

Water service provision for the peri-urban poor in post-conflict Angola

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with
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This paper is an output of the Sida, DANIDA and DFID funded project entitled: Improving urban water and sanitation provision globally, through information and action driven locally. This project was carried out by IIED and five of its partners in Angola, Argentina, Ghana, India and Pakistan. The project aims to document innovative and inspiring examples of locally-driven water and sanitation initiatives in deprived urban areas. The project provides a basis for better understanding of how to identify and build upon local initiatives that are likely to improve water and sanitation services. The project also looks at how local organisations in those countries have managed to: scale up successful projects; work collaboratively; finance water and sanitation schemes; and use information systems such as mapping to drive local action and monitor improvements.

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Development Workshop Angola is an NGO committed to developing local capacities to improve the living conditions in less developed communities. Development Workshop has supported the construction and management of hundreds of wells and standpipes, and the development of locally elected water committees united through bairro-level associations to manage these standpipes, working in collaboration with the water utilities and the local authorities. E-mail: dwang@angonet.org

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ABBREVIATIONS AND GLOSSARY

ACA	Association of Water Committees
ANGOMENHA	Association of water truck operators
Danida	Danish International Development Agency
DFID	Department for International Development of the British Government
DNA	National Directorate of Water
DPEAH	Huambo Provincial Department of Energy and Water
DW	Development Workshop
EPAL	Luanda Provincial Water Company
GIS	Geographic Information System
GPS	Global Position System
IIED	International Institute for Environment and Development
INE	National Statistics Institute
Kwz	Kwanza (Angolan currency)
LUPP	Luanda Urban Poverty Programme
MDGs	Millennium Development Goals
MICS	Multiple Indicator Cluster Surveys
ODA	Area Development Organisation
PRUALB	Urban Rehabilitation Program for Benguela and Lobito
Sida	Swedish International Development Cooperation Agency
Bairro	Neighbourhood or Ward
Comuna	Urban District
Girafas	Water truck filling stations
Musseques	Informal settlements for the urban poor

SUMMARY

The provision of water and sanitation services in deprived urban settlements is a challenge faced by many countries in the South. The high rates of urbanisation and the rapid increase in urban population has meant that peri-urban areas are growing much more rapidly than formal urban areas resulting in low levels of services such as water supply and sanitation. The lack of these services threatens not only the public health and environment of the people in peri-urban areas, but also those living in the formal urban areas as well (See McGranahan, 2007; Mulenga et al., 2004).

The adoption of the international water and sanitation targets within the Millennium Development Goals are therefore laudable but the problem has been the failure to give attention to indicators, financial mechanisms and institutions that are designed by local organisations at local level. The dominant response to water and sanitation problems, has been to look to internationally comparable indicators to monitor improvement, international financial mechanisms to fund improvements, and internationally endorsed institution shifts (e.g. more private sector participation) to drive improvements. And yet, there are many innovative and inspiring examples of locally driven initiatives that improve water and sanitation provision in deprived urban areas, including some that have reached considerable scale. Although efforts to replicate local successes or models have sometimes been disappointingly slow, there have been important advances in local information collection, financing, and organisation.

The World Bank (2003) World Development Report on “Making Services Work for the Urban Poor” and the report on the Millennium Development Goal Task on Water and Sanitation (2005) conclude that a prerequisite for success is for deprived residents and their organisations to be driving efforts to improve water and sanitation. Building on the successes of existing locally driven initiatives, can bring international water and sanitation targets closer to realisation. Many of these local innovations not only improve water and sanitation provision, but do so in a manner that involves and responds to women far more than conventional water and sanitation projects do.

Successful local initiatives are sometimes documented as “best practices”, and attempts are made to develop replicable models that can be promoted more widely. However, a best practice in one setting can be bad practice in another, and even highly relevant examples rarely provide the basis for directly replicable approaches. Moreover, the qualities needed to deliver improvements to local residents are not the same as the qualities needed to engage in international promotion or to attract the attention of the institutional promoters of “best practices”.

Locally successful initiatives can, however, provide the basis for horizontal learning (through having local teams learn directly from each other). They can also provide the basis for a better understanding of how to identify and build upon local initiatives that are likely to improve water and sanitation provision in deprived areas (through careful research based on the analysis of a range of different cases). Furthermore, by combining forces, local initiatives can also become more visible and influential in both national and international arenas.

This paper is one of five case studies that were part of an IIED coordinated research project funded by Sida, DANIDA and DFID. This project was entitled Improving Water and Sanitation Provision Globally, Through Information and Action Driven Locally. The main goal of this project was to contribute towards the improvement of water supply and sanitation in low-income urban settlements so that the water, sanitation and slum improvement targets of the Millennium Development Goals can be achieved.

The immediate objective was to strengthen successful locally-driven water and sanitation initiatives, starting with a network based on a selection of ongoing initiatives. Five local organisations actively engaged in local water and sanitation initiatives were identified for the project and these included: Development Workshop (DW) in Angola, IIED-America Latina in Argentina, People's Dialogue Ghana (PDG) in Ghana, the Orangi Pilot Project Research and Training Institute (OPP-RTI) in Pakistan and The Society for the Promotion of Area Resources Centre (SPARC) in India. The partners were identified based on their innovative experiences and efforts to improve conditions in urban poor communities, including local water and sanitation. The project also aimed to enable the partners to learn and share experiences directly from each other, and influence the efforts of international agencies to improve water and sanitation in deprived urban communities.

Although the teams may have different strategies, there are striking similarities and common principles. All the partners work outside the water sector, but have a deep understanding of the conditions and politics of urban poverty. Each team designed their part of the project so that it contributed to the local agenda, but also so that they could all combine to have an important impact internationally. Building on these advances and sharing them among localities are critical to achieving international water and sanitation targets. Although most of the partners are already performing well it was the intention of the project that, the teams involved in the network will increase their capacity to address local water and sanitation deficiencies through what they have learned from other successful initiatives.

One of the motivating factors that led to the project was the need to develop a better understanding of how to identify and support successful locally driven initiatives to improve water and sanitation provision in urban poor communities. To allow for effective dialogue and sharing of information between the five teams working on this project, a web based discussion forum was set up. The discussion forum offered a platform through which any common themes, common approaches, sharing of experiences and resources could be debated and the knowledge shared easily. The sharing of ideas also enabled the teams to inspire each other.

In order to help focus the research, four key issues in the water and sanitation sector were identified and agreed upon by the participating teams as being common to all of them. These issues made it easier for the teams to link the more group-specific issues with those of other teams at the international level. These issues were:

- Working in collaboration
- Financing water and sanitation improvements
- Using information to drive local action and monitor improvements
- Going to scale

Working in collaboration

Partnership has always been recognised as a key component in the achievement of development in communities. It must be noted that community-driven water and sanitation improvements are very limited if they are pursued by communities acting on their own. The same applies to private, market-driven improvement efforts, and to government-driven schemes, at least when it comes to improving conditions in the most deprived urban areas. Much depends on the relations between these communities, government authorities and water and sanitation providers, both formal and informal. A great number of development projects are designed and implemented by professionals which permit urban poor groups no influence and which rarely produce the hoped for improvements in water and sanitation. Many professionals object to community-driven projects because their own role and importance is diminished – and because their professional training did not equip them to know how to work with urban poor groups and to support their initiatives. And in most cases,

the official development assistance agencies find it difficult to support community-driven development because their structures and procedures were never designed to do so.

However, new and interesting methods and institutional structures have emerged in urban poor communities, sometimes leading to the establishment of new institutions such as water boards or community-based organisations with legal standing, and the development of new “paperwork” (including contracts, charters, licences and regulations). In post-war Angola, Development Workshop has supported the construction and management of over 200 urban standpipes, more than 700 hand-dug wells, and the development of local elected committees to manage these standpipes, working in collaboration with the water utility and the local authority. Development Workshop uses the stakeholder approach to bring community and state actors together. The approach does not just involve identifying the potential partners or building their capacity but involves bringing them together and helping them to work together. It also involves, repeated face-to-face interaction, so as to achieve a successful outcome and also create trust and an understanding of mutual benefits of working together.

In order for these initiatives to work, however, communities need to be organised and committed and the water and sanitation agencies need to be responsive to the needs of these people. Although there are attempts in many places where Development Workshop operates, to move towards involvement of a wider range of stakeholders, it must be noted that not all engagements are productive and result oriented.

Financing water and sanitation improvements

Financing and cost recovery are key issues for sustainable water and sanitation schemes. Considering the importance of household and community action and investment in improving water and sanitation, there is need to develop appropriate finance schemes. The impact of better local financial systems on improving the provision for water and sanitation may be direct - as they fund these improvements – or indirect as, for instance, they finance urban poor communities acquiring official tenure of their land, which then allows official water and sanitation utilities to serve them. In one sense, loan finance might seem inappropriate for low-income households, especially the poorest, since they have the least capacity to repay loans. But experience from some countries has shown that if loan packages are designed and managed in ways that match the needs and repayment capacities of low-income households, limited funding can go much further. In addition, when a small loan is combined with community-driven initiatives that strive to keep down unit costs, its potential becomes much greater. Collective loans can have particular importance – for instance by allowing savings groups formed by urban poor households to purchase land together and on which new housing can be developed. Subsidies too can play a role, at least when they are part of a viable financing strategy.

Experience by Development Workshop in Angola, shows that, relying solely on centralised funds from the state budget to maintain local infrastructure in low-income urban areas has proved unrealistic. The DW experience also shows that the extension of services to the urban poor need not be about securing external finance, but can be achieved through the development of competent, capable, accountable local agencies or utilities that can work with community organisations. Costs are recovered through the payment of water sold at the standposts by users. These standposts are managed by Associations of Water Committees. The participation of the community in the management of services in order to ensure sustainable services is fundamental. Some local Associations of Water Committees have actually managed to invest their own accumulated capital in the extension of the network supply, through the construction of new standposts and the organisation of management committees.

Using information to drive local action and monitor improvements

One of the major reasons given by water and sanitation agencies for their failure to extend services to slums and squatter settlements has been the lack of baseline data about these settlements. A survey and documentation of physical conditions, social actors and relationships, economic conditions is very important because this will show what already exists and what needs to be improved on. It must also be noted that, in the absence of such documentation, realistic and cost effective planning cannot take place (Hasan, 2006). All of the partners on this project have used locally gathered or processed information to help drive local action. Some involves using high-tech equipment, much of it is map-based, and almost all of it serves a clear strategic purpose.

To initiate action and dialogue with government agencies, Development Workshop and the local communities carry out detailed slum enumerations and surveys that draw information from each household and develop detailed maps with the participation of the residents. The maps provide a basis for detailed plans for development. Mapping is a useful tool to gather information about existing conditions in deprived urban areas. Through mapping communities have been more knowledgeable about their situation, and empowered to challenge and find solutions to the issues they face. Development Workshop has also invested considerable time and resources in the development of tools appropriate for local administration staff and residents' committees to monitor service provision and to gather all available information in one place (Cain et al., 2002). Development Workshop also encourages local administrators to use the information generated locally to lobby provincial and central government for further allocation of resources.

Scaling up

Despite the observation in the international development circles that the urban poor communities are badly served with water and sanitation services, the local authorities have in most cases remained unresponsive. The majority of urban poor have ended up building their own water and sanitation facilities which are often of poor quality due to lack of support from the local authorities. However, there are numerous small-scale models of successful sustainable community managed water and sanitation projects, but most remain models. The common criticism of many such innovative water and sanitation projects is that they cannot deliver at scale. At one level, this is supremely unfair. In many of the most deprived urban communities, local groups collaborate to improve water and sanitation services, often under very difficult circumstances. Authorities and donors should be striving to find ways to support and link up to such initiatives, and not just criticise them for not going to scale. If these initiatives do not all follow the same reproducible blueprint, this may be because adaptability is a critical element of success. The obstacles to expanding community-driven programmes are as likely to lie in the policy environment as in the community-level strategies. Both the duration and nature of the community engagement vary considerably among the partners to this project, as do their strategies for going to scale. Among partners this may be a value in sharing strategies.

There are few examples of donors who are supporting replication and providing adequate capital for well-conceived strategies, but many more are needed if the challenges facing the majority of the urban poor are to be addressed. If scaling up is to occur and proven ideas are to spread, support is needed at both community and national levels. Failure to work in more coordinated approaches, pooling resources to work with governments on a coherent agreed set of policy reforms has contributed to the failure to scale up successful water and sanitation projects. Project approaches have also been divisive of international agencies, often leading to competition rather than coordination, and resulting in fractured policy agendas. The funding patterns which promote short duration projects also conspire against building strong organisations ideal for scaling up processes. Further, there has been a concern that the project approach has 'tended to accelerate rather than retard the deterioration of local institutions and to undermine the foundation needed for long-term

sustainability. Problems include bypassing local capacity development, creating small islands of excellence promoted under special conditions not shared by those institutions or providers outside the project environment, and reducing a push for nationally developed and owned policy strategies that signal long-term commitment to change.

This paper shows how Development Workshop has managed to scale up water supply and sanitation initiatives. It has done so by engaging strategically with the communities, Angolan Government, the national Water Directorate, UNICEF, the European Union and other actors in the sector. DW is one of the Angolan Government's key implementing partners on their urban community based water programme which aims to institutionalise the concept of community management and the accountability of service providers to the consumers. This gives DW an opportunity to introduce lessons from research into the practical implementation of water projects that will be replicated widely by Government.

DW has also concluded that in order to provide a sustainable service, it is necessary to adopt many of the principals of cost-recovery, to charge an affordable fee for water that is used to keep the local infrastructure operational. Experience has shown that relying solely on centralized funds from the state budget to maintain local infrastructure in the peri-urban *bairros* has proved unrealistic. An inevitable part of developing sustainable basic services that serve the collective good and which people will support and have trust in is the creation of accountable institutions. Peri-urban residents are not averse to the idea of paying for a public water supply, provided that:

- the cost is less than what they pay for water from private water tanks;
- they have some assurance about the quality of the service provided;
- they have some assurance that funds go to sustaining the service (Pinto and Ribeiro, 1998).

Apart from highlighting some of the issues raised above, this paper discusses strategies developed by the informal private sector and communities themselves to meet the demand for water services that the Angolan Government was unable to provide. Local communities' own engagement in the management of water distribution and their assumption of the responsibility for maintenance and the payment of service fees is a model that the paper demonstrates is sustainable and affordable.

The paper also shows how DW has supported the construction and management of a significant number of water systems through locally elected water committees in collaboration with the water utility and the local authority. This experience has translated into advocacy for the adoption of these lessons into Government plans and policies, with the aim of mobilising state resources to scale up the provision of community services through participatory methods.

1 Introduction: demand for equitable access to services in post-war Angola

One of the important challenges of post-war reconstruction is to provide more and better quality basic services, such as water. Previous attempts at upgrading main supply systems to accommodate peri-urban areas have been overwhelmed by the explosive demographic growth of Angola's major cities. The amount and quality of water available in most areas (especially peri-urban areas) is significantly below recommended levels. It is highly unlikely that Angola will come close to reaching its MDG targets. Water is costly and of poor quality, representing both a significant household expenditure for the urban poor as well as a growing health hazard as witnessed by recent outbreaks of highly communicable diseases (such as cholera) known to correlate with poor water quality and restricted access. There have been over 50,000 cholera cases since 2006 to date and over 5,000 deaths.

The Millennium Development Goals (MDGs) map out ambitious targets to half the number of people lacking minimal access to potable water by 2015. The Angolan Government has incorporated the MDGs into their short and medium term plans for the Water Sector. In the present context of post-war reconstruction there are large-scale plans (both Government of Angola and bi-lateral and multi-lateral donors) for increasing water-supply to Luanda and other cities, through increased pumping and pipeline capacity.

Previous attempts to improve peri-urban water supply have been hampered by the government's lack of capacity to maintain the infrastructure that already exists, much less upgrade these systems or build and manage new ones. Development Workshop has played a pioneering role in developing projects that have offered one of the few viable alternatives: local community management water systems. Such systems will likely remain indispensable and their expansion inevitable for the foreseeable future. However, the overwhelming majority of Angola's peri-urban population continues to rely for its water supplies on informal mechanisms. The large shortfall of supply is met by the informal market of sellers and transporters of water. Supply systems in Luanda typically involve the purchase of water from owners of tanks who have bought their water from lorry-owners who transport water from the nearest river. In some of the other urban centres like Benguela, lorry-drivers have begun to fill up at official (and unofficial) stations where water comes from the piped supply. In inland cities of Angola other informal sources of water that are important such as traditional wells, protected wells and boreholes with handpumps or even purchase from other people who have access to piped water.

All strategies for providing better quality basic services, such as water, will require institutional development, of the water company, of local government and of local institutions at a local (bairro) level. Previous projects have encountered difficulties due to the lack of Government capacity to supervise the upgrading of water systems and to manage new systems, as well as the lack of mechanisms to manage and maintain. Institutional development implies as much work as infrastructure creation. Angola's war-broken infrastructure and backlog of maintenance and repair presents a special challenge to meeting its MDG targets.

A vital input to this institutional development for managing and maintaining water supply is better knowledge of the existing (mainly informal) systems and institutions for supplying water. These are likely to continue for some time to come. They may help in developing formal water supply or they may hinder it. There may be important lessons of how to create systems using non-conventional opportunities and institutions for community enterprise and management of this natural resource. There is thus a need to know more about the informal supply of water and how it has evolved since Development Workshop research in the 1990s. There is a need also to understand better how it is likely to evolve and react to improved formal, regular water supply systems. There is also a need to understand better how

institutional capacity can best be developed, especially at the interface between Water Companies and community management.

Development Workshop has been the principal non-governmental actor in the water sector in Angola since the late 1980's. Through many of the crisis years of conflict DW has worked together with local war-affected communities, local government administrations and international humanitarian agencies in implementing almost three hundred urban based and over seven hundred rural water systems that brought basic water services to close to one million people. (see *Annex A for a summary of these*) Community management was an essential component to sustainability of all of these systems. Weak capacities of public utilities and local authorities in the war and post-war period meant that management strategies that involved consumers in implementing, maintaining and financing basic services were developed. The informal sector emerged as the principal supplier of basic services, including water, to the majority of urban and peri-urban families. The water infrastructure of Luanda built in the early 1970s for a colonial population of half a million could not be stretched to serve four million that lived in the capital by the end of the war in 2002.

This paper discusses strategies that were developed by the informal private sector and communities themselves to meet the demand for water services that the state was unable to provide. Local communities' own engagement in the management of water distribution and their assumption of the responsibility for maintenance and the payment of service fees is a model that the paper demonstrates is sustainable and affordable. Development Workshop advocates with government and investors in basic services provision for the adaptation of these lessons and their scale-up in public water programmes.

DW's programmes over the last two decades have addressed the challenges of basic services for the urban poor who had fled to the safe havens of cities like the capital Luanda during the war. Populations returning to rural areas at the end of the war found no infrastructure of water or on-site sanitation. In 90 percent of the rural areas of return, water sources were contaminated or located at an inconvenient distance. Vulnerable populations living in these conditions experienced higher levels of morbidity and mortality than populations with access to adequate water and sanitation systems. Well and latrine construction, water chlorination and hygiene awareness were required in virtually all areas of the country directly affected by the conflict.

This paper contributes to the knowledge of how the specific problems of basic service provision can be addressed in a post-conflict country where massive displacements of populations, the destruction of infrastructure and the diversion of investments away from maintenance and infrastructure development has produced chronic public health problems. Angola is now recovering from almost 3 decades of civil war. The majority of the low-income urban communities are served by informal water vendors. The paper draws on research and DW's experience of practical project implementation in Angola dating back more than twenty years. The paper draws on knowledge gathered on the functioning of the informal water economy from the mid-1990's war years through to the current post-conflict reconstruction. The informal economy has provided and continues to provide the bulk of water services to Luanda's population. DW estimates that the annual value of this informal water economy has grown from about 60 million US Dollars to almost 250 million today. The paper uses mapping (geographic information systems) and value chain tools to analyse this market.

Development Workshop's research is employed to feed and develop its practice. DW has supported the construction and management of a significant number of water systems through locally elected water committees in collaboration with the water utility and the local authority. This experience has translated into advocacy for the adoption of these lessons into

Government plans and policies, with the aim of mobilising state resources to scale up the provision of community services through participatory methods.

2 Background: a review of the literature and past research

Reliable sources of information on social conditions in Angola are scarce. Beginning in the early 1990s large-scale surveys of social conditions began to be carried out. However, they did not have a complete coverage of the country, even of urban areas, because of the difficulty of logistics in a war-torn country. Those that were published suffer from incomplete analysis and from the use of categories that are difficult to interpret in Angolan conditions. Some useful surveys have not been officially published and the original databases have not been placed in the public domain for independent researchers to query and analyse. Study data was aggregated in such a way into gross categories that useful local variations are masked. The grouping of all data into rural and urban categories hides the reality of urban poverty and the geographic differences between regions. This literature review uses large-scale social conditions surveys, while noting some of the difficulties of interpretation. It also uses research on smaller areas, some of it project evaluations and beneficiary assessments. Some of the sources of information are unpublished. The literature review also includes several studies carried out by the Development Workshop at the same time, which were designed to address the shortcomings of the official studies and penetrated issues related to urban water access, the water market and also capture the opinions and perceptions of consumers and future beneficiaries.

The Multiple Indicator Cluster Surveys (MICS 1996 and 2002) are reports of research carried out in 1996 and 2002 by the National Statistical Institute (INE) sponsored by UNICEF, collecting information about a wide-range of social indicators including access to water sources. The research was carried out in samples of both urban and rural areas, but only those areas safely accessible at the time of each research. The published data does not include data specifically for individual cities. Some regional data is presented in the reports, but this includes both urban and rural areas. The region that covers Luanda is called the Capital Region but also includes three other provinces that are mainly rural, and so is of very limited use for reporting on conditions in the capital city. The data from the MICS presented in this literature review are from the tables for urban areas, though it should be born in mind that the various urban areas included in these surveys have different water supply characteristics. See table 3 for the survey results which show how many households and how many regions were included in the studies.

The conditions-of-life survey, 1996 was also carried out by INE in 1995, though separately from the MICS. Sometimes the two surveys show different results for similar indicators, possibly because of the different geographical distributions of the samples. It is unclear whether the report of this survey has officially been published: limited numbers of copies were circulated and some results from this survey have been used in other reports (such as the Human Development Report). The survey areas were the cities of Luanda, Cabinda, Benguela, Luena, Lubango and Lobito and some rural areas immediately surrounding these cities.

The willingness-to-pay survey (Inquérito sobre a disposição e capacidade no pagamento dos serviços sociais básicos: água, educação, saúde) was carried out by INE (the Instituto Nacional de Estatística for UNICEF and the World Bank. It looked at access to social services in Angola (including water supply), focusing on payment for services and the willingness and capacity to pay for services. It also examined the factors that affect the use of services and existing mechanisms for payment for basic services. The research was carried out in Luanda, Uige, Huila and Huambo Provinces in September and October 1998. It provides useful data about how much people are paying for water, though does not

indicate how much water they manage to obtain with this expenditure. The tables in the report usually provide data for Luanda, other urban areas and rural areas. It is thus the only large-scale survey that provides data sources for Luanda, and which allows a comparison between Luanda and other urban areas. It also uses categories of water source that are more appropriate for the context of Luanda, for example the category "neighbour's water tank" which does not appear in the other large-scale surveys. It doesn't, however, present data separately for the concrete city and peri-urban areas. It does provide information about how much households spend on water (and shows that in Luanda the poorest 25% of households spend more than 5% of their household budget on water), but it does not analyse the cost of water by the source of water. The report has never been officially published and the reports that are in circulation appear to contain errors.

Water supply characteristics differ greatly between different parts of the country, and between different parts of the same city. The above surveys, however, often do not provide information about individual cities and about the differences between different parts of the same city. They show that in the same area there are people who obtain water from formal sources and those who obtain water from informal sources, and that the latter are paying much more for their water, but they do not show which geographical areas are involved and what the impact is. There are some other sources of information that explore these areas, though they cover only limited areas.

Although these sources of information are now sometimes more than 10 years old, there are no reliable official information sources that are more recent. A new MICS and/or an Income/Expenditure Survey is being carried out in 2008 and 2009 that will provide more comprehensive data from all of the regions of the country.

Because of the enormous differences in land use, housing types, population density and current access to water, within the city and within municipalities, and because of the lack of reliable statistics for these areas, and because those statistics that do exist are usually aggregated to the municipal level without being published separately for each bairro, it has been necessary to carry out local studies to obtain a better vision of water supply. In the 1990s (in 1995 and 1998) Development Workshop was contracted by the World Bank and the Ministry of Planning to carry out surveys in Luanda with the objective of describing the water distribution system in the peri-urban areas of the city, identifying the stakeholders, investigating the extent of their involvement, assessing water consumption and price and understanding consumers priorities for improvement. Development Workshop was subsequently engaged in 2008 by the World Bank and the National Water Directorate to carry out a set of similar willingness-to-pay studies for water systems in five provincial cities, Huambo, Kuito, Ndalatando, Malange and Uige.

An intern working with Development Workshop in 1997 developed case studies¹ in Luanda and Lobito to draw lessons from pilot projects that used private sector or community-based models for the management of improved water supply in Angola. The lessons relate to fundamental issues that have to be addressed in private sector and community-based management of improved urban water supply. A Beneficiary Assessment was carried out in 1998 towards the end of PRUALB² a large-scale World Bank funded upgrading programme for water supply and sanitation in the cities of Benguela and Lobito³

¹ Development Workshop (1997) *"Managing Public Water Standposts: Privatisation or Community Based Management. Lessons from Five Case Studies in Angola"* Siad Omar Master Thesis, Univ. of Guelph, Canada & DW Angola, 1997.

² Urban Rehabilitation Programme for Benguela and Lobito, supported by the World Bank and Angolan Ministry of Planning.

³ OXFAM UK (1998), *"Beneficiary Assessment of water supply and sanitation in Benguela and Lobito"*. Report for PRUALB and the World Bank.

There has been little recent research in the area of urban water supply since the end of the conflict in 2002. It is likely that conditions have changed substantially. For example, the population of the city of Luanda has doubled in the last 10 years since earlier studies were done, though the formal water system has not (until recently) been expanded. Development Workshop's current research sets out to answer some key questions; whether this urban growth has had an effect on water supply and prices, and :

- has informal supply increased to meet this demand?
- have prices increased?
- what is the quality and price of water in the newer areas that are probably even more remote from supplies?

2.1 Urban water sources and access to water

The two MICS provide data on water sources for the urban areas included in the surveys. The 1996 MICS has data for both primary and secondary water sources, while the 2002 MICS has data only for primary water sources. There are also some slight differences in categories for the two years. In both years only a small proportion of urban households have water supply in their residence. Just over half have water supply with 100 metres of their residence but significant numbers have to go more than 500 metres to get water. There would appear to have been a small improvement between 1996 and 2002 and some further improvement in the years to the present. (see Tables 1 & 4). Even in urban areas, springs, wells and rivers are used as water sources.

There are relatively few mentions of tanker-lorry, but this may be due to the fact that it is mainly a phenomenon of Luanda, it is considered as a secondary source, and few people buy directly from the lorry (so may be included in "neighbour's tap when buy from a neighbour's tank).

Table 1: Urban water sources

URBAN AREAS	MICS 1996		MICS 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 neighbour's	16.3	9.3	14.3
Tap in yard or garden	**	**	5.1
Public stand-post	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 – tanker	11.2	25.2	6.5
Others	10.9	12.5	3.3

Source: Development Workshop (DW)

Table 2: Distance to water source

URBAN AREAS	MICS 1996	MICS 2002
HOUSEHOLDS	MAIN WATER SOURCE %	MAIN WATER SOURCE %
Tap in residence	5.7	7.2
Less than 100 metres from residence	47.3	51.0
100 to 500 metres from residence	30.3	28.6
500 to 1000 metres from residence	12.2	7.7
More than 1000 metres from residence	4.4	5.5

Source: DW

Table 3: Conditions-of-life survey

Water sources by area/%	Cabinda	Luanda	Benguela/Lobito	Luena	Lubango	TOTAL SAMPLE
Piped water	16.6	43.0	64.6	13.2	48.6	43.4
Public stand-post	4.2	6.3	9.0	0.0	23.1	7.5
River or lake	1.4	0.3	0.0	62.3	0.2	2.2
Well or spring	70.4	2.1	3.6	2.3	25.2	6.5
Tank or water lorry	5.8	47.2	18.2	22.3	1.9	38.8
Others	0.9	1.1	4.6	0.0	0.8	1.5

Source: UNICEF (1996)

The report of the conditions-of-life survey makes clear that piped water is not necessarily in the home of the respondent, and does not necessarily provide a regular supply. While 45% of households have access to piped water only 15% of households have permanent access to piped water. Wells or springs are quite important water sources in some cities (Cabinda and Lubango) and the river is an important water source in Luena. Water tanks and water trucks are the most important source of water in Luanda and are also important in Luena. Public stand-posts are of limited importance, except in Lubango. The report of the conditions-of-life survey also shows that poorer households are less likely to have access to piped water and to have less regular piped water. Those with piped water, and the less poor, are more likely to treat drinking water.

The willingness to-pay survey uses different categories from the other surveys for the questions about water sources. These categories include "Neighbour's water tank", so the survey is more adapted to the conditions of Luanda. It shows the overwhelming importance of neighbours' water tanks as a source of water in Luanda: this category does not appear in the other large-scale surveys carried out by INE and international organisations.

Table 4: Willingness-to-pay survey

HOUSEHOLDS	MAIN WATER SOURCE, LUANDA %	MAIN WATER SOURCE, OTHER URBAN AREAS %
Neighbour's water tank	37.9	1.2
Tap in residence linked to network	25.3	8.5
Tap in building or neighbour's	25.1	9.4
Public stand-post	5.2	13.7
Borehole with pump	0.5	9.2
Spring or well	0.2	55.0
Surface water	0	0
River water	0	1.7
Lorry – tanker	4.2	0.6
Others	1.5	0.8

Source: UNICEF (2000)

In Luanda only about half of households access water mainly through a tap in their own residence or their building or at a neighbours, Stand-posts are less important in Luanda. In other urban areas neighbours' water tanks are insignificant as a source of water and few households have access to water through taps. Public stand-posts are more important in other urban areas than in Luanda, possibly because stand-posts from the colonial era and the immediate post-independence period have survived better in other urban areas and have not been so overwhelmed by the growth of population numbers.

The willingness-to-pay survey showed that only half of households with a tap in their residence received water every day; 35% received water most days while 14% received water only once or twice per week. The Development Workshop survey of peri-urban Luanda (1998) also shows that a third of households with domestic water connections did not receive water through them. Only 5% of households reported that their connections provided water at least two or three times a week. Only 3 of the 43 zones in the survey had more that 20% of households reporting domestic connections that provided water at least two or three times a week.

Table 5: Survey of peri-urban Luanda

DW (1998)	People per house	Houses with domestic connect	Houses with connect - flowing
Luanda peri-urban sample	7.6	17%	10%

Source: DW (1998)

In summary, the various large-scale surveys of Angola in the 1990s show that water is obtained in urban areas from a variety of sources. Only a small minority have domestic water supply, and when they do supply is erratic. The alternative sources vary in different cities: Luena is close to a river so river water is an important source of water. In Luanda, the city is distant from the river and there is no ground water supply, so the main alternative source of water is by transport of water by private lorry to households who have water tanks who then resell their water to others. The informal economy is important for water supply: access to a neighbour's tap or tank or to other water source will often involve an informal economic transaction.

Table 6: Payment for water

URBAN AREAS	%
Pay for water	52.5
Don't pay for water	47.5

Source: MICS (1996)

The 1996 MICS shows that in urban areas just over a half of households paid for water. (The data is not available in the report of the later MICS.) The willingness-to-pay study shows that in Luanda only three-quarters of households who obtain water from formal sources report paying for it, though in theory all should be paying for it. A higher percentage of those who obtain water from informal sources pay for it than those who obtain water from formal sources. The majority of people using natural sources pay for water.

Table 7: Willingness-to-pay study

Percentage of households who pay for water	Formal %	Informal %	Treated or transported%	Natural %
Luanda	74	86	95	-----
Other urban areas	87	70	69	49
Rural	-----	-----	91	65
TOTAL	75	85	83	59

Source: UNICEF (2000)

In Luanda, on average a household spends 4.1% of its household budget on water. This is greater than in other urban areas (2.6%) and in rural areas (3.9%) and is not far short of the 5% line which is considered internationally the limit of what households should be spending on water. Poorer households spend less on water than richer ones in absolute terms, but spend a higher proportion of their budget on water, implying that poorer households are consuming considerably less water than richer ones. The poorest 25% of households spend much more than 5% of their budget on water⁴. The report unfortunately does not analyse how much is spent on water by households that have access to different water sources, though this should be possible if one had access to the baseline data.

In other urban areas, expenditure on water is lower than in Luanda in both absolute and relative terms, and expenditure in all the household categories is well below the 5% level. Other urban areas do not face the same problems of water supply as does Luanda (lack of groundwater due to its great depth and saline intrusion near the coast, rivers at some distance from the city, very high population density). Poorer households spend considerably less on water than richer ones in absolute terms, and also in percentage terms. This may be due to poorer households having better access to less expensive sources of water than in Luanda, the fact that they do not calculate the time of family members invest in carrying water and to richer households being more likely to pay for their water in cash.

⁴ UNICEF 1996, MICS, The report unfortunately does not analyse how much is spent on water by households that have access to different water sources.

As an average for the whole sample in the willingness-to-pay survey, those who obtain water through formal sources spend 1.2% of their household budget on water, while those who obtain water through informal sources spend 5.0% of their household budget on water. In Luanda the amount spent on water is higher than in other areas, particularly from informal water sources. It is therefore likely that in Luanda those who are obtaining water through informal sources are spending more than 5.0% of their household budget on water.

Overall a quarter of households are spending more than 5% of their household budget on water, and this percentage is highest in Luanda and in rural areas. The survey does not tell us who these households are, or whether there are households who restrict their water consumption (or other household expenditure) because of the cost of water.

The report of the conditions-of-life survey shows that, although just less than 40% of households are supplied by water from a tank or a water-lorry, more than 80% of overall household expenditure on water in the sample is on water from these sources. No information is available from this source, of information, however, about the amounts of water obtained by households who have different water sources.

Table 8: Monthly household expenditure on water in Luanda

Willingness-to-pay survey, LUANDA	Poorest 25% of households	Second poorest 25% of households	Third poorest 25% of households	Least poor 25% of households	Average
Total monthly household expenditure in US dollars	268	406	481	985	535
Percentage of household expenditure on water	5.2	4.1	4.6	2.5	4.1
Total monthly household expenditure on water in US dollars	14	17	22	25	22

Source: UNICEF (2000) - National Statistical Institute, "Multiple Indicator Cluster Survey (MICS)", sponsored by UNICEF

Table 9: Monthly household expenditure on water in provinces

Willingness-to-pay survey, OTHER URBAN AREAS	Poorest 25% of households	Second poorest 25% of households	Third poorest 25% of households	Least poor 25% of households	Average
Total monthly household expenditure in US dollars	39	80	140	337	149
Percentage of household expenditure on water	2.1	2.7	2.7	3.0	2.6
Total monthly household expenditure on water in US dollars	1	2	4	10	4

Source: UNICEF (2000)

Table 10: Amount spent on water per month

AMOUNT SPENT ON WATER PER MONTH IN US DOLLARS	Formal water source USD	Informal water source USD	Created water source USD	Natural water source USD	TOTAL USD
Luanda	7.40	20.94	11.81		17.00
Other urban areas	1.10	4.25	2.20	5.35	4.09
Rural			3.78	2.68	2.83
TOTAL	6.77	19.68	5.04	3.94	10.86

Source: UNICEF (2000)

Table 11: Household expenditure on water

PERCENTAGE OF HOUSEHOLDS SPENDING DIFFERENT PROPORTIONS OF THEIR HOUSEHOLD BUDGET ON WATER	5.0% or less	5.1% to 7.5%	Over 7.5%
Luanda	71.7	14.8	13.4
Other urban areas	82.8	7.7	9.4
Rural	70.3	15.2	14.5
TOTAL	73.9	13.3	12.8

Source: UNICEF (2000)

The Development Workshop survey of Luanda of 1998 showed that the overall price of water in peri-urban Luanda averaged about USD 10.00 per cubic metre. However, the price varied enormously between zones. The lowest price was USD 3.91, in the area immediately surrounding EPAL water tower in Kikolo. The highest price of USD 19.89 was in Cazenga, immediately surrounding the SONEFE installations. In general, the higher prices were found in those areas with the fewest domestic connections. Delivery times and pricing are not only due to distance. Traffic congestion in many parts of the city makes water delivery problematic and expensive.

In these areas, people are more reliant on water provided by water trucks. The Development Workshop survey of Luanda of 1995 showed that at the time the price of water varied from 1.21 to 16.90 US Dollars per cubic meter. The highest prices for water in Luanda are in on the south side of the city, furthest from the river and the piped network. (Mapping of prices was carried out.)

Table 12: Average cost and consumption of water

DW (1998)	Cost per m3	Litres per person/day
Peri-urban Luanda	\$10.22	22

Source: DW (1998)

In the focus group discussions carried out as part of the Development Workshop research of 1998 in Luanda, it was women who were more likely to talk about the cost of water. It was primarily women who collected and paid for water and women manage their household budgets on a daily basis. In some groups it was said that many people eat less to buy water and that households buy the water they can afford, not the water they want or need. Very high prices are related to areas where there are the fewest water supply choices, such as areas where erosion prevents trucks delivering water. Water prices increased during heavy rains because trucks were unable to serve certain areas or were able to make fewer trips per day. In some groups, women indicated clearly that if an alternative service (such as stand-

posts) did not compare to the water tanks in relation to waiting times and queues, they would prefer use the water tanks because their time was valuable and they could not spend time waiting for water to be available. Often women will collect water from standposts because it is cleaner for drinking purposes only and purchase river water from the tankers for other household uses. In most of the urban settlements in Angola, water is generally carried by females as Table 14 shows.

There is a high price inelasticity in the demand for water and most people continue to buy a basic minimum quantity regardless of the cost (Development Workshop, 1995). Families in Rocha Pinto pay about 10,000 times more for water than those in Ingombota with official household connections, but they continue to buy water. Discussion groups suggest that people stop buying other important items in order to buy water. The examples given were eating less often, not using the household toilet because it required water and having to save up to wash their clothes and bathe their families. However, it was sometimes said that some families were too poor to buy enough water (Development Workshop, 1995).

In summary, the cost of water is higher in Luanda because of the high demand and the difficulties of supply (distance to the river and lack of ground-water). While there may be severe difficulties of water supply access and quality on other areas of the country, it is Luanda where cost is an important factor. In Luanda the average household is spending over 4% of the household budget on water, so it is likely that there are a significant number of households who are spending more than 5% of the household budget on water. These are likely to be the poorest households. Qualitative interview results suggest that the cost of water in some areas of Luanda has the effect of reducing water consumption, or of reducing expenditure on other basic items.

The cost of water varies markedly between areas, depending on the type of supply and difficulties of supply. The principal determinant of the price of water in Luanda is whether or not one lives in the urbanised, serviced part of the city, which consists of Municipality of Ingombotas and parts of Maianga, Rangel and Sambizanga. Most dwellings within this area of the city have piped water from the main city distribution network, although some people also buy water from informal sector vendors. Rates for the water from this network are set by EPAL (Luanda Provincial Water Company) (Development Workshop, 1995).

The price of water, however, rises very sharply if one is not able to access water at the official price, which is the case for more than 70 per cent of Luanda's residents. Most people in the peri-urban areas have to buy water from water vendors and the price can be as high as 10,000 times the official rate. The price of water in a bairro is inversely proportional to the number of people who have piped water in the bairro (see Table 13 below). The price of water at water tanks is reduced by the availability of water from the piped system though water from a tank supplied by lorry is always higher than at a tank supplied by the piped system (even in the same bairro or street) (Development Workshop, 1995).

Table 13: Relationship between access to piped water and price

Bairro	Price USD/m ³	% of vendors with piped connections
Rocha Pinto	16.91	3
Palanca	14.30	12
Golfe	12.73	7
Tala Hadi	12.27	6
Val Saroca	9.36	8
Sector Central Ngola Kiluanje	8.70	50
Ngangula	8.36	1
Cazenga	8.18	18
San José	7.94	13
Mabor	7.79	3
Sambizanga	6.33	58
Mota	3.52	94
<i>Bairro</i> Popular	3.09	96
Kikolo	2.33	64
Rangel	2.15	93
Marcal	1.52	100
Zangado	1.52	100
Boa Esperanca	1.21	85

Source: DW

Water prices in general increase as a function of distance from the piped supply and from the River Bengo (the main primary source of water). However, difficult road conditions that prevent easy access to water-trucks also have an impact on price (and availability of water). Water supply improvement plans that increase the overall supply of water in the cities will have an impact on availability and price of water, but such plans will need to be examined in detail to assess their impact on areas which have a limited supply or high prices. The plans for upgrading of the water system of Luanda in the late 1990s (for which the 1998 survey by Development Workshop was carried out, but which was implemented only in 2008 & 2009)⁵ to provide stand-posts within 300 metres of the existing primary network, fed by small diameter extension pipes running off the primary network. It was considered that it would be too expensive to provide additional lateral pipes on the primary network, and that there was too much risk of illegal connections if small diameter extension pipes ran more than 300 metres from the existing primary network. This, however, leaves quite large areas with no direct improvement in water supply.

In Lobito, after improvements to the water system of Benguela and Lobito, the water supply was erratic at stand-posts in higher areas of the city (on the escarpment behind the main town, the poorer areas of the city) because water pressure could not be high enough to reach those areas without exceeding the recommended pressure in other parts of the system. It is thus possible that future upgrading plans for urban water supply will not benefit all areas, and that some areas will still be reliant on informal systems of water supply, such as resale from household tanks supplied by lorry. If this is the case it will be important to understand better the informal water supply systems and find ways of easing the constraints on such systems.

⁵ The 1998 engineering study was funded through a World Bank mechanism but was not implemented. The European Union provided funding to EPAL to revive the project after almost 10 years and was eventually implemented with Development Workshop's participation in the social mobilization and community management components.

2.2 Water consumption

The Development Workshop surveys of 1995 and 1998 assessed household water consumption in Luanda. Development Workshop has also carried out assessments of water consumption as part of the evaluations of the impact of its water projects. Unfortunately there are inconsistencies in the results from these studies, and this suggests that there are methodological difficulties in assessing household water consumption. It is usual in these kinds of survey to interview one member of the household, who estimates the consumption of the family. There may be difficulties for the interviewee to make this assessment. It may be that the interviewee, or the interviewer, estimates the consumption of one adult in the household and then multiplies it by the number of people in the household: however, if there are 7 or 8 people in the household it may not be valid to assume that all adults and children are in fact consuming this amount of water.

The overall average was 22 litres per person per day, which is relatively low, but comparable to other African cities in which water is both expensive and scarce. The highest consumption figures were found in those zones with the lowest water prices. Conversely, in the highest price zones water consumption was often below 20 litres per person per day (Development Workshop, 1998).

2.3 The informal water supply system

In Luanda, the informal water supply depends on trucks which bring water to the city from the River Bengo, or which fill up at filling stations run by EPAL⁶ at the main water treatment centres. The trucks then sell water to households who have built water tanks, who in turn sell to their neighbours.

In 1995 it was found that, of a random sample of water trucks, 72% were owned by individuals, 14% were owned by the Government and 14% by private companies. The average number of trucks owned by one person was 1.5, indicating a low concentration of ownership in the business. This may have changed since then, as it has been reported that in recent years there has been greater concentration of ownership in what appears to be a lucrative business. However, there is little evidence that the tanker industry is controlled or monopolised by any one group and that individual operators still predominate. The research did not reveal any cases where communities had pooled their resources to purchase a tanker for themselves, however, in some cases they have developed close relationships with tanker owners who reside in their neighbourhoods and predominantly serve that community for convenience. Other neighbourhoods are served by a variety of tankers. Sometimes consumers will go to the filling point at the river to seek out a supplier.

In 1995, calculations indicated that only 7% of the wholesale water price could be considered as profit for the lorry owners. However, this may have changed, and the calculations were based on real costs (of trucks and other equipment): if trucks were purchased using foreign currency obtained at subsidised exchange the profit may be higher.

The Development Workshop report of 1995 suggested that owners of water tanks who fill their tanks more cheaply, sell more cheaply to the consumer and that there is some form of social control limiting the profits of water vendors. Some discussion groups said that vendors do not sell for profit at all, but rather to cover their own water consumption costs, and only rarely did groups say that they felt exploited by the water vendors.

⁶ EPAL, Luanda Provincial Water Company, a public sector enterprise.

2.4 Preferred solutions for improvements in water supply

The Development Workshop studies of 1995 and 1998 consulted potential beneficiaries about preferred improvements to water supply. In all cases the majority of participants preferred the provision of public stand-posts linked to the piped network with adequate pressure. Discussion groups said that they were reluctant to contribute to short-term solutions. Stand-posts were perceived as an acceptable solution bearing in mind the current poor water supply. Long walking distances to stand-posts were seen as a disadvantage, and sites on main roads were a danger as children may be involved in car accidents.

The willingness-to-pay study did not explore the willingness to pay for water in urban areas (apparently because this had been done in other surveys such as those by Development Workshop). However, for other services it was found that urban residents were already paying for services (even if these were unofficial payments), and would be willing to continue to pay for services provided that they knew where the money was going, the service was better and cases of very high payments were avoided.

The two Development Workshop surveys (1995 & 1998), as well as the Beneficiary Assessment in Lobito and Benguela (Oxfam 1998), found that users were willing to pay for improved services and were willing to accept community responsibility for maintenance and management of local aspects of the service (such as stand-posts and water tanks). Help was expected for setting up community systems of management of money. The expectation was though that the amount spent on water would decrease and the service would improve in exchange for paying for a service. Most people preferred a pay-as-you-go payment system for stand-posts.

In these surveys and consultations, respondents feared that the government had no capacity to regulate private operators. They tended to prefer systems where the community could influence the process and did not see privatisation as a panacea, as there was little institutional capacity and no legislative framework in order to regulate private sector participation.

3 Diagnosing the challenges of water access after conflict

Development Workshop's studies of the informal water market in the 1990s were carried out when the civil war was still ongoing. The research questions presented in these early studies have been revisited for use in a new cycle of research studies in order to take into account the significant urban growth (population size, density, and in occupied territory) that has occurred since, and the changes in the informal water market that have developed since the end of the war in 2002.

In 1995, 1998 and more recently in 2008, Development Workshop was contracted by the World Bank to carry out surveys in with the objective 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 price and understanding consumers priorities for improvement.

In Luanda (2002) only about half of households access water from the formal piped water system, mainly through a tap in their own residence or their building or at a neighbour's. A small proportion of them have water supply in their residence. Only half of households with a tap in their residence receive water every day; 35% receive water most days while 14% receive water only once or twice per week. Just over half of the households have water supply with 100 metres of their residence (Table 3) but significant numbers have to go more

than 500 metres to get water. There would appear to have been a small improvement since the end of the war in 2002.

It was primarily women who collected and pay for water and women manage their household budgets on a daily basis. Women interviewed said that their families eat less in order to buy water and that households buy the water they can afford, not the water they want or need. The cost of water varies markedly between areas, depending on the type of supply and difficulties of supply. The principal determinant of the price of water in Luanda is whether or not one lives in the urbanised, serviced part of the city.

4 Public versus small scale private water suppliers

Rebuilding and extension of formal water systems is taking place as part of the post-war rehabilitation programme in both Luanda and other cities. However, these programmes are still at an early stage: rebuilding the core of the systems that had not been maintained sufficiently over the last 30 years or was intentionally sabotaged during the conflict (main pipelines, treatment and pumping stations) with some new extensions to the system. But there are still large areas that still rely on informal water supply and are likely to for some time. The rebuilding of the core systems is still in progress in many cities. It is planned that these rehabilitated systems will supply piped water to households in the urbanised districts of the cities but often it is only intended that they will supply standpost water points in the peri-urban peripheries.

In Luanda, only a portion of domestic water consumed is provided by the public sector. The public utility EPAL⁷ takes charge of the water production and 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 had not kept pace with the growing urban population. For at least 15 years, small scale water providers have been an important part of the water service delivery in peri-urban areas where the public utilities has failed to supply. Small scale private water providers provide the bulk of the water in these peri-urban areas.

It is only recently that these suppliers gained some sort of recognition as a viable alternative for supplying water to areas not connected to the water grid. This recognition, however, has not yet translated into a legal and effective encompassing institutional framework under which the small scale water service providers can operate. The government still considers that small scale water service providers in the main urban centres are opportunistic rent seekers who are there to fill the supply gap until government develops its full capacity. The exception to this is in smaller municipal centres. Recent legislation which aims at promoting decentralisation and the creation of municipalities with their own administrations allows for the creation of municipal service companies. The legislation does not stipulate whether these companies are to be public or private. Several municipalities have created "Municipal Water Brigades" which function as small scale public enterprises. This model has not yet been widely implemented nor yet demonstrated its financial sustainability but may provide a model for future investigation. The second argument raised against the small scale water service providers is that they provide a poor service to consumers – failing to meet both technical and quality standards. On the other hand, government officials in charge of water distribution have recognised the important role of the informal suppliers in two respects. First, it is acknowledged that most urban poor gain access to water through informal sources and this segment of the population would go un-served if small scale water service providers stop working. It is also known that the provincial government plan to extend water supply system to new and informal settlements is unattainable in the immediate future. Secondly,

⁷ Luanda Provincial Water Company (EPAL) is a publicly owned corporation.

there is also growing recognition that urban management in Luanda with respect to the water sector goes beyond the government's sole mandate – and it is supported by a strong interaction of formal and informal activities. Therefore it is necessary to develop a policy and operational framework that defines a role for small scale water service providers. Such a framework needs also to set quality stands, efficiency, tariffs, and appropriate solutions to the water problem that does not ignore the role of important actors within the existing delivery system, such as the small-scale and informal market actors.

Official attitudes favour the participation in water supply provision by an “organised private sector” but experience has shown that private sector is still disorganized and needs to develop its own capacity to be reliable partners of the Government in the provision of essential services like water to the population. 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 proven to be unreliable and unable to guarantee the maintenance of water systems that they have assumed responsibility for.⁸

5 Luanda peri-urban water value chain

The informal peri-urban water market in Luanda probably turns over more than 250 Million US Dollars per year. It provides almost 20 litres of water per person per day to almost 4 million people at a price of about 0.01 US Dollars per litre.

Development Workshop has adopted value chain tools in its recent research on the urban informal water market. Issues related to this market can be subdivided into three main components:

- (i) water market – main source of supply and spatial price differentials (i.e. where value is added and money is made);
- (ii) market chain actors – relationship between formal and informal institutions (i.e. the process of delivery);
- (iii) consumer end-point – access, satisfaction, affordability and willingness to pay.

Value chain is a tool for market analysis involving the mapping of sequential commodity transactions. It has proven to be a particularly useful tool in assessing the water economy in Luanda, where water services can be unbundled into the various components of the distribution chain – from production to consumers and sometimes disposal. In the informal market, the bulk of the water is supplied through a very simple vertical structure.

The services that are provided in the supply-chain include:-

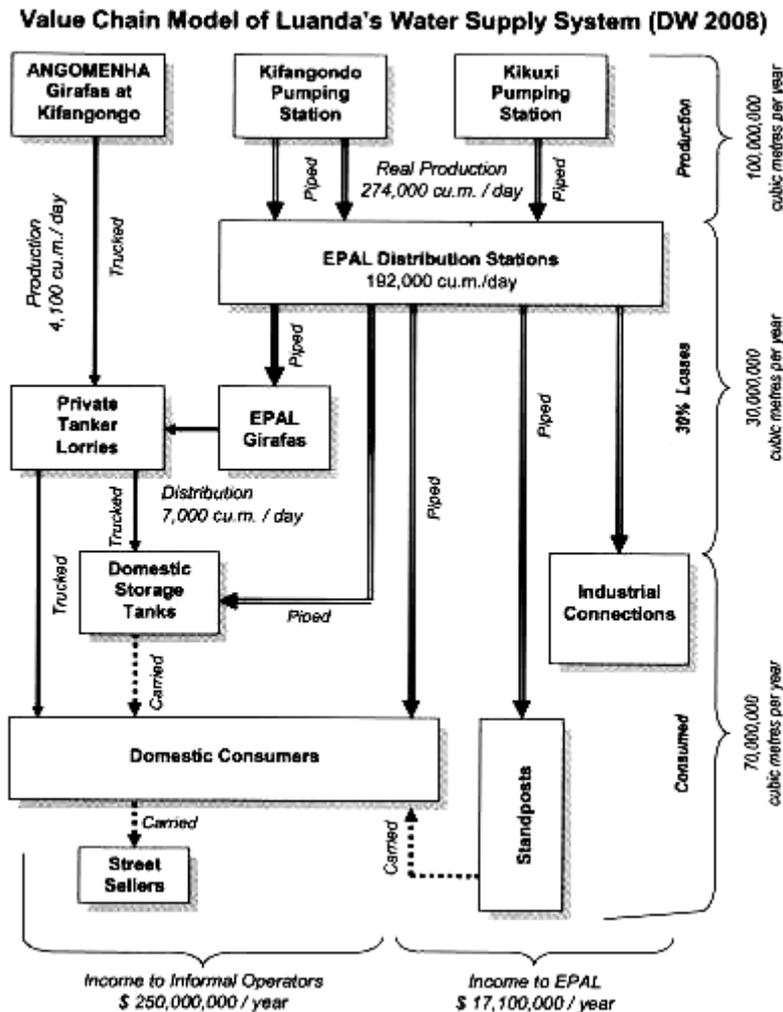
- Pumping (removing water from the river)
- Transport and distribution (by tanker-trucks, *roboteiros* and street-vendors)
- Treatment
- Storage (In tanks)

The market chain actors include: the Government of Angola represented by the National Directorate of Water (DNA); EPAL- which is the public company responsible for the production and distribution of water in Luanda; ANGOMENHA – an association of operators – who pump river water for their lorry-driver members and transport it with cistern-trucks to the informal supply network; Water truck operators and home tank owners are key actors in the informal market. The truck operators are responsible for transporting water to

⁸ Development Workshop (1997) Managing Public Water Standposts - privatisation or community based management? Lessons from five case studies in Angola, University of Guelph & DW, Luanda, Angola.

unconnected consumers, whereas the home tank owners provide retail water sale from the underground tanks. It is reported that 2/3 of the total population in Luanda is supplied by water truck operators and standpipes. Rapid population growth has meant that the proportion of population served by a tap in their own residence or their building or at a neighbour's has not increased. The standpipe system is increasingly important and is being developed to eventually serve a larger proportion of the unconnected consumers in the peri-urban areas – as an interim solution until individual households can be connected. The end consumers in the formal piped delivery system may be called passive actors as they stand on the receiving end of the chain – i.e. the end delivery point.

Figure 1: Value change model of Luanda's water supply system



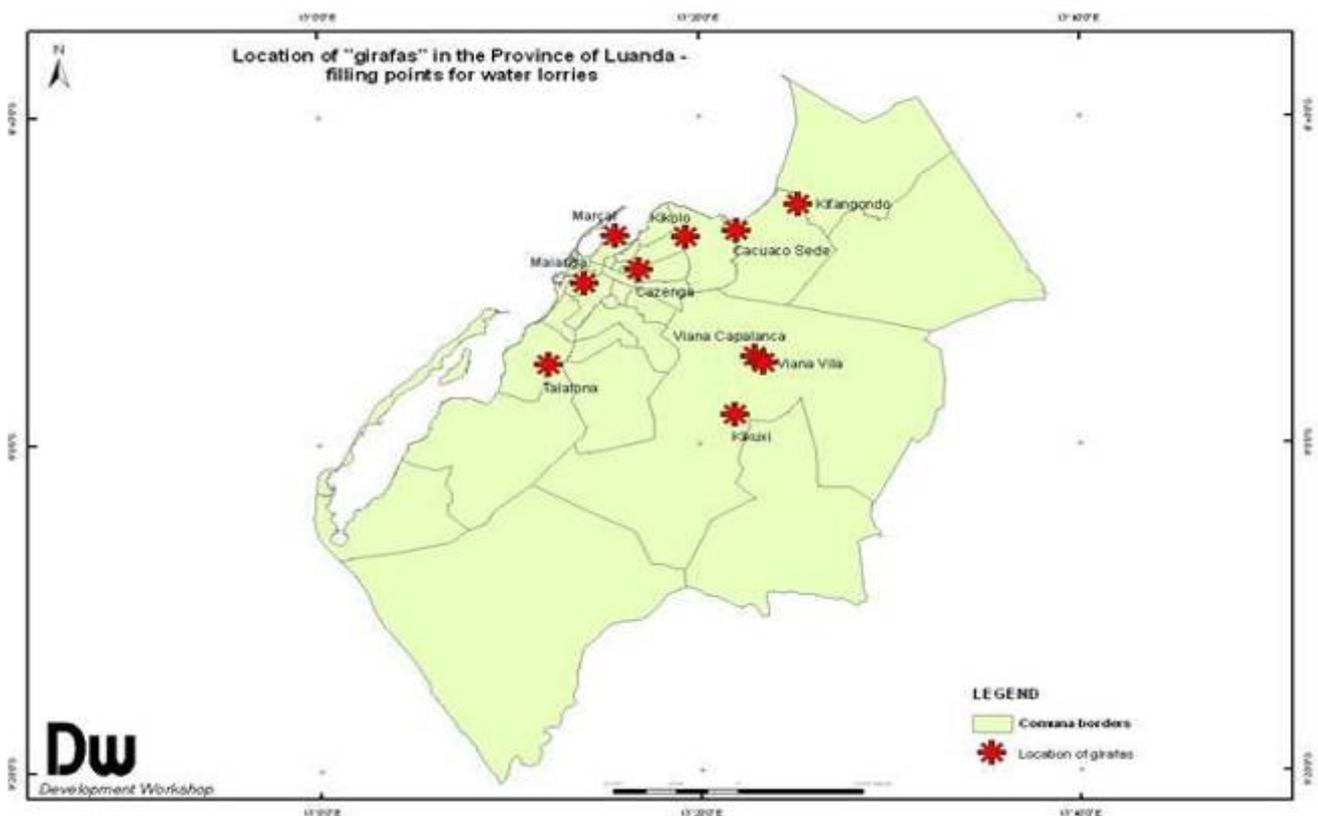
5.1 Actors: formal sector service provider

EPAL the formal sector service provider has a facility in place to produce 255,000m³ per day but it is currently operating at 35% below the capacity (165.500m³/day). Under full operations capacity, EPAL would provide every inhabitant in Luanda with 57L per day, and under current capacity, the amount of water per person drops to 37L per dayⁱ, due to leakages in the distribution systems and other technical and managerial constraints. The amount of water that reaches connected consumers is estimated at only 64.000m per day

whereas the remaining 101.500m³ is distributed to unconnected consumers through stand pipes, water truck operators and home tank owners⁹.

EPAL had planned to construct water-truck filling stations (girafas) in the underserved peri-urban areas of the city as a short term solution to the water distribution problem. Water truck operators can buy water in the filling stations and resell to unconnected households. Based on recommendations made by Development Workshop in their 1995 report, EPAL had planned to build the stations in sites in the periphery of the city where underground pipe-network did not exist. However, most of the filling stations were constructed instead adjacent to the EPAL water treatment centres within the city where the water pressures were higher and EPAL considered they could be more easily controlled.

Figure 2: Location of filling points for water trucks



The underserved households therefore still remain in locations at 10Km to 20Km away from the filling stations. Since water is transported primarily by water truck operators, the further away a household is from the filling station the more it pays for water, even if the price of water in the filling station is set at low subsidized prices. Water delivery trucks having to circulate in the crowded city centre add to Luanda's traffic congestion problems.

New water systems serving individual households have only been built to serve the green-field commercial high-income areas in the southern extension of the city (Luanda Sul). These new systems, drawing from the upgraded Kikuxi treatment station, often bypass high

⁹ The amount of water that reaches connected and unconnected consumers cannot be estimated with certainty because there are too many illegal connections to the pipeline in *Bairros* without a secondary network distribution system to the households. In addition, intermittent water supply to households with connections means that they also buy water from the informal distributors at various times during the year. Conversely, unconnected households close to the better served *urbanised bairros* like Alvalade, Maianga, Bairro Azul, also have the "privilege" of accessing piped water – from clandestine connections to officially served households.

density low-income neighbourhoods on-route. Water provision to the new development subdivisions, greatly enhances the value of land plots for the private benefit of the commercial developers but brings little income to EPAL, the public water company, who sells water at the official subsidised price to a relatively small number of consumers living in these low density housing areas.

5.2 Informal water service providers

Unable to meet the water needs, particularly in new informal settlements, the provincial government has been obliged to recognize the role of water truck operators who fill the water supply gap. The difference between formal and informal is, however, not clearly defined. In the water sector, the informal is often regarded as an extension of the formal – covering up for the lack of capacity of the formal sector to extend the services beyond the official network of household connections. Informal water operators, some of whom are military officers or relatives of government functionaries, tend to see themselves as partners of the government, and government officials in the water sector give due recognition. They are in fact, essential and important actors in the market chain.

One of the official water filling stations in Luanda is owned by water truck operators who organise themselves in an association called ANGOMENHA. The association for the water extraction and management of the station and interacts with the EPAL and the provincial government on behalf of truck drivers and water pump owners who are members of the association. The ANGOMENHA water filling station, is the main source of water sold by trucks in Luanda, and is located in Kifangondo (Cacuaco) adjacent to the Bengo River. The Kifangondo water filling station - which is the largest in Luanda - serves about 550 trucks per day with capacities varying from 5m³ to 25m³.

Photo 1: Tanker-trucks filling up from River Bengo at the ANGOMENHA Girafas at Kifongondo¹⁰



ANGOMENHA has the most efficient filling system and drivers do not need to wait in long queues. There are 26 pumps which operate on alternate days – 13 a day. This technical management strategy is aimed to ensure that water flows continuously on a daily basis. Each pump earns between US\$100 and US\$150 per day with trucks paying US\$0.88/m³ of water. Modest gross revenue for the association can reach close to US\$5,000 – assuming no major breakdowns occur and the official tariff is maintained throughout the month. However, start-up as well as operations costs are high. With the pump and engine costing about US\$10,000 to US\$12,000 and an additional US\$6,000 for tubing, pump owners commit an investment capital close to US\$20,000 per unit or over half a million dollar investment in ANGOMENHA's pumping station. The pumping station in turn earns annual gross revenue of \$470,000 to \$700,000 a year against running costs for fuel, operator maintenance and spare-parts.

Each pump owner who is a member of ANGOMENHA *along with* the water truck operators is expected to contribute towards a monthly maintenance fee to ANGOMENHA and a 1% monthly tax on revenue paid to the Ministry of Finance. A fee that contributes to the maintenance of the road leading to the station is paid on an ad hoc basis. While ANGOMENHA's members are individually informal operators the creation of the association itself is a clear attempt to formalize, rationalize and establish a key 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. Of course water truck operators pass on these taxes and other costs accumulated within the market chain to the end consumer. Consumers are therefore indirectly paying taxes for the, often, poor quality river water that they purchase.

¹⁰ Photo: Hetherington, T. (2005), Luanda Urban Poverty Programme.

Water vending is exceptionally profitable for the pump operators who can earn a return on investment in two years or less, but less so for the truck operators who have high labour costs of drivers and fuel exacerbated by long-wasted hours consumed by traffic congestion in Luanda's over-crowded roadways. For truck operators the margin of income over expenditure is just over 900 US Dollars per week, though from this has to come the salary of the driver, the depreciation of the vehicle and the profit of the owner. The most significant cost is the depreciation cost of the lorry, which is estimated to be over half the costs of running a tanker-lorry. The system of delivery of water by tanker-trucks leads to a high price for water because of the cost of the vehicle and its operation rather than any unreasonable profits by owners.

The water sold at the ANGOMENHA filling station is untreated at source – posing potentially serious health risks. All drivers are expected to stop nearby at a small water treatment station for chlorine treatment. Although the chlorine treatment costs only US\$0.12/m³ there is no system to enforce that the truck drivers do stop for water treatment, or ensure that the water has successfully being treated. Most of the time no one actually verifies whether the drivers add the chlorine to the tank or not.¹¹

5.3 Informal sector retailers

The interface between the transporters and the retailer is central to the informal water supply system. This is where costs and the amount of water available to the household-based retailer are determined. Water truck operators bring water from the main filling stations to unconnected household re-sellers who in-turn retail to the estimated 70 percent of the population of Luanda who are not connected directly to the formal network.

The retail price is set by the household-based reseller who buys from the trucker, stores water in their (usually) underground tanks and most often sells to their neighbours. The tanks are underground concrete blocks with the capacity to store 5m³ to 15m³. The majority of the tanks (some 86%) are filled with water supplied by the water truck operators, 11 are connected to a pipeline, and 4% receive water from a combination of trucks and pipeline – depending on availability.

¹¹ EPAL takes weekly samples of water are taken to their labs for chlorine analysis, but only from the cisterns of trucks that have voluntarily stopped for chlorination.

Photo 2: Water is resold from household underground tanks to neighbours¹²



5.4 Water street-sellers

A secondary level of retailing is sometimes practiced by street vendors who operate in the informal market selling water in small containers or plastic bags. These vendors usually receive their water from home tanks and standpipes and sell in units of half litres for Kwz 5 to 10 (US\$0.06 to 0.12). Water selling in the street and market place is often done by ambulant traders who are usually considered to be at one of the lowest rungs of the water market and make marginal profits.

Photo 3: Vendors reselling water in plastic bags in the informal market¹³



¹² Photo: Hetherington, T. (2005), Luanda Urban Poverty Programme.

¹³ Ibid.

5.5 Water carriers and carters

Water carrying by women and children 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 meters, to their homes and children who haul water carts often weighing 40 – 50Kg for even longer distances.

Table 14: People responsible for carrying water

MICS 2002 Urban areas	Who carries water %
Woman	62.2
Man	4.7
Child aged 5 - 11	5.9
Female 12 - 17	16.6
Male 12 – 17	5.3
Everyone	3.5

Source: DW

Photo 4: Labour of women and children is rarely factored into the price of water¹⁴



¹⁴ Ibid.

Photo 5: Haul water carts often weighing 40-50kg¹⁵



6 Spatial price differentials

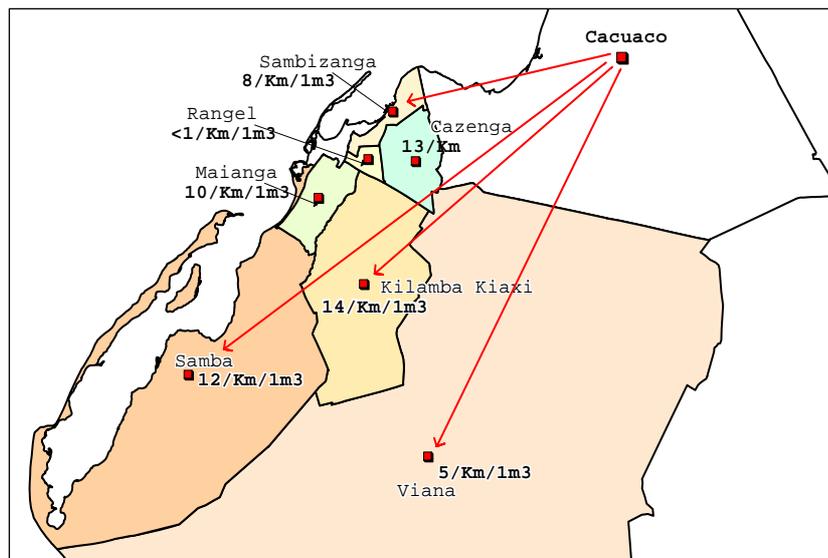
A price survey was carried out by Development Workshop between 2006 and 2007 in all (264) bairros of Luanda. These prices, paid by consumers for 20L of water are considered as the retail price. The study also recorded the average price of one cubic meter (m^3) of bulk water – which is the price sold by the water truck operators to consumers who have underground storage tanks. The price of water sold by the water truck operators is considered to be the wholesale price. Both retail and wholesale prices are found to vary widely across the province and within municipalities – with the highest price exceeding the lowest by more than 100 percent for both retail and wholesale. The highest prices are found in Samba municipality, with Ramiro and Futungo communes leading the price list. The average price of 20L in these communes were recorded at US\$0.7 and US\$0.4 respectively. The price of $1m^3$, which is supplied by water truck operators to the fast growing informal settlements in southern Luanda, where there are only two water filling stations, is found to vary between US\$10 and US\$14. The average retail price across all bairros was recorded at US\$0.50 reaching US\$0.65 during periods of limited water supply¹⁶.

¹⁵ Ibid.

¹⁶ There are also, however, big price differentials within the southern Municipalities of Luanda. There is now an important girafa in Benfica (supplied from a pipe). There is also an important girafa in Kikuxi both supplying the up-market developments in the southern Municipalities of Luanda. Prices rise steeply at distances from these points to the rest of southern Luanda.

Figure 3: Consumer spatial price coefficients

Consumer Spatial Price Coefficients Kz/Km/1cu.m. from water source in Cacucaco, demonstrating the index of price increase related to time and distance from the water source.



Source: DW

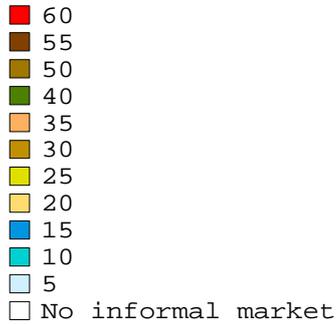
The lowest water prices are found in the Central and Northern parts of Luanda, particularly in areas where the water supply systems from the colonial periods remains minimally functional. In addition, four of the five water filling stations that are managed by EPAL are located in the Central and Northern municipalities, where supply is found to be more adequate - in relative terms – and prices are lower. These include Rangel, Maianga, Maianga, and Cacucaco. The retail price range from as low as US\$0.10 in Rangel to as high as US\$0.25 in Cacucaco.

The lowest wholesale prices per cubic meter are also found in Cacucaco and Rangel municipalities. Since Cacucaco supplies the bulk of the water that flows through the informal network DW calculated price differential factors based on the average price at Kifangondo water filling stations. The prices of 1m³ increase at an average rate of US\$4.75 per kilometre as trucks travel from Cacucaco southwards. This figure is expected to be higher when time due to traffic congestion and other daily operational factors are brought into the equation.

The results of the current price differential analysis conform to those of Development Workshop's earlier 1995 study in two important aspects. First, the proportional deviation of the informal price from official remains extraordinarily high for all Bairros. Second, as in 1995, the areas where water is most expensive are all located south of Luanda. These areas have never been supplied by a piped system and they are far away from the main source of supply in Cacucaco.

Figure 4: Average price of water per 20 litres

**Average Price of Water
Bairro [Kz/20L]**



**Average Price of Water
Bairro [Kz/20L]**

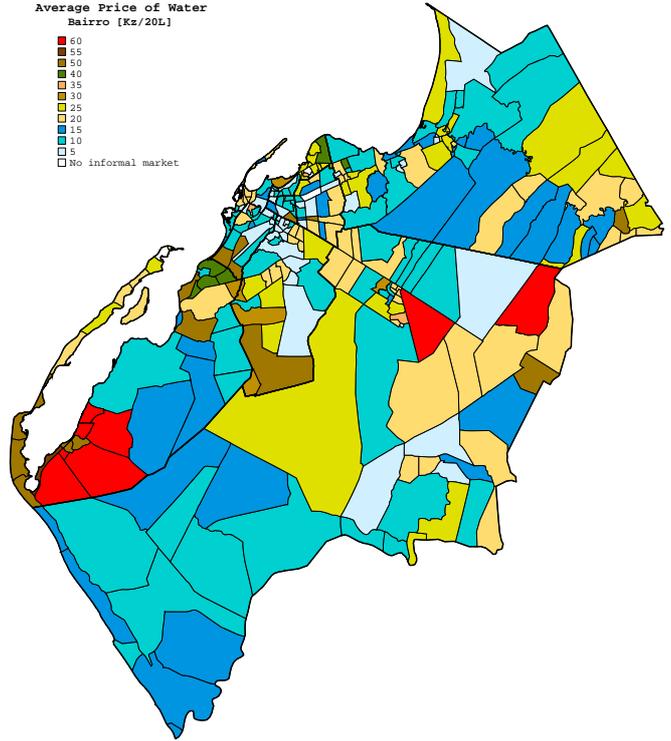
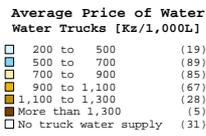
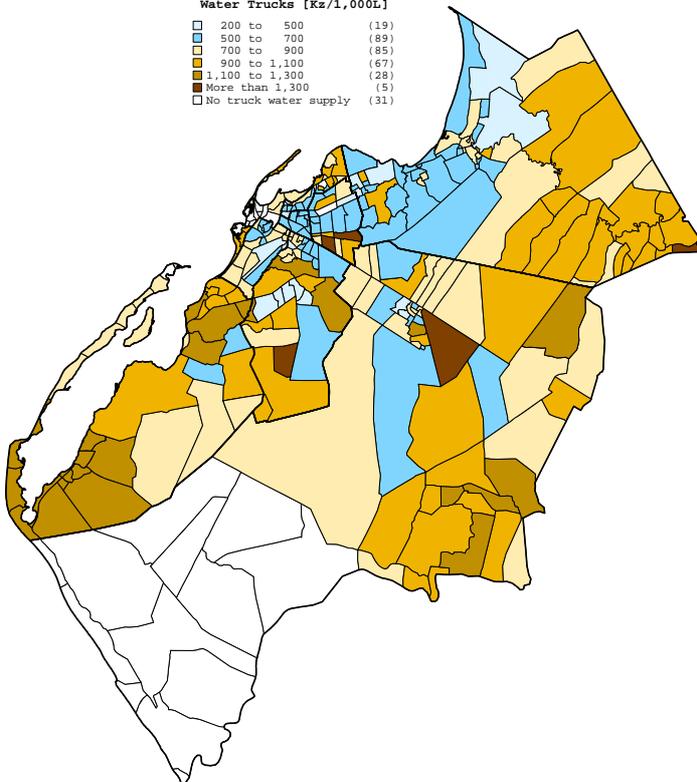
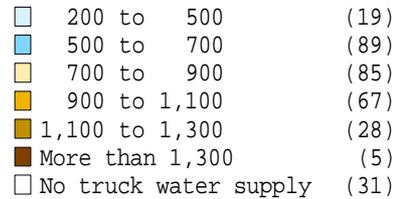


Figure 5: Average price of water supplied by water trucks



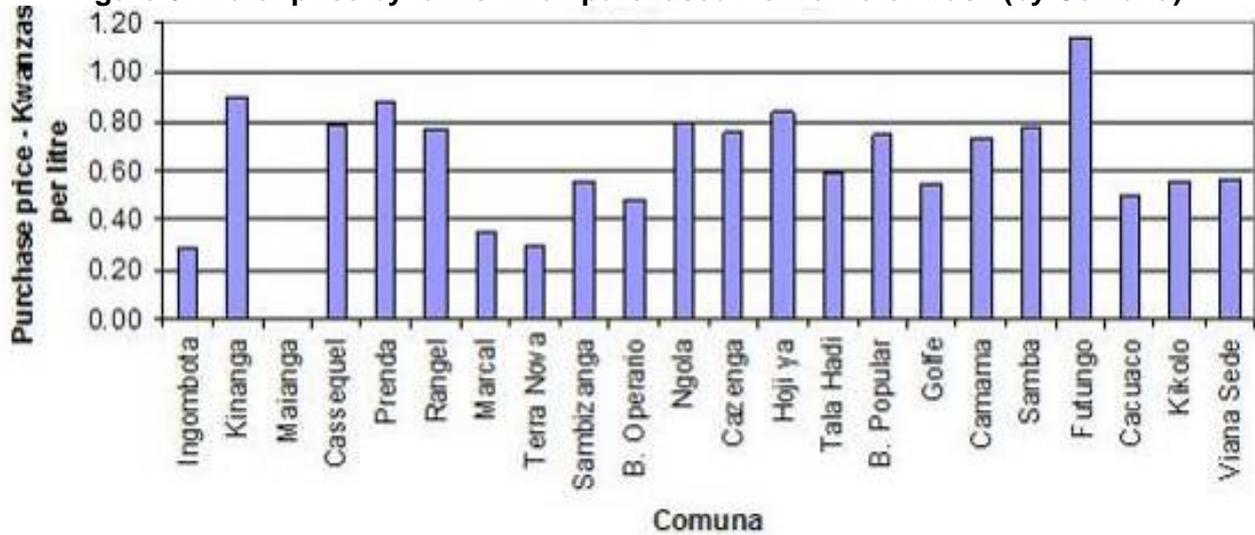
**Average Price of Water
Water Trucks [Kz/1,000L]**



Source: DW

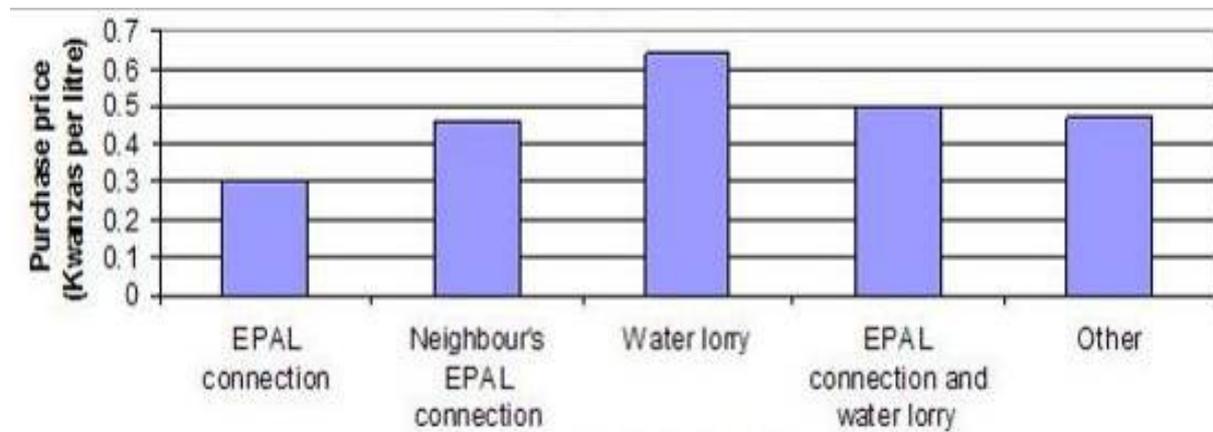
The normal (informal retail) price in Luanda for water today is 20 Kwanzas for 20 litres (25 US cents for 20 litres). However, there are areas where the price is much higher (50 Kwanzas for 20 litres) because they are distant from the piped water supply and distant from the places where the trucks fill up. Figure 6 lists the comunas of Luanda against the wholesale prices for water delivered by tanker truck. Price variations are largely due to the distance from the pumping station. Figure 7 shows the variation in wholesale prices paid by tank owners from different supply sources.

Figure 6: Water price by tanks when purchased from a water truck (by Comuna)



Source: DW

Figure 7: Purchase price (Kwanzas per litre) by owners of tanks by type of supply to tanks

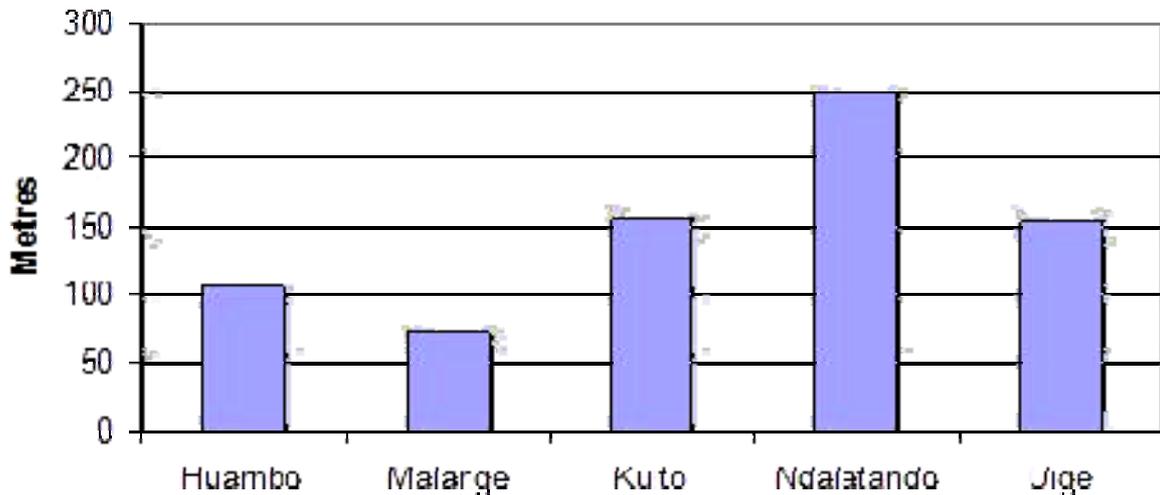


Source: DW

6.1 Provincial town water supplies

In provincial towns of Ndalatando and Uige¹⁷ there is some groundwater and surface water but not close to every house. In Uige the inhabited areas are on the ridges while wells and streams are in the valleys. In Ndalatando the groundwater and surface water is in limited areas. There thus is a market for water in these cities and the normal price is 10 Kwanzas for 20 litres (12 US cents for 20 litres).

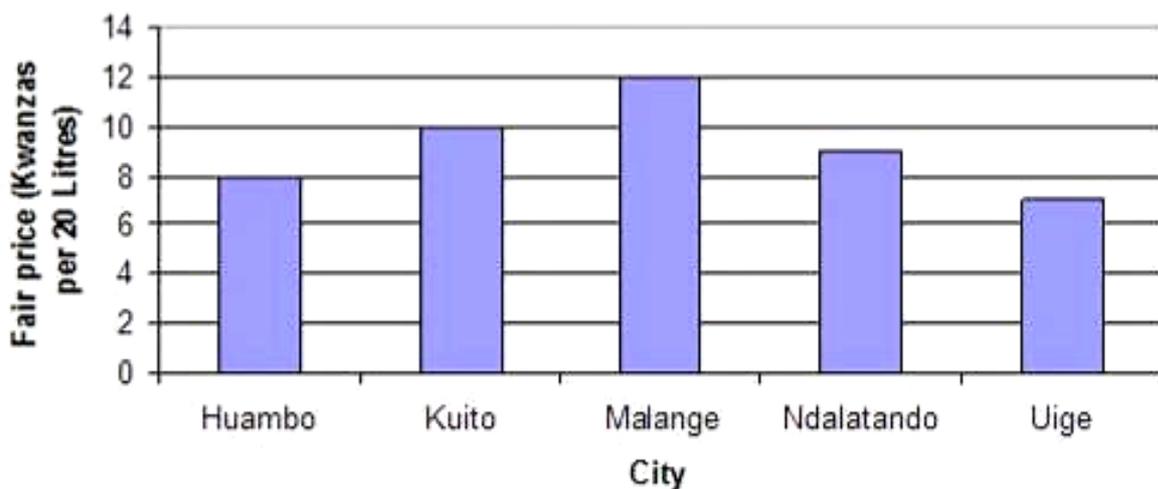
Figure 8: Average distance to the main water source in metres



Source: DW

These prices are high per cubic metre and a significant proportion of people's overall household budgets. Low income groups normally spend significantly more than 5% of their household budgets on water.

Figure 9: Average fair price for a 20 litre container of water from a standpost



Source: DW

¹⁷ Development Workshop (2008), "Willingness and Ability to Pay Study for Water in Five Provincial Cities", World Bank and National Water Directorate, May 2008.

Photo 6: Water collection at a public standpost



Source: DW

7 Community management¹⁸ – a model of local enterprise development

With support from DfID's Luanda Urban Poverty Programme¹⁹, DW's has moved from its strong base in practice to advocating for pro-poor policies in basic service provision. DW's sustainable community service project has focused on building up its partnerships with the provincial and national water authorities EPAL²⁰, DPEAH²¹ and DNA²² to develop robust

¹⁸ This section is drawn from the LUPP Good Practice Series, Model of Community Management of Water: good practice in the musseques of Luanda (2007).

¹⁹ Luanda Urban Poverty Programme (LUPP) is a consortium of NGOs including Development Workshop, CARE, Save the Children (UK) and One World Action, which has support from DFID.

²⁰ Luanda Provincial Water Company.

²¹ Huambo Provincial Department of Energy and Water - Since the inception of its programme in Huambo in 1997, Development Workshop has built or rehabilitated over 700 water points and has introduced a system of community management and maintenance for all the water points constructed. DW has successfully created a network of committees, elected by users, to manage these water points. Contributions from the users have created management and maintenance funds that cover the repair costs as they arise.

²² Angolan National Water Directorate.

systems for water, sanitation and solid waste collection that could work within a city that is growing rapidly, with much of the population living in self-constructed housing and having very low incomes and with very weak local governments.

It was clear from DW's research, affordability and willingness-to-pay studies that low-income households were prepared to pay for a public water supply service if they got a reliable service and the price was less than that charged by private water vendors. DW therefore developed a model that provided such a service at a price that was affordable to people and which would cover the cost of the water and the standpost maintenance and with revenues for the water company to encourage them to sustain water supply to the standposts. Water committees were formed to operate the standposts and collect the revenue, ensure that the taps work and are maintained, keep standposts clean, keep the drainage tube clear, register the number of days of water flow, and ensure that records of all payments and expenses are kept in a cash book. This meant developing community organizations that were accountable to residents – for which there was little precedent. It also meant developing community organizations that could manage finances and deal with conflict (including getting action against illegal connections). From this, associations were developed through which committees involved in managing standposts could share their experiences and work together in seeking better services from the water company and from local authorities. The water company also recognizes that it does not have the capacity to manage water supply at the community (*bairro*) level and that it should concentrate on improving bulk water supply (extraction from river, treatment and distribution through water mains). In effect, the programme is building local institutions from the bottom up – and seeking to create trust and working partnerships between community organizations, local governments and the water company in which each has defined roles and performance standards. But this kind of long-term support for institutional development is not one that most international funding agencies can support. Their support is more for capital investments in time-bound projects. Many external agencies also see privatization as the solution but this would be inappropriate for Luanda with its weak national private sector, public institutions still too weak to manage privatization and a large part of the population with incomes too low to be attractive to private enterprises.

7.1 Promotion of sustainable basic service models

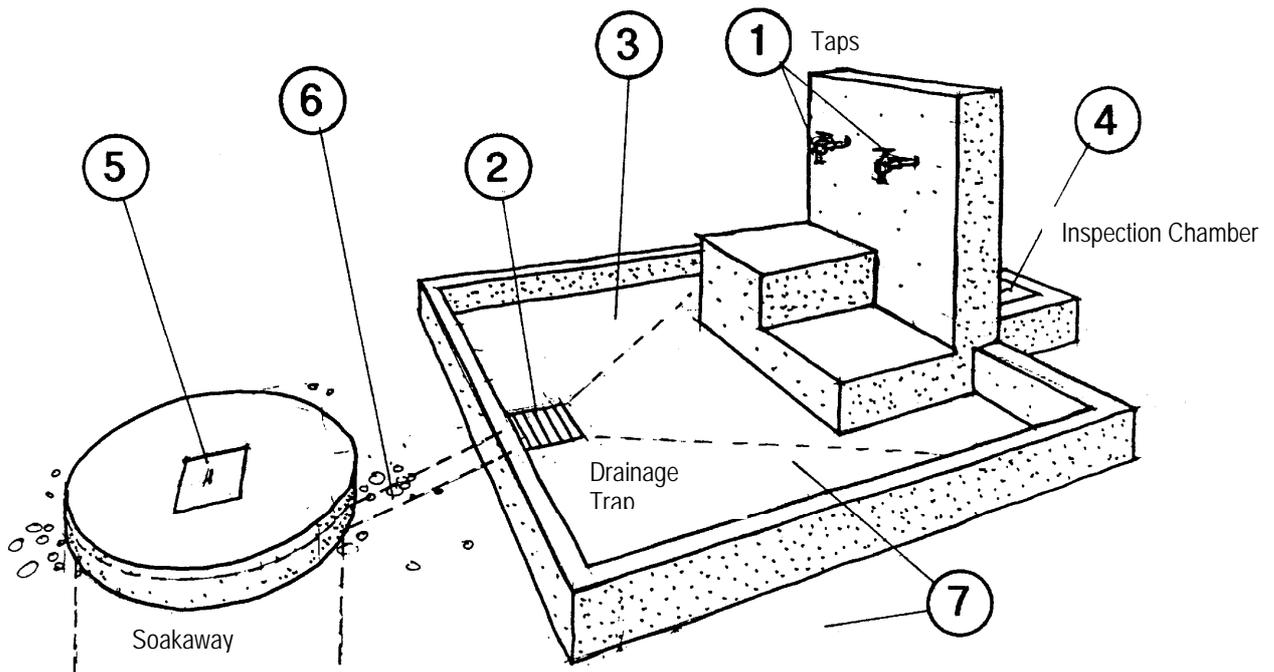
Development Workshop and its LUPP partners have refined models of sustainable community water management that have evolved and been rigorously tested in practice with the aim of replication and scaling up to a significant target group. This process has invested adequate time for learning and feedback. DW programmes 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 Government through commercial credit lines such as those now available from China and Brazil.

The model for community water supply has several key components; the hardware that is based on robust and low-cost technology, the sustainability or cost-recovery strategy and the community management system.

a. Robust, low-cost technology

DW programmes facilitate water supply through public standposts linked to the mains water supply and constructed by EPAL/DW construction teams. There is rigorous screening of sites selected by the communities, to limit the selection of sites where head pressure would diminish over time.

Figure 10: Community standpost design



Source: DW

Specific design features have been developed through testing in the field and in consultation with the users:

- perimeter walls or curbing around the standpipe reduce the spread of spillage to surrounding areas;
- the structure is built mainly of good quality concrete blocks or cast-in-place concrete that is more durable;
- there is a drainage pit lined with concrete blocks to prevent the accumulation of stagnant water;
- there is a grille on the drain (for filtering garbage) which can be opened for cleaning the drainage pipe;
- there is an isolation valve contained in a lockable valve box;
- the valve box is large enough (50 centimetres by 50 centimetres) to facilitate repairs;
- the standpipes have taps (usually two or four) that are manufactured locally and available in local markets and so can be easily replaced by the monitor or other users;²³
- there is no water meter incorporated into the design of the individual standpost;
- there is no structure to protect the standposts in the basic design, although local water committees often set up barriers such as half-buried tyres to obstruct vehicles, and some communities have transformed standposts into water kiosks with roofed and lockable, fenced enclosures;
- some standposts (in lower-density areas where there are gardens) have soak-away drains rather than soak-pits that allow the use of waste water for irrigation.

²³ Experiments with specially designed shut-off taps promoted by some development agencies were undertaken but they have generally proved unsuccessful and expensive. Locally manufactured taps are cheap and easily replaced by the user committee. The local manufacturer has made small improvements to strengthen its taps, based on recommendations from DW.

Water meters have been omitted from the design as they appear to be a weak point in standposts that are fed intermittently and with low water pressure. It was found that reasonable estimates of water consumption were available through records kept by both the standpost monitors and the water company. Water meters are costly to maintain and repair, and have been shown to register readings when air is pushed through the pipes and not water. They may even run backwards in certain circumstances when negative pipe pressure occurs. Silt particles suspended in the water are abrasive and wearing on meter parts, which break down after a short while²⁴.

The aim has been to bring water to within 100 metres of every house, as a number of studies have shown that when water is supplied at a distance of less than 100 metres from the house, water consumption increases. In practice, to date, this has never been possible in Luanda, where water pressure has never been sufficient to allow this coverage, although the current programme attempts to approach this by also improving water supply to a particular area.

b. Components for sustainable service provision based on community access to piped water

The following table summarizes the key issues for sustainable development of service provision.

Table 15: Key issues for sustainable service provision

Installed and functioning systems	Competent stakeholders	Delivery systems
Community consultation before installation Adequate coverage Efficient operation and maintenance Complete cost-recovery or recognized need for a public subsidy	Management skills, transparency and accountability, technical skills User groups with leadership skills and representation Public/user education Quality control and effective consumer protection	Decentralization and local authority involvement Systems and support for learning and problem solving (monitoring, data collection, data analysis, review and planning) Mechanisms for client feedback, systems review and planning Mechanisms for dialogue, collaboration

Source: DW

The key elements of the programme strategy have been:

- To start with a priority need identified by the community. Water supply was the first area of basic service intervention in 1991. In areas where improvement of the water supply is not a viable option in the context, communities have opted to begin with on-site sanitation.
- To use appropriate technologies, which are accessible, affordable, accepted by the users and where the users can manage the on-going maintenance.
- To apply an informed stakeholder analysis. Stakeholders are encouraged to dialogue and collaborate and to perform and monitor their respective roles in service provision. Stakeholders are supported to develop their capacity to carry out their responsibilities and to deal with the conflicts that can arise from provision of basic services.

²⁴ In a World Bank-sponsored project in Lobito and Benguela, the connections on either side of the meters on the standposts were frequently tampered with by users when water pressure was low, as the meters were at a lower level than the taps and there was more water available at this level than from the taps; this interference then produced substantial leaks from the joints, which were difficult to repair.

- To ask users of the service to contribute to the costs of the service, but ensure that the service is affordable and that institutions are developed that account for the use of funds and that apply them to sustaining the service.
- To raise community awareness in relation to viable options to improve their access to basic services. To train and support community residents to reach their potential as user-managers of services.
- To advocate with policy makers to consider community management of resources as a viable option. Users are client-consumers, who make fair payments for services provided, look after their community's investment and put pressure on other stakeholders to be accountable.
- To establish a monitoring system to systematically track progress. The monitoring system should identify technical and systemic problems and identify new opportunities. Problems should be addressed promptly and in a transparent fashion with the stakeholders. Opportunities should be used optimally where following the new opportunity does not compromise the on-going commitments.

Data have been collected regularly on the costs of construction, maintenance and operation of standposts, and on the amount of money collected at standposts. It costs about US\$ 2,000 to build a standpost and another US\$ 2,000 to maintain it over a ten-year period. Data are also obtained from the water company on the cost of supplying water. Standposts can only be built in areas that are within approximately 300 meters from an existing water mains supply line. Large areas of peri-urban Luanda are still outside the water mains network. In these areas, water tankers are the principal source of supply.

Currently, with the limited overall supply of water to Luanda, families buy from standposts an average of five buckets of water per day (100 litres) at a cost of US\$ 0.13 per day. This corresponds to US\$ 1.30 per cubic metre, which is 12 per cent of the price charged by private water vendors selling water from tanks supplied by trucks. The amount charged at standposts has proved to be adequate to maintain and repair the standpost, pay a monitor and pay a contribution to EPAL for the water supplied. Users may be willing to pay more for a household or yard tap, and there may be health benefits from the greater use of water that normally results from such water connections. There is, however, not currently enough water being supplied to the city to supply a large number of household connections.

c. Community management through water committees and associations (ACAs)

DW through the Luanda Urban Poverty Programme LUPP promoted a *Community Management Model* that develops reciprocal actions and increases responsibility between consumers, local administrations and water provision companies. The beneficiaries of this model must be involved in the process from the beginning. The community management committee has decision-making authority to select the location and plan for the standposts and water system. The provision of water does not only consist of planning for management but also includes the development of an appropriate technical programme for maintenance.

The Community Management Model for Water was developed over a fifteen year partnership between DW and EPAL (Public Water Company, EPAL-E.P.). This partnership has been progressively consolidated since 1992 with the objective of improving the functioning and technical capacity of EPAL to construct community standposts as well as systems of community management, which can be expanded and replicated across all Luanda.

The management and maintenance of this model is carried out at the local level by community groups²⁵ elected by the users of the service. This requires investment in constant/permanent training and capacity building of all actors involved in the process, with special attention being given to the community groups.

The LUPP Model allows the development of reciprocal actions and increases responsibility between consumers, local administrations and water provision companies. The beneficiaries of this model must be involved in the process from the beginning, once community management has decision-making authority to select the location and plan for the standposts and water system. The provision of water does not only consist of planning for management but also includes the development of an appropriate technical programme for maintenance.

Central to the Model developed through LUPP is the commitment that the local groups must be involved in the negotiation and management of public assets in order to promote local development. The Model involves local authorities, EPAL and representative community groups.

The community management is a form of cooperation between various actors in the water sector and in the community. This diversity involves the joint identification of problems that need resolving and linked 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, as often as possible each community must develop their own management system and external actors should only facilitate the changes rather than lead the processes.

7.2 Overall impact

LUPP has implemented the Community Management Model for Water Provision 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 metres of the principal water distribution pipeline in order to ensure that the community standposts would function. The construction of the standposts increased water consumption from 7.6 to 14.58 litres/person/day, reduced the average distance to collect water (200 to 89 metres), reduced the price of water (5 times cheaper than water purchased from private sellers) and has considerably improved the quality of water consumed from the public network²⁶.

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

The community is not a passive recipient of a technical asset, but an active group and participates with knowledge, capacity and accountability for their actions. The implementation of the Community Management Model has stimulated reflection between the LUPP Programme, the local authorities and EPAL-EP, on the capacity of communities to manage their own standposts.

²⁵ The community is represented by Water Committees, Associations of Water Committees (ACAs) and Area Based Organisations (ABOs) like bairro and residents commissions.

²⁶ Study on water consumption (2004), Development Workshop.

Through the provision of water, the Model promotes the creation of social capital and local structures that allow community participation in the resolution of their own problems, more independently of external actors. In addition, these groups represent a mechanism to exercise citizenship at local level and to promote active participation focused on the importance of the rights and duties of citizens. Entrepreneurial spirit is also promoted at local level, as surplus funds are reinvested by the community in extending the basic water network and social projects such as child day-care services for working mothers who have businesses in the informal marketplaces.

The participation of the community in the management of services, in order to ensure the functioning and maintenance of the standposts is fundamental. Here community participation is characterised by the direct involvement of users in the negotiation, site selection, construction of standposts, and election of Water Committees, payment of water consumed, maintenance and monitoring of the standposts. The communities show that they are interested in participating in activities when they feel that they benefit directly from the services, which means they must be informed about how their money is used.

The election of Water Committees by users is essential. This principle has two important elements: exercising citizenship at the local level, which incorporates elements of inclusion and participation, and the development of transparent management and accountability mechanisms.

The development of systems for cost recovery to ensure the maintenance and functioning of the standposts is fundamental. Costs are recovered through the payment of water sold at the standposts by users. The money collected is divided proportionally to pay for water from EPAL-EP, local authorities for police protection, Associations of Water Committees (ACAs) and Water Committees. The maintenance fund is managed by the ACAs through a bank account. The bank account is audited annually to evaluate the quality and transparency of the management of the community money. The application of this strategic principle helps to guarantee the financial sustainability of the standposts, helps people get accustomed to paying for public services, to feel they have rights and strengthens the capacity of local structures in management and accountability.

The development of partnerships with local authorities and service providers is crucial. The cooperation between different partners is necessary for the service to be provided. However, in each aspect of cooperation, it is necessary that there is communication among the people involved and agreement on responsibilities taken.

7.3 Lessons learned

a) LUPP has demonstrated that the Water Committees have the capacity to manage and maintain the standposts, although continued support to the Water Committees is necessary to help them work in groups and resolve collective problems.

b) The experience of working with these groups demonstrates that it is possible to develop coherent community structures that have the capacity to articulate the needs and priorities of residents with legitimacy. It has also shown that the community structures are directly involved in water provision in partnership with EPAL-EP. In addition, the creation of community management groups leads to other opportunities for citizens to participate in political, economic, social and cultural life as well as decision-making at local level. The social capital that this kind of public participation develops, changes attitudes and promotes equality and the well being in the community.

b) The users of the water system must be involved in the process from the beginning. The beneficiaries must voice an opinion on where standposts will be constructed: the most convenient sites should be chosen, where it is possible to keep an eye on the standposts at all times. Thus, sites can be chosen in the *bairros*, with the participation of the users, which can be controlled and where is the least danger from traffic. The users show reluctance to assume responsibility for standposts for which they have not been involved in selecting the site, especially when it is a big standpost with many users and on the edge of the *bairro*, making it more difficult to watch over.

c) Due to the way it was implemented and tested, the *Model* does not require the use of water counters/meters in the standposts. It has been demonstrated in the past and in other cities in Angola that the maintenance of the water counters/meters in the standposts increases the operational costs significantly and increases the probabilities of breakdowns. On the other hand, the water counters/meters are not very reliable when there is irregular water supply. Currently, the amount of water that passes through each standpost is estimated by comparing the data of water collection from operators with the data on provision from EPAL-EP. Another option that could be tested would be the adaptation of counters/meters in each standpost, which would supply an independent water measurement for each standpost.

d) The adoption of “pre-paid cards” was tested by LUPP and the advantages and disadvantages of this system evaluated. The daily payment for the immediate consumption of water is considered preferable for some consumers, due to instability of the savings of the poorest families. The system of “pre-payment” brings some advantages for the Water Committees and the Associations of Water Committees, as it facilitates better financial budgeting and helps guarantee the payment of the accounts to EPAL, with money that can be saved in the Association’s bank account. There was considerable pressure from EPAL to adopt the prepaid system which was inspired by the successful and profitable model of cellular-telephone cards. The “pre-payment” allows the accumulation of capital, which makes a faster response possible when repairs or the substitution of material, such as the purchase of taps, are needed, for example. As a consequence, LUPP incorporated pre-paid cards in all its standposts. It was the responsibility of EPAL to print and make available prepaid cards, but the supply of cards became irregular and fell into disuse. The water committees therefore reverted to practice of daily payments.

Mechanisms for negotiation and decision-making were developed, including rules, regulations and systems of payment. This was preceded by the formation of 73 Water Committees elected by the users of each standpost, with one year mandates. They ensure the functioning of the taps, open and close the standpost at the agreed time, register the water at the standpost, they collect and register the payment of the users and organise monthly meetings with the users of each standpost.

Photo 7: Water committee members at a standpost²⁷



Source: DW

Five representative community associations were also created (ACAs and ODAs), elected by the Water Committees and the residents of each area. The functioning of the associations increased the representation of the Water Committees and the residents; it allowed the establishment of institutional links with the key actors, the management receipts for the sale of water, to provide continuous training, the organisation of the election process for the Water Committees, to ensure the maintenance and the repair and monitoring of the standposts.

Another option would be the creation of Water Committees responsible for several standposts at the same time, but this option would need testing. The adoption of this method would lead to the establishment of fewer Committees which, in turn, would facilitate the training of the Water Committees. However, it would be essential to ensure that there is confidence between the individuals responsible for each standpost and the respective users, as well as the capacity of Water Committees to take on responsibility before this sector was extended.

The Association of Water Committees provides the necessary linkage in the Model between the operational level (Water Committees and users) and the level of institutional relationships (the local authorities and EPAL-EP).

The community management of services cannot be addressed in isolation from the institutional context. In this way, it becomes important to integrate the key actors and all the initiatives that take place to enable the improvement of community participation in local management. Experience has shown that integration is vital for the efficient and sustainable management of the community standposts.

²⁷ Photo: Hetherington, T. (2005), Luanda Urban Poverty Programme.

Consultations carried out with beneficiaries indicate that residents want better water supply services and that they are willing to pay for them if they know how the money will be used. The Water Committees and Associations of Water Committees represent the users and represent them to institutional organisations. EPAL is conscious of its lack of capacity to manage the water supply for the *musseque bairros*, but is willing to participate in the development of local management models for water supply. The local authorities strongly influence what happens at the local level and are aware of the technical support they need to keep the water supply systems operational. These aspects have determined the structure of the management system and the definition of the decision-making processes of the Model.

LUPP facilitates the development of partnership agreements (formal and informal) that integrate the local authorities, EPAL and the representative community groups. The partnership agreements clearly define the key responsibilities of each actor for collective action.

This integration has allowed the planning and the development of the systems of water supply (presently only the responsibility of EPAL) to be linked to land use and the development of municipal plans. It has facilitated the linkage between EPAL and the local authorities, through the community services of the communal administrations. It has improved the systems of payment made with the money collected from the sale of water and has also responded to the initiatives of the representative community groups with respect to improvement in the water supply system in the standposts and support to the implementation of other local initiatives, on the basis of the collected money.

7.4 Cost recovery

Consultations carried out with beneficiaries indicate that residents want better water supply services and are willing to pay for them, if they know how the money they pay is spent. In addition, the experience demonstrated that the introduction of cost recovery systems, managed entirely by the people who use the standpost, is essential to ensure the efficient functioning of the standposts. This implies the existence of a system for the management and accountability of the money.

The experience demonstrated that the reality of each municipality determines the way water income is managed. From this perspective, LUPP supported the development of a cost recovery system in which the water is paid for by the users and received by the Water Committees and the Associations of Water Committees manage the income. The income is divided up monthly and distributed to the different groups involved (Water Committees, Local Associations of Water Committees, local authorities and EPAL) according to agreed percentages to ensure their participation and to guarantee the supply of the water, the legal framework and the operation and maintenance of the standposts.

For security reasons and in order to guarantee the transparent management of the money, LUPP facilitated the opening of bank accounts entirely managed by the Representative Community Groups, which are audited annually by external auditors.

The distribution of specific responsibilities between the actors involved has allowed the representative community groups, EPAL and the local authorities to establish prices of water which are affordable to the users. The price of the water was established bearing in mind the prices charged by tank owners²⁸. The price of the water in the standposts was 200 Kwanzas for 1m³ of water (1,000 litres) which is, 5 Kwanzas for 25 litres of water, corresponding US\$

²⁸ The tank owners are individuals who possess tanks in their houses, all over the musseques, and develop a business from the sale or re-sale of water.

2.5/m³. This price is about 300% cheaper than private sellers charge and approximately six times higher than EPAL charge (32.00 kwanzas/m³).

If the price of the water supplied to consumers were reduced to the level of the official price of the state, the cost recovery system managed by the community would still be viable, the pressure and volume of water would be guaranteed as well as the financial support available for the members of the Associations of Water Committees. Currently the official price of the water is lower than the cost of production and is significantly subsidised for people who have access to this water. Those who benefit most from this subsidy are the well-to-do living in urbanised neighbourhoods in the city centre and the new commercial development areas in southern Luanda who are fortunate enough to have formal household connections linked to the mains water supply lines.

7.5 Business case

Based on the example of a standpost with two taps, overall cost of construction is US\$ 2,000. The price of the water was agreed between LUPP, EPAL and the community, using a criterion of comparison with the prices charged by the owners of water tanks. The money is collected daily by the Water Committees for each standpost and paid monthly to the Associations of Water Committees, which have responsibility for sharing it out as agreed. According to the August 2006 database, with reference to 64 standposts, an average of US\$ 170 per month was paid by each one to EPAL. Even though water supply was intermittent each standpost averaged only 15 days per month. This means that EPAL receives US\$ 2,040 per standpost per year, a total of US\$ 130,560. If EPAL was able to increase the supply and guarantee a daily provision they could potentially double the income from the system.

The amount received by EPAL in one year is more than the cost of constructing one standpost, even if the standpost does not function every day. Over a five-year period, the income from the standpost makes a significant contribution towards the cost of water treatment and extraction. The standposts therefore, represent a good business opportunity. The creation by the Commercial Directorate for EPAL of a specific department to deal with standposts, and the opening of a bank account, indicates that the income from standposts is being taken very seriously.

7.6 Sustainability and replication of the community enterprise approach

The Association of Water Committees in Ngola Kiluange have invested their own accumulated capital in the expansion of the network supply, through the construction of new standposts and the organization of management committees. This is an example of how effective the model is. As a community enterprise the model has demonstrated a successful capacity to generate income and stimulate the replication of standposts.

The LUPP Programme has worked with EPAL for several years on community water development and has always advocated with the commercial departments of the water companies, the adoption of the Community Management Model as a strategy for the city of Luanda.

The European Union is using a strategy of community management in their support to EPAL for a sizeable programme for standpost construction. In this context, LUPP is providing valuable and tested lessons, which are being adapted, applied and replicated on a large scale.

7.7 Capacity building

Building the capacity of community groups is also a key aspect in the Model for the Community Management of Water. The aim of the capacity building component is to transform the community into managers of their own services and development, instead of simply being users. It is extremely important to give training and technical support to the Representative Community Groups so that enough knowledge and capacity is acquired to improve the water supply services, participate in the management of the services and develop negotiation capacities to allow the establishment of strong and advantageous institutional relations. From this perspective, LUPP developed specific packages of training for the different community groups involved in the management of the standposts.

7.8 Appropriate tools for participatory planning

The peri-urban areas of Luanda grew spontaneously without any urban planning. As a result, basic water and sanitation infrastructure does not exist in many inner-city musseques and peri-urban areas. The immediate priority is, therefore, the supply of some type of service for the largest number of people possible. This can be achieved through the construction of collective standposts, which can supply a basic level of service to more than a thousand people. Later in a more advanced phase, improvements and up-grading of the network can be made, if it is adequately dimensioned, to establish household connections.

The community standpost is a modular structure generally made from reinforced concrete, linked to EPAL's distribution network and with soak-away pits for water drainage. The number of taps for each standpost varies between two and twelve. This variation depends on factors such as the potential amount of users, water pressure in the network, available space for construction and available money. The majority of the standposts constructed have two taps because they are more robust, easier to maintain and cheaper. Larger multi-tap standposts have a larger catchment area and tend to be built at a greater distance from each other, necessitating water carriers to walk greater distances, usually beyond the 100 meters indicated in the programme targets.

Although the majority of the standposts constructed have two taps, a larger number of standposts with smaller dimensions take water closer to their users. Smaller standposts are easier to maintain and manage. It is also easier to manage the queues and there is less probability of people concentrating around the standpost. The users identify themselves more with the smaller standposts because they can see them from their houses and watch them more closely.

Low water pressure is still a problem almost everywhere in the city. To ensure good functioning and reduce the risks of the clandestine connections, it is important that in the distance of the connection between the standpost and the main network it is not more than 200 to 300 metres. The standpost strategy is a political compromise between consumer's preferences for individual household connections and the current capacity of EPAL to produce sufficient potable water and distribute it equitably to the rapidly growing population of Luanda.

7.9 Geographical Information Systems (GIS)

LUPP has used the Geographical Information System (GIS) as an instrument to assist EPAL and the community partners in the planning of the distribution of the water networks and sites for the standposts. GIS is an appropriate and sophisticated instrument developed to spatially programme all programme factors and data. Through the use of this instrument, it is possible to set out and inter-relate population density, public health indicators, water prices, and reduce walking distances between standposts to less than 100 metres. The GIS is a

powerful instrument to evaluate the impact of the water programme and the financial sustainability of the system administration.

Photo 8: Participatory mapping using GPS



Source: DW

8 Conclusions and recommendations on going to scale

In order to achieve significant scales and ensure that lessons learned from engagement with communities during the years of conflict are incorporated into ambitious post-war reconstruction programmes DW engages strategically with the Angolan Government, the National Water Directorate, UNICEF, the World Bank, the European Union and other actors in the sector to promote a national policy of “community water management” through the programme “Agua para Todos” which is drawn from experience of participatory practice over many years. DW is helping the National Water Directorate (DNA) to pilot the programme in Huambo province, where DW has worked for many years in both conflict and post-war contexts.

Angolan politicians have often defended the position that basic services should be free of charge. This simplistic populist position has in practice resulted in a lack of funds being available for maintenance of the existing services. Adequate funds have not been invested in basic services which are seen as technically difficult to provide for informal settlements which are seen by official planners as impermanent even though the majority of urban populations live there. Central government income from the country’s extractive industries has rarely trickled down to basic service provision in peri-urban and rural areas and as a result, the poor find themselves paying more for essential services from the private sector or losing income because of frequent illness from contaminated water.

An opposite position has been promoted by international financial institutions, namely a “privatization” approach. As implemented in Angola, this has meant an obsession with “profitability”, with little attention being paid to:

- affordability;
- accountability for funds collected;
- the correct use of funds to maintain service delivery systems; and
- adequate preparation of the public institutions so that they can manage or oversee private operators and account for money (or so that they can effectively regulate any private sector participation).

When the model has been applied in Angola, a country with a still weak undeveloped national private sector, this has led to:

- operators attempting to extract short-term gains, resulting in high prices for services;
- suppression of demand; and
- a lack of clarity about how profits have been used.

The assumption of those advocating for privatization is that competition will provide accountability. They assume that holders of concessions to supply water will compete among each other to bring better services at cheaper prices. However, the institutions to manage this sort of competition do not exist and concessions which are offered on the basis of geographical districts do not readily offer consumers a choice of services from competing providers who actually operate local level monopolies. Such privatization models usually operate on the basis of franchises and necessitate the presence of a strong “regulation body” operating on behalf of the state and able to defend the interests of the consumers who either pay for services through their taxes, local rates or direct fees. The “regulator” does not yet exist as an institution as yet in Angola although the creation of such a role is envisioned in emerging policy discussions.

In practice, peri-urban residents, in the absence of a public water supply, are paying high prices for often-contaminated water from private suppliers who distribute water by tanker truck. Peri-urban residents are not averse to the idea of paying for a public water supply, provided that:

- the cost is less than what they pay for water from private water tanks;
- they have some assurance about the quality of the service provided;
- they have some assurance that funds go to sustaining the service (Pinto and Ribeiro, 1998).

To provide a sustainable service, it is necessary (and has been shown to be feasible) to adopt many of the principals of cost-recovery, to charge an affordable fee for water that is used to keep the local infrastructure operational. Experience has shown that relying solely on centralized funds from the state budget to maintain local infrastructure in the peri-urban *bairros* has proved unrealistic. An inevitable part of developing sustainable basic services that serve the collective good and which people will support and have trust in is the creation of accountable institutions. These principals have been incorporated into the legal framework for water services that has been formulated in the Water Law, 6/02, published in 2002²⁹. This document provides an overall policy and strategies and defines the organisational structures for an integrated management of the water resources. In this document amongst other regulations, it is indicated that users should pay a financial contribution (“taxes”) for the maintenance of their water systems.

²⁹ Diario da Republica of 21 July 2002.

In 2008 the Government launched the “*Agua para Todos*” or Water for All Programme. At its launch the National Water Director made a public commitment to provide water to communities “*wherever they are*” signalling a new more inclusive government policy to bring water to poor-previously excluded communities. DW is a member of the National Water Policy Working Group chaired by DNA and supported by UNICEF. DW is one of the Government’s key implementing partners on their urban community based water programme which aims to institutionalise the concept of community management and the accountability of service providers to the consumers. This gives DW an opportunity to introduce lessons from research into the practical implementation of water projects that will be replicated widely by Government.

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ANNEX 1

Development Workshop's Water Sector Programme

Development Workshop is a professional not-for-profit organisation working in Angola since 1981 on programmes of human settlements, basic services local capacity building and research. Development Workshop Angola provided technical support to the Angolan Government since the 1980s, and was for many years the only non-governmental organisation in Angola. DW is acknowledged as being one of the few knowledge centres in Angola today and through their experienced research associates have built a national research team capacity through training and supervised in-the-field practice.

Development Workshop has been involved in the water and sanitation sector in Angola for approximately 25 years and is the leading NGO working in this sector in Angola. Development Workshop has been involved in studies and evaluations of the sector for the Angolan Government, World Bank, the European Union, and implemented substantial water and sanitation programmes with the support of DFID, Swiss, Swedish, USA, Canadian and Netherlands Cooperation. Development Workshop is a partner of the Angolan Government and member of the national water working group chaired by the National Water Directorate and UNICEF. DW has over the last 10 years developed a close partnership with the Huambo Provincial Government's water authority who has co-financed several projects including the emergency rehabilitation of the municipal water system that had been damaged during the conflict. DW has worked with over 1000 local communities on water projects in peri-urban and rural areas of several provinces.

The overall model which DW Angola uses when approaching a particular problem area (such as water supply, and sanitation) starts with research (in the literature and in the field in Angola) and consultation with stakeholders. Experimentation with possible solutions in the context of a concrete intervention then follows. The next phase usually involves Pilot projects, which address the interrelated issues of technology (i.e., the technical intervention), social mobilisation (i.e., organising communities or stakeholder groups to act on the problem, developing the appropriate institutions) and financial sustainability (i.e., cost recovery). Possible solutions are then demonstrated and replicated either directly by DW or by its other partner agencies. As the experience in the pilot project is consolidated and the experience is disseminated, the organisation begins to plan a scaling-up process with local partners while continuing to monitor progress, and identify new problems and opportunities which arise. These can then feedback into further basic research and programme planning. All stages up to demonstration are usually part of a programme implemented by Development Workshop's technical and monitoring team. If successful, scaling-up takes place involving other partners (community, NGO, local and national government) but with Development Workshop ongoing supervision and monitoring. At all times, monitoring and evaluation leads to modification and adaptation. It is the goal of DW to promote the replication and roll out of good practice models based on local experience and testing.

Development Workshop has built a national staff of approximately 250 employees. The team is made up of young Angolan professionals supported by a number of experienced national and international experts. DW is a learning institution and aside from on-the-job training and short overseas courses supports over 30 of its staff to obtain degrees and post-graduate qualifications by distance education and at local universities. Development Workshop's experienced professional water/sanitation technicians and social mobilisation team will be involved with the proposed assessment.

Development Workshop Research Unit

DW has been—and intends to continue to be—a leader in producing the basic data and focused analysis that informs effective policy-making and development programming. DW seeks to foster information-based approaches to policy-making, social advocacy, and

development activities through rigorous action-focused research. Much as DW's operational effectiveness has been enhanced by its ongoing action research, which aims to capture the important emergent socio-economic, demographic, and cultural changes in Angola's new post-conflict period. DW's research has played an important role for the international development community in Angola as a whole. DW studies and data have been used and integrated into baseline studies, assessments, and programming studies of numerous other development organizations including World Bank, UNDP, UNHabitat, DFID some of who's recent studies have drawn extensively on data and analysis produced by DW.

DW has information accumulated through its research programmes and project implementation, but has also a wealth of knowledge embedded within its personnel and its associated networks. It has set up processes for knowledge management, and has integrated various forms of knowledge storage (e.g. data, internet and GIS).

The proposed study will be lead by DW's research unit which is acknowledged as being one of the few knowledge centres in Angola today. DW will engage its experienced research associates and its national research team while enhancing partner institution's capacity through training and supervised in-the-field practice.

Community outreach and network

DW works annually with more than 50 local NGOs and hundreds of Community Based Organizations (CBOs) on projects associated with access to basic services, capacity building and civic education. Over the years DW has built a national network of collaborative partners numbering in the hundreds including local professional teachers and health workers and community leaders in each of Angola's provinces. DW uses this network in building local research teams and in mobilising focus groups and identifying key informants.

Some past and ongoing project activities

Community consultation on the extension or the water system & willingness to pay Basic water services 1995 - 1998

The project provided the engineering and design team of the World Bank supported Luanda Infrastructure Programme with information on community preferences for accessing water and willingness to pay for services. The objective was to collect sufficiently detailed information on water demand, consumption patterns and consumer preferences related to public standpipes in all areas affected by the extension of the primary network to an area encompassing over half a million residents. The project involved beneficiaries in the decision-making and design processes so that the final decisions and designs reflect local priorities.

Sustainable community services project (Luanda Urban Poverty Program) 1999 – 2006

Replication and scaling-up of a model of sustainable community service provision based on community management. Developed with an important degree of cost recovery and the participation of various levels of local government and public service providers. The model was tested and refined in the project through close monitoring and necessary adjustment. The successful model achieved a significant buy-in from local government and state policy makers.

Fundamental to an urban poverty reduction programme is the guarantee of essential water and sanitation services to all urban and peri-urban residents at an affordable cost, with an acceptable minimum standard of service and guaranteed maintenance of the systems. DW's programmes have demonstrated that it is possible to achieve this through participation by the users in the management of the system, charges to users and with accountable and transparent management by the public service providers. This system makes it possible to cover running and maintenance costs while still only charging affordable rates.

Partnerships between service providers and NGOs are viable ways of piloting, testing and implementing ways of providing such a service. NGOs are not just providers of emergency services or micro-projects but can be serious partners in looking for new solutions. An adequate legal framework is needed for water and sanitation services that defines the duties and rights of the serviced providers, permitting them, for example, to charge enough to cover their running and maintenance costs.

Emergency renovation of the Huambo City Water System 2001

The project established a safe reliable water supply for vulnerable residents and displaced people fleeing the conflict in the city of Huambo in South Central Angola. Specifically increased the quantity and quality of piped water supply to an estimated 130,000 direct beneficiaries. The project rehabilitated the generation and water treatment plant that had been sabotaged during the war.

Water vendors and their clients – base line study – 2002

The project was carried out in three Comunas (urban districts) in Sambizanga Municipality of the peri-urban Luanda. The baseline study on water pricing and consumption levels in the bairros were carried out on from May 2002. At the same time a preliminary study was also carried out of residents of this bairro who have water tanks in their yards from which they sell water. The result of this survey was used as a baseline for future impact assessment following the opening of the system of standposts in the area, as well as to help in identifying issues that may arise from the improvement of water supply. The area was selected because forty-five stand-posts were being constructed and/or rehabilitated in the bairro.

Water point, Water Committee and Hand Pump Assessment 2004

the survey measured the impact, sustainability, (Water point, Water Committee and Hand Pump), relevance¹ and effectiveness¹ of the improved water systems constructed in the Province of Huambo by the different projects implemented by DW since it started operating in the province.

Beneficiary Assessment & Willingness-to-Pay Study in five cities 2008

The infrastructure in provinces targeted by the pilot phase of the current project – Kuito, Huambo, Malange, N'Dalantando and Uige – was severely damaged in the post-1992 elections resurgence of conflict. The Angolan Government through the National Water Directorate (DNA) with credit and technical assistance from the World Bank is rehabilitating water supply systems in these and other provincial cities throughout the country. Development Workshop's water team was engaged in order to ensure that tariffs are adequately structured and reflect consumers' willingness and ability to pay, more recent and better information is needed on consumers and the water market including the informal/illegal water sellers market.

Strengthening national and sub-national Institutions for effective community management of water supply and sanitation facilities 2008 – 2009

The project strengthens the capacities of the social mobilization units of the National Water Directorate DNA and the Provincial Departments of Water in Cunene and Huambo provinces. Tasks included designing, developing, testing and documenting a model of effective community management of water and sanitation facilities. A community based system of cost recovery that guarantees the sustainability of ongoing maintenance of water systems was tested and documented. The project documented and disseminated training materials of community water management model targeting policy makers, planners and managers for scaling-up to other provinces across the country.

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