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Informal water markets and community management in peri-urban Luanda, Angola

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ABSTRACT

The majority of Angola's peri-urban population still rely on informal mechanisms for water supply. This water is expensive and of poor quality, representing a significant household expenditure for the urban poor. The article uses qualitative tools and tracking of the supply chain to analyze the scope of the informal water economy in Luanda. Marketing water at the local household level involves significant trading in social capital. A financially sustainable model of community water management that builds on this neighbourhood social capital has been adopted by the government for implementation across the country.

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Angola; post-conflict; musseque; slum; poverty; water governance; sustainable

Luanda's informal economy in war and peace

Luanda is one of Africa's fastest-growing cities, its population increasing at a rate of almost 7% annually, and reaching over 7 million people by 2016. The breadth of Angola's informal sector – and its pervasive role in the lives of most Angolans – cannot be overstated. Throughout the vast urban *musseques* (informal settlements) of peri-urban Luanda, in which approximately half of the city's population currently reside, essential services – such as water and food distribution – are provided for the overwhelming majority through private initiative in the informal sector.

Luanda's informal economy grew during the conflict years before 2002, when it was estimated to employ 37% of the entire country's labour force, robustly justifying UN Resident Representative Erick de Mull's assessment that 'Luanda had become the largest laboratory for survival strategies in the world' (private communication, 7 April 2003).

The current article is based on studies conducted by Development Workshop aimed at providing basic information about the informal market's structure, as well as the knowledge gained from subsector studies on the dynamics of peri-urban water markets.¹

Water selling in its various forms is probably the largest subsector of Luanda's informal economy. The water infrastructure of the city was built in the early 1970s for a colonial population of half a million and could not be stretched to serve the four million living in the capital by the end of the war in 2002. The lack of public investment

during the conflict years meant that the informal sector, which provided the only source of economic opportunity and development for many, emerged as the principal supplier of water.

Post-war investments in urban infrastructure extended the water network to supply new middle-class condominiums with household connections and improved services in the central business district. However, little was initially invested in upgrading basic services for the *musseques*.

Leading up to the elections in 2008, investments were eventually made in the water sector and included the government's Water for All programme.² The latter aimed to make drinking water available for 80% of peri-urban and rural populations and to guarantee a minimum daily per capita availability of 40 litres per day. These targets were not met: only 51.4% of the target population was reached, and of the water systems installed, less than 50% proved functional (Development Workshop & Cowater International, 2012).

The informal market thus continues to meet demand for water that the State cannot satisfy for a third of all city dwellers (Figure 1). The market typically involves the purchase of water from owners of tanks, who have bought their water from truck owners, who transport water from the nearest river. This water is expensive and of poor quality. It represents both a significant household expenditure for the urban poor, and a growing health hazard, as witnessed by outbreaks of highly communicable water-borne diseases.³

The government sees these suppliers as an enemy of development, labelling them profiteers, the 'water mafia', exploiters of the poor – arguing that small-scale water service providers give poor service to consumers, failing to meet both technological and quality standards. Development Workshop contends that rather than criminalize the informal market, the government should view its operators as allies.

Research for influencing public policy and community action

Against this background, it was essential to understand the informal water supply market in order to see whether and how it could be adapted to work in parallel with the official system to meet the shortfall in supply. Co-production was the strategy

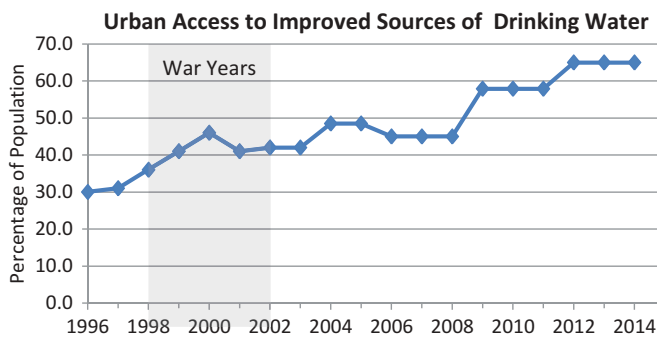


Figure 1. Evolution of access to improved sources of drinking water in war and peace.

Source: Ministry of Urbanism & Housing (2016, p. 99), with permission of author.

employed for exposing policy makers to the results of research. Development Workshop engaged local government, community associations and academics in research and data collection. Subsequent co-ownership of results, however unpalatable, allowed them to be fed back into policy discussions.

In parallel, local communities have demonstrated how their social solidarity provides lessons for the development of a system of water management in Luanda's *musseques*. A sustainable and affordable model was developed where communities assumed the responsibility for maintenance of public standposts and managed the payment of service fees.

Development Workshop's research into the informal water sector began in the mid-1980s when asked by the Organization of Angolan Women to work with them on the overwhelming preoccupation of their members: spending hours every day searching for and hauling water to their homes. Better access to water was a key to empowerment of women and helped free girls from the servitude of carting water, giving them more time to attend school. Development Workshop employed a variety of approaches, including microeconomic studies of the supply chains, water price mapping using GIS, and institutional analysis of the actors and their roles in the subsector (Cain, 2017).

It was found that the price of water varied markedly between areas, depending on the type and difficulties of supply. The price of water was high in Luanda because of the huge demand and the distance to surface sources from rivers to the north and south of the city. The average household in Luanda was spending over 4% of its budget on water, with a significant number spending more than 5%, and the poorest households 9–12% (Development Workshop, 2009). Inevitably this had the effect of reducing the amount of water consumed, or of diverting household funds from other basic needs such as food and medical expenses.

The principal determinant of the price of water in Luanda is whether or not one lives in the urbanized part of the city, with piped household connections, or in the unconnected *musseques*. In the latter, water has to be purchased from water vendors, and the price can be as much as 40 times the official rate for domestic connections. The official subsidized price for water is USD 0.25 per cubic metre, but prices in the informal market reach over USD 10.00 per cubic metre.

Formal-sector water service providers

The provincial water company EPAL is the sole public-sector service provider. If working at full capacity it could provide every inhabitant in Luanda 57 litres per person per day, but it delivers only 60% of this to householders with domestic connections, principally due to leakage in the distribution systems. Unconnected consumers access water through standpipes, water truck operators and home tank owners. EPAL-constructed water-truck filling stations (aptly nick-named *girafas*) in the underserved peri-urban areas of the city are a short-term solution, allowing water truck operators to buy treated water for resale to unconnected households.

Informal water service providers

The provincial government, recognizing the lack of capacity of EPAL, has been obliged to recognize the vital role of water truck operators by registering their association, ANGOMENHA. The association has bridged the gap between the formal and informal by incorporating themselves to pump, transport and sell river water to the informal market. Water operators, members of the association, some of whom are military officers or relatives of government functionaries, tend to see themselves as partners of the government, and government officials reciprocate this, tacitly recognizing that they are in fact essential actors in the market chain.

ANGOMENHA has the most efficient filling system, to ensure that water flows continuously on a daily basis, and drivers do not need to wait in long queues (Figure 2). Each pump owner at the filling station who is an association member contributes towards the monthly maintenance of the system and pays a 1% monthly tax to the Ministry of Finance. The very creation of the association is an attempt to formalize and rationalize a key part of the market chain. The operators' willingness to pay taxes and water fees demonstrates their acceptance of some degree of regulation.

Water extraction from the river is exceptionally profitable for pump operators, who can achieve a return on investment in two years or less, but is less lucrative for the truck operators. Their margin of revenue over expenditure is just over USD 900 per week, and from this has to come the salary of the driver, fuel, and (most significantly) the



Figure 2. Tanker trucks filling up from the River Bengo. Photo by Tim Hetherington (2009), used by permission.

depreciation of the vehicle. The high price of water delivered by tanker trucks reflects these costs rather than any exploitative net profits for operators.

The water sold at the ANGOMENHA filling station is drawn directly from the river and is untreated at source. The association has, however, made provision for water treatment. Drivers are expected to stop nearby at a small water treatment station for chlorination. The chlorine treatment costs only USD 0.12/m³, but there is no system to force truck drivers to stop, or to ensure that the water has successfully been decontaminated, posing potentially serious health risks.⁴

Informal home-based water retailers

The interface between the transporters and the retailer is a critical point in the informal water supply chain. This is where price and the amount of water available to the household-based retailer are negotiated. Truck operators bring water from the main filling stations to the household resellers, who in turn retail it to the estimated 70% of the peri-urban population of Luanda who are not connected directly, or indirectly through standposts, to the formal network. The water purchased is stored in householders' yard tanks, with 5 m³ to 15 m³ capacity, usually underground (Figure 3). Water is procured for both family consumption and for sale to neighbours. 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 consumer neighbours, rarely selling for profit, but generally only to cover their own water-consumption costs. Neighbourhood water access and prices are not determined solely by commercial factors. Social relationships and community solidarity play an important role. Neighbourhood relationships are built on proximity, common local problems and shared deprivation. Householders who have a water tank are



Figure 3. Water being resold from household underground tanks to neighbours. Photo by Tim Hetherington (2009), used by permission.

in a position to choose not only the price of the water they sell, but also the neighbours to whom they wish to sell. They often sell at a lower price to people with whom they have a relationship or mutual solidarity (Lindblom, 2010; Cain, 2014).

Home tank owners often do not have sufficient capital to buy a truckload of water every time their tank becomes empty. They may then become consumers of water from other tank owners. Social networks evolve locally among neighbours, who may be buyers and sellers at different times. It is essential for each water consumer in a poor, unserved *musseque* to maintain amicable social relationships with a range of water suppliers within walking distance of their homes.

Home-based water retailers have not developed networks beyond their neighbourhoods, by creating associations like ANGOMENHA, for example. Thus there are no seller networks that could be mobilized to press for quality control and pretreatment of the water being delivered to them. It is left to public-health authorities and NGOs to advocate for household water treatment and safe storage.

Water street vendors

A secondary level of retailing is sometimes practiced by street vendors selling water in small containers or plastic bags (Figure 4). These usually obtain their water from home tanks and standpipes and sell half-litres for AOA 5–10 (USD 0.06–0.12), making only marginal profits (Development Workshop, 2009).



Figure 4. Street vendors reselling water in plastic bags in the informal market. Photo by Tim Hetherington (2009), used by permission.



Figure 5. Children hauling water carts. The labour of women and children is rarely factored into the price of water. Photo by Tim Hetherington (2009), used by permission.

Water carriers, carters and stevedores

The transporting of water by women and girls, accounting for 85% of the carriers, is rarely factored in to the price of water after it is delivered by truck to the neighbourhood tank owner-reseller or by pipe to the standpost. Significant time – and therefore value – is added by women and girls who head-carry jerry-cans, basins or buckets, sometimes hundreds of metres, to their homes. Child stevedores are contracted for minimal fees to haul water carts, often weighing 40–50 kg, for longer distances of up to several kilometres (Figure 5).

Self-management, building community social capital

Large areas in Angolan cities are likely to continue relying on informal water suppliers for some time into the future. Officials have been obliged to accept the role of water truck operators, who are filling the supply gap while the government improves its capacity to meet its full obligation to the public.

Development Workshop had been working with the Angolan government through the war years on the supply of basic services, including water, to the thousands of displaced families that had fled rural conflict zones to the relative safe havens of the cities. More than 1500 water systems were constructed to serve these communities. Standpost caretakers were elected by each community to take over the management of these systems to make sure that water was distributed equitably, and they were trained to do basic repairs.

Community self-management of local water systems proved to be an effective way of preventing vandalism and neglect and of keeping them running over the many years of protracted war. In the post-war period, when international humanitarian assistance was withdrawn, the continuing weak capacity of public-utility operators and local authorities meant that management strategies had to be developed that involved consumers in implementing and maintaining basic services. Affordability and willingness-to-pay studies demonstrated that low-income households were prepared to pay for a public water supply service if it was reliable and if the price was lower than that charged by private water vendors (Development Workshop, 1995; 1998). Local residents generally assume that piped water from the public grid has been treated and that the quality is superior to the water sold by the bucket on the informal market. A model was therefore developed to provide a community service at a price affordable to consumers. The costs of the water and the standpost maintenance were covered, and revenues for EPAL encouraged it to provide a continuous supply to the standposts. The government adopted a new policy to remove subsidies and accept the principal of cost recovery for basic services.⁵

Water committees were progressively formed to operate Luanda's 1500 standposts, to 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. By 2017, two hundred committees had already been formed, representing over 100,000 consumers. Each committee managed its own finances and dealt with conflict, including enforcement of the prohibition of illegal connections. Urban district-based associations or federations of water committees 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 government 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 process of extracting water from the river, treating it, and distributing it through water mains. Sixteen district-based associations had been organized by 2017, each representing between 10 and 20 community water committees, covering about 10% of Luanda's consumers of standpost water.

The model of sustainable community water management called MOGECA⁶ was developed through rigorous testing of its components in practice, which allowed adequate time for learning and feedback.

The development of associations of local consumer groups provides the legal framework necessary for their registration with municipal administrations, and trains and supports community residents to help them reach their potential as consumer-managers of water services. They make fair payments for services provided, look after their community's investment, and put pressure on utility suppliers to be accountable for the performance of their roles. The money collected is divided proportionally to pay for water from EPAL, create a savings fund for buying spare parts, invest in improvements, and 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 guarantee the financial sustainability of the standposts, helps people become accustomed to paying for

public services, and strengthens the capacity of local structures in management and accountability.

Conscious of the shortcomings of its flagship Water for All programme, in 2014 the Ministry of Water and Energy adopted MOGECA as part of the government's national water sector policy and to address the priority of sustainability.

Co-ownership and demand for the right to water

Community ownership is the foundation of MOGECA's sustainability. When the community feels that it has a share in the ownership of the water infrastructure, it uses the system more judiciously and will take on the responsibility to maintain and repair it. Financial sustainability is secured through the willingness of consumers to pay fees for this service. Consumers who pay for services and have a sense of entitlement also put more demands on service providers, towards improving their performance and quality.

Consumers' associations have demonstrated their capacity to monitor service reliability and quality. They have become a strong voice in advocating for the right to water and have been successful in gaining access to better services. In the MOGECA model the neighbourhood-based association of water groups (ACA) has the responsibility of liaising between consumers and the water utility provider (such as EPAL in Luanda). However, the lines of communication, in practice, proved cumbersome, and response to system failures was slow. A real-time complaint system was needed if the system was to meet communities' expectations and respond to emergencies when they occur. Development Workshop, a pioneer of information communications technologies in Angola, piloted a mobile-phone-based water monitoring system called VerAgua, engaging the caretakers at the 200 standposts who had already been trained in basic bookkeeping and maintenance (Figure 6).



Figure 6. Community water management using the mobile-phone-based VeraAgua monitoring system.

Source: Development Workshop, with permission from photographer (2017).

The VerAgua programme uses mobile-phone services (free missed calls, SMS and data) to relay information on water service status. In Angola, mobile-phone service providers do not charge for calls that are not picked up. The project's caretakers were given unique phone numbers that correspond to their specific water point. Caretakers' own phone numbers were also assigned to their water point in the database. This allowed the computer server linked to the Groupe Speciale Mobile Association (GSMA) mobile network to associate the missed calls with specific water points and Development Workshop to contact the caretakers assigned to each point. Caretakers made their reports by placing a missed call to specific phone numbers, each corresponding to the current status of water point functionality (functional, partially functional, or non-functional). Within 20 minutes, an SMS was automatically sent back to caretakers, confirming the water status reported. The web platform tracked these calls to aggregate the status of all water points. A weekly status report showing water point status and statistics on functionality of standposts was forwarded to the water supply utility. The pilot aims to use information on water services to increase government awareness and build consumer conscience, thereby driving the government to improve services. Early results are seen as promising, with consumers and service providers alike remaining enthusiastic, and expectations that close-to-real-time water monitoring will lead to more sustainable and effective service.

Is community management of water sustainable in Luanda?

Practitioners and academics promoting community management argue that this model leads to better performance: local technicians are able to respond to breakdowns more quickly, and users have a direct interest in making financial contributions through fees to ensure the continued functionality of their water supply (UNC Water Institute, 2017). Detractors of the model, however, point out that by transferring the responsibility to manage water systems to communities, local and national governments abdicate their long-term responsibility for service provision.

In December 2016, almost 20 district-based associations of water groups (ACAs), representing tens of thousands of consumers, met at Luanda's Annual Community Water Conference. Each ACA has been self-managed and self-financed for over a decade, since external support from Development Workshop ceased. Detailed financial accounts were presented to the membership, showing that AOA 1.15 million had been collected in fees at the standposts.⁷ Of this, 70% was then forwarded to EPAL for the purchase of bulk water, while 30% had been retained for maintenance costs and caretaker stipends.

The informal water market still functions in Luanda and other urban centres in Angola, with the supply chains that were mapped out in this article largely intact. While it is still a parallel market, it increasingly crosses over and links with the formal supply system at strategic points, notably where water is extracted or stolen from the public network for resale. Despite State patronage, Angola's private sector has been slow to develop and present sustainable business models, despite external agencies like the World Bank often promoting privatization as the solution (World Bank, 2006). Innovation in the water supply markets has come largely from the informal sector. The association of water-truck operators that formed ANGOMENHA is evidence of this. Their business model is sustainable, their

modest profits are distributed along the supply chain, and they pay their taxes, effectively joining the formal sector.

However, even the beneficiaries of MOGECA are burdened with paying close to the real production cost for water while the economic elites, fortunate enough to have running water in their homes, have used their political weight to actively resist and delay implementation of the government's plans to impose full cost recovery for municipal services.

State investments in programmes like Water for All need to continue, but they should be phased so that *musseque* communities at least get access through standposts, before individual household connections are installed in middle-class neighbourhoods. Development Workshop's research provides evidence that the poor, who have habitually paid high prices for poor-quality water, are the most reliable consumer-clients and the most willing to pay for services. They should therefore be priority beneficiaries of government infrastructure programmes.

Poor neighbourhoods have demonstrated that social capital built through collaborating in water committees has been used to gain recognition in new Municipal Government Councils and given them a platform for voicing their demands for more equitable services.⁸ The tradition of collaboration to access scarce water has become a community-enterprise approach of mutual reselling to neighbours. MOGECA grows out of this community-enterprise model and has evolved to provide and maintain services on a financially sustainable basis for a growing number of communities in Luanda. Thanks to the adoption of community management nationally, the government is promoting the model as a transitional solution until piped water can be delivered to all.

Notes

1. Development Workshop's research through the war and post-conflict years has been supported by the International Development Research Centre, the World Bank, the Bill & Melinda Gates Foundation and the UK's Department for International Development.
2. The investments came principally from the World Bank, the European Union, and the African Development Bank, through commercial credit lines.
3. There were over 50,000 cholera cases in 2006, and over 5,000 deaths. Cholera and other diarrhoeas are endemic in Luanda and recur in years of heavy rainfall.
4. EPAL takes weekly samples of water for chlorine analysis, but only from the cisterns of trucks that have voluntarily stopped for chlorination.
5. The collapse of global oil prices in 2014 obliged the Angolan government to follow recommendations from the World Bank and IMF to progressively remove subsidies from basic services and fuel.
6. MOGECA is a Portuguese-language acronym for Model of Community Water Management.
7. The 2014 exchange rate of AOA 100 to USD 1 had declined to AOA 165 to USD 1 by the end of 2016.
8. Consultative Councils (CACS) were established in 2007 in all of Angola's municipalities as a preliminary phase before local government elections are held in 2020. The representatives of water associations formed under MOGECA normally represent their communities in the CACS.

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