop and its LUPP partners have refined the Community Management Model of sustainable community water management, have rigorously tested its components in practice, and have allowed adequate time for learning and feedback, with the aim of replication and scaling up to serve a larger target group. The project can be seen as a low-cost experimentation phase in advance of major investments that are eventually likely to be made in peri-urban Luanda by the World Bank, the European Union, the African Development Bank, and the Angolan government through commercial credit lines such as those now available from China and Brazil.

The Community Management Model has three key components: hardware that is based on robust and low-cost technology; a sustainability, or cost-recovery, strategy; and a community management system.

Robust, low-cost technology

Development Workshop programs supply water through public standposts constructed by joint EPAL and Development Workshop construction teams and linked to the main water supply. Communities suggest the sites, which are then rigorously screened to prevent the selection of sites where water pressure will diminish over time.

The program promotes the construction of standposts in areas where water pressure is insufficient to supply household connections. The aim has been to bring water to within 200 meters of every house because a number of studies have shown that when water is supplied at a distance of less than 200 meters, water consumption increases. To date this has never been possible in Luanda because water pressure has rarely been sufficient to allow this coverage. The Angolan government continues to work toward the commitment made in its Water for All project to increase water supply in order to reach at least 80 percent of slum dwellers with this minimal level of service.

Sustainability strategies

The Community Management Model employs a number of strategies to ensure that the water supply system will be sustainable. It starts by addressing a priority need that the community has identified during meetings to which representatives of each household were invited. It uses appropriate technologies that are accessible, affordable, and accepted by the users, and for which users can manage the ongoing maintenance.

As each water supply project progresses, the Community Management Model applies an informed-stakeholder analysis. Stakeholders are encouraged to dialogue and collaborate as they perform and monitor their respective roles in service provision. The project supports them in the development of their capacity to carry out their responsibilities and to deal with the conflicts that can arise from provision of basic services. The project also assists with the development of consumer associations, provides the legal support necessary for their registration with municipal administrations, and trains and supports community residents to help them reach their potential as user-managers of water services. The project also raises community awareness about ways to improve access to basic water services, and it urges policy makers to consider community management of resources as a viable option.

In this water supply model, users are client-consumers. They make fair payments for services provided, look after their community's investment, and put pressure on other stakeholders to be accountable for the performance of their roles. The money collected is divided proportionally to pay for water from EPAL, to pay local authorities for police protection, and to fund water committees and associations of water committees. Maintenance funds are managed by the associations through bank accounts that are audited annually to ensure the quality and transparency of the management of community money. This strategy helps to guarantee the financial sustainability of the standposts, helps people to become accustomed to paying for public services, and strengthens the capacity of local structures in management and accountability.

Finally, the Community Management Model establishes monitoring systems to track progress, identify technical and systemic problems, and identify new opportunities. Problems are addressed promptly and in a transparent fashion with the stakeholders. It pursues new opportunities in water service management when doing so does not compromise ongoing commitments.

Currently families participating in community management projects buy from standposts an average of five buckets of water per day (a hundred liters) at a cost of US$0.13 per day. This corresponds to US$1.30 per cubic meter, which is 12 percent of the price charged by private vendors selling water from tanks supplied by trucks. The amount charged at standposts has proved to be adequate for maintaining and repairing the standposts, paying a monitor, and contributing to EPAL for the cost of water supplied. Users may be willing to pay more for a household or yard tap, and this would yield health benefits because

people with such water connections tend to use more water. Currently, however, not enough water is supplied to the city to serve a large number of consumers with household connections.

Community management through water committees and associations

The Community Management Model increases local responsibility and develops reciprocal actions between consumers, local administrations, and water provision companies. The beneficiaries of the model must be involved in the process from the beginning. The community management committee has decision-making authority to select locations and to plan for the standposts, the water distribution system, and maintenance.

The Community Management Model was developed over a fifteen-year partnership between Development Workshop and EPAL. This partnership has been progressively consolidated, with the objective of improving EPAL's capacity to construct community standposts and of developing systems of community management that can be expanded and replicated across all of Luanda.

The management and maintenance of this model is carried out at the local level by community groups—water committees, associations of water committees, and area-based organizations—elected by the users of the service. Community management requires constant investment in training and capacity building for all participants in the process, with special attention being given to the community groups. Central to the model is local groups' participation in the negotiation and management of public assets, so the model involves local authorities and EPAL as well as the representative community groups.

Cooperation between the water sector and communities involves the joint identification of problems that need to be resolved and linkage with appropriate technologies that need to be promoted. In accordance with the fundamental principles of community management, the community must take on the process of change, and if it is possible it must develop its own management associations. Angola's water sector authority, the National Directorate for Water Supply and Sanitation, has set up national and provincial departments to promote community water management under the recently launched Water for All program. Training materials created by Development Workshop are now used widely by the directorate.

Overall impact

LUPP has implemented the Community Management Model in the communes of Ngola Kiluange, Hoji-ya-Henda, Kikolo, and Kilamba Kiaxi. Seventy-three standposts were constructed that supply 74,000 people with water. It was necessary to rehabilitate 4,250 meters of the principal water distribution pipeline to ensure that the community standposts would function. Construction of the standposts increased water consumption from 7.6 to 14.58 liters per person per day;

reduced the average distance to collect water from 200 to 89 meters; reduced the price of water, making it five times cheaper than water purchased from private sellers; and considerably improved the quality of water from the public network (Development Workshop 2004).

Increased access to water reduces the time spent in water collection, which provides people—particularly women—with more time to pursue educational or income-generating activities. The increased proximity of the standposts to homes has had a positive impact on social inclusion because access is now easier for the most vulnerable groups.

The participating communities are not passive recipients of a technical asset; they are actively involved. They contribute and expand their knowledge and capacity, and they are accountable for their actions. The implementation of the Community Management Model has stimulated reflection among LUPP, local authorities, and EPAL about the capacity of communities to manage their own standposts.

The Community Management Model thus promotes the creation of social capital and of local structures that allow communities to participate in the resolution of their own problems, more independently of external experts than might otherwise be the case. Water management groups represent a mechanism for exercising citizenship at a local level and for promoting active civic participation focused on the importance of the rights and duties of citizens. The model also promotes an entrepreneurial spirit locally as demonstrated by several community water committees who have reinvested surplus funds earned into extending the basic water network and initiating social projects such as day care services for working mothers who have businesses in the informal marketplaces. Home-based retail sellers and street vendors still operate in places where the Community Management Model has not reached. At the time of writing, large parts of Luanda are not served by EPAL's water network. Trucked-water sellers, being by definition mobile, have shifted their services to these otherwise unsupplied neighborhoods, where they are still in great demand.

RECOMMENDATIONS

During wartime, state structures are usually underfunded and often ignored, and a lack of accountability often becomes embedded in the structures, so they need to be thoroughly reformed. The conflict in Angola weakened the state's capacity to deliver basic necessities such as water, and it provided an excuse for the state and the political elite to sever the link between their responsibilities and society's needs. The state became strong and weak at the same time: the conflict strengthened the security and command-oriented aspects of the state while weakening institutions that function through trust, dialogue, and accountability (Development Workshop 2006).

National post-war strategies need to address the rebuilding not only of physical infrastructure but also of human and social capital. Strategies should assist in consolidating peace and overcoming the legacies of war by addressing

the root causes of conflict, such as inequitable access to essential services and resources, including water. Stabilizing fragile and vulnerable post-conflict transitions includes supporting the return of displaced people, promoting livelihoods strategies, and rebuilding essential public services.

Until the state-managed Water for All program is able to deliver potable piped water in adequate quantities and at affordable prices to virtually all Angolan households, or at least to construct standposts within close walking distance of every home, a transitional strategy needs to be adopted with a policy and operational framework that defines a role for small-scale water service providers. Such a framework needs to set standards of quality and efficiency and must not ignore the role of important participants in the existing delivery system.

Angolan politicians have often defended the position that basic services should be provided free of charge, and as a result insufficient funds have been available for the maintenance of existing services. Informal settlements are considered difficult to provide for, and official planners see such settlements as impermanent even though the majority of the urban population lives in them. Central-government income from the country's extractive industries has rarely trickled down to basic service provision in peri-urban and rural areas,[5] so poor people must pay a high price for essential services delivered by the private sector or lose income because of frequent illness from contaminated water.

International financial institutions have promoted privatization. As implemented in Angola, this has meant an obsession with profitability, with little attention being paid to affordability, accountability for funds collected, and inadequate preparation of public institutions for effective regulation of private-sector participation. When the privatization model has been applied in post-conflict Angola, operators have attempted to extract short-term gains, prices have risen, demand has been suppressed, and there has been a lack of clarity about how profits are used.

Those advocating for privatization assume that competition will provide accountability. They believe that holders of concessions to supply water will compete among each other to provide better services at cheaper prices. However, the institutions required to manage this sort of competition do not yet exist in Angola, and when concessions are based on geographical districts, they operate local monopolies; consumers cannot readily choose among services from competing providers.

This chapter demonstrates that in post-conflict Angola the unregulated informal private sector has stepped in to meet a basic need that state water service providers have not met. Although informal water service providers are unable to deliver adequate quantities of water of sufficient quality at affordable prices, they have, with narrow profit margins, enabled the survival of people living in the peripheral musseques where basic services from the state have not yet reached.

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[5] Angola rivals Nigeria as sub-Saharan Africa's principal oil producer. Diamond mining is Angola's second most important extractive industry.

Contrary to classic privatization models, the informal private water economy, operating in an environment of scarcity, has been sustained on the basis of complex collaboration and social solidarity rather than on the basis of competition. Slum dwellers are often both buyers and sellers of water at different times and therefore are obliged to maintain amicable social and economic relationships with their neighbors, who may also be alternatively water suppliers and customers.

In an urban center like Luanda, its population swollen by people who have fled decades of civil conflict, the Community Management Model promotes the development of social capital. It builds on the strengths of the informal sector while improving the accessibility, quantity, quality, and price of water. Its collaborative approach can be adapted by other post-conflict urban societies where physical water infrastructure has broken down and community networks need to be rebuilt.

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