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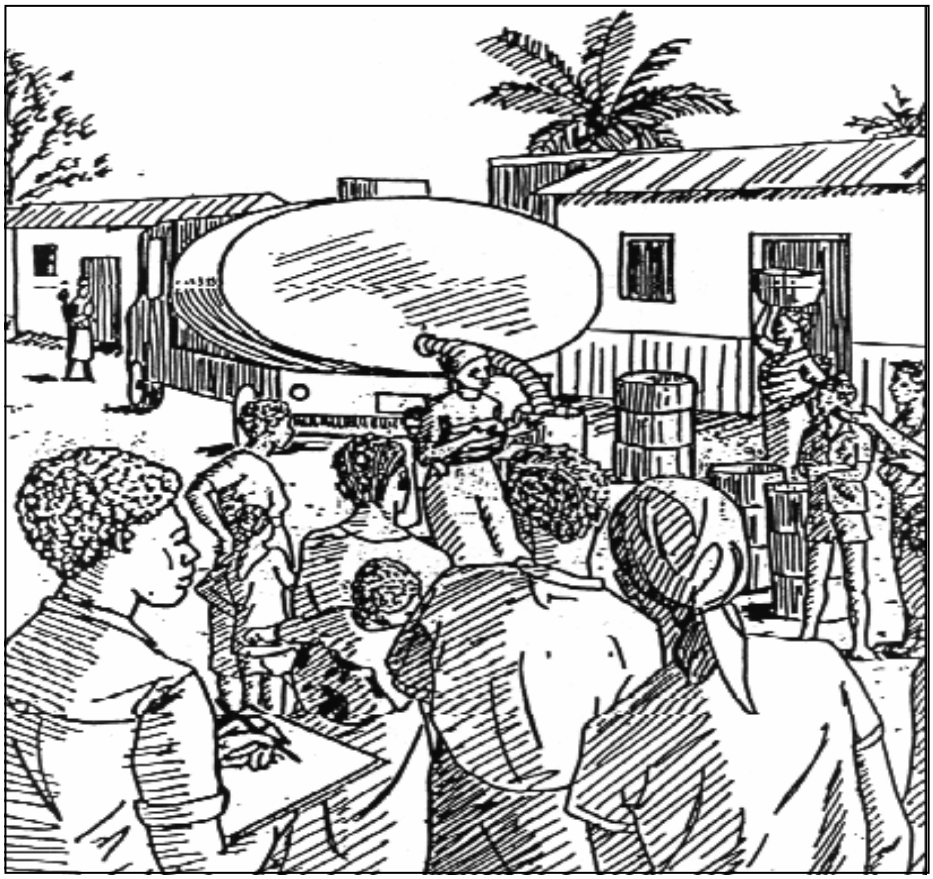
Water Supply and Sanitation in Luanda
Informal Sector Study and Beneficiary Assessment



FINAL REPORT

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ACRONYMS

DNA	National Directorate for Water
DW	Development Workshop
EPAL	Luanda Provincial Water Company
FAA	Angolan Armed Forces
GOA	Government of Luanda
GPL	Provincial Government of Luanda
INE	National Statistics Institute
IRE	Infrastructure Rehabilitation Engineering Project of the GPL
NGO	Non-Governmental Organization
NKZ	New Kwanza (Currency of Angola 1 USD = 1,950,000 NKZ). All NKZ values in this paper are also given in US$.
WB	World Bank
WHO	World Health Organization

EXECUTIVE SUMMARY

This study was designed to examine the water and sanitation sectors in Luanda from the perspective of the consumers of these services. It is a departure from other work, which has concentrated on the formal infrastructure for water distribution, sewerage and solid waste disposal. As well as reporting on current practices in water and sanitation in Luanda, this study synthesizes information from interviews and discussion groups with people who live in the peri-urban areas of Luanda. The recommendations deal directly with people's priorities for improvements and their willingness to pay for them.

The study was commissioned for two main reasons. Firstly, since perhaps 70 per cent of Luanda's population live in the peri-urban areas, water and sanitation improvements here are likely to affect more people than improvements targeted only at the urban services. Secondly, planners realized that their understanding of water and sanitation practices and priorities in the informal or peri-urban parts of the city was incomplete.

The study was divided into three phases. In Phase One, using the existing administrative divisions, the city was divided into its nine municipalities, 24 comunas and 55 bairros. Existing information was collected from a number of government ministries, compiled and in some cases disaggregated, in order to present demographic, health and infrastructure indicators for each division. This information was then used to select areas for more detailed study.

Phase Two of the study was a detailed investigation of the existing system of water distribution in the peri-urban areas of Luanda. Because of the number of diverse actors in the water distribution system, several different data collection tools were used. A survey of informal sector water vendors was conducted, water trucks were observed at water sources and interviews were conducted with a number of water truck drivers.

During Phase Three of the study, the community consultation phase, information was collected on water and sanitation practices in the peri-urban areas of Luanda, people's priorities for improvements and their willingness to pay for these improvements. During this part of the study a group of 20 researchers were trained and 60 discussion groups were held.

The major findings of the study are:

- There are an estimated 10,000 water vendors in the peri-urban areas of Luanda, the majority having an underground storage tank with a capacity between 5 and 10 cubic metres. These vendors sell water to their neighbours, usually by the bucket (20 L). Most consumers walk less than 100 meters to the nearest water vendor.

- The price of water in the studied areas varies between $1.21 to $16.90 per cubic meter. The highest prices are in Rocha Pinto ($16.91/$m^3$), Palanca ($14.30/m^3), Golfe ($12.73/$m^3$) and Tala Hadi ($12.27/m^3). Price is influenced by the source of water (ie. either from the piped distribution network or from trucks). In neighbourhoods where the primary source is water trucks, the price depends on the distance from the River Bengo, the major source of trucked water.

- There is no monopoly ownership of the water trucks in Luanda. Rather, over 70 per cent of the water trucks on the road are owned by small operators with a maximum of two trucks. The profits made by water truck operators are less than 10 per cent.

- Most of the communities consulted selected public standposts fed by piped connections to the city network as the preferred improvement in terms of water. People articulated their preference for investment in a sustainable long-term solution. This applied both to community resources and to the use of public funds. Participants were clearly more willing to invest resources in improvements in water rather than sanitation.

- Accumulation of rubbish in the bairros was seen as the most pressing sanitation problem. However, participants were wary of investing in rubbish removal services because they doubted the government's capacity to maintain such services in long-term.

- Household latrines were identified by participants as "a basic necessity" and families that did not have a latrine were considered "very poor".

- The newer bairros (Cazenga, Palanca, Golfe and Rocha Pinto) had more experience with community-managed projects than older bairros (Rangel, Sambizanga).

The principle recommendations of the research team are:

- The first priority for improvement is clearly increasing the volume of water produce at Kifangondo. This will increase the volume of water provided to water vendors, thereby lowering the cost to the final consumer.

- In the musseques without access to the city's pipe network priority should be given to increasing the volume and lowering the cost of trucked water supplied to these areas. In musseques with access to the city's pipe network, priority should be given to increasing the number of public standposts

- The authors of this report recommend strongly that the musseques of Rocha Pinto, Palanca and Golfe be given a high priority for future investments in water infrastructure.

- Support should be made available for programmes designed to improve the hygienic conditions of existing water vendors with underground tanks in the musseques.

- Cost recovery for improved sanitation services should be linked in some way to user fees for water supply. All improvements in the water sector should have significant community participation components, particularly in the maintenance and management of any new facilities.

- Support should be given for developing pilot projects for solid waste removal from the musseques, as there are no documented experiences applicable to the current

challenges in the bairros.

- Support should be given for a city-wide household latrine project designed to target low-income families.

ACKNOWLEDGEMENTS

The study was designed, supervised and written by Allan Cain, Mary Daly and Andrew Kirkwood, all from Development Workshop. However, they had plenty of help from many others. The successful completion of this study is due in large part to the excellent participation all of the people mentioned below.

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- Direcção Nacional de Agua (DNA)
- Empresa Provincial de Aguas de Luanda (EPAL)
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1 INTRODUCTION

1.1 Background

1.1.1 Rationale for the Beneficiary Assessment

This study was designed to provide information for the two water and sanitation programs for Luanda

that are currently being implemented by the Government of Angola (GOA) and the World Bank (WB), namely: the Emergency Program (EP) and the Urban Environment and Sanitation Project. This is a departure from other work which has concentrated on the formal infrastructure for water distribution, the city's piped distribution network and associated production and treatment facilities.

The study was commissioned for two main reasons. First is that, since perhaps 70 per cent of Luanda's population live in the peri-urban areas, water and sanitation improvements here are likely to affect more people than improvements targeted only at the urban services.

The second reason is that planners realized that their understanding of water and sanitation practices and priorities in the informal or peri-urban parts of the city was incomplete. Their knowledge consisted of a number of unconfirmed assumptions, including:

a) water trucks sell water house-to-house in the neighbourhoods;

b) owners of water trucks enjoy huge profit margins;

c) the ownership of water trucks is concentrated in a few large cartels;

d) market forces are the sole determinant of the price of water;

e) residents of Luanda's peri-urban areas, would support immediate, short-term improvements to the water distribution system; and,

f) differences between different peri-urban areas of the city are not great enough to warrant area-specific interventions.

The study findings contradict all of these assumptions.

The study also provided a forum for public discussion of water and sanitation issues in periBurban Luanda. Experience in many countries has revealed that consultation with prospective consumers is an important factor in the success of major capital investment projects in the water and sanitation sector.

With these considerations in mind, and in order to help the GOA develop a cohesive and equitable program for the rehabilitation of water and sanitation services in the city of Luanda, the World Bank Angola program contracted Development Workshop to do the study, titled *Water Supply and Sanitation in Luanda: Informal Sector Study and Beneficiary Assessment.*

1.1.2 Description

Luanda, the capital city of Angola, has an estimated population of 2,500,000.[1] More than 20 per cent of these people are thought to have arrived in the city in the last three years, fleeing the fighting that started after the breakdown of the 1992 elections. Nearly all of the new arrivals have settled in the peri-urban areas of the city, where basic services are either unreliable or non-existent.

The River Bengo, located about 20 kilometres north of the city's centre is the city's main source of water. Some water is also provided by the River Kwanza to the south of the city. Both rivers have water throughout the year. The majority of the water consumed in Luanda is supplied through two piped systems from the River Bengo. However, between 15 to 25 per cent is trucked into the city from both rivers[2].

The city is divided into nine municipalities (see Map in Annex 4). The "cement city", or urbanised part of the city, encompasses primarily the Municipality of Ingombota and parts of the Municipality of Maianga. There are other small pockets of formal, urban settlement in some other municipalities. Two municipalities, Viana and Cacuaco, have rural characteristics with relatively smaller populations. The majority of the population lives in the remaining peri-urban areas (popularly known as *musseques*, which describes the red earth common there). In these *musseques*, between 70 and 100 per cent of the population buy water from water vendors who sell from water tanks in their yards.

1.1.3 Development Workshop

Development Workshop is a non-profit organisation, which has been working in Angola since 1981. Development Workshop specialises in the upgrading of human settlements and currently manages several water and sanitation projects in peri-urban Luanda. Development Workshop's intervention strategy involves:

a) active collaboration with local government partners, non-governmental organisations (NGOs) and civil associations;

b) an emphasis on health education for the community by the community; and,

c) an extensive social mobilisation program to promote the long-term maintenance of water and sanitation interventions.

1.2 Objectives

The overall objective of this beneficiary assessment was to initiate a process of community/client consultation in urban upgrading projects in Angola. This was to be done by training Angolan staff of NGOs, government agencies and community groups in participatory project planning and focus-group techniques.

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[1] No accurate population figures are available. This estimate is commonly used by many government ministries and non-governmental organizations.

[2] This is based on published estimates of Kifangondo production of 40,000 cubic metres per day and the observation that an average of about 9,000 cubic metres per day is trucked to the city from the Rio Bengo.

The specific objectives of the study were:

a) to describe the water distribution system in the peri-urban areas of the city by identifying the stakeholders and investigating the extent of their involvement; and,

b) to conduct 60 discussion groups in the peri-urban areas of Luanda to provide baseline information on:
   - current water and sanitation practices;
   - opinions on feasible and desirable improvements to the current situation;
   - existing potential for community organisation; and,
   - willingness to pay for improved services.

1.3 Methodology

1.3.1 Overall Approach

This study was designed to examine the water and sanitation sectors in Luanda from the perspective of the consumers of these services. As well as reporting on current practices in water and sanitation in Luanda, this study synthesizes information from interviews and discussion groups with people who live in the peri-urban areas of Luanda. The recommendations deal directly with people's priorities for improvements and their willingness to pay for them.

The time frame for this study allowed six weeks for the preparation and completion of the field work. Many people had to be consulted quite quickly. Considerable effort was also devoted to designing a methodology that could triangulate the information gathered. A lot of planning and logistical support was needed to successfully complete the 60 discussion groups in the third phase of the study. Therefore, in the hope that similar work will be carried out in Luanda in the future, a detailed methodology, including details of how the field work was managed, is included in Annex 3.

1.3.2 Study Phases

The study was divided into three separate phases. In Phase One the entire city of Luanda was mapped and divided into categories which enabled the research team to select specific areas for detailed study. Phase Two was a detailed investigation of the water distribution system in the peri-urban areas of the city. Phase Three was a community consultation effort involving 60 discussion groups.

Phase One. Using the existing administrative divisions, the city was divided into its nine municipalities and 24 comunas. Existing information was collected from a number of government ministries, compiled and in some cases disaggregated, in order to present demographic, health and infrastructure indicators for each comuna.

The 24 comuna divisions, while providing much more precise data, were deemed by the study team to be still too large for the purposes of this study. Most comunas are not homogeneous enough in terms of settlement patterns or infrastructure to provide accurate information on water and sanitation practices or priorities for improvement. The part of Comuna Prenda called BairroBPrenda, for example, has a number of urban services, including household connections to the city's water network. Another part of Comuna Prenda called Rocha Pinto, on the other hand, has very little formal housing and virtually no household is connected to the city's water network.

To provide a more useful map of the city, the research team sought the help of a number of key informants. The following people were interviewed: Engineer Antonio Matadidi and Mr. Simão Lopes, from Luanda Provincial Water Company (EPAL); Engineer Afonso and Engineer Wellington, from the technical department of the Provincial Government of Luanda (GPL); Mr. Lucato, from the Angolan NGO Christian Solidarity and Mutual Relief (SCAM); Architect Angelo from the National Statistics Institute (INE); Dr. Vita Vemba, the director of the provincial public health department; and Mr. Joaquim Hernani, Ms. Marion Birch and Mr. Allan Cain all from Development Workshop. Reports from the GPL's, Infrastructure, Rehabilitation, Engineering (IRE) project were also consulted.

While the term *bairro* (neighbourhood or quarter of a city district) is not an official administrative designation, and thus the boundaries used can be debated, nearly everyone can identify the *bairro* in which they live. The research team identified 55 *bairros* in Luanda. For the purposes of this study, each *bairro* was characterised as to its:

- relative degree of urbanisation;
- ease of access for large vehicles during the rainy season;
- existence of drainage and sewage network;
- status of rubbish removal service; and,
- main sources of water.

After the mapping was complete and the city divided into 55 *bairros* using criteria agreed between the client and the study team, each *bairro* was assigned to one of four categories:

a) the formally urbanised section of the city for which the original water and sanitation infrastructure was designed (e.g., Ingombotas);
b) high density, inner-city *musseques* that have limited access to a water distribution network and limited solid waste removal services (e.g., Rangel);
c) high density *musseques* in the middle-belt (between inner-city *musseques* and those on the periphery) where a water distribution network was never built and no solid waste removal (or very little) is provided by the state (e.g., Cazenga); and,
d) medium density *musseques* on the periphery of the city where no water distribution network exists and other municipal services are basically non-existent (e.g., Palanca).

The complete mapping exercise is summarised in Table 2.2.

***Phase Two*.** Phase Two of the study was a detailed investigation of the existing system of water distribution in the peri-urban areas of Luanda.

Because of the number of diverse actors in the water distribution system, several different data collection tools were used. A survey of informal sector water vendors[3] was conducted, water trucks were observed at water sources and interviews were conducted with a number of water truck drivers.

During the survey of water vendors, 1270 interviews were conducted. Only people who had a tank at their home and who claimed to sell water were interviewed. The questionnaire asked: the size of the tank; the cost to fill it up; the selling price of water; the source of the water (truck or piped connection); and, the way in which contact is made with the trucks. The actual questionnaire used, which was pre-tested in 15 interviews, is included in Annex 2.

In order to collect information about the water trucks operating in the city, a survey was carried out at

[3] Water vendors are defined as those people who sell water from storage tanks at their house.

five locations where water trucks fill up with water: Kifangondo (both the official EPAL site and the informal site at the river); and the EPAL sites at Mulemba, Cazenga and Marcal. At each site the licence plates of each truck were recorded to determine if the truck was state-owned or privately-owned. As well, each driver was interviewed to find out the truck's capacity, the number of trips the truck is able to make each day, the price of the water, how the driver is paid, and the number of trucks owned by the owner of the truck in question.

Phase Three. Phase Three of the study, the community consultation phase, collected information on water and sanitation practices in the peri-urban areas of Luanda, people's priorities for improvements and their willingness to pay for these improvements. During this part of the study a group of 20 researchers were trained and 60 discussion groups were planned. The results of the discussion groups are synthesised and discussed in Section 4 of this report.

1.3.3 Selection of *Bairros* for Phases Two and Three

Municipality Ingombota and three *bairros* of Maianga were excluded from the second and third phases of the study because the existing infrastructure and level of operation placed these areas in the formal, urbanised part of the city and not in the peri-urban areas. The Municipality Viana was also excluded because it has a separate, specific water supply from the Kikuxi plant on the River Kwanza.

Eighteen of the remaining *bairros,* were selected for Phase Two of the study in order to get a good representation of each of the peri-urban categories outlined in Section 1.3.2 above.

Ten *bairros* were selected for Phase Three. These ten *bairros* were also included in the work of Phase Two, allowing many of the results to be triangulated.

1.3.4 Recruitment and Training of Researchers

Researchers were recruited from local NGOs and community groups for Phase Two, the water study in the peri-urban areas. With the exception of Hoji Ya Henda and Cazenga, all the interviews were conducted by residents of the *bairro*. The research groups included six to ten researchers and one supervisor. The supervisor had at least a complete secondary school education. The researchers attended three-hour training workshops conducted by Development Workshop personnel.

Local NGOs, national staff of international NGOs and staff from state institutions involved in water and sanitation were invited to submit candidates for training in participatory tools for community planning and focus group techniques to carry out Phase Three. It was a condition of training that candidates be available to conduct the field research afterwards. Twenty people were trained. Six of the researchers had a university-level training and two thirds had a secondary school training combined with experience in community development work. The training was conducted during seven full working days.

The principal trainers were Lyra Srinivasan (Participatory Training Consultant on SARAR Self-Esteem, Associative, Strengths, Resourcefulness, Action Planning, Responsibility Approach) and Bérengere de Negri (Information and Education Communication Specialist, Academy for Educational Development,AED). Mary Daly (Development Workshop coordinator for this study) and Valerie Uccellani (AED) provided co-training support for the workshop. The training details are available in *Training Workshop on Participatory and Qualitative Research Techniques,* prepared by Bérengere de Negri and Lyra Srinivasan in Luanda, Angola (May 1995).

In order to run the discussion groups, six teams of researchers were formed, each composed of:

a) one team leader, who was responsible for ensuring that the discussion guide was followed and that the daily discussion group report was completed satisfactorily;
b) one facilitator, who conducted the discussion groups, guided by the team leader. In practice, the facilitators were residents of the *musseques* with previous experience in community development; and,
c) one reporter, who took notes during the discussion groups.

Two researchers were on standby to replace anyone who could not come to work due to illness or other reasons.

1.3.5 Constraints

Phase One. The mapping work attempted to disaggregate Luanda into discrete, relatively homogeneous residential entities that could provide useful information for planning. The information available for Luanda is, however, normally only presented at a municipal level. This is problematic because municipal level data is usually too aggregated to truly identify vulnerable or particularly needy groups for priority interventions.

Where possible, considerable effort was made to disaggregate provincial level data to the municipality and the comuna. Population and population density figures, for example, were disaggregated to the comuna level. However, for health data (the mortality for diarrhoea and malaria) disaggregation was only possible down to the municipal level.

Another problem encountered was that the population figures were based on the election register of 1992. It appears that many people registered in their place of work in the formal part of the city (i.e., Ingombota and Maianga), and not in their place of residence in the peri-urban *bairros*. Many *bairros*, therefore, have underestimated populations and hence lower than expected population density figures. Cazenga is a good example of this. Lacking more accurate population data, the study team made use of the data published in the IRE consultants' report for 1992, extrapolating the figures to 1995 using a conservative growth rate estimate of 7.5 per cent per annum.

Phase Two. The majority of the information collected during this study, particularly during the survey of water vendors and truck drivers, was limited to quantitative data drawn from closeBended questions. As a result, some issues were not addressed. The survey of water vendors, for example, did not ask whether the vendor sold water openly on the market or only to certain friends or to family members. Some of these questions were addressed in the focus groups in Phase Three.

Interviews were conducted with a number of water truck owners to determine the costs of operating a water truck in Luanda. However, none of those interviewed were able to provide accurate operating costs. None of the owners interviewed kept records of repairs made or costs incurred. As a result, the operating costs used in the financial analysis in section 3.4.3 are estimates based on Development Workshop's experience of operating other vehicles in Luanda.

Phase Three. During the field work all of the researchers were using qualitative research techniques for the first time. One of the team leaders was conceptually familiar with rapid rural appraisal techniques, but had never used these in practice. Those of the researchers who were from NGOs with community development and community mobilisation programs had previous experience using participatory

techniques.

It was the first experience for the trainer consultants in training a group which was to immediately undertake a specific study. Hence, the training schedule had to include time to develop a real discussion guide, reducing the time available for the practice and reinforcement of newly acquired techniques. In order to compensate for the shortened training time available, the training program included two field discussion groups for all participants. This experience was invaluable, and to some extent was the key preparation factor for the actual study.

During the field work, the quality of information improved as the participants gained confidence and experience. The most obvious negative habits which had to be corrected during the initial discussions were:

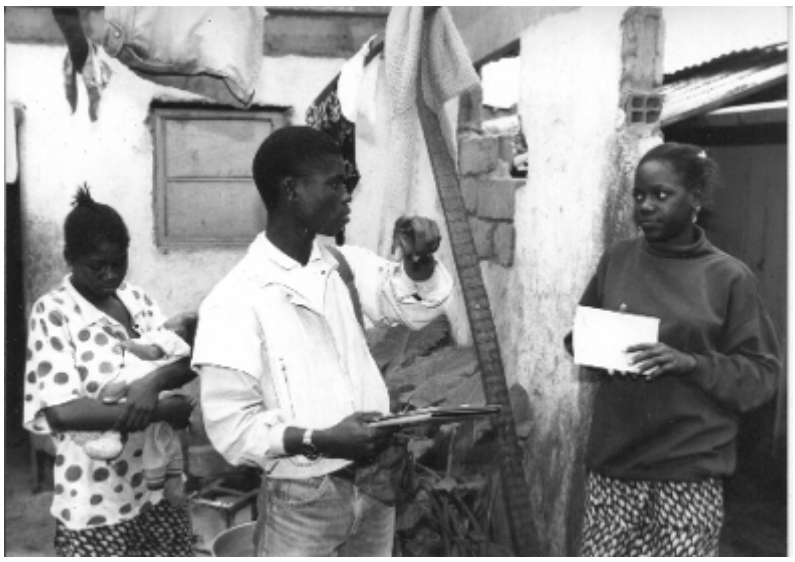
a) asking close-ended questions instead of doing stepwise probes;
b) the tendency to lead discussion groups into their own areas of interest; and,
c) reluctance to follow-up on unanticipated but interesting information.

The daily meetings in plenary and with the group leaders helped correct these tendencies and seemed to produce an amiable atmosphere of competition.

The discussion groups were organised into the following groups:
a) men with family responsibilities;
b) women with family responsibilities; and,
c) young people of either sex without major family responsibilities.

In practice some groups were mixed sex because women are most likely to be out in the market place during the day. These groups had quite animated discussions and to some extent the emerging differences of opinion helped researchers probe more deeply into certain issues.

Prior to the discussion groups, there was a prevailing opinion that communities might not be very motivated to participate, that the time for discussions was past and their problems required action rather than further discussions. Many communities felt so marginalised, that they were grateful for the opportunity to discuss their problems. In these cases, however, the participants regarded the researchers as spokespersons who could make their case to the government and to donors.



Researchers used participatory rapid appraisal methods including focus groups in order to collect community level information.

2 RESULTS OF PHASE ONE - MAPPING

A map of Luanda in Annex 4 provides a detailed breakdown of the city into nine municipalities, 24 comunas, and 55 *bairros*[4]. In the remainder of this report the *bairro* is used as the unit of analysis.

Table 2.2, on the following page, is a matrix representing all of the results of the mapping phase of the study. Seventeen different indicators have been used in the table to help categorize each of the 55 *bairros* in the city. Table 2.1 below gives an explanatory note for each of the indicators.

Table 2.1 Explanatory Notes for Mapping Indicators

Indicator	Source	Explanatory Note		
		with ●	with ⊗	with ○
Population	IRE report, 1992	1992 figures extrapolated to 1995 assuming growth of 7.5% p.a.		
Area	IRE report, 1992	given in hectares (ha)		
Density		calculated from above in people/ha		
price of water	phase two study	given as price per 20 L bucket in USD converted at $1=1,950,000 NKZ		
category	*bairro* category for study see descriptions in section 1.3.2 type a) not used; type b) = 1; c) = 2; d) = 3			
Urbanization	interviews	normal service network	limited service network	little or no services
Access	interviews	has all weather roads	limited access	difficult in rainy season
Diarrhoea	Ministry of Health	given as number of deaths per 1000 people from registered deaths		
Malaria	Ministry of Health	given as number of deaths per 1000 people from registered deaths		
Sewers	interviews	functional sewers	exist but non-functional	no sewers
Drainage	interviews	existing drainage network	limited drainage network	no drainage / serious rainy season problems
1.1m^3 rubbish bin	interviews	>50% area coverage	25-50% coverage	<25% area coverage
7m^3 rubbish bin	interviews	>50% area coverage	25-50% coverage	<25% area coverage
Residential water	interviews	residential pipe network functional >50% time	residential pipe network 25-50% functional	no residential network or functional <25% time
Standpost water	interviews	network for standposts functional >50% of time	pipe network for standposts 25-50% functional	no standpost network or functional <25% of time
tanks filled by pipes	phase two study	>50% vendors fill tanks w/ piped connections	25B50% vendors fill tanks w/ connections	<25% vendors fill tanks w/ piped connections
tanks filled by trucks	phase two study	>50% vendors fill tanks with water trucks	25-50% vendors fill tanks with water trucks	<25% vendors fill tanks with trucks

[4] Some confusion in terminology arises since the name Sambizanga, for example, is used for the Municipio Sambizanga as well as the Comuna Sambizanga and the Bairro Sambizanga. Unless otherwise stated, where the name of an area occurs without a designation (e.g., Sambizanga) it refers to the *bairro* (i.e., Bairro Sambizanga). When referring to larger administrative units (e.g., Comuna Sambizanga), however, the full name is used.

Table 2.2 Mapping Matrix of Luanda

MUNICÍPIO	COMUNA	BAIRRO / SECTOR	CODE	População Área (ha)	Densidade	Pop/ha	CARACTERIZAÇÃO		SAÚDE		SANEAMENTO		LIXO (Contentor)		FONTE DE AGUA >		TANQUES COMERCIAIS			Categoria do Estudo	BAIRRO / SECTOR
							Urbanizado	Acesso	Diarreia	Malária	Esgotas	Agua Pluvial	1.1m	7m	Residencial	Chafariz	Canalizada	Camiões	Preço 20 lit		
INGOMBOTAS	ILHA DO CABO	Ilha do Cabo		**36,400**	**94**	**387**	●	●			●	●	●	○	●	●	○	○			Ilha do Cabo
	PATRICE LUMUMBA	Patrice Lumumba		**87,600**	**164**	**534**	●	●			●	●	●	○	●	○	○	○			Patrice Lumumba
	INGOMBOTA	Ingombota		**90,800**	**182**	**499**	●	●	0.13	0.32	●	●	●	○	●	○	○	○			Ingombota
	KINGANGA	Kinanga		**24,500**	**176**	**139**	●	●			⊗	●	●	○	●	○	○	○			Kinanga
	MACULUSSO	Maculuso		**59,600**	**130**	**458**	●	●			●	●	●	○	●	○	○	○			Maculuso
MAIANGA	MAIANGA	Maianga		**56,800**	**236**	**241**	●	●			●	⊗	●	○	●	○	○	○			Maianga
	CASAEQUEL	Cassequel		**77,900**	**335**	**233**	●	⊗			⊗	●	●	○	⊗	●	○	○			Cassequel
	PRENDA	Prenda		**129,300**	**2,412**	**54**	⊗	⊗	0.40	0.75	⊗	⊗	●	⊗	⊗	●	●	○			Prenda
		Rocha Pinto					○	○			○	○	○	○	○	⊗	○	●	0.34	1	Rocha Pinto
		Luanda Sul					○	○			○	○	○	○	○	○	○	●			Luanda Sul
RANGEL	RANGEL	Rangel		**121,800**	**161**	**757**	○	○			○	○	○	⊗	●	●	●	○	0.04	3	Rangel
		Precol					●	⊗			⊗	○	○	⊗	⊗	●	●	○			Precol
	MARCAL	Marcal		**44,200**	**125**	**354**	⊗	○			⊗	○	○	⊗	●	●	●	○	0.03		Marcal
		Zangado					⊗	○	0.55	0.92	⊗	○	○	⊗	○	●	●	○	0.03		Zangado
	TERRA NOVA	Vila Alice		**120,900**	**310**	**390**	●	●			●	⊗	●	⊗	●	○	○	○			Vila Alice
		Citadela					●	●			⊗	⊗	○	⊗	●	○	○	○			Citadela
		Terra Nova					⊗	⊗			⊗	●	○	⊗	⊗	●	⊗	○			Terra Nova
SAMBIZANGA	SAMBIZANGA	Sambizanga		**79,400**	**334**	**238**	○	○			○	○	○	○	⊗	●	⊗	⊗	0.13	3	Sambizanga
		Mota					○	○			○	○	○	○	⊗	●	●	○	0.07		Mota
		Lixeira					○	○			○	○	○	○	○	⊗	⊗	●			Lixeira
		Boa Vista					○	○			⊗	○	○	○	●	●	⊗	○			Boa Vista
		Roque Santeiro					○	○			○	○	○	○	○	●	●	○			Roque Santeiro
	BAIRRO OPERARIO	Bairro Operario		**75,000**	**180**	**417**	⊗	⊗	1.32	3.78	●	⊗	⊗	⊗	●	○	○	○			Bairro Operario
	NGOLA KILUANJE	Val Saroco		**92,000**	**1,570**		○	○			○	○	○	○	○	●	○	●	0.19	2	Val Saroco
		Sao Pedro de Barra					○	○			⊗	○	○	○	○	●	⊗	●		2	Sao Pedro de Barra
		Sector Central					○	○			○	○	○	○	○	●	⊗	●	0.17		Sector Central
		San José					○	○			○	○	○	○	○	●	○	●	0.16		San José
CAZENGA	CAZENGA	Cazenga		**119,200**	**1,671**	**71**	○	○			○	○	○	○	○	○	○	●	0.16	2	Cazenga
		Tungangó					⊗	⊗			○	○	○	○	●	●	●	○			Tungangó
	CUCA	Cuca		**125,800**	**1,420**	**89**	●	⊗			⊗	⊗	○	○	●	●	●	○			Cuca
		Hoje ya Henda					⊗	○	3.18	3.93	⊗	⊗	○	○	●	○	⊗	●		2	Hoje ya Henda
		Petroangol					⊗	○			○	○	○	○	○	○	○	●			Petroangol
		Mabor					⊗	○			○	○	○	○	○	○	○	●	0.16	2	Mabor
	TALA HADI	Tala Hadi		**51,000**	**1,042**	**49**	●	⊗			⊗	⊗	○	○	⊗	○	○	●	0.25		Tala Hadi
		Cariango					⊗	○			⊗	⊗	○	○	⊗	○	⊗	⊗			Cariango
KILAMBA KIAXI	BAIRRO POPULAR	Bairro Popular		**111,000**	**1,254**	**89**	●	●			⊗	⊗	○	⊗	⊗	○	●	○	0.06		Bairro Popular
		Palanca					⊗	○			⊗	○	○	⊗	○	○	○	●	0.29	2	Palanca
	GOLFE	Golfe		**108,000**	**1,002**	**108**	⊗	○			○	○	○	⊗	⊗	⊗	⊗	●		2	Golfe
		Novo Golfe (II)					○	⊗	1.86	3.18	●	○	○	○	○	○	○	●	0.25		Novo Golfe (II)
		Sapu					○	○			○	○	○	○	○	○	○	●			Sapu
		Cambamba					○	○			○	○	○	○	○	○	○	●			Cambamba
		Morro Bento I					⊗	⊗			○	○	○	○	○	○	○	●			Morro Bento I
SAMBA	CORIMBA	Corimba		**124,500**	**288**	**432**	⊗	⊗			⊗	⊗	⊗	⊗	○	●	⊗	⊗			Corimba
	FUTUNGO DE BELAS	Futungo de Belas		**33,000**	**3,970**	**8.3**	⊗	●	0.92	1.10	●	●	⊗	○	●	●	○	⊗			Futungo de Belas
		Morro Bento II					○	⊗			○	○	○	○	⊗	○	○	●			Morro Bento II
	BENFICA	Benfica		**24,700**	**27,200**	**0.9**	⊗	⊗			⊗	○	○	○	○	○	○	●			Benfica
CACUACO	CACUACO	Cacuaco		**46,000**	**31,490**	**6**	⊗	●			⊗	●	○	○	●	●	○	○			Cacuaco
		Kikolo		**113,400**			○	○			○	○	○	○	○	⊗	●	⊗	0.05		Kikolo
		Mulemba					●	⊗			⊗	○	○	○	○	●	⊗	⊗			Mulemba
		Boa Esperanca					○	○	1.19	5.55	○	○	○	○	○	⊗	●	⊗	0.02		Boa Esperanca
		Ngangula					○	○			○	○	○	○	○	○	○	●	0.17	1	Ngangula
		Mulenvos Baixos					○	○			○	○	○	○	○	●	○	○			Mulenvos Baixos
VIANA	VIANA	Viana		**189,500**	**65,940**	**2.9**	●	●	0.81	1.00	⊗	⊗	○	○	●	●	⊗	⊗			Viana
		Viana II					●	⊗			⊗	⊗	○	○	○	●	⊗	⊗			Viana II

3 RESULTS OF PHASE TWO – WATER DISTRIBUTION IN PERI-URBAN LUANDA

3.1 Mapping the Price of Water

Table 3.1 Results of Water Prices Survey

Highest Priced *Bairros* (more than 10.00 USD/m³)		Intermediate *Bairros* (5.00 - 10.00 USD/m³)		Least Expensive *Bairros* (less than 5.00 USD/m³)	
Bairro	Average Price USD/m³	*Bairro*	Average Price USD/m³	*Bairro*	Average Price USD/m³
Rocha Pinto	16.91	Val Saroca	9.36	Mota	3.52
Palanca	14.30	Sector Central	8.70	Popular	3.09
Golfe	12.73	Ngangula	8.36	Kikolo	2.33
Tala Hadi	12.27	Cazenga	8.18	Rangel	2.15
		San José	7.94	Marcal	1.52
		Mabor	7.79	Zangado	1.52
		Sambizanga	6.33	Boa Esperanca	1.21

The table above summarises the results of the price survey carried out in 18 *bairros*.[5] These are the average prices paid by people each day when they collect water, usually using a 20Blitre bucket. In the 18 *bairros* surveyed, the average price charged by water vendors selling truck water was USD 9.62 per cubic metre. As one can see, the price of water varies tremendously. In Boa Esperanca, for example, the average price, during the study was USD 1.21 per cubic meter, nearly 800 times the official price. In Rocha Pinto the average price was USD 16.91 per cubic meter, over 10,000 times the official price.

The *bairros* where water is most expensive are all in the south and south-west parts of the city. There is no access to the city's piped water distribution network in any of these four *bairros*, which are also the farthest from the Rio Bengo, the source of most of the trucked water (see map in Figure 3.1).

The intermediate *bairros* where water costs between USD 5-10 per cubic metre also have limited access to the piped network, but they are located closer to the Rio Bengo and therefore are likely to be better served by the water trucks that fill up at Kifangondo.

The third group, where water is least expensive are *bairros* that have access to the water distribution network. Some of the water sold in these areas is still trucked from the Rio Bengo, but the majority of the water is taken from the piped network.

[5] A water vendor is defined as anyone who sells water from a tank on their property. There are likely more than 10,000 with vendors in Luanda (assuming the study interviewed one third of the vendors in 18 of 51 *bairros* in Luanda). Nearly all of them have underground tanks constructed with concrete blocks. Some of the tanks (24%) are filled by piped connections to the city's water distribution network, but most (71%) are filled by tanker trucks and the rest (5%) by a combination of both methods.

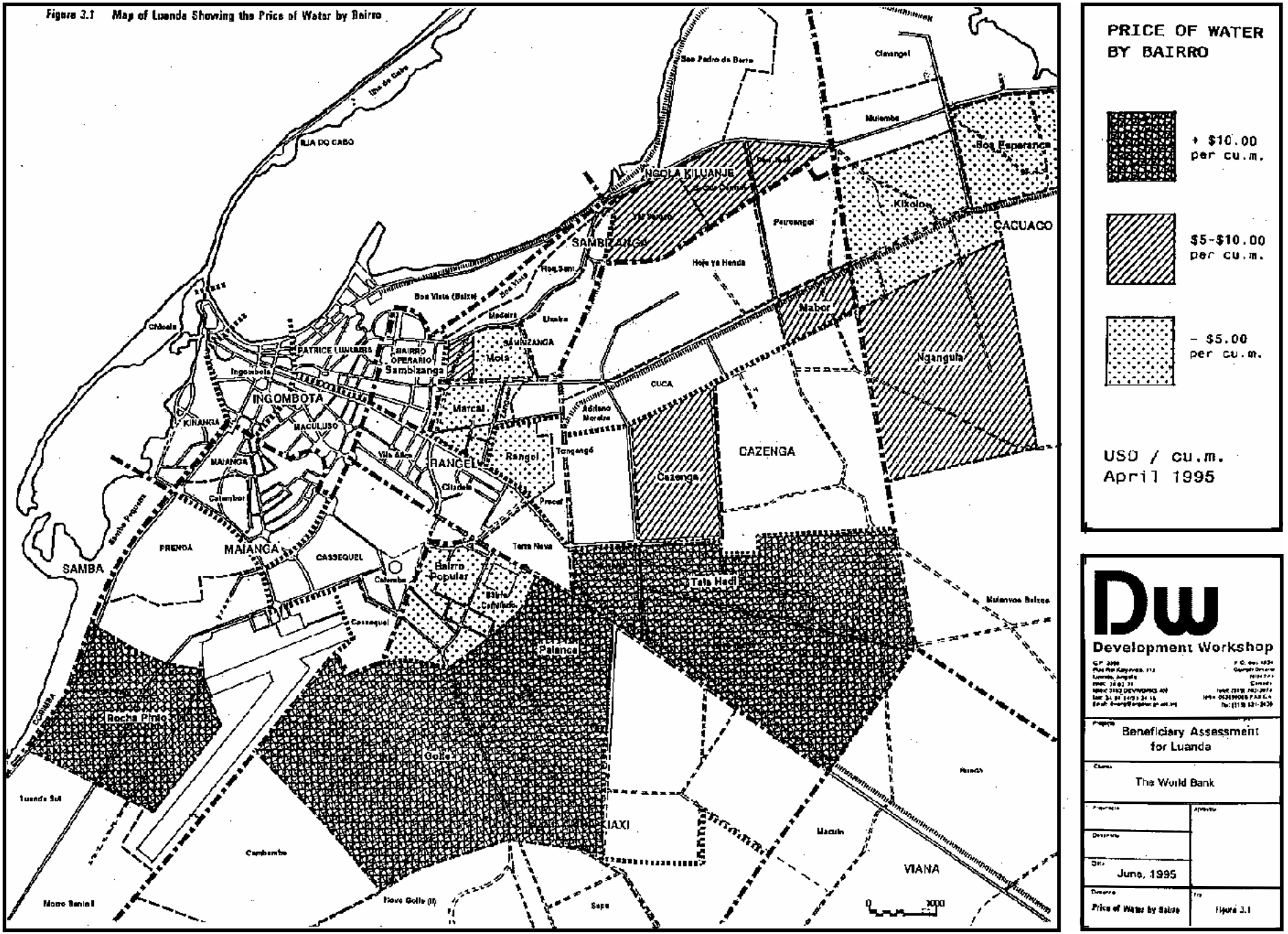
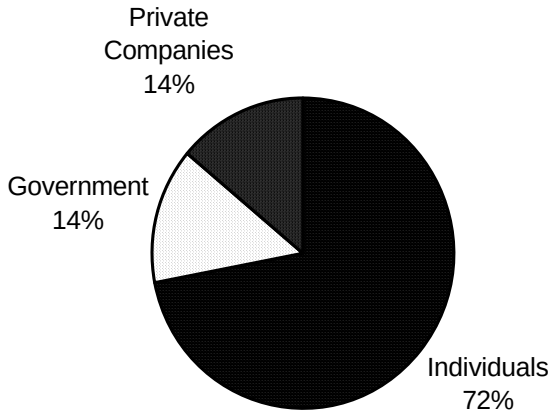


Figure 3.1 Map of Luanda Showing the Price of Water by Bairro
PRICE OF WATER BY BAIRRO
+ $10.00 per cu.m.
$5-$10.00 per cu.m.
- $5.00 per cu.m.
USD / cu.m.
April 1995
Development Workshop
Beneficiary Assessment for Luanda
The World Bank
June, 1995
Price of Water by Bairro
Figure 3.1
Ilha do Cabo
BIA DO CABO
São Pedro da Barra
Cimangol
Mulemba
Boa Esperança
NGOLA KILUANJE
Kikolo
CACUACO
SAMBIZANGA
Petrangol
Hoje ya Henda
Mabor
Ngangula
Boa Vista (Baixa)
Chicala
PATRICE LUMUMBA
BAIRRO OPERÁRIO
Sambizanga
Ingombota
INGOMBOTA
Mota
CUCA
Marçal
KINANGA
MAGULUSO
Adriano Moreira
CAZENGA
Cazenga
RANGEL
Rangel
MAIANGA
Cidade
Precal
Calemba
PRENDA
SAMBA
CASSEQUEL
Bairro Popular
Terra Nova
Tala Hadi
Palanca
Rocha Pinto
Golfe
Cambamba
Maculusso
VIANA
Mopo Benial
Nova Golfe (II)
Sapu
0 3000

3.2 Ownership of Water Trucks in Luanda

The nature of water truck ownership in the city has some significant implications for any emergency programme designed to improve water distribution in Luanda. The main question is whether the water provided by the water trucks is expensive because of monopoly or near-monopoly ownership of the trucks? Figure 3.2 below illustrates the breakdown of truck ownership of 109 trucks surveyed at random at water filling points around the city.

Figure 3.2 Ownership of Water Trucks in Luanda



As the figure illustrates, the majority of trucks appear to be owned by individuals. An interesting fact, not indicated here, is that 64 per cent of government-owned trucks are registered to the military. This amounts to nine per cent of the total number of vehicles.

Of all the drivers of privately-owned trucks surveyed, 27 per cent of them claimed to be owner-operators, indicating a relatively high percentage of small operators. Furthermore, when asked how many other trucks were owned by the same person, the average response showed that truck owners owned an average of 1.5 trucks, indicating a very low concentration of truck ownership in the private sector.

3.3 Factors Affecting the Price of Water in the Informal-Sector

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 Municipio Ingombotas and parts of Municipios 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, and at the time of this writing was 3,000 NKZ per cubic metre for residential consumers or USD 0.0015.

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 *musseques* have to buy water from water vendors. As shown in Table 3.1, the average price of water within the *musseques* but can be as high as 10000 times the official rate. The following sections discuss some of the important determinants of the price of water.

3.3.1 Piped Water Vs. Water Delivered By Trucks

The relationship between the average price of water and the percentage of vendors that are able to fill their tanks with piped water is clear: the *bairros* where more vendors have piped connections, the lower the average price of water. The reverse is also true: those *bairros* where vendors are totally reliant on water trucks have the highest average water prices[6]. This is exactly what one would expect, since the vendors themselves must pay a much higher price for trucked water than water from piped connections to the city network.

Table 3.2 Relationship Between Access to Piped Water and Price

Bairro	Price USD/m³	% 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
Bairro 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

What is rather more surprising, however, is that the price of water within each *bairro* varies considerably, depending on whether the vendor receives the water from a water truck or from a piped connection. For example, in Sambizanga the average price of water was USD 6.33 per cubic metre, however, actual prices ranged from USD 0.30 per cubic metre to USD 15.15.[7] During the survey, we even found that vendors on the same street often sold water for very different prices, depending on whether the vendor had access to piped water or not. This indicates clearly that factors other than market forces help determine the price that vendors are charging.

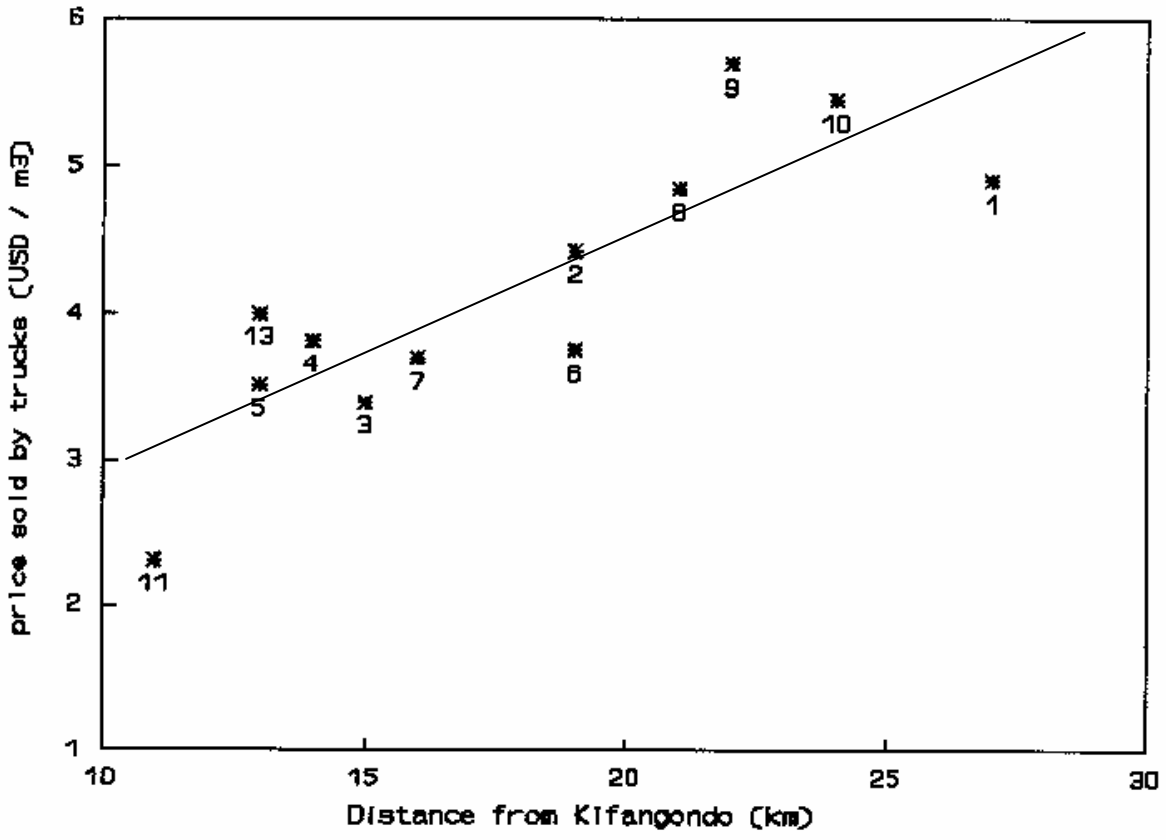
[6] One notable exception is Sector Central, where 50 per cent of vendors have piped connections. However, the average price is still one of the highest amongst the *bairros* surveyed. In fact, all of the vendors surveyed in Sector Central claimed that they also used water trucks because the water pressure in the area's piped network is extremely low.

[7] The average price in Bairro Sambizanga from vendors with piped connections was USD 3.02 per cubic metre. From vendors using only trucked water the average was USD 8.51 per cubic metre.

One explanation is that some vendors, especially those with piped connections, sell water at low rates to an exclusive group of friends and family, rather than operating on a first-come-first-served basis. Another is that because the people buying the water know whether the water came from a tap or from a truck, the consumers are able to limit the mark-ups of vendors with piped connections to some acceptable level. This issue was addressed in more detail by the discussion groups in Phase Three.

3.3.2 Transportation Costs

Figure 3.3 Transportation Costs of Trucked Water



1 Rocha Pinta
2 Sambizanga
3 Val Saroca
4 Sector Central
5 San José
6 Cazenga
7 Mabor
8 Tala Hadi
9 Palanca
10 Golfe
11 Kikolo
12 Ngangula

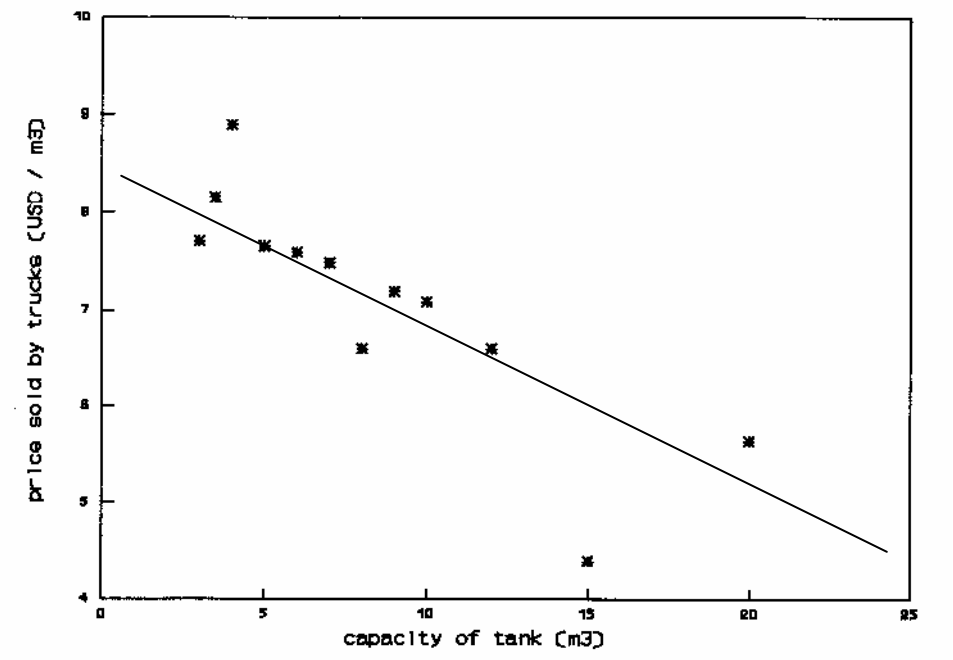
Note: These 12 *bairros* are those where the bulk of the water supply is trucked in.

Transportation costs are another key determinant of the eventual consumer price of water in the *musseques*. Figure 3.3[8] illustrates that for water that is delivered by truck, the distance between source and destination has a direct relationship with the wholesale price of water (i.e., the price paid by the water vendors). From the graph, the trend is clear: the price of trucked water increases as one moves further away from Kifangondo. In Figure 3.3 the first cluster of data points, about 15 kilometres from Kifangondo represents the *bairros* in Comuna Ngola Kiluanje which is located near the main road to Kifangondo. The centre of Luanda is about 20 kilometres from Kifangondo. The data point farthest to the right in the graph below represents *bairro* Rocha Pinto.

In addition to Kifangondo, there are also a number of locations within the city where trucks fill up with water which is then sold in the *musseques*. According to EPAL there are four principal sites, Marcal, Mulemba, Maianga and Cazenga, each of them EPAL distribution centres. During this study, however, the capacity at each of these points was so low that they are not significant in comparison to the quantity of water trucked from Kifangondo. The following capacities were calculated: 20 cubic metres per hour Mulemba, and 21 cubic metres per hour at Marcal.

3.3.3 Vendors' Tank Capacity

Figure 3.4 Average Price of Water at Source by Volume Purchased



Another determinant of the cost of water in the areas where the majority of vendors rely on trucked water is the size of the vendor's tank. As Figure 3.4 illustrates, there is an economy of scale when one is able to purchase water in larger quantities. Vendors with tanks of 15 cubic metres, for example, pay an average of USD 4.40 per cubic metre, while vendors with tanks of 5 cubic metres pay an average of

[8] *Bairros* where more than 65% of vendors have piped water are not included in the graph.

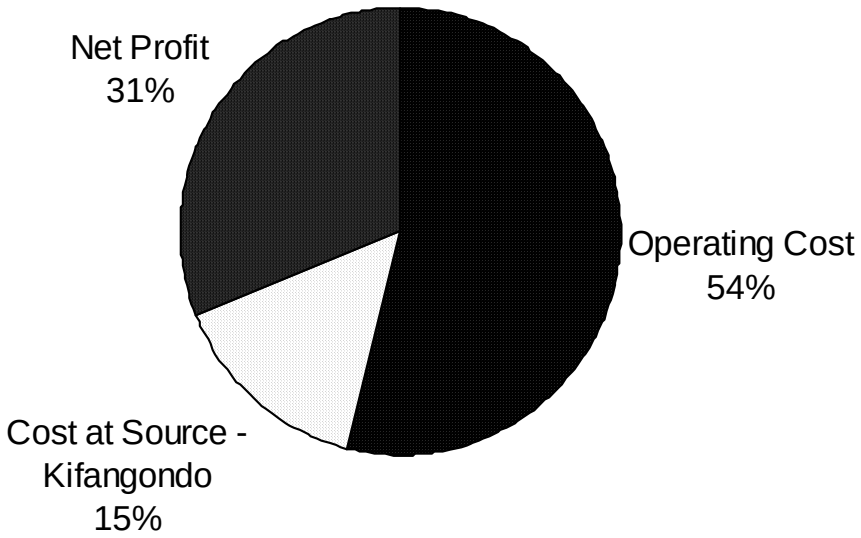
USD 7.60 per cubic metre. There does not appear to be a significant saving in the unit price of water in quantities greater than 15 cubic metres. This appears to be related to the fact that the average water truck on the road has a capacity of 15 cubic metres. Another factor may be that access to the water filling stations for the largest trucks, those with a capacity of more than 15 cubic metres, is more difficult in many areas, than the smaller trucks.

3.4 Distribution of Profits

From the previous data it is clear that the price of water is extremely high in many parts of the city, too high for many people to be able to consume adequate quantities for good health. In order to understand how one might reduce the price of water for these consumers, it is necessary to understand the relative importance of transportation and retail costs on the eventual consumer price of water. The following sections provide an analysis of where the costs might be reduced.

3.4.1 Cost Breakdown

Figure 3.5 Cost Breakdown for Trucked Water



We know that the water in many parts of Luanda is expensive because much of it is trucked into the city from the Rio Bengo. However, transportation costs are not the only major factor contributing to the high price of water. Figure 3.5 to the left illustrates that transportation costs (as actually charged by the truck drivers) accounts for only 40 per cent of the final cost of the water (using the city-wide average retail price of USD 11.50 per cubic metre for trucked water). The other costs are: the cost of pumping the water into the trucks at the river (USD 0.80 per cubic metre) and the mark-up charged by the vendors in the *bairros* (USD 6.04 per cubic metre). It should be noted that the vendor mark-up includes the cost of constructing and maintaining the vendor's tank, salary of the person who collects the money

at the point of sale and a profit margin.

3.4.2 Average Income of Water Truck Per Trip

Drivers at water filling points were asked how much they sell the water for. Based on these responses the average selling price was USD 5.46 per cubic metre. This figure corresponds nearly exactly with the figure of USD 5.48 per cubic metre calculated from the responses of more than 1200 water vendors in the *bairros* to whom the truck drivers sell. This triangulation indicates that the majority of water vendors interviewed provided truthful responses about how much they pay for their water.

Since the average capacity of all trucks observed was 15 cubic metres, the average potential income is about USD 82 per trip, per truck. Furthermore, when asked how many trips they were able to make in one day, the average response was 1.7, indicating an average potential income of about USD 140 per day, per truck. Clearly, if the trucks were able to make more trips during the day their income would increase substantially. However, it is also reasonable to assume that if more trips were possible, the wholesale selling price of the water would likely decrease as well.

Potential Income for Water Trucks Per Day		
Average selling price	USD	5.46 per m^3
Average truck capacity		15 m^3
Average # of trips		1.7 per day
Total average income	USD	139.23 per day

Water filling point at Kifangondo on the Bengo River.

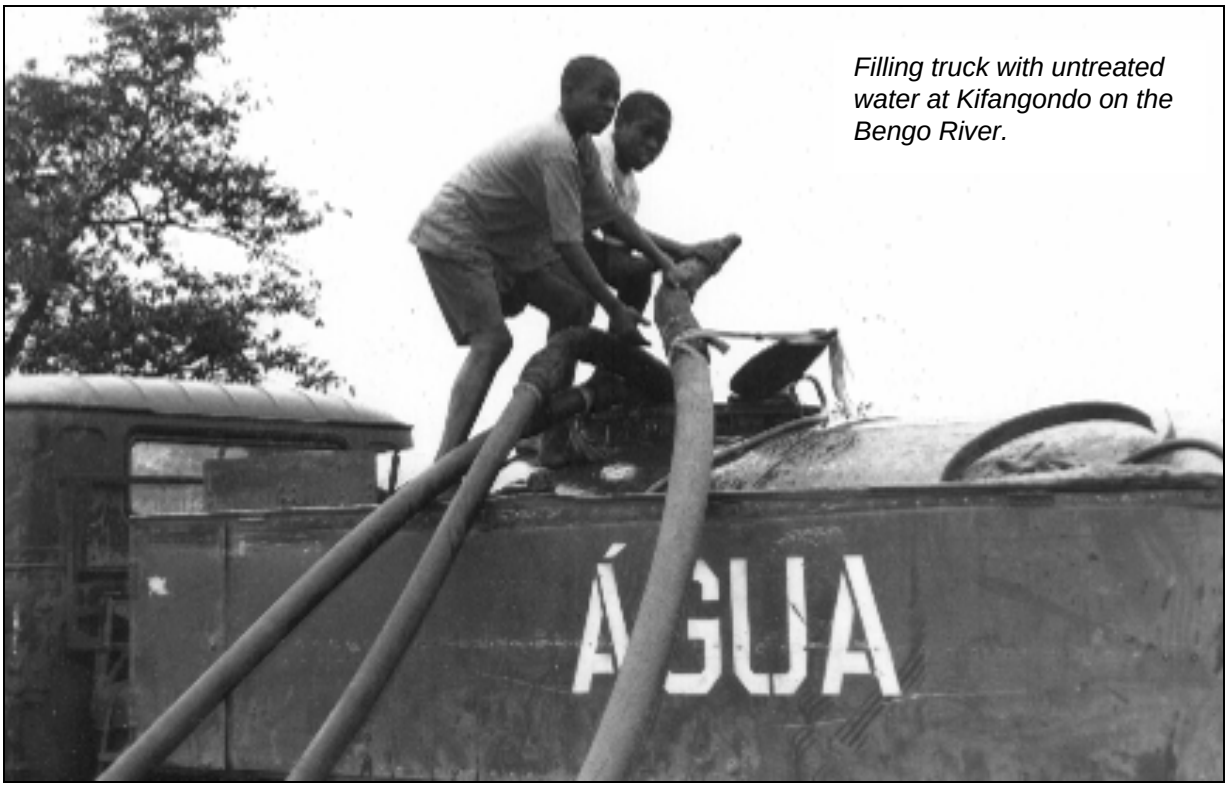
3.4.3 Financial Analysis of a Water Truck

It is possible to do a simple financial analysis of operating a water truck in Luanda. Annex 5 contains the details of the analysis. The table below summarizes the results of the analysis for a 17 cubic metre truck. The analysis assumes that the truck fills up with water at the Rio Bengo (Kifangondo) and sells the water in a *bairro* 20 kilometres from the river (Rangel, Sambizanga, Cazenga and Tala Hadi all fit this criteria). The city-wide average of USD 5.46 per cubic metre is assumed as the selling price.

Table 3.3 Summary of Financial Analysis for 17 Cubic Metre Water Truck

	USD /m^3	USD /trip	USD /day	USD /year	% of income
Income	5.46	93	186	55,700	
Expenses	5.06	86	172	51,636	93
Profit	0.40	7	14	4,056	7

As the table shows, only about 7 per cent of the total wholesale selling price is estimated to be profit for the owner of the truck. It is also worth noting that this does not include the cost of borrowing the money to purchase the vehicle, nor does it account for the fact that the owners of the trucks assume all of the risk of accidents that happen on the road. Some of the owners interviewed had no accident insurance on their vehicles.



Filling truck with untreated water at Kifangondo on the Bengo River.

Many of the trucks actually operating on the road were acquired using dollars purchased at the official (subsidized) exchange rate. These trucks would therefore have significantly lower initial purchase costs and thus higher profit margins than estimated above. However, the 7 per cent profit quoted above is realistic for trucks purchased at real rates of exchange.

4 RESULTS OF PHASE THREE COMMUNITY CONSULTATION

Since discussion groups were held separately for water and sanitation, the results are also discussed separately. Sections 4.1 and 4.2 present the results of the focus group discussions on water in ten peri-urban *bairros*. Section 4.3 presents the results from the discussions on sanitation in the same *bairros*. Detailed results for each *bairro* are provided in Annex 1.

4.1 Current Water Practices

Table 4.1 provides a summary of current water practices in ten peri-urban *bairros* of Luanda as presented by the participants in the discussion groups. The table is organized with inner-city *bairros* on the left side; more peripheral *bairros* are on the right side. This allows analysis of trends related to location factors.

4.1.1 Buying Water

The focus group discussions confirmed and clarified the quantitative data collected during Phase Two. Most people buy water from a nearby vendor with an underground tank. In most cases, this retail vendor buys water from a water truck or wholesale vendor. In some cases the retail vendors may also fill their tank from a piped connection to the city's pipe network. Vendors with piped connections were common in Rangel and Sambizanga. In other *bairros* the vendors relied mostly on trucked water.

For many people the distance they had to go to fetch water was not a significant factor, since there is usually a water vendor within 100 meters of the their house. However, people in Sambizanga, Ngangula, HojiBYaBHenda, Cazenga and Rocha Pinto said that when money was particularly short they would walk much greater distances to fetch water at alternative, cheaper sources (i.e., public standposts). People in Val Saroca stated that they walk greater distances when they need clean water. This happens when someone in the household is sick.

The discussion groups indicated a marked price inelasticity in the demand for water. Nearly everyone said that because they cannot live without water, they continue to buy a basic minimum quantity regardless of the cost: 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. The discussion groups confirmed 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. A number of groups indicated that some families were too poor to buy enough water.

Table 4.1 Current Water Practices

	RANGEL	SAMBIZANGA	VAL SAROCA	NGANGULA	MABOR	HOJI-YA-HENDA	CAZENGA	PALANCA	GOLF	ROCHA PINTO
SOURCE	household connection; vendors (mostly piped water)	vendors (mostly piped water)	vendors (mostly trucked water); cacimbas (wells)	vendors (mostly trucked water but piped in Kikolo)	vendors (mostly trucked water)	vendors (mostly trucked water)	household connect.; vendors (mostly trucked); standpost with tank	vendors (mostly trucked water)	vendors (mostly trucked water)	vendors (mostly trucked water); standpost in Samba
DISTANCE	unimportant factor	walk 1.2 km when no money	walk if they need clean water	walk if money is short	unimportant factor	Walk to standpost if have no money	walk to tank if have no money	unimportant factor	unimportant factor	walk to Samba if no money
REGULARITY	daily if network operational	twice weekly; quantity N.B.	regular; quantity N.B.	regular	regular	vendors are regular	vendors are regular	regular	regular	vendors are regular
PERCEPTION OF QUALITY	S.P. & piped water = clean; trucked = dirty	S.P. & piped water = clean; trucked = dirty	S.P. & piped water = clean; trucked = dirty	S.P. & piped water = clean; Kikuxi = dirty; Kifangondo=dirty	S.P. & piped water = clean; Kikuxi = dirty; Kifangondo=dirty	S.P. & piped water = clean; trucked = dirty	S.P. & piped water = clean; trucked = dirty	S.P. = cleaner but can be dirty; Kikuxi = clean; Kifangondo=dirty	S.P. = cleaner but can be dirty; Kikuxi = clean; Kifangondo=dirty	S.P. = cleaner but can be dirty; Kikuxi = clean; Kifangondo=dirty
WATER TREATMENT	no	treat trucked water with bleach or chlorine	with bleach	with chlorine or boiling, but both ways expensive	with chlorine	chlorine or boiling (by women), but both expensive	with chlorine, but expensive	with chlorine, but expensive	with chlorine or boiling, but both ways expensive	with chlorine, but expensive
ASSOCIATED ILLNESSES			diarrhoea			diarrhoea; cholera	diarrhoea; cholera	diarrhoea; cholera	diarrhoea	diarrhoea
PERCEPTION OF COST	acceptable; related to availability	high; related to availability and source	high; related to availability, source, access	high; related to availability, source, access	high; related to availability and access	high; related to availability, source, access	high; related to availability, source, access	high; related to availability and access	high; related to availability and access	high; related to availability and access
ATTITUDE TO VENDOR	neutral to positive; called neighbour	neutral to positive	acceptance; profit making; fact of life	should recover costs; women feel exploited	profit making; called neighbour	acceptance; profit making; fact of life	acceptance; profit making; fact of life	acceptance; profit making; fact of life	acceptance; profit making; fact of life	acceptance; profit making; fact of life

Note: S.P. = public standpost

Participants repeatedly said that the cost of water was related to both the source and the quantity of water available. The fact that vendors who fill their tanks more cheaply, sell more cheaply to the consumer suggests that there is some form of social control limiting the profits of water vendors. This is similar to findings by Cairncross and Kinnear (1992) in Sudan, and the Whittington, et al. (1988) in Honduras and Kenya. In fact, participants in Mabor, Ngangula, Rangel and Sambizanga confirmed that many vendors do not sell for profit at all, but rather to cover their own water consumption costs. Where vendors were seen to be making a profit, this was viewed as a “fact of life”. Only in Ngangula did the women's group say that they felt exploited by the water vendors.

4.1.2 Health Implications

Throughout the *bairros* and across the discussion groups, probing on issues of quality proved difficult as participants were much more interested in discussing the problem of the quantity of water they were able to consume. However, most participants were clearly aware of health hazards related to drinking dirty water and most people knew how to treat water. The issue most often raised was that the cost of chlorine, bleach and fuel for boiling is very high. People with no disposable income did not treat water. From there the scale went to treating only drinking water for babies to treating water for the whole family.

Though the water from Kikuxi water plant was identified in five *bairros* as cleaner than water from Kifangondo, the price difference was either, insignificant or none at all. In the Golf, Palanca and Rocha Pinto *bairros* water from poorly kept and uncovered tanks was cheaper than water from well maintained tanks.

Participants in the more peripheral *bairros*, such as Cazenga, Palanca, Golf and Rocha Pinto, where water is most expensive, described diarrhoeal disease transmission in more graphic detail than people in those *bairros* where water was cheaper. Participants described community outbreaks of cholera as well as hand-to-mouth transmission of diarrhoeal disease due to insufficient water for appropriate levels of individual hygiene. This would suggest that while local health education programs are effective, an overall shortage of water is limiting the potential impact of this education.

4.2 Priorities for Improvements in Water Distribution

Table 4.2, on the following page, provides a summary of the participants' stated priorities and preferences for improvements in the water sector. The highlights of the table are discussed below. As in Table 4.1 the inner-city *bairros* are on the left side and most peripheral *bairros* on the right.

Table 4.2 Priorities for Improvements in Water Distribution

	RANGEL	SAMBIZANGA	VAL SAROCA	NGANGULA	MABOR	HOJI-YA-HENDA	CAZENGA	PALANCA	GOLF	ROCHA PINTO
IMPROVEMENTS PREFERRED	standposts	standposts; standposts with tanks by gov't.	standposts	standposts	standposts; household connections	standposts	standposts; standposts with tanks by gov't.	standposts; household connections	standposts	standposts
SUGGESTED MOBILIZATION AGENTS	local authorities	local authorities	churches; NGOs	community; churches; local authorities; NGOs	community	community	community; NGOs	community; churches	community	community; churches
LEADERSHIP	poorly defined	not defined	not defined	not defined	well defined	well defined	well defined	well defined	well defined	well defined
RESOURCES IDENTIFIED	gov't. for major costs; but, also community contributions	gov't. for major costs; but, also community and NGO funds	gov't. for major costs; but, also community and NGO funds	gov't. for major costs; but, also community and NGO funds	gov't. up to *bairro*; community within *bairro*	gov't. for major costs; but, also community contributions	gov't. for major costs; but, also community and NGO funds	gov't. to *bairro*; community within *bairro*; NGOs	gov't. for major costs; but, also community and NGO funds	gov't. for major costs; but, also community and NGO funds
MAINTENANCE RESPONSIBILITY	community	community	community	not defined	community	community	community	community	community	community
MONEY MANAGEMENT	clear, well defined ideas	clear, well defined ideas	no definite ideas	clear, well defined ideas	clear, well defined ideas	clear, well defined ideas	clear, well defined ideas	clear, well defined ideas	clear, well defined ideas	clear, well defined ideas
RESPONSIBILITY FOR ILLEGAL CONNECTIONS	local authorities	local authorities	local authorities	authorities	community; local authorities	community; local authorities	community; local authorities	community	community; local authorities	community
SUCCESSFUL COMMUNITY INITIATIVES IN PAST	none identified	none identified	household electricity connections	electricity; public latrines	electricity; security	electricity; security; schools ?; standposts	electricity;	electricity; roads ?;	electricity	electricity

Note: ? indicates an uncertain outcome from the discussion group.

4.2.1 Preferred Solutions

The improvement suggested by the majority of participants in all *bairros* was the provision of public standposts. All groups specified standposts linked to the piped network with adequate pressure. The most common reason for specifying standposts that are connected to the piped network was that this was felt to be a long-term solution. Groups in Rocha Pinto, Mabor, Cazenga, Val Saroca, Palanca, Golf and Ngangula articulated their reluctance to contribute to temporary solutions. Other groupsX Sambizanga, Rocha Pinto, Palanca and Mabor also indicated that they did not feel that public money should be used in expensive short-term solutions.

It was also articulated clearly that standpipes could provide cheap water near people's homes. Residents of Rocha Pinto, Palanca and Golf also indicated that cheap, available water would provide other income generation possibilities, such as construction work and local bakeries.

Where groups discussed the large, public standposts with elevated, truck-fed storage tanks of 120 cubic metres, it was acknowledged that these standposts could provide a quick solution that did not require community contributions other than paying for the water at the time of purchase. The problems envisaged, and actually experienced, by the group in Cazenga were:

a) because they were so big and served a large area many people would have to walk long distances to collect water;
b) too many things could go wrong. Examples given included spare parts for the lorry, sick drivers and poorly disciplined drivers; and,
c) in Rocha Pinto, where water is most expensive, the participants clearly stated that any solution which was local to their *bairro* was not appropriate, because once it broke down, nobody would ever fix it for them only. They, therefore, wanted a piped water system, which fed other *bairros* also.

Groups in Mabor and Palanca suggested household connections as a solution. In both these communities a significant number of the residents have returned from Kinshasa since independence. They have a memory of affordable household water connections in Zaire. It is probable that families with disposable income who want household connections will not contribute to a less convenient service like standpipes, but would continue using tanks in their own yard, which they get filled by water trucks.

4.2.2 Role of Local Authorities

All groups recognised that mobilisation and organisation of the community was crucial to the success of any intervention. Participants in the older *bairros* of Sambizanga and Rangel felt that this was the responsibility of the local authorities. In the more peripheral *bairros*, the local authorities were not considered as agents of mobilisation; instead the groups opted for relying on their own initiatives.

This same trend was repeated in the discussions on illegal connections where Rangel, Sambizanga, Val Saroca and Ngangula felt that the effective control of illegal connections was the exclusive responsibility of the local authorities. This attitude is, in part, due to the fact that many “illegal” connections have “legal” documents obtained from EPAL. Hence, the residents feel that the authorities caused the problem and should, therefore, accept the responsibility for fixing it.[9] All the other *bairros*,

[9] From an interview with Engineer Antonio Matadidi from EPAL, it is clear that the vast majority of these "legal"

where there is no existing network, and therefore no existing illegal connections, indicated that the primary responsibility for control of illegal connections lay with the community, in some cases in collaboration with the local authorities.

The groups in Palanca and Rocha Pinto discounted local authority intervention of any kind, but indicated that the churches were important forces in their communities. It was clear during discussions that communities in the peripheral *bairros* did not feel that their local authorities represented them adequately. Some communities, notably Palanca, Mabor and Rocha Pinto, articulated a clear sense of marginalisation. Women were generally more critical of local authorities than men, who were more likely to suggest local authority intervention. This polarity of opinion was most striking in Sambizanga, where men said that the local authorities were effective and women said that they were "useless to the point that the community did not even notice their presence."

4.2.3 Willingness to Pay

Participants clearly stated that they were willing to pay for improved services. From the results of Phase Two of this study, it is estimated that peri-urban residents are likely paying in the range of USD 35 million each year for trucked water. If one includes the payments to vendors who have piped connections, the total is higher still.

Most groups indicated that they felt that the responsibility for the major capital investments lay with the government. The groups in Golf, Palanca and Mabor also made it clear that if these capital investments could be considered for other *bairros*, then they should be equally considered for their *bairros*. In seven of the *bairros*, participants mentioned NGOs as possible sources of resources. In some cases, participants suggested that NGOs could collaborate in the management of government-supplied resources.

All the groups also stated that residents could contribute money to the initial investment costs and many groups, particularly groups of young people, said that their communities would contribute labour. The women's groups frequently suggested feeding workers as a partial contribution.

4.2.4 Management and Maintenance

Three payment systems were suggested:

- PAY AS YOU CARRY: This meant that consumers would pay every time they carried water. Many participants felt that the major disadvantage of this system was that it required the permanent presence of a monitor.
- MONTHLY PAYMENTS: This was recognised as a relatively simple solution by some groups, but the inner-city *bairros* were more likely to identify potential problems such as:
  ! non-payment by users;
  ! managing payments if the supply was irregular; and,
  ! the fact that the fund would lose value to inflation.
- PAY AS THE NEED ARISES: The stated advantage of this system was that the community fund did not accumulate money, which would decrease in value.

No community rejected the idea of community management of money. The issue of management of money and leadership were linked. It was apparent that the six most peripheral *bairros* had much

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documents are not legal at all, but were made either by the house owner or by someone within EPAL without the proper authority to do so.

clearer ideas about collection and control of money. The four innerBcity *bairros* described these same issues more loosely and were not forthcoming with clear descriptions of leadership roles. Inflation and the nonBfunctioning banking system were considered problems by many groups.

All of the groups indicated a willingness to accept responsibility for maintenance.

4.2.5 Successful Community Initiatives

The group from the most peripheral *bairros*, with poorer services, poorer health indicators and more expensive water, presented more examples of previous successful community initiatives. The initiative with the most frequent successful outcome was organising electricity for the *bairro*. One of the eight electricity initiatives was a private enterprise initiative led by a local businessman. All the others were communities organising themselves, in some cases with quite sophisticated systems of technical, financial and administrative commissions.

However, it is important to note that only two of the initiatives required ongoing contributions or payments: Mabor which continues as a community initiative, and the privately managed electricity supply in Val Saroca. All the other initiatives required only one-off capital contributions.

4.3 Sanitation

Table 4.3 summarizes the group discussions on sanitation practices and priorities for improvement in ten peri-urban *bairros* in Luanda. Once again the *bairros* are listed in the same order as the two previous tables, allowing analysis of trends in the inner-city *bairros* and peripheral *bairros*.

Table 4.3 Attitudes, Practices and Diseases Associated with Sanitation

	RANGEL	SAMBIZANGA	VAL SAROCA	NGANGULA	MABOR	HOJI-YA-HENDA	CAZENGA	PALANCA	GOLF	ROCHA PINTO
RUBBISH DISPOSAL										
Where	containers; anywhere	holes	burn; bury; gulleys	burn; bury; gulleys	burn; bury; empty plots	burn; bury; unofficial dump	burn; bury; unofficial dump	unofficial dumps	unofficial dumps	gulleys
Who	children; women	children; women	men; women; children	men; women; children	young people	women; children	women; children	children	children	women/ children
DISEASE TRANS. ROUTES IDENTIFIED FOR RUBBISH	Non-specific	Non-specific	flies; food; direct contact	flies; food	flies; food	flies-food; dirt-hand-mouth	flies-food; dirt-hand-mouth	flies-food; dirt-hand-mouth	flies-food; dirt-hand-mouth	flies-food; dirt-hand-mouth
DRAINAGE										
Description	no drainage	slopes	slopes	no drainage	no drainage	no drainage	no drainage	no drainage	no drainage	no drainage
Diseases caused	malaria		non-specific	non-specific	diarr.;	malaria	malaria	cholera;	diarr.; malaria	diarr.; malaria
Other problems caused	not a major problem	rainy season access	electrocution; access	electrocution	malaria rainy season access	rainy season access	electrocution; access	malaria electrocution; access	drowning; rainy season access	rainy season access
DEFECATING										
Dry pit latrine		+	++	+	+++	+		++	+	
Pour-flush latrine	++++	+++	+++	+++	+	++++	++++	+++	+++	++
Open air	++	++	+	++		++ (cholera)	++ (diarrhoea)	++	++	+++
LATRINE PREF.										
Dry pit					+++			+		
Pour-flush	++++	++++	++++	++++		++++	++++	++++	++++	++++
PRIORITY FOR IMPROVEMENT	water	water	water; rubbish; chlorination	water; rubbish; latrines; roads; chlorination	water; rubbish	water; electricity; rubbish; public latrines	water; rubbish; public latrines; roads; burst pipes	water; rubbish; public latrines; road surfaces	water; rubbish; household latrines	water; rubbish; latrines; drainage
RESOURCES IDENTIFIED			gov't. for major costs; but, also community contributions	mostly gov't; but, also community; NGO for latrines	gov't. for major costs; but, also community contributions	major costs from gov't and NGOs; some from community & businesses	mostly from gov't; contributions from communities; possibly also NGOs	gov't?; NGOs for big %; some from comm. & businesses	major costs from gov't and NGOs; some from community	major costs from gov't and NGOs; some from community
IMPLEMENTATION RESPONSIBILITY			community; government		community; government	community	community	community	community; government	community

Note: + = few; ++ = some; +++ = many; ++++ = most

All discussion groups made it quite clear that though sanitation was a problem, water was the major priority. Though the discussion groups on sanitation were equally as interesting as those on water, it was apparent that people did not expect any government intervention in this area in the *bairros*. One young woman from Golf actually commented that it was unlikely that they [the government] would organise rubbish removal for the *musseques* when it had not been done properly for lower Luanda.

4.3.1 Solid Waste

Accumulating rubbish was widely recognised as a health hazard by the participants. With the exception of Sambizanga and Rangel, all groups described disease transmission routes related to rubbish. Only Rangel had any degree of functioning city rubbish removal service. In all of the other areas, people said that they simply attempted to keep rubbish away from their houses. A number of *bairros* have erosion gulleys or natural gulleys where rubbish was deposited. Participants from Mabor, Palanca, Golf, Cazenga and Hoji Ya Henda stated that they had no alternative but to throw rubbish on vacant land, which gradually become rubbish heaps.

Accumulation rubbish was widely recognised as a health hazard by the participants.

All of the suggested improvements included a city-run rubbish removal service. All other measures, such as filling in erosion gulleys, were considered temporary. All groups suggested that the major investment should come from the government, but that the community could participate in mobilisation and implementation. The five peripheral *bairros* described systems of mobilisation and implementation which clearly gave the community a leading role.

A number of groups said they could pay for any functioning service which was in the interest of their community, but that there was no consistent pattern in relation to rubbish. One of the problems was that, for the participants, discussing how to manage "a functioning rubbish removal system" resembled an exercise in collective fantasy and they were somewhat reluctant to participate in such an exercise. Secondly, a number of the groups of young people stated that some people would not make a clear link between rubbish removal and potential health benefits. Most groups felt that few people would regard an investment in rubbish removal as a savings, reducing the number of future episodes of illness. However, many groups did state that people would prefer to live in cleaner environments.

4.3.2 Drainage

None of the participating *bairros* has any type of drainage network. Those *bairros* with the more severe problems from accumulating water were Cazenga, Palanca and Golf.

The most frequently mentioned problem was the difficulty in accessing the *bairro* during the rainy season. In three *bairros*, the groups referred to deaths from electrocution because of live wires lying under water. In Golf, people had died from drowning in the gulleys after very heavy rains. In Palanca, an entire informal sector activity had grown to respond to the challenges of living in the *bairro* in the wet season. People hired out Wellington boots to cross pools. One can also pay to get carried across stagnant water pools, and some children provide a message service and do people's shopping for payment. Inner-city *bairros* associated stagnant water with specific disease problems, such as cholera, malaria and diarrhoea.

Improving drainage was not articulated as a priority during the group discussions. However, it is likely that this is as much a reflection of the enormity of the problem and the absence of simple solutions as it is an indication of a lack of interest in resolving the problem. Some groups suggested filling in specific stagnant pools which persisted throughout the year.

4.3.3 Latrines

Most groups said that most people who had latrines had pour-flush models. This agrees with the findings of a sanitation survey done in Val Saroca in 1989 by Development Workshop. In Mabor, the participants expressed a preference for dry pit latrines because they required less water. Participants that expressed a preference for pour-flush latrines stated that they:

a) were more hygienic and odourless;
b) were safer (dry pit latrines caved in, they said, particularly after heavy rains);
c) were suitable for having a bath in; and,
d) had a longer life.

In Mabor, where people used dry pit latrines, the participants said they had always used them and that it made sense when water was scarce and expensive. In the other areas, dry pit latrines were considered temporary models and commonly built with barrels. This would account for the perception of dry pit latrines as unsafe, with short life spans. In Val Saroca and Rocha Pinto, some residents with pour flush latrines, had direct outlets into the gulleys, spilling raw sewage into the open gulleys. There did not seem to be any negative perceptions of this activity.

Nearly all participants felt that a latrine was a basic household necessity. Many groups said that those families who did not have latrines “were very poor with no means or they had arrived recently in Luanda.” But all groups, with the exception of Mabor, said that some people in their community defecated in the open air. This happened, they said, when the family had no latrine or when there was no water to use the pour-flush type of latrine.

It was also apparent that children frequently did not use latrines. This was also felt to be related to limited water resources as well as poor family education. Defecating in public was considered a health risk, but more frequently the major sentiment expressed was that it was a “dirty habit”. When participants said that adults defecated in the rubbish areas because of limited water resources, they said that people did it at night time.

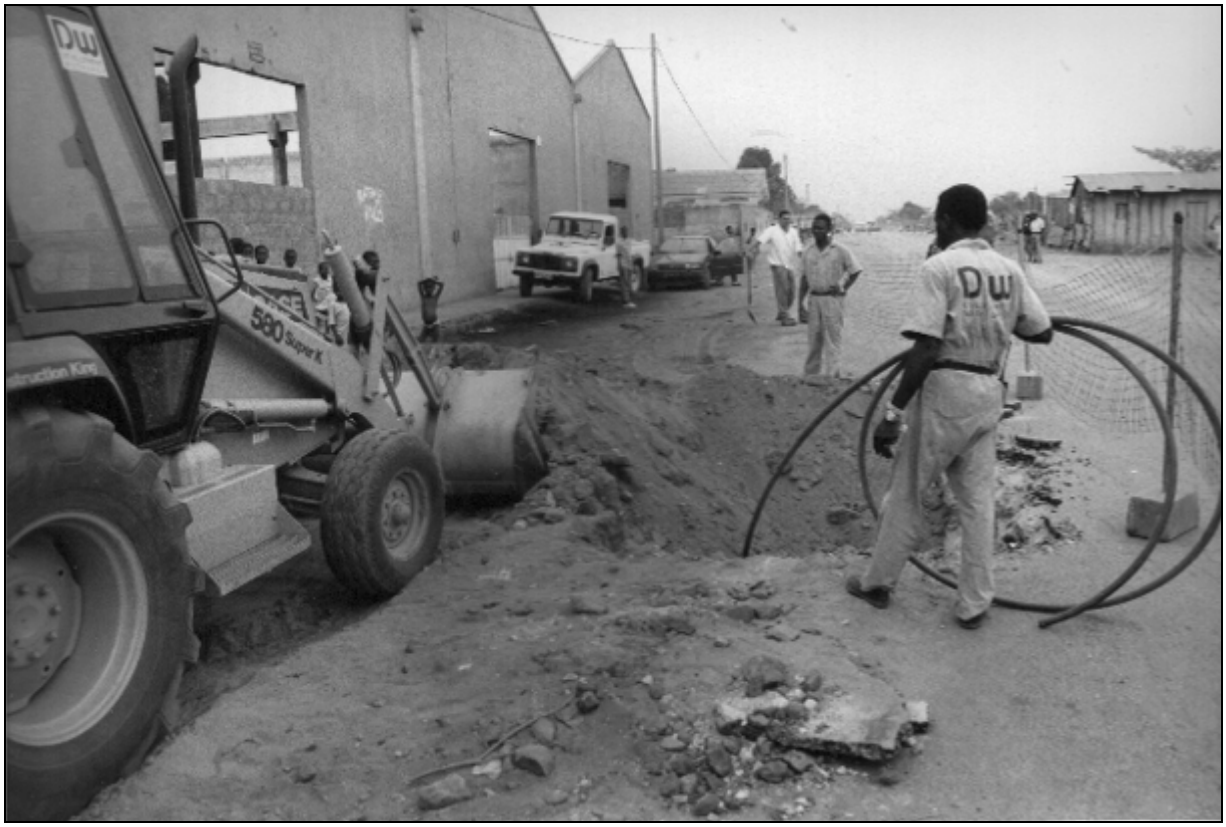
In Hoji Ya Henda, Palanca and Golf, groups suggested public latrines. In all of these cases, the participants suggested that there should be a person responsible for looking after the latrine. They also suggested that the users should pay for the upkeep of the latrine and the salary of the latrine monitor. Sambizanga and Ngangula described functioning public latrines in marketplaces where one was required to pay for each use.

4.4.4 Priorities for Improvements and Resources

Participants from all *bairros* said their first priority was water. Sambizanga and Rangel did not discuss any possible improvements in the context of sanitation. When sanitation improvements were discussed by the other groups, the most frequently identified priority was rubbish, followed by latrines and roads. Two *bairros* with previous experience of community chlorination of vendor and domestic water suggested an extended program of chlorination.

In most cases, participants felt that the major investment should come from the government. Palanca was the exception, where participants felt that it was more in the interest of the community to begin negotiating with NGOs. During the discussions on sanitation, six of the *bairros* mentioned NGOs as possible partners and five of those felt that the NGO contribution could be significant. Ngangula had previous experience with two NGOs in programs for household latrines. Hoji Ya Henda and Palanca mentioned local businesses as a possible resource.

The control of implementation was considered primarily a community task. Three of the eight *bairros* discussing sanitation improvements described a government role as one of support for sanctions; the other five mentioned no role for the government apart from the provision of resources.



Communities gave priority to water investments and identified both Government and NGOs as potential partners.

5 CONCLUSIONS

This is one of the first studies to systematically describe the water and sanitation practices in the peri-urban areas of Luanda. It is certainly the first study to consult with a wide cross-section of peri-urban residents about their priorities for improvements in water and sanitation services. The results of this study call into question assumptions that many people have about the informal water and sanitation sectors in Luanda, particularly the system of water distribution in the peri-urban areas. The main conclusions of this study are:

1. The water-related health statistics, once disaggregated to the municipal level, reveal vast differences between the formal, urbanized part of the city and the *musseques*. The number of deaths per 1000 people due to diarrhoea, for example, is 24 times higher in Municipio Cazenga than in Ingombotas, the city centre.

2. It is clear that water trucks do not sell water house-to-house in the *musseques*. The trucks sell to an estimated 10,000 water vendors, the majority of whom have tanks with a capacity of between 5 and 10 cubic metres. These vendors then sell water to people who live nearby, usually by the bucket.

3. Anyone who is not able to directly access the city's piped network through a household connection is forced to pay up to 10,000 times the official price for water. Water prices in the *musseques* surveyed ranged from USD 1.21 to USD 16.90 per cubic metre.

4. The price charged by informal sector water vendors depends on whether the vendor obtained the water from the piped network or purchased the water from a water truck.

5. Social factors, such as the relationship between vendor and customers, as well as market forces, determine the price of water in the *musseques*.

6. Distance from the Bengo River, the main source of water sold by water trucks, is directly related to the price of trucked water. Reducing the distance that trucks need to travel between source and destination, therefore, is likely to lower the price charged by truck owners.

7. There is no monopoly ownership of the water trucks in Luanda. Over 70 per cent of the water trucks on the road are owned by small operators with a maximum of two trucks. Twenty-seven per cent of the drivers interviewed claimed to be owner-operators.

8. The owners of the water trucks are not, as assumed, making excessive profits. From a financial analysis of a 17 cubic meter truck, profits are in the range of 7 per cent.

9. The four official places within the city where water trucks are authorized to fill up, (known locally as "*giraffes*"), are providing very small quantities of water (average of 20 cubic metres per hour for each site) when compared with the volumes taken directly from the unofficial sites at the Bengo River (estimated at about 750 cubic metres).

10. During the community consultations, most groups selected public standposts fed by piped connections to the city network as the preferred improvement in terms of water. People stated clearly that this was seen as a long-term solution for their areas and that they were willing to contribute resources to the construction and maintenance of these standposts. People also stated clearly that they were far less interested in contributing resources to projects that would provide improved services in the short-term.

11. While all groups recognised that mobilisation and organisation of the community was crucial to the success of any intervention, participants in the discussion groups from the so-called periphery *musseques* such as Cazenga, Palanca, Golf and Rocha Pinto were found to have more experience with community-organized projects than the *musseques* of the inner city. These participants were also able to describe more clearly the systems of management for the community-led initiatives.

12. Attitudes of the participants towards local government as an agent of development varied markedly between peripheral *musseques* and inner-city *musseques*. In the older, inner-city *musseques* such as Sambizanga and Rangel, participants felt that social mobilization and organization were primarily responsibilities of the local authorities. In the more peripheral *musseques,* the local authorities were considered "unsuitable" for this role. In fact, the groups in Palanca and Rocha Pinto discounted local authority intervention of any kind.

    Women were generally more critical of local authorities than men, who were more likely to suggest local authority intervention.

13. Participants in the discussion groups made it very clear that their willingness to invest resources in improvements in water delivery far outweighed their willingness to invest in sanitation improvements.

14. In terms of sanitation, accumulation of rubbish was identified most often as the worst hygiene problem in the *musseques*. However, they were very wary about investing resources in a rubbish removal project, which they said would require ongoing support from the government to move the rubbish to a sanitary landfill. Many participants doubted the Government's motivation to make these investments.

15. Household latrines were identified by participants as a basic necessity and families that did not have a latrine were "very poor."

16. The system of informal sector water vendors is providing reasonably good coverage in the *musseques*. Most participants stated that there is a water vendor within 100 meters of the their house.

17. The discussion groups indicated a marked price inelasticity in the demand for water. In other words, nearly everyone said that because they cannot live without water, they continue to buy a basic minimum quantity regardless of the cost. People stop buying other important items in order to buy water.

18. Most participants were clearly aware of health hazards related to drinking dirty water and most people knew how to treat water. Not withstanding this awareness of the importance of water quality, probing on issues of quality proved difficult as participants were much more interested in discussing the problem of the quantity of water they were able to consume.

6 RECOMMENDATIONS

The principal recommendations of the research team are:

1. The first priority for improvement is clearly increasing the volume of water produced at Kifangondo. This will increase the volume of water provided to water vendors, thereby lowering the cost to the final consumer.

   Based on studies in other African countries, experience shows one does not have to vastly increase the amount of water provided to these areas in order to have a significant impact on the price of water. For example, one study in the peri-urban areas of Khartoum, Sudan clearly illustrates that the demand for water does not vary with the price of water or the income of the consumers (Cairncross and Kinnear, 1992). In other words, a small increase in the supply of water usually causes a significant decrease in the price of water. Furthermore, as the authors of the Khartoum study conclude, the high cost of water is a major contributor to the high rates of malnutrition ...and hence that a reduction in this price has a significant impact on the nutritional status of the poor, as well as permitting expenditure on other items such as health care (Ibid: 188).

2. In the *musseques* without access to the city's pipe network priority should be given to increasing the volume and lowering the cost of trucked water. This could be done by increasing the capacity of existing official truck-filling facilities and constructing new facilities in strategic locations within the city.

3. The *musseques* of Rocha Pinto, Palanca and Golfe be given a high priority for future investments in water infrastructure. Water prices were far higher in these *musseques* than anywhere else in Luanda (average of USD 14.65 per cubic metre). The long-term solution is clearly to extend the pipe network to these areas once the quantity of water produced in Kifangondo increases. However, a possible medium-term solution is to construct truck-filling facilities at the EPAL station at Golfe, which is not currently working but could be integrated into the network once the volume of water produced is increased. An upgrading of the truck -filling facility at Maianga could also benefit the Rocha Pinto area.

   Population estimates for the south-west area of the city (Rocha Pinto, Palanca and Golfe) vary, but assuming a population of 300,000 people, each consuming 15 litres per day, these people are spending close to USD 2 million per month for water (USD 6.60 per person per month). Expenditures on water is obviously consuming a very large portion of each family's income in this area and any reduction in the overall cost of water will enable these families to: a) consume more water; and b) increase their expenditures on other items such as food and housing.

4. Priority should be given to increasing the number of public standposts connected to the city's pipe network. This could be done even before any increase in the water production from Kifangondo is realized. This is also technically feasible in Golfe at the present time since, while the quantity of water in the pipe network in that area is not sufficient to supply the EPAL tower, there is sufficient quantity and pressure to construct public standposts.

5. Support should be made available for a programme designed to improve the existing system of water vending from underground tanks in the *musseques*. This programme should: focus on ensuring that all tanks have proper covers; encourage vendors to clean their tanks regularly and chlorinate the water they sell; and, improve the method of extraction from the tanks to reduce the

contamination caused by lifting water with buckets.

6. All improvements in the water sector should have significant community participation, particularly in the maintenance and management of any new facilities. In practice this is likely to mean community involvement in setting and collection of user fees. This is particularly important in the peripheral *musseques* where the communities appear to be most organized.

7. Cost recovery for improved sanitation services should be linked in some way to user fees for water supply. This recommendation is based on the findings that while people are willing to pay relatively high user fees for water services, they appear far less willing to pay for sanitation services.

8. Support should be given for developing pilot projects for solid waste removal from the *musseques*. Rubbish removal in all *musseques* practically non-existent and there is a need to gain experience in how such a system could be economically managed before any city-wide programme is developed.

9. Support should be given for a city-wide household latrine project designed to target low-income families.

10. Line ministries, such as the Ministry of Health, should be encouraged to collect and analyze the data they collect on a *bairro* and comuna level. Currently, nearly all data collected is aggregated at the provincial level, making planning decisions for water and sanitation interventions difficult.

11. Further work needs to be done in developing guidelines for how user fees for improved water and sanitation services are set, how they are managed, and what proportions of the revenue are distributed to the various stakeholders. For example, it is not clear at the moment what percentage of any revenue from public standposts should be paid to EPAL. Similarly, the role of local government in the management of these services has not been well defined.

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Annex 1 Detailed results of discussion groups

The detailed results from the discussion groups are presented on the following data sheets. The bairros are presented in the same order as in Tables 4.1 to 4.3 (i.e., starting with the inner-city musseques and progressing towards the most periphery musseques).

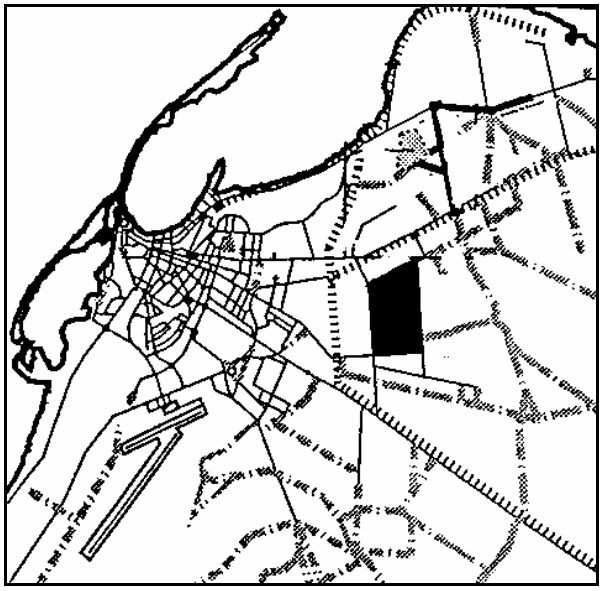
BAIRRO CAZENGA

1.1 General Indicators

Location:	Middle Belt
Description:	New Musseque
Density:	High
Access:	Poor
Water Source:	Vendors Primarily Water Truck
Diarrhoea: **(deaths / 1000 pop)**	3.18
Price USD/20 lit	$ 0.16

1.2 Discussion Groups

Water:	21 participants, 3 groups women / youth / men
Sanitation:	26 participants, 3 groups women / youth / mixed
Average Residence in Bairro:	8.9 years



2 WATER

2.1 Water Source / Distance / Regularity

There are four sources of water in the bairro; water vendors, household connections, one standpipe and the Provincial Government Water Tank. Before December 1994, water flowed two to three times weekly but with little pressure. Now it rarely flows. Normally, people who do not have their own household connection buy from a neighbour. Water vendors with a mainline connection often sell to fixed clients or to friends and family; people who buy water from the water trucks sell water when there is no mainline supply. Many people walk to the Provincial Water Tank when they have little money. The only regular water supply is the water vendors but even that chain can break down on occasions. When there is water, the pressure at standpipes is very low. People begin to queue there at 04.00 hours.

Participants felt that the major problem was the quantity of water available. One group of women (11 de Novembro) refer to "spending a lot of time looking for water". It is primarily young girls who go looking. Some participants referred to paying people to carry water on occasions. Carrying water back home is the major problem "because then you have a weight on your head". Frequently, there are fights in the families because the boys who did not go and look for water want to use it for bathing and their sisters who carry the water object.

People who use the Provincial Water Tank say that many users walk 1 - 2 Km to carry water. The queues are very long and people make the queue with buckets; buckets are frequently stolen. When there are water shortages there are often "lutas e confusao" around the tank. Then the guards "beat the people and close the tap" and the users have to look someplace else for water. The participants said that users of the tank pay for token on a daily basis but they did not know what was done with the money.

2.2 Cost /Water Vendors /Quality

People felt that though water was not very expensive in their bairro in comparison to other bairros, it was still "too expensive for their purses" (men's group). The women's group said that sometimes they ate less to buy water. The cost of water depended on the source and the condition of the vendor's tank i.e whether the tank was covered and clean. Participants felt that tap water (including standpipes) was generally cleaner though it sometimes flowed with rust in the water. Water from Kifangondo was considered dirty but participants said that the police obliged the truck drivers to treat the water. Hence participants said they did not treat either tap water or truck water. The only exception was in the case of new-born babies whose water was boiled (women's group).

All groups clearly associated dirty water with diarrhoea but said that they had no option but to buy what was available.

2.3 Proposed Improvements for Water

The two improvements suggested were:

a) Standpipes from the main water line: The advantages cited were cheap, regular supply near their homes. Two groups said that standpipes filled by water tanks were not viable because of the difficulties of access during the rainy season and if there were too many trucks on the road the traffic congestion would be worse.

b) Tank "Tipo Roques Santeiro" (discussed by one group): It was not clear what the advantages the tank "tipo Roques Santeiro" had over other government water tanks. The advantages given were rapid construction but the reservations

raised in the same group were that it was a costly investment and it was dependent on being filled by water lorries. Participants seemed to feel that truck water was never of dependable quality and not sustainable in the long term.

2.4 Leadership and Management

The young people's group suggested that a Residents Commission be elected with appointed leaders; it could have a technical commission and an inspectorate (Commissao de Fiscaliçao). They also felt that the community should seek the support of an NGO for the major resources required.

The women's group felt that the major resources should come from the government and the community could provide skilled and unskilled labour and water for the construction. The men could organise rotating "civil defense duty" at night time to guard the standpipe. The women were divided on how money should be collected. Some felt that a Community Fund could be created and users then pay monthly fees; others felt that because of inflation people should only contribute when the need arose.

The men's group felt that the leadership should come from the current heads of quarteroes; the monitors could be selected from people living near the standpipe, preferably an older man with no other occupation. Holding of money was a major issue in the men's discussion group. Participants felt that money "always caused problems" and it was no longer safe to keep money in one's home. They also felt that "nobody was honest where money was concerned".

Participants felt that this was not an issue at present, given that the water pressure was so low, it was not worth making an illegal connection. The existing private connections were legal, in the opinion of the young people, and their owners paid EPAL. The men felt that if the community had standpipes where water flowed regularly, individuals should not be allowed rob what belonged to everyone by making illegal connections. The women's group felt that the community "civil defense" groups were the only solution and they felt that they could convince their husbands to participate in such an initiative.

2.5 Previous Experience of Community Organisation

All groups referred to previous experiences with community contributions to solve the electricity problem; the mens and young people's group were satisfied with the result but the women's group felt that the electricity was still very weak. The EDEL technicians said they needed new cables and a transformer. They estimated that the work would require a contribution per household of 30,000,000,00 NKw and the women said that was way beyond their means.

One group (men in 11 de Novembro) said there was a community structure, with elected leaders for quarteroes and sectors. All other groups said that there was no existing community organisation or leadership. Some groups (women) were dissatisfied with the fact that the Municipal Administrator lived in Palanca and hence "did not live the problems in their bairro".

3.0 SOLID WASTE - RUBBISH

3.1 Where is it disposed? By Whom? How?

There are no fixed rubbish places in the bairro. There are a number of big rubbish dumps and many small ones throughout the bairro, several of them near the houses. As there are no proper sites children are often chased when throwing out the rubbish. A small number of people bury and burn in their yards if they have room. Women and children throw out the rubbish with old buckets, bags and basins.

3.2 Association between rubbish and disease

Accumulating rubbish is associated with ill health, cholera and malaria. The young people said that the rubbish tips "were an alternative source of cheap illness". They also said that the health authorities used to spray the bairro in 1978/79.

Rubbish also blocks access, particularly when it gets mixed with stagnant pools of water. The women's group felt that the smell was a particular problem.

4.0 SANITATION & DRAINAGE

4.1 Stagnant Water / Access / Disease Associations

Stagnant water in the bairro is perceived as causing

- malaria, because it provides breeding ground for mosquitos
- it provokes short circuits in the electricity cables, causing deaths and interruptions of supply.
- the water also causes big holes in the road, making access to the bairro even more difficult.

The ruptured water pipe lines also causes longterm stagnant water pools.

5.0 LATRINES

5.1 Use of Latrines

Most people have Pour Flush models. Small children often defecate in the open air, either

because they are in a rush or because their parents have told them to do it to save water. Some adults also use the rubbish tips at night time to save water. Faeces in the open air is clearly associated with diarrhoeal diseases.

5.2 Preferences for Types of Latrine /Emptying Latrines

Participants prefer the Pour Flush model: it is considered more safe, cleaner, has a longer life and does not smell.

Traditionally people called ELISAL when their latrines were full but the service is now expensive and difficult to get. Some people do it manually, burying the contents in another hole or throwing it in the rubbish. But the participants said that many toilets in the bairro continue full.

Participants said that tenants do build latrines. If the tenant lives in the annexes, they share the cost of construction and maintenance with the owner of the house.

Women suggested that there should be Public Latrines, three latrines at the end of each street, for women, men and children. They felt some people did not have latrines because they did not have enough money to build one. Provision would have to be made for guards for the latrines and water for cleaning. The young people suggested that there should be public latrines in the market place of Asa Branca.

6.0 PRIORITIES FOR IMPROVEMENTS

6.1 Proposed Improvements and Resources Required

People's priority was clearly water. In the area of sanitation they suggested

a) fixing the burst EPAL pipes

b) filling in the areas with stagnant pools of water

c) providing rubbish containers with twice weekly collections by ELISAL. The young people's group suggested open gulleys for rubbish as they doubted ELISAL's capacity to remove the rubbish regularly. The women's group said that "the poor man does not invent", meaning that people must adapt to their circumstances but they expect some government support.

Participants suggested that the community could contribute with labour and money for a service that worked. Young people said that "the contribution of the residents would be secondary and that the major subsidy would have to come from the government". The young people said that "people do not realise that it would be cheaper to contribute to rubbish removal rather than paying for treatment for diarrhoea for the children". NGOs were named as another source of resources.

6.2 Organisation and Inspection

The young people suggested that the lead should be taken by the coordinators of the bairros "that was supposed to be their job". The other groups suggested the Residents Commission.

Money could be managed by the Residents Commission who would elect a treasurer. Mobilisation and education could be done by young people in association with the residents commission (young people's group).

People who live near the rubbish points should see that they are properly used. The young people said that each resident should be a rubbish control agent (policia).

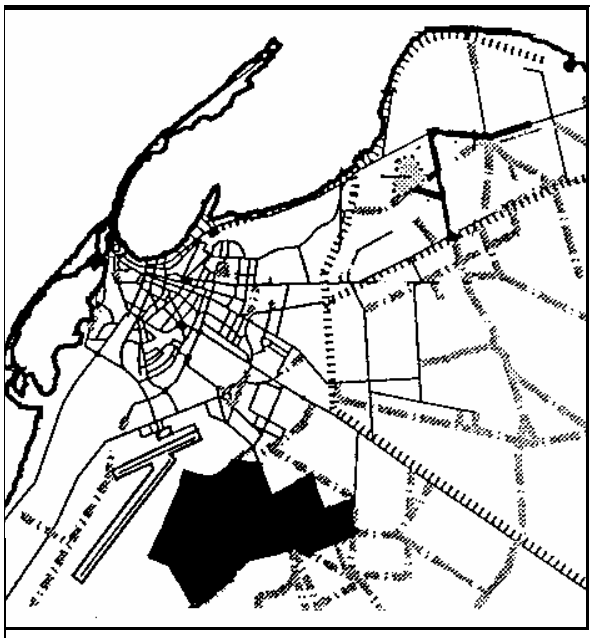
BAIRRO GOLFE

1.1 General Indicators

Location:	Periphery
Description:	New Musseque
Density:	High
Access:	Poor
Water Source:	Vendors Primarily trucked water
Diarrhoea: (deaths / 1000 pop)	0.25
Price USD/20 lit	$ 0.25

1.2 Discussion Groups

Water:	23 participants / 3 groups women / youth / men
Sanitation:	19 participants / 3 groups women / youth / men
Average Residence in Bairro:	6.7 years



2 WATER

2.1 Water Source / Distance / Regularity

The primary source of water is trucked water from vendors. Six out of twenty three participants owned their water tanks. Some people use water from gulleys to wash floors and for the toilet. Very poor people use water from ground springs which is salty (mentioned were elderly people living on their own). The women's group also explained that if you use salt water to wash clothes you must use powder detergent to make suds. Distance was not considered a major problem since many people had tanks in the bairro.

All groups felt that the tank owners ensured a continuous supply. One group of men (majority owners of tanks) referred to not always having the money to buy a tank of water.

2.2 Cost / Water Vendors / Quality

In general participants felt that the price of water was related to supply and demand (procura e oferta). When there was more water the price was lower. One group (women) felt that "that it was a disgrace. Luanda is between two rivers and they still cannot bring water to the people". Other factors which affected price were:

- the person (unemployed) who sold water to make a living charged more to make a profit.
- those who sold to recover costs to fill their tank charged a lesser amount
- the cheapest was where water was filled by the driver of a company lorry who filled his family's water tank.

There were mixed attitudes towards vendors but the dominant one was that "vendors do not sell water to help others but to make money". Another similar quotation was that "water is a business". Parallel eighties they had some standpipes feed by a feeder was the feeling that people had no choice because it was their only source of water. One group said that some people prefer putting a water tank on their truck rather than carrying passengers.

People were clearly aware of issues of quality; dirty water was related to diarrhoea. Tap/standpipe was considered generally cleaner; but the women's group said that even tap water sometimes "came dirty with bichos because the pipes are old and allow sewage to mix with water". The tank water was generally considered dirty with the exception of water drawn from Kikuxi "which was considered properly treated". The other problems related to tank water was

a) some tanks had no lids
b) water which lay in a tank for a long time was contaminated
c) many participants said that the water tanks were sometimes used for carrying other things such as sewage.

Most participants said they treated water only when there was an announcement on the radio about an epidemic. They referred to treating with lixivia or boiling water. But all groups repeatedly referred to the fact that in the current context quality was not the major problem; the major problem was quantity of water. The women's group stated clearly "If there was more water, we would be spending less on the water and we could afford to treat the water we drink. With more water, we would not have to pile up clothes until we can afford to buy water to wash them. With sufficient water, we could wash our children a few times a day and we could even have vegetable gardens."

2.3 Proposed Improvements for Water

Most people suggested that the solution was to build standpipes from the Kikuxi line which passes by their bairro to Golf 2. In the latter half of the

pump from the FTU. The standpipes should have locks on the valve-box. The large "Tanque do Governo Provincial" were felt to be too "central" which meant that people had to walk too far and queue for too long.

2.4 Leadership and Management

The community could elect a leader by Quarterao. The women suggested that the leader should be a man because women have too much other work to do. Another group felt that leaders should have minimum economic standing on the basis that if

they stole money, they would have other means that could be confiscated by the community. Though local government was felt to be non-existent, all groups suggested that the "Government should provide the resources". These resources could be provided in conjunction with an NGO. The community could contribute with labour and professional skills. All groups felt that the community could contribute money in relation to their means; but one group (young people) said that the community could only begin to contribute when the saw the standpipe being built because "people no longer give money without some guarantee". A bank account could be opened in the community name. One group (young people) suggested that the bank account could be held jointly by the NGO and the community and the community contribution could be payed in once work began on the standpipe. Community members with less means could pay in instalments with a time limit.

The number of people suggested for a water committee varied from five to eight. Users should have user cards. Those who do not pay should not be allowed draw water.

Participants felt very strongly about illegal connections. It was felt that if the standpipe belonged to the community, they should be responsible for ensuring that no illegal connections were made. The community should be clearly informed at the beginning that drawing of connections from the standpost line was illegal; in the event of infractions, the infractor should pay a fine and be imprisoned.

2.6 Previous Experience of Community Organisation

The groups referred to previous community initiatives to solve problems such as

a) connecting the bairro to electricity

b) organising civil defence to control lawlessness.

In the case of the electricity, an individual called the meeting and suggested that the community contribute to buy poles and cables. The individual (Sr.Ferreiro) contributed 50% of the costs and made the contacts with EDEL. The outcome was initially successful. Some houses which had not contributed were linked to the project but were subsequently disconnected when it was brought to the attention of the organisers. Unfortunately, a drunk man shot into the distribution box and the area has not had electricity for over one year.

The initiative to have community patrols was not effective because when robbers were apprehended who were recognised from the bairro they were let go again.

3.0 SOLID WASTE - RUBBISH

3.1 Where is it disposed? By Whom? How?

People throw rubbish in the gulleys and in the streets. The young people said that "lazy people throw rubbish in the streets". There are three main rubbish collections and distance is not considered a problem. Children throw the rubbish out. The men's group explained that "parents leave the house early in the morning and often do not come back until 20.00hrs, such that children take care of the domestic chores".

3.2 Association between rubbish and disease

The rubbish was clearly recognised as a health hazard; the groups mentioned transmission of diarrhoeal diseases by flies, children playing in the rubbish and not washing their hands afterwards. Dead animals rotting in the rubbish was also mentioned as a health hazard.

4.0 SANITATION & DRAINAGE

4.1 Stagnant Water / Access / Disease Association

The bairro has no drainage and this causes problems in the rainy season. Issues discussed included:

- difficult access to the bairro in the rainy season, making the price of water go up
- stagnant pools where you can even find fish at times
- rubbish mixing with the water creating smelly fermenting masses.

They also spoke about a gulley with a salt water spring where people washed clothes (they did not say poor people as been said in the water discussions) and children played. Some children have drowned there. When there is heavy rain, the same gulley becomes a raging torrent and a number of people were drowned in the rainy season of 1995.

Stagnant water pools are associated with malaria and diarrhoea.

5.0 LATRINES

5.1 Use of Latrines

The young people said most people do not have latrines. Those who have latrines mostly have a Pour Flush model; the dry pit latrine is referred to as the "provisional latrine". All groups said many people used empty grassy fields or open spaces, even those with latrines, in order to save water. Children again are frequently encouraged to defecate in the open air to save water. The young people said that "people defecate anywhere there is a bit of grass". Faeces in the open air was clearly associated by all groups with diarrhoeal diseases.

The reasons given for people not having latrines were:

a) lack of money and
b) not wanting to waste money when they could use a field for a toilet.

5.2 Preference for Types of Latrines / Emptying Latrines

The participants expressed a preference for Pour Flush latrines, which were considered

- cleaner and not smelly, the young people said that "you could take your dinner in a Pour Flush latrine"
- safe
- definitive models
- you can take a bath in them

The dry pit latrine was less expensive but considered smelly, prone to collapse and dangerous for children.

The men said that when the latrine was full they called ELISAL; the women calling ELISAL as too expensive and too difficult and people normally emptied their latrines manually and buried the contents. Some families did this themselves, other families hired people to do it

6.0 SANITATION IMPROVEMENTS

6.1 Proposed Improvements and Resources Required

The community's major problem was water. The groups selected rubbish and latrines as a priority for action in the context of sanitation. The solution suggested for rubbish was containers with regular collection. For latrines, the women's group suggested family latrines and if not possible, collective latrines. Users could pay monthly payment to cover the cost of running the latrines.

6.2 Organisation and Inspection

All groups felt that organising the community was not a problem, once the activity was clearly in the community's interest. All groups suggested a residents commission with members from the young people, women and men. They would be responsible for mobilisation and collection of money. Again, all groups felt that there were a number of suitable candidates for leaders.

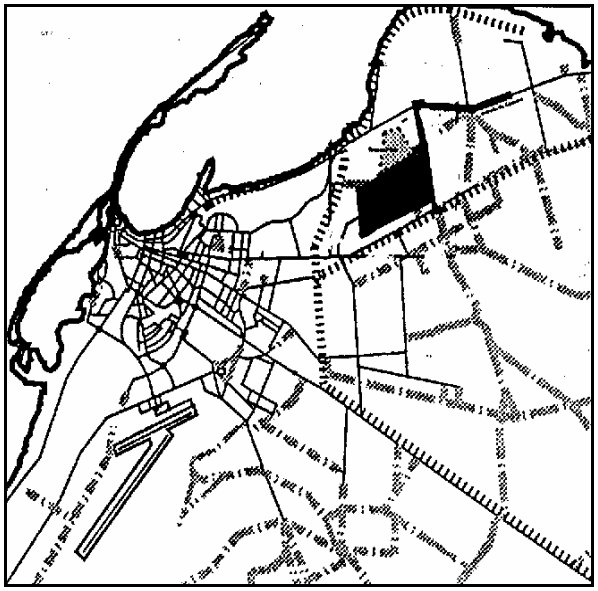
All groups felt that the community had limited resources on their own. The mens' group said the community could contribute labour and some technicians. They could also contribute financially if the leaders were trusted and if the activity was valued by them. They would be more willing to contribute to improve water; any improvement in rubbish disposal which did not include regular collections was not considered worth paying for.. The young people and mens group suggested that the needed resources could come from an NGO. They said that "we need to learn how to negotiate with NGOs because they have lots of dollars".

The women's group said that "the Government has a responsibility to look about us; we pay social security from our salaries and we never see any return".

All groups said that the community could manage their own money; they suggested putting it in a bank account with multiple signatures. The mens' group said that "many community collections had been made previously without money being stolen". The amount of an acceptable contribution varied from 500,000NKw to 10 million NKw, (0,25 US to 5.0 US) depending on the reason for the contribution.

The men and young people felt that inspection and control of any community initiative was a community responsibility. Again, the women's group said that this should be a government responsibility.

HOJE YA HENDA



1.1 General Indicators

Location:	Middle Belt
Description:	New Musseque
Density:	High
Access:	Poor
Water Source:	Water Vendors Principally Water Trucks
Diarrhoea: **(deaths / 1000 pop)**	3.18
Price USD/20 lit	$ 0.16

1.2 Discussion Groups

Water:	13 participants, 3 groups womwn / men / youth
Sanitation:	21 participants, 3 groups mixed / youth / men
Average Residence in Bairro:	14 years

2 WATER

2.1 Water Source / Distance / Regularity

The primary water source is vendors; most vendors are supplied by water trucks but some few have tanks feed by the mainline supply. There is one standpipe in the bairro but the supply is very irregular. People walk some distance (500m) to the tanks supplied by the mainline (water is cheaper).

There are no queues at the tanks but very long queues at the standpipes when there is water. The only families who manage to use the standpipe live very near it. Water supply by the vendors is regular; the standpipe is not dependable and one can only get 20L in a day

2.2 Cost /Water Vendors /Quality

The cost of the water depends on the source of the vendor; mainline water is cheaper than truck water. Mainline water and standpipe water are also cleaner but it still comes sometimes with particles. Water from Kifangondo is considered dirty. People drink dirty water because they have no choice. The women's group associated dirty water with cholera and diarrhoea. No group spoke of treating water in their homes.

Participants considered that the vendors sold to recover their costs and make profit; this was not considered unreasonable but the problem was that many people did not have "enough resources to buy the water they needed".

2.3 Proposed Improvement for Water Resources

All groups proposed standpipes with increased pressure in the mainlines and a regular water supply, as the desired improvement. The women's group felt that steps would have to be taken to ensure that the "pequena burguesia" did not place the standpipes outside their houses.

One participant in the men's group proposed the "Tank Type Roque Santeiro". The other participants felt that it was too much money to spend on a temporary solution and people would still have to walk and queue for water.

2.4 Leadership and Management

All groups proposed some type of community committee to organise the project. Mobilisation of the community would need to be done by residents. No group mentioned the local authorities and the women's group did not think that the bairro had a local coordinator. The profile suggested by the women's groups for a leader was male, middle-aged and living a long time in the bairro. Participants felt that the monitor for a standpost should be a respected member of the community with no other occupation. Participants felt that resources like cement, materials should come from an outside agent i.e state or an NGO. The community could provide skilled and unskilled labour and water for the construction; they could also provide food for the workers. Afterwards the community could make the necessary contributions for maintenance for the standpipe. All groups felt that communities would be quite feeling to contribute within their means as long as they were getting an improved service. They suggested an initial contribution to create a community fund and then monthly payments for user cards. Some groups suggested money could be put in the bank (youths): others were against banking money because of the difficulties in withdrawing money.

Illegal connections was not an existing problem in the community because of the low water. In the future, women participants said children could report on illegal connections; the men felt it should be government inspectors and the young people were afraid of reprisals if community members denounced illegal connections.

pressure. In the future, women participants said children could report on illegal connections; the men felt it should be government inspectors and the young people were afraid of reprisals if communitymembers denounced illegal connections.

2.6 Previous Experience of Community Organisation

The previous activities mentioned were:

a) Contributions to connect electricity: The community contributed to buy cables and a transformer. It is not clear what happened to the money. Those who collected the money say they gave it to EDEL and EDEL neither confirms or denies this.

b) Contributions to build standpipes: The community worked on the standpipes and only contracted a technician to supervise the work.

c) Extensions of the School: The parents committee elected a person to collect money to extend the school but the money has been collected and the school has not been extended

d) Organisation of Civil Defence: Participants were generally happy with the Civil Defence initiative

e) Organisation of Clean-Up Campaigns: The clean-up campaigns are organised by individuals with initiative and are designed to clean up the smaller rubbish heaps in the bairro.

3.0 SOLID WASTE - RUBBISH

3.1 Where is it disposed? Who does it? How?

People burn and bury if their yard is big enough. Most people throw in unofficial lixeiras throughout the bairro. There are no official rubbish tips; the four unofficial ones are big ones strung along the bairro, two beside the market and two others including the grounds of ETP. There are other small rubbish tips throughout the bairro. Some people walk a considerable distance (1 km) to one of these bigger rubbish heaps. This is a problem, particularly since some people throw their rubbish out at night time and the bairro has had no electricity for two years. Many of the rubbish heaps impede access to the bairro particularly in the rainy season.

Women and children throw out the rubbish, using old basins, buckets and bags. Women and children do it because these are household tasks and they do the sweeping also. The mens group said that "men do not like to be seen carrying rubbish". The children should be older children who will not be tempted to play in the rubbish.

3.2 Association between rubbish and disease

b) Private companies (@ 150 million NKW, May 1995)

c) Manually, either by the owner or by hired labour

Rubbish is clearly considered a health hazard. The mechanisms of disease transmission cited where hands - eating with their hands.

The specific disease hazards mentioned were cholera and malaria.

4.0 SANITATION & DRAINAGE

4.1 Stagnant Water / Access / Disease Association

Stagnant water is considered a problem during the rainy season. Stagnant water and rubbish accumulate and cause health risks and impede access to the bairro. The groups specifically mentioned malaria as a consequence of stagnant water pools.

The men said that "since it had rained a lot this year, malaria had killed many people". The mixed group said that the Kwanza market road was impassable because of drainage problems.

5.0 LATRINES:

5.1 Use of Latrines

All participants said that most residents have household latrines. Most of the latrines are Pour Flush models. Small babies use potties and younger children often defecate in the streets. Even adults sometimes use the rubbish tips at night time to save water.

Faeces in the open air is associated with cholera. The mens group said "they would prefer allow somebody use their latrine rather than have faeces outside their door".

5.2 Preference for Type of Latrine / Emptying Latrines

All participants preferred the Pour Flush model; the reasons given were it had a longer life and they had large numbers of people in their families. The dry pit latrine was considered a temporary measure (made with barrels) and only used while a family saved to build a definitive latrine. Dry pit latrines collapsed often with rain, children could fall in and people lost their documents in them. The mens group said that if tenants built a latrine in a rented house, if they left that house they were normally reimbursed the money they had invested in the latrine.

The pits (Pour Flush) are emptied by

a) ELISAL - but rarely because it is very difficult to hire the ELISAl truck contributions, either in house to house collections or people could be asked to give their contributions to indicated persons. Older, respected members of the community should hold the money; the bank was not an option. The men

and the contents are buried.
Dry pit latrines are closed and a new hole opened.

The young people discussed Public Latrines. Some that they would contribute to building public latrines as long as the following issues were addressed:
- somebody or some association to manage the latrines
- that people would pay to use the latrines
- that the money would be used to clean the latrine and pay the guardian of the latrine.

6.0 SANITATION - IMPROVEMENTS

6.1 Proposed Improvements and Resources Required

The major priorities in the bairro were water and electricity. In the context of sanitation the major issue was rubbish. The solutions suggested were:
a) containers
b) official rubbish deposits
c) large holes which would be filled

a) and b) required the intervention of ELISAL and the participants felt that the rubbish should be collected every three days. The people who supported the third option (mixed group) did so on the basis that "ELISAL cannot even clean the cement city so there is no point expecting them to clean out here". The mens group were opposed to using rubbish to fill in holes in the streets. They said that without drainage it only becomes a greater mess in the rainy periods.

The community has spades, shovels and wheel-barrows and can participate locally in the clean-ups. Machinery would need to be provided by an external source (Government/NGO/Companies). The community would be prepared to make contributions to a functioning service.

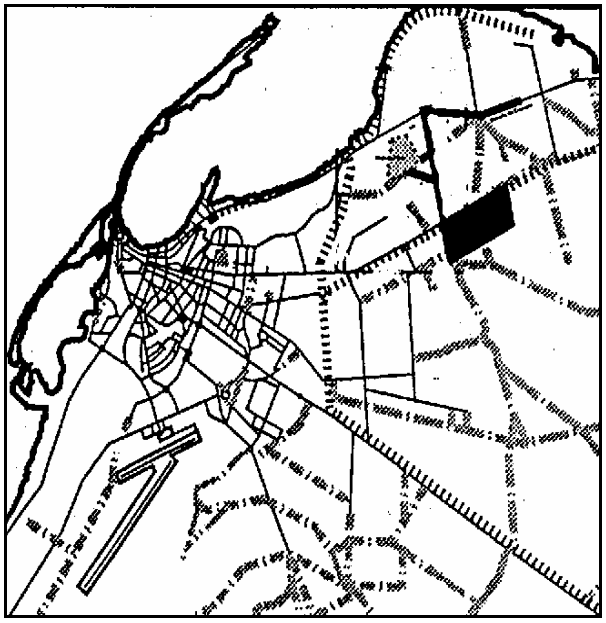
6.2 Organisation and Inspection

First of all the existing rubbish must be removed. Then a Community Education and Mobilisation campaign would inform people where to throw their rubbish in the future. Fines should be applied stringently to people who do not comply.

The young people felt that the local administration should take the lead but doubted that it would. The mens group were strongly opposed to the involvement of the local administrator. All groups eventually suggested community meetings where the Commissao de Moradores (Residents Commission) could take a lead.
Money could be collected on the basis of established said that "you can never withdraw the money from the bank that you actually deposited and when you want to withdraw money, the bank never has money." The mixed group emphasised that the person controlling the money would have to present regular accounts to the community.

The mens and mixed group emphasised that the mobilisation and education would need to be on-going. An educated community would all be voluntary "inspectors". The mixed group gave the negative example of the inspectors in the Kwanza Market who collected 100,000NKW daily and never organised clean-ups. The participants felt that the community would need to assume control of any activity.

BAIRRO MABOR



1.1 General Indicators

Location:	Middle Belt
Description:	New Musseque
Density:	Medium
Access:	Poor
Water Source:	Vendors Water Trucks
Diarrhoea:	n/a
(deaths / 1000 pop)	
Price USD/20 lit	$ 0.16

1.2 Discussion Groups

Water:	22 participants / 3 groups women / men / youth
Sanitation:	24 participants / 3 groups women / men (2 groups)
Average Residence in Bairro:	5.3 years

2 WATER

2.1 Water Source / Distance / Regularity

Water source is truck water only; many people in the bairro have underground tanks and those who do sell water. Distance was not considered important; people bought from the nearest "neighbour" selling water. Participant said water supply was regular but the price went up when there were breakdowns in the main network supply.

2.2 Cost / Water Vendors / Quality

The participants did not consider the prices unreasonable in view of the costs of transport and vehicle maintenance but all groups alluded to the fact that some people did not have sufficient resources to buy water. One man said he knew a family who sometimes went days without washing because of lack of money. Water vending was not considered a lucrative activity. All groups said people sold water to recover the costs of buying the next tank full.

Truck water from Kifangondo was considered dirty; water from Kikuxi was clean and cost more to buy from the truck driver. This cost was not passed on to the consumer. (Those who bought water from Kikuxi were generally better off people). All groups said that really clean water comes out of taps. The water from Kifangondo was treated with Pedra Uma. Few people referred to treating water with chlorine or lixivia.

2.3 Proposed Improvements for Water

Two solutions were proposed by the groups. Both were based on the fact that a main water line passes close to the bairro. Two groups (women and young people) suggested standpipes. The young people said that "every other bairro in the city, with the exception of Mabor, Palanca and Petroangol is considered for improvements". This statement would seem to reflect a perception of marginalisation on an ethnic basis, as the named bairros are predominantly people from the north of Angola who have returned from Zaire. Both groups said the community would be prepared to contribute financially. The young people also said the community could contribute with labour during construction of the standpipes but that the government must make the major contribution. "They (the government) charge people taxes and manage the state coffers and we see nothing".

The mens' group proposed house connections. They all said that once the main lines were brought to the bairro that the consumers would support the cost of house connections. One of the research team raised the issue of residents without the means to pay for house connections; the group said that these people could pay over a longer period in monthly instalments. This proposal reflects previous experience of such a system in Kinshasa, Zaire.

2.4 Leadership and Management

The women's group felt that somebody (a man) should be selected to look after the standpipe and collect the money. The standpipe should have railings and be locked except during opening hours. The women also suggested that the "Night Watch Group" formed in the bairro by the community could help guard the standpipes. The young people felt that the primary responsibility for inspection and control should lie with the government but the community could assist by denouncing abuses.

Both men and women said that leaders are not

All groups said that management of money was not a problem; the community itself could organise the collection of money and the men suggested that one of the churches with an accounting system could manage the money for them.

2.5 Previous experience of Community Organisation

The community had two successful previous experiences with community organisation. The community bought a transformer to facilitate electricity supply from SONEFE. The person responsible for the transformer collects monthly fees to pay SONEFE and the Army Regiment on whose land the transformer is placed.

The second initiative was the organisation of night watch groups in collaboration with the police. Families contribute a small amount to feed the night watch teams. The community is particularly pleased with this initiative which has considerably reduced assaults and robberies in the bairro.

3 SOLID WASTE - RUBBISH

3.1 Where is it disposed? By Whom? How?

Most participants burned and buried in their yards. Some people did it in empty plots. Rubbish was carried, when carried in bags, old buckets or hand carts. The mens group said they dealt with the rubbish, that the women had other household tasks. Young men said they disposed of rubbish or sent their younger brothers to do it. There were no official rubbish dumps in their bairro

3.2 Association between Rubbish and Disease

The health hazards mentioned were people defecating in the rubbish and transmission of diarrhoeal diseases by flies. The groups also said that the rubbish can block access to the bairro by mixing with pools of water in the rainy season.

4 Sanitation - Drainage

4.1 Stagnant Water / Access / Disease Associations

The bairro has no drainage system. This is a particular problem for houses built in low lying areas. The walls of some houses have collapsed. Stagnant pools also prevent access to the bairro.

The associated health problems were malaria and diarrhoeal diseases where children play in the dirty water.

elected, that a "real leader stands out" (destacar-se).

i5 LATRINES

5.1 Use of Latrines and Preferences

The participants felt that most families had latrines. They gave tradition and cultural habits as the reason. The overall preference was for dry pit latrines because:

- they were accustomed to this model
- it did not require water
- the pit was easily closed up
- longer life

Those participants with Pour Flush latrines said it was because they were tenants and could not alter the latrine they found on the rented property.

5.2 Emptying Latrines

With dry pits they close the pit and dig another. For Pour Flush models they burn petroleum in the pit, then empty it manually and bury the contents.

6 SANITATION - IMPROVEMENTS

6.1 Proposed Improvements and Resources Required

Water was the major priority. In the context of sanitation, this community suggested rubbish removal as the main priority. They suggested containers in specific areas with access in the bairro. The major resources should be provided by the government. The women said "the government have money and we do not. They should be made fulfil their obligations".

6.2 Organisation and Inspection

All groups felt this would require a major education campaign. The mens group said "if people do not know what rubbish causes, then they will not use the containers". The men suggested that an NGO could help the local authorities organise the education campaign. They suggested that monthly inspection rosters could be set up in the bairro with community members. (Women felt that inspectors should be from local government). The community could pay for a service with within reason. People appointed during community meetings could collect the money but the church should hold the money.

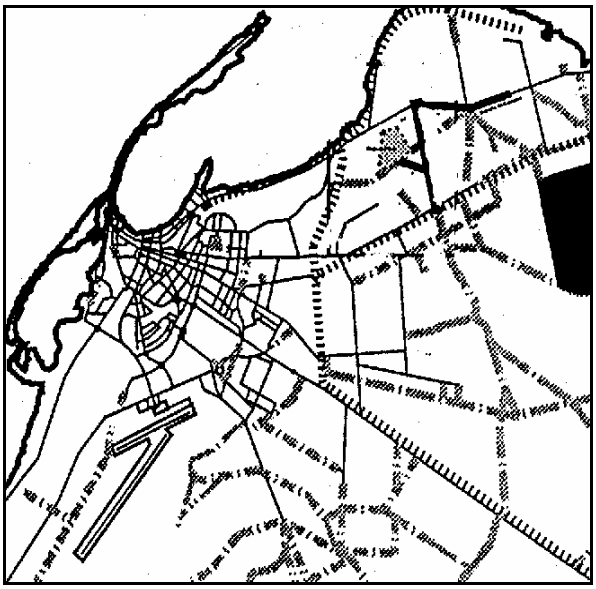
N'GANGULA

1.1 General Indicators

Location:	Periphery
Description:	New Musseque
Density:	Medium - Low
Access:	Poor
Water Source:	Vendors Water trucks
Diarrhoea: (deaths / 1000 pop)	1.19
Price USD/20 lit	$ 0.17

1.2 Discussion Groups

Water:	26 participants / 3 groups women / youth / men
Sanitation:	28 participants / 3 groups youth / men / mixed
Average Residence in Bairro:	2.9 years



2 WATER

2.1 Water Source / Distance / Regularity

The primary source is the water tanks in the bairro: when they have less money they walk to the factories in the area or to the Market Garden area in Kicolo. (Small farmers have piped connections for irrigation from the mainline). If there is an absolute shortage and the mainline has no water they walk to Mabor or Panga Panga - a distance of 1 - 2 Km. Distance is, therefore, only an issue if there is an overall shortage.

Two groups said that sometimes water vendors did not have enough money to buy a tank of water. The supply to the Market Gardens, because it is on the main water line from the River Kwanza to Luanda, is rarely interrupted.

2.2 Cost/Water Vendors / Quality

The price varies in relation to supply and demand. In the rainy season, when access to the bairro is more difficult, the price goes up. Attitudes to vendors varied somewhat between the groups. The women's group felt exploited but did not feel anything could be done about the situation because they needed water. The mens and young peoples groups said that vendors needed to recover the money they invested and make some profit. In the mens group, the facilitator had asked what might be the reaction of vendors if standpipes with water were built in the bairro. The men had answered "that the water tanks had been built because people
needed water, not because people needed to sell water. If there was a sufficient quantity of water in standpipes people would no longer need tanks".

Tank water was felt to be dirty and the water in them impure and many tanks were uncovered.

carrying water. Kikuxi water was considered better quality because it could only be bought after the treatment station whereas the participants felt that water could be taken from any part of the River Kwanza with no treatment control. Most participants felt clean water was worth paying for within reason. The women's group referred to NGO sponsored community agents who had "machines" which checked the chlorine in the water and distributed chlorine to the residents.

2.3 Proposed Improvement

The improvement suggested by the most participants was standpipes on the mainline. The standpipe "Type Roques Santeiro" was discussed but the participants felt they were too many unreliable components in the solution, citing broken down or stolen lorry, sick driver or the driver just decides to go somewhere else. (Their experience of mainline supply to the Market Garden area is positive).

2.4 Leadership and Management of the Improvement

The mens and the young peoples group suggested that the leaders be selected in a meeting with the residents and the coordinators of the bairro; one group felt that the leaders should be indicated by an NGO (women).

The women stated clearly that they were not prepared to contribute money to such a project because it was the government's obligation to bring water to the people. The mens and young people's group said the community could contribute with labour such as digging; they also said they could pay a monthly contribution to the upkeep. The women said that they were not prepared to pay

anything until they saw water. All groups said that the major resources required should come from the Government or an NGO.

The money could be collected by an independent commission and held by the administration. The accounting control could be done by members of the commission. One group (women) felt that any system of control should be supervised by an NGO. All groups referred to "independent" commissions when they talked about collecting money.

The women's group suggested that community mobilisation be organised by the churches and the coordinators of the bairro; for each area, 20 people should be indicated, 10 women and 10 men. These people could then explain the project to the residents. The women also felt that the standpipes should have fixed opening hours.

One group (young people) suggested community inspectors should be selected who would inform the local administration of infractions and they would decide on sanctions: the men felt that illegal connections should be cut and the infractor not be allowed carry water from the public standpipe.

2.6 Previous Experience of Community Organisation

The groups described previous initiatives to organise electricity for the bairro. The initiatives started with individuals; following on community meetings a number of commissions were organised for specific tasks. The results were positive.

One group of residents organised themselves to get electricity. At a community meeting, a financial committee, an accounting committee and a technical committee were appointed. Those families who did not contribute were not connected.

When public latrines were built in the market place, the women sellers contributed to feed the workmen who built the latrines.

3 SOLID WASTE - RUBBISH

3.1 Where is it thrown away? By Whom? How?

The groups indicated a number of current practices in relation to rubbish:

- burn or bury in the family yard or in an abandoned place
- Throw in gulleys but it means walking some distance (1-2Km)
- throw anywhere on the street some distance from one's house (the mixed group felt that was what most people did)

The young persons group felt that it was preferable to throw rubbish in the nearby gully because it was far enough away from people's houses. Men bury and burn; women and children carry rubbish to throw out. The mens group explained that their wives were little involved in domestic tasks because they "left early in the morning to sell at the market."

There are three main unofficial rubbish tips, two near the markets places and one at the edge of the bairro where there was a taxi stop.

3.2 Association between rubbish and Disease

All groups spontaneously explained disease transmission via flies and food. Diarrhoea and Cholera were specified as the major risks.

4 WASTE WATER - DRAINAGE

4.1 Stagnant Water / Access / Disease Associations

Collected pools of stagnant water were considered problems only in the rainy season. The major problems caused by no drainage were

a) no access to much of the bairro
b) electricity cables were covered by water and people inadvertently walking on them got electrocuted. There were three deaths this year.
c) children play in the dirty pools and this was considered a health risk
d) when rubbish and water were mixed, a fermenting, smelly, green pond developed

The mixed group mentioned that very poor people (elderly and displaced) used stagnant pool water to wash clothes.

5 SANITATION - LATRINES

5.1 Use of Latrines

All groups felt that many families did not have latrines: it was also felt that for most of those people who did not have latrines the problem was lack of resources. But the mens groups said that many latrine owners still used empty plots and grassy spots for defecating to save water and prolong the life of the latrine. All groups said children frequently did not use latrines (particularly dry pit latrines where there was a risk of children falling in). Small children in educated families used potties which were emptied into latrines.

5.2 Preferences for Latrine Types / Modes of Emptying

Most people preferred Pour Flush latrines; two participants with dry pits claimed to be saving to build a Pour Flush model.

The advantages of Pour Flush models were seen as:
• no smell and no flies
• you can bathe in it
• it is safe i.e it does not cave in the rainy season
• longer life
• easier to empty

The dry pit model was recognised by all groups to be cheaper but was considered a temporary model with the following disadvantages:
• smelly and attracting flies
• you can not bathe in it
• it sometimes collapses in the rainy season
• fills rapidly

When a dry pit was full it was closed and another opened. Pour Flush latrines were
a) emptied by trucks (ELISAL) if people were wealthy
b) emptied manually and the contents buried

6 SANITATION - SUGGESTIONS

6.1 Proposed Improvements and Resources Required

The major priority was stated as water. Selecting priorities for action in the area of sanitation was further compounded by a lack of conviction among participants that there existed any motivation on the part of Government/State to improve living conditions in the bairro. The men's group said "the government is not worried about rubbish in our bairros" and the mixed group wondered "if the state cannot fix the roads, it does not seem likely that they will think of latrines for our houses".
On further probing possible solutions were offered for roads, rubbish and latrines.

To provide access to the bairro the participants said that the Government/State should provide materials and heavy machinery and the community could provide labour when the roads give access to their houses. Roads were stated as a basic priority since rubbish could not be removed without having access and latrines could not be built without water (referring to access for water lorries).

The latrines were discussed in greater detail by the men and mixed groups. Both groups felt that though the health implications of defecating in the open air applied for the whole community, they still felt very strongly that the solution of the problem was the responsibility of each family. In the late 1980's one NGO (ADPP) had built latrines for families and they paid afterwards in monthly payments; currently, another NGO (DW) provided some materials and the construction was the responsibility of the family. In the case of families
with little resources, the NGO could provide all of the materials and the family could pay in instalments. The mixed group said that destitute families should receive all material without payment.

The young peoples group proposed public latrines and suggested that a monitor should be selected by the community for each latrine and people charged for using the latrine. The money collected would be used to pay the monitor, buy cleaning materials and pay for emptying the latrine

The mens and mixed group cited the example of water testing and water chlorination supported by DW as an activity which could be expanded with community participation.

6.2 Organisation and Inspection

The community could organise in areas in conjunction with the Bairro Administrator. Mobilisation and Education should be facilitated by the churches. The community could provide labour and financial contributions. Inspection, "fiscalisaçao" was discussed by the mens and young people's group in relation to latrines: both groups felt that this was primarily a community responsibility. In the case of public latrines they

proposed that a resident be appointed to manage the latrines and use of the latrines would only be with payment.

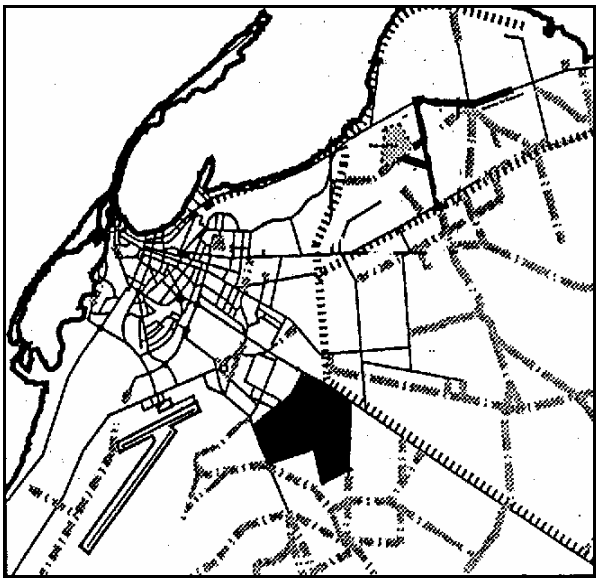
PALANCA

1.1 General Indicators

Location:	Periphery
Description:	
Density:	High
Access:	Poor
Water Source:	Vendors Trucked water only
Diarrhoea: (deaths / 1000 pop)	1.86
Price USD/20 lit	$ 0.29

1.2 Discussion Groups

Water:	25 participants / 3 groups women / men / youth
Sanitation:	25 participants / 3 groups women / men / youth
Average Residence in Bairro:	9 years



2 WATER

2.1 Water Source / Distance / Regularity

The main water source is water trucks but access is particularly difficult in the rainy season. Most houses have structural arrangements made for rain water collection. People who live on the border with bairro Popular carry water from pipes off a main line. Distance is not a major concern.

Most participants felt that the water tanks provide a dependable service and there were many of them. In the event of one owner not having enough money to buy water, there were many other tanks in the neighbourhood. There could be queues on occasions in the rainy season and at weekends.

2.2 Cost / Water Vendors / Quality

People felt that cost was related to the availability of water. When there is a shortage of water, prices go up. The factors that lower prices are

- if most of the tanks in the bairro are full
- if the tank has no lid (issue of quality and the owner needs to sell the water quickly)
- if water is turbid or if it has been standing for a long time.
- if the tank was filled at a low price.

One mens group referred to the fact that if the water quantity were to increase that people would build more buildings and there would be other income generating possibilities like bakeries.

There were mixed attitudes towards vendors. Most felt that "water was a business". A minority felt that the water vendors were just part of a bigger system and that the real problem was insufficient quantities of water.

implications of drinking dirty water but they felt clean or treated water was a luxury. If one had money "one bought water from Kikuxi not Kifangondo; if you had money you bought bottled mineral water for your baby or you boiled your babies water; we know how to use lixivia but one litre of lixivia costs 7 millions"(women). Some people referred to using Pedra Uma in their tanks.

Tap water and standpipe water is generally considered more clean but the women's groups said one could only be sure if one treated water oneself.

There were also reservations in two groups about possible other uses for the water lorries, like removing drain water and waste water.

2.3 Proposed Improvements for Water

The improvement suggested by all participants was to draw the Kikuxi line down the edge of their bairro and build standpipes. The young people said that standpipes could be built at the end of the roads for those with less means and those who wished house to house connections could contribute to bring the water line down their streets. (Palanca is planned out on a grid). All groups were opposed to any solution which required lorry filled tanks. They felt that the problems of access, traffic congestion and maintenance of the lorries would make such an initiative a very temporary and costly one.

2.4 Leadership and Management

Most participants felt that the community should be organised by streets, with elected street leaders. The women's group felt that there should not be "an absolute leader" (um chefe maximo) because an absolute leader is more easily corrupted. Two groups said that initiatives should primarily come from the community because they know the area

best but that an NGO partner would be desirable.

The mens group suggested that each community should have a monitor and a treasurer, but some participants commented that "once the roads are open there will be few unemployed people with nothing to do". The same group suggested that the standpipe should be built in one persons yard to avoid vandalisation. This person could look after it. The facilitator did not probe whether this person should be payed or how. The women's group suggested payment for the monitor; some people suggested a nominal rate each time the user collected water. The disadvantage of this was that the monitor would have to be there all the time. The group eventually agreed on a monthly contribution to pay the monitor.

It was proposed by two groups (men and young people) that money be placed in a bank account which required a number of signatures for withdrawal.

The participants felt that the "Government" should bring the water line to their bairro. (All groups stated that Local Government was non-existent). Construction costs within the bairro could be shared with the community. Again it was felt that the communities would be reluctant to contribute until they saw something happening.

All groups suggested initially that local government should mobilise the population. When they were questioned why they suggested this when they had previously said that local government did not exist, they answered that it was due to habit and the notion that the state must be involved in everything. They then suggested that community mobilisation and education could be supported by an NGO initiative. They also underlined that 80-90% of the bairro population was organised in religious sects and the churches could provide an organisational focal point.

The responsibility of preventing illegal connections was felt to be primarily a community problem. Participants felt that if they had water, monitoring would not be difficult. One group suggested that community members should be vigilant and that infractors should have automatic fines and be jailed. Other people felt that "inspectors" should be nominated by the community.

2.6 Previous Experience of Community Organisation

The groups felt that when problems arose the community held meetings and indicated "people who understood the subject" as leaders for a particular action. In this way, they have solved problems of wakes, sickness and in the larger spectrum, installed handed over to the communal administration to solve the electricity problem. The problem was not solved and the people who contributed confiscated much of the furniture in the Communal Administrator's house.

3 RUBBISH DISPOSAL

3.1 Where is it disposed ? By Whom? How?

There are no specific places to throw rubbish; people throw in the big rubbish heaps which have grown up in the bairro, in abandoned plots. Children throw it out in buckets and bags the young group said they normally threw out the rubbish.

3.2 Association between rubbish and disease

Groups related rubbish to cholera, malaria and typhoid fever. The major problems associated with rubbish were:

- children playing in the rubbish and putting their hands in their mouth without washing their hands
- breeding ground for flies and mosquitos
- blocks access to the bairro, particularly in rainy seasons
- when it mixes with water it creates a green smelly mass.

4 DRAINAGE & SEWAGE

4.1 Stagnant Water / Access / Disease Association

The problem is greatest during the rainy season but there is one large permanent stagnant pool in the middle of the bairro, parallel to the Catete Road. The water is used for construction, washing clothes and children play in it. Some people even fish for catfish there. In the rainy season many road are impassable with mud and green slimy pools. This causes electrical short circuits and deaths from shock. People going to work, either have to cover their shoes with plastic bags, go barefoot to the main road or hire somebody to carry them on their back through the worst parts. People pay children to do messages to avoid getting dirty.

The participants associated stagnant water with diarrhoea and malaria but the physical conditions were so difficult that health issues were secondary.

5 LATRINES

5.1 Use of Latrines

Participants said that the community used dry pit latrines, pour flush latrines, defecated in the rubbish heaps or did it in tins or basins and threw it in the

electricity in the bairro. In one case, money was collected in a specific area and
group said that children did not use the latrines because of water shortage. All groups said that availability of water was a limiting factor. The young people said that "some people did not have latrines because they were too lazy to dig the hard ground".

5.2 Preferences for Types of Latrines / Emptying Latrines

Participants expressed a preference for pour flush models which they considered safe, clean, not smelly with ventilation and safe for children. Some participants considered dry pit latrines smelly and dangerous for children; one could also see the pit and people often lost their documents in the pit. In the young people group, some participants said they preferred the dry pit latrine because it did not require water and water was very expensive.

When latrine pits were full the participants said that the residents:

a) called the commisariado lorry (to do a moonlighting at lunch-time). Officially, it was impossible to request and receive the service.
b) burn a tyre on the pit which makes the contents sink
c) dig the contents manually and bury in another hole. People with means pay other people to do this. Otherwise, the family does it. The young people said that "many nephews have left home because of having to empty the latrine".

6 SANITATION IMPROVEMENTS

6.1 Proposed Improvements and Resources Required

The community's main priority was water. In the context of sanitation, they listed as priorities for action

- surfacing main entry roads
- providing rubbish containers with regular removal by ELISAL
- public latrines

The men said that "in every country in the world rubbish was put in containers in cities".

6.2 Organisation and Inspection

All groups said any improvement would have to be in association with an NGO. The government would be informed. The men were prepared to work with the government, women and young people less so. The women said "that they had little confidence in the government" and the young people said that they "felt abandoned and hated" by society. All groups said the community could organise itself

rubbish afterwards. The mens' group said everybody in the family used the latrine; the women's
without great difficulties, electing a residents commission and specific people or groups for specific tasks.

All groups felt that the community would contribute to anything that was beneficial. The women's group felt that "a good association does the work first and asks for money afterwards"; the men said that "they gave money willingly because they wanted their problems solved".

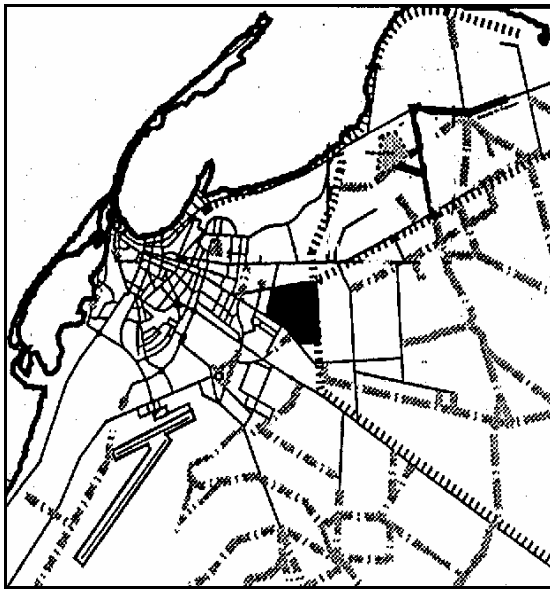
The community had also private entrepreneurs who were willing to contribute (Pensao Mavala) and residents had shovels, spades and barrows. The major resources required would have to come from an NGO.

The community have collected money for previous activities. The women said that "age did not matter in relation to management of money, what was important was the persons sense of responsibility".

Mobilisation would be done through the churches. The young people had a discussion about which came first, educating the community and then placing the containers or placing the containers and then educating the population. An education campaign could be lead by teachers and nurses in the community.

The women's group suggested that the residents should organise the appropriate use of the containers, citing the market inspectors as examples of ineffective control, where money is collected and no service is provided. The mens group said that it be should be some association of forces between community and government but lead by an NGO. The young people said that the residents committee should take the lead in controlling any abuse of the system.

BAIRRO RANGEL



1.1 General Indicators

Location:	Inner City
Description:	Old Musseque
Density:	High
Access:	Poor
Water Source:	Vendors Primarily Piped
Diarrhoea: **(deaths / 1000 pop)**	0.55
Price USD/20 lit	$ 0.04

1.2 Discussion Groups

Water:	18 participants / 3 groups youth / women / men
Sanitation:	20 participants / 3 groups youth / women / men
Average Residence in Bairro:	19.4 years

2 WATER

2.1 Water Source / Distance / Regularity

People either buy water from a neighbour with a house connection or have their own house connection; the vendors either sell directly from their taps or when water is not running people buy from neighbours with storage tanks. Distance is not a problem and the supply is regular except when there is a breakdown in the main supply lines.

2.2 Cost / Water Vendors / Quality

Cost is related to source (piped or truck) and the overall availability of water. The price was felt to be affordable by most of the participants but they did recognise that some people have no resources at all; one man said that when times were difficult his wife would tell the family that they had "enough water to wash faces only".

Vendors were not perceived as exploiting people. It was felt that people with storage tanks guarantied a "dependable" supply in the current context; the higher price of water supplied by trucks was directly related to the higher cost of acquiring the same. One young man whose family sold water felt it was unjust to sell something as basic and essential as water.

All participants regarded piped water as cleaner than truck water. Most participants felt that EPAL always treated the water and they therefore did not treat it further in their homes. Dirty water did not smell of chlorine and had particles "materia" in it.

2.3 Proposed Improvements for Water

All participants suggested that the only acceptable improvement was to build more standpipes. This would involve rehabilitation of the network and the pumping stations but would benefit all of the population in the end.

2.4 Leadership and Management

The men said that leaders were the Municipal Administrator and Presidents of Bairro Commissions. The women said that leaders could be anybody except young people. Young people felt it depended on who showed initiative.

It was difficult to probe successfully on the management issues. The major obstacle was a certain scepticism in relation to the probability of any improvement ever happening; furthermore there was no clear shared notion of how the government or state functioned. The terms "government" and "state" were interchangeable and it seemed apparent that the

a) "Governo" was holder and controller of resources

b) Local government and EPAL had no resources and were hence dependent on the "Governo".

Most participants held the view that the government, because it controlled the state's money has an obligation to provide people with water. All groups felt they had little resources in comparison to the government, hence the government should build the standpipes and the community would look then maintain the standpipes. The mens group wanted a concrete project proposal for discussion; the technicians would study the existing situation and should then inform the community of what the options were and the cost of each option. The young people felt that the government should organise, implement and provide inspection and control for the standpipes (fiscalisar). The community could contribute labour during construction and keep the standpipe clean afterwards. The women suggested that a resident

be elected to look after the standpipe but that people would pay only when the standpipe was broken and needed fixing. Men (sanitation discussion) said that the community had the "desire to work and could contribute payment for a service that was seen to be useful". The women also said that they were only prepared to pay for something when "they saw it working".

Illegal connections were recognised as a major problem. All participants agreed that illegal connections reduced the pressure and flow of water. Control of current illegal connections was felt to be the exclusive responsibility of EPAL and the local government because "they were the ones that allowed it happen". Some participants in a young peoples group felt that if an individual had the resources to tap into the mainline supply, that person was perfectly entitled to do so. Some young people felt that if the standpipes had a regular water supply, the communities would have some interest in reporting illegal connections.

2.6 Previous Experience of Community Organisation.

The young people referred to the Clubo Juvenil de Rangel. This was the initiative of an individual with "poder economico". People made contributions and activities like clean-up campaigns and tree-planting were organised. The association faded away because people felt that their contributions were being used by the president for his own personal use.

The women's group said that the community used to organise itself prior to 1990; but gradually government support diminished and now community resources were inadequate on their own. The women referred to previous activities to
a) surface a road
b) build standpipes
c) buy containers
d) organise electricity

3 SOLID WASTE - RUBBISH

3.1 Where it is disposed? Who does it? How?

Most people throw rubbish into containers. There are some people who wait for the cover of darkness and throw the rubbish anywhere. It is considered a domestic task and is done by mothers and grown children. Women said it had to be done by grown children to reduce the risk of children getting knocked down by cars. Some people pay others to throw out their rubbish. Two groups referred to a man with a wheelbarrow who goes from door to door collecting rubbish. (In May 1995, he charged 100,000 NKw or food.) Rubbish is thrown out in buckets, bags and by handcart.

Unofficial rubbish tips are found near the market Tungango. Otherwise, there are containers along the roads at the edge of the bairro. Young people said that rubbish tips must be far away from the houses. Participants estimated that people walked 200m to 500m to throw out their rubbish.

3.2 Associations between rubbish and disease

Rubbish was associated with malaria and diarrhoeal diseases.

4 SEWAGE AND DRAINAGE

4.1 Stagnant Water / Access / Disease Association

There are no drains in the bairro. The ground absorbs water and participants referred to two roads which collected water in the rainy season. Participants related stagnant water to breeding grounds for mosquitos and the young people said that the residents contributed by throwing out used water between the houses.

5 LATRINES

5.1 Use of Latrines

Participants all felt that most of the residents had "bathrooms" in their houses and that long term residents did not defecate in the open air. But the young people said that people who came from rural areas recently did defecate in empty lots or on rubbish heaps.

5.2 Preference for Types of Latrine / Mode of Emptying

All participants said they preferred bathrooms in the house with septic tanks in the yard. When the septic tank is full they call Elisal or pay someone to empty it manually. This model was accepted to be very expensive but the men said it was the most "civilised type". The other problem raised by the women was that the cost of creoline, disinfectant to clean the bathroom, was now prohibitive.

6 SANITATION - IMPROVEMENTS

The community's main priority was water. The facilitators had not been able to steer the discussion groups into "Improvements in Sanitation".

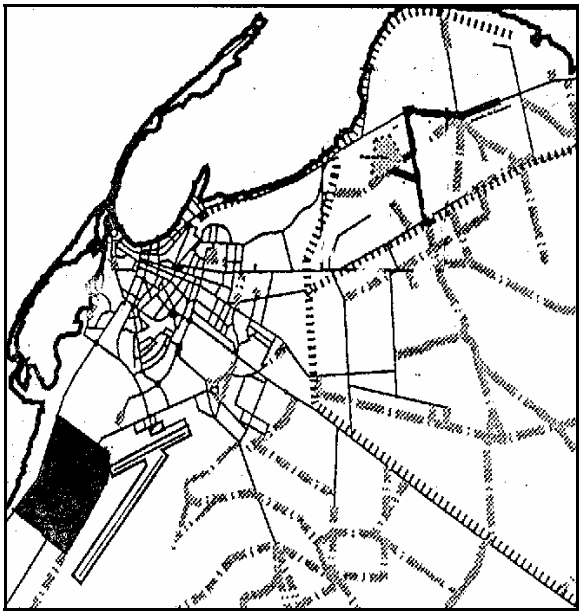
ROCHA PINTO

1.1 General Indicators

Location:	Periphery
Description:	New Musseque
Density:	High
Access:	Poor
Water Source:	Vendors only Water trucks only
Diarrhoea: (deaths / 1000 pop)	0.40
Price USD/20 lit	$ 0.34

1.2 Discussion Groups

Water:	21 participants / 3 groups women / men /youth
Sanitation:	25 participants / 3 groups
Average Residence in Bairro:	7.4 years



2 WATER

2.1 Water Source / Distance / Regularity

The primary source is the water tanks in the bairro. Water is trucked primarily from Kifangondo and less often from Kikuxi.

When there is no water in the bairro, people walk to Samba, one to two kilometres, where they can collect water from mainline connections. There are also two standpipes on the Samba side of the bairro.

Distance is only a factor if they walk to Samba. When there are severe water shortages in the bairro there are queues at individual vendors and on occasions major disturbances requiring police intervention have arisen out of such situations. One group of young people said "that it was better to pay 1,000,000,00 for a bath of water (20L) than to waste time walking to Samba". Tank owners do not always ensure a regular supply and the mainline connections (EPAL) in Samba often have no water.

2.2 Cost / Water Vendors / Quality

The price of water in Roche Pinto is much higher than in other areas because of

a) the distance from Kifangondo. The water trucks prefer to sell in bairros nearer their source.

b) Secondly, the road access to the interior of Roche Pinto is very difficult; persuading water trucks to enter the bairro is difficult because " they can make the same money with less problems in other areas".

The price at the Paviterra side of Roche Pinto is lower because access is easier and there are more water tanks. Near Samba, the price is also lower except when there is an acute water shortage, because of the proximity to mainline water sources. In the central zone, on the heights, the water is

expensive because of the difficult road access. Price was quoted as "answering to those who held water". There is no price increase for better quality water (i.e water from Kikuxi). The women's group said "it is preferable to have less food than no water".

Though the study of water vendors (see vol 1) indicated comparatively greater mark-ups for water vendors in Roche Pinto in relation to other bairros, the discussion groups did not indicate that the population felt specifically exploited by the water vendors. All groups felt the prices were exorbitant but felt that this was related to the fact that there was not enough water to meet consumption demands. One group (young people) specified that the owner of the tank must recover the initial investment costs and ensure that in spite of inflation that he has enough money to buy a new tank of water.

The health related concerns raised were:

- lorries were frequently used for other purposes apart from carrying water
- the sources of water are sometimes very doubtful and the water was often full of hairs and other "materia".
- some water tanks were uncovered
- all groups knew of the methods of water treatment but said it was to expensive to use regularly.

Mainline (EPAL) water was felt to be overall cleaner but the young people's group observed that the mainline pipes were old and allowed for infiltration and in the Samba area many of the illegal connections were badly made and on the surface such that children could be seen defecating on the water lines.

2.3 Proposed Improvement of Water Services

The improvement suggested was standpipes on a mainline supply with a pumping station to bring water to the high area of Roche Pinto. The advantages cited were that they could then have more water at lower cost, nearer their houses; this would enable them to have clean houses, clean children and vegetable gardens (women's group). The suggestion of a standpipe with a reservoir to be filled by a water truck was rejected. The reasons put forward were:

a) that access to the bairro was too difficult

b) if the lorry broke down who would fix it?

c) they also felt very strongly that any solution which was specific to their bairro would not be successful i.e they needed to be on a mainline supply which supplied other bairros. They felt that any breakdown or interruption which only affected their bairro would not be fixed by the authorities.

2.4 Leadership and Management

Leaders could be selected following meetings between the church leaders and the local administration. Participants said that the majority of the population in the bairro belonged to a church and the churches could serve as the main agents for community mobilisation. Local residents commissions could be formed and a monitor elected for each standpipe. The existing standpipes are looked after by a nearby resident and users make a monthly contribution of 1,000,000,00NKw. If there is a breakdown they make a further contribution if required.

The major resources would have to come from external agents e.g. Government or NGOs. The women said the government had a responsibility in relation to the community but in reality "they paid little attention to the people and nothing run by the state worked". The young people felt that the support of an NGO would be required for an intervention.

The community could provide labour, technical skills and food for workers. The community would accept to make financial contributions but for something specific that they could verify the implementation.

Money could be collected by the local residents commissions. It could be deposited with local business men or with church structures. Most people felt that it was important that whoever held money should have means of their own. The women said that in the event of community funds been stolen, the business person could have money or assets confiscated. Some people felt that money should be collected only in the event of a breakdown. This was to reduce the opportunities for stealing money.

Mobilisation and education of the community to prevent illegal connections could be done by the churches. In the event of anybody making such a connection, they should be obliged to disconnect it immediately and repair the damage. There should also be a fine on the spot.

2.6 Previous Experience of Community Organisation

All three groups (in different areas of the bairro) described previous experiences in community organisation for electricity. In the first case, a commission of residents collected money and a resident engineer was appointed to liaise with EDEL. The outcome was successful.

In the second case, two groups of five resident electricians are substituting cables. An individual collected the money. The work was to be finished within one week of the discussion group. The women's group referred to an unsuccessful initiative where money was collected without any palpable result. The same group said that the existing Residents Commission was ineffectual and that "the men chosen were weak". There was also a Latrine Commission in 1990, which subsequently dissolved because people did not have sufficient resources to buy materials.

3.0 SOLID WASTE - RUBBISH

3.1 Where is it disposed? Who does it? How?

Most of the residents throw their rubbish in gulleys. There are six large gulleys, running the length of the bairro. Few residents burn and bury their rubbish. The average space per house is too small to do this on a regular basis.

Women and children throw out the rubbish in old buckets and bags. Very occasionally people use handcarts to dispose of rubbish. It is considered a "domestic task". The young people felt that parents who sent their children were unaware of the health hazards of rubbish.

All groups recognised health risks associated with rubbish. All groups mentioned transmission of diarrhoeal diseases. One group gave the example of a family of five who all contracted cholera "because they live on top of a rubbish heap". Other considerations were children playing in the rubbish and people defecating in the rubbish. The young people felt that "half the bairro was an ugly rubbish heap" and that the same was "a cheap source of disease".

4.0 SANITATION - DRAINAGE

4.1 Stagnant Water / Access / Disease Associations

Stagnant water was considered a problem by all groups in the rainy season. It prevented road access and the cases of malaria and diarrhoea also rose during the rainy season.
But the mens group also mentioned that the rains opened more gulleys and washed away the rubbish.

5.0 LATRINES

5.1 Latrine Use

The participants felt that most people do not have latrines. The reasons given are limited space and not enough money. The young people said that "some people live in tin huts; how could they afford a latrine". Most people defecate in the gulleys; even those who have latrines frequently use the gulley to save on water. In those families who have latrines, the children do not always use the latrines. Small children in "educated families use potties which are subsequently thrown in the latrine or in the gulley".

Faeces in the open air is clearly associated with transmission of disease by flies. The word used to describe the habit of defecating in the open air was "feio" (women and young people). The young people said that "there were sometimes people jams (as opposed to traffic) in the gulleys when there was cases of collective diarrhoea". The women said that "when one person gets sick, everybody gets sick because of inadequate hygiene facilities". This would suggest some notion of person to person transmission.

5.2 Preference for Latrine Types /Emptying Latrines

Most participants said they preferred a Pour Flush model, though expensive, because it was considered:
a) safer
b) longer life
c) the user can not see the pit
d) it does not smell and does not attract flies

One of the women participants said that her family shared a latrine with four other families.

Many latrines are built on the edges of gulleys, with direct outlets to the gulleys. In other areas, latrines are emptied manually and the contents buried or thrown in the gulley. Sometimes petrol is burned on top of the latrine first.

6.0 SANITATION - IMPROVEMENTS

6.1 Proposed Improvements and Resources Required

The community's first priority was water. In the context of sanitation, they ranked the problems in the order rubbish, latrines and stagnant water. The solution suggested for the rubbish was to place containers and barrels throughout the bairro.

The major resources i.e containers and vehicles would have to come from an external sources such as the Government or an NGO. The community could contribute labour and they would be willing to pay a fee for a functioning service.

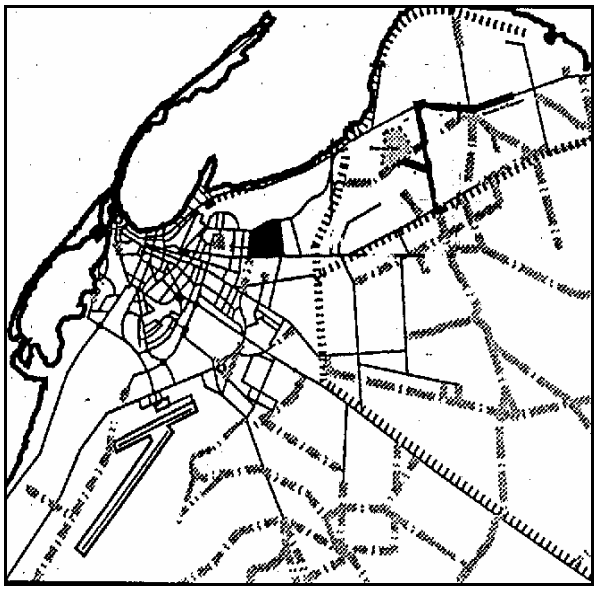
6.2 Organisation and Inspection

The bairro would be organised in area Committees in association with the Commission of Residents. Different ideas emerged on how leaders should be chosen; irrespective of sex, participants suggested electing leaders, selecting church leaders or others in a meeting or simply allowing people with the most initiative to go forward.

With the resources in place, the community would mobilise and educate. The young people said that it was important to do this on a one to one basis through visiting houses because many people, especially women were too busy to watch television or listen to the radio. The mobilisation and education could be organised by young people through the churches. The young people also considered the police a resource which should be tapped because they have cars and megaphones. It was also felt by the young people that if the police were involved from the beginning they could help with inspection and control during the phase of implementation.

To implement a system of control the participants suggested appointing residents who live near the containers as monitors or organising a group of inspectors who would answer to the residents commission. Most participants were in favour of sanctions with an on the spot fine for those who ignored the official dumping sites. The money collected in fines would revert to the community rubbish fund. The mens group felt that collective fines could force people into acting in a more responsible way; one man said "having paid a fine once I will not accept to pay again because of other people's rubbish and I will denounce the people who throw rubbish in the wrong place". The young people felt the opposite, saying "that people should be educated not punished".

BAIRRO SAMBIZANGA



1.1 General Indicators

Location:	Inner City
Description:	Old Musseque
Density:	Very High
Access:	Poor
Water Source:	Vendors Piped and Trucked
Diarrhoea:	1.32
(deaths / 1000 pop)	
Price USD/20 lit	$ 0.13

1.2 Discussion Groups

Water:	22 participants / 3 groups youth / mixed / men
Sanitation:	9 participants women / men
Average Residence in Bairro:	17 years

2 WATER

2.1 Water Source / Distance / Regularity

People buy water from vendors who in turn get their water from water trucks. Distance is not normally an issue; people walk to the nearest neighbour with a tank. People walk further to a standpipe if they have no money or to Marcal (2-3 Km) if their is a widespread water shortage. The service is considered regular except when there is a breakdown in the main water supplies. Water supply to the areas where there is still flow is two to three times weekly.

2.2 Cost /Water Vendors /Quality

The cost is related to the source of water (piped or truck) and overall availability. Bairro Madeira in Sambizanga had water 24 hours a day, ten years ago. Now people buy water all of the time. Most groups felt that vendors simply passed on the real costs to the consumers but that those costs were excessive in relation to their available resources. Men and women alike made statements like "sometimes we eat less to buy water" (woman) and "it is better to live near water and buy your food in Caxito". One mixed group (B.Madeira) described how people beginning queuing up at 04.00a.m. at the one standpipe where water flows.

Piped water was considered clean and not treated. Participants referred to boiling or putting lixivia in the truck water.

2.3 Improvements - Water

Most participants suggested standpipes with sufficient pressure in the mainline supply as the desirable improvement. The participants were aware that this was a long-term solution; one woman quoted the Provincial Governor as saying that it could be 20 years before there was any real improvement in water supply. The men suggested more sources of clean water for the water trucks, as an interim solution. "Just as they do when Kifangondo breakdown". This refers to the fact that when the main water plant is out of order, the Provincial Government tries to send many more water lorries to the bairros.

Two groups were concerned that the existing water lines were so old that they were not worth rehabilitating. The young people felt that an overall increase in water pressure would only encourage more "illegal connections". One group referred specifically to a pump which pumped from the main-lines.

The two mixed discussion groups discussed the Water Tanks with Standpipes as in Roque Santeiro. Both groups were in B. Madeira, across the road from the market place. The advantages suggested were:

- rapid Construction
- they did not require any community organisation or contribution. (gift of Luanda government).

The disadvantage was that it was a lot of money to invest in a temporary solution.

2.4 Leadership and Management

Participants felt that probing on how the community would manage a future project was like asking them "to name a child before it was born". The two mixed groups said the existing local bairro leaders, heads of quarteroes and sectors, could lead any community initiatives. The discussion facilitators were not convinced that this represented the opinion of the majority but rather the opinion of those who already occupied such "leadership positions" and were participants in the group

discussions. The young people felt there were was no existing community organisation. In principle, all the participants were prepared to contribute to something which was in the community interest. One man said that "having a standpipe was like having a car". Participants were divided on whether it would be better to pay monthly and have a user's card or buy tokens daily. The problems with the monthly system were:

- what happens if there is no water
- what do they do if some people do not pay and insist on carrying water.

The disadvantage of the token system was that it required somebody at the standpipe all of the time.

The suggestions for looking after the standpipe were:

- choosing an old person in the community
- the government appoint inspectors who could be paid from community contributions
- Respected people volunteering to look after the standpipe.

Illegal connections were felt to be the responsibility of EPAL. All participants seemed to feel that the community had limited resources and technical capacity and the primary responsibility for solving the water problem lay with the government. Both mixed groups suggested that the external resources required could be provided by a collaborative intervention with an NGO and the government

2.5 Previous Experience of Community Organisation

The women (sanitation discussions) said they knew of no previous example of the community organising itself. They also said that old people are reluctant to participate in community actions because such activities could be "called politics". The men and mixed groups described where money had been collected by the local authorities (some years ago) to build standpipes which have never been built because of alleged shortages of construction material.

3 SOLID WASTE - RUBBISH

3.1 Where is it disposed? Who does it? How?

Most people throw their rubbish in the old Luanda rubbish dump, "barrocas" or where containers used to be placed. Women and children throw it away in old buckets, boxes and bags.

3.2 Association between rubbish and disease

Participants said rubbish was a problem "because it caused disease" but they could not explain how or name what specific diseases.

4 SEWAGE & DRAINAGE

4.1 Stagnant Water / Access / Disease

Most of the bairro is on an incline, therefore water does not accumulate. In Sector 5, there are basins which collect water and mosquitos breed there.

5 LATRINES

5.1 Use of Latrines

Areas with long established residents have water flush toilets. In Sector 4, a number of families have dry pit latrines and in Sector 5, many families have no latrines and use the "barrocas". Most participants felt that not having a latrine was an indication of limited resources. The mens group said that the materials to construct a latrine were now too expensive. They also said they could not use a neighbours bathroom because it meant using the neighbours water which was also expensive.

5.2 Preference for Type of Latrine / Emptying Latrines

Of the two discussion groups, the women's group stated a preference for the Pour Flush model and the mens group said they preferred the dry pit latrine because it was cheaper, one did not need water and you could use the material again to build a new one.

People with septic tanks call ELISAL or empty it manually, throwing the contents frequently into the barrocas. The mens group mentioned it had cost 248 million Kwanzas (approx. 120 USD) to clean the public latrine in Roque Santeiro.

6 IMPROVEMENTS

The groups discussed no potential improvements in the area of sanitation.

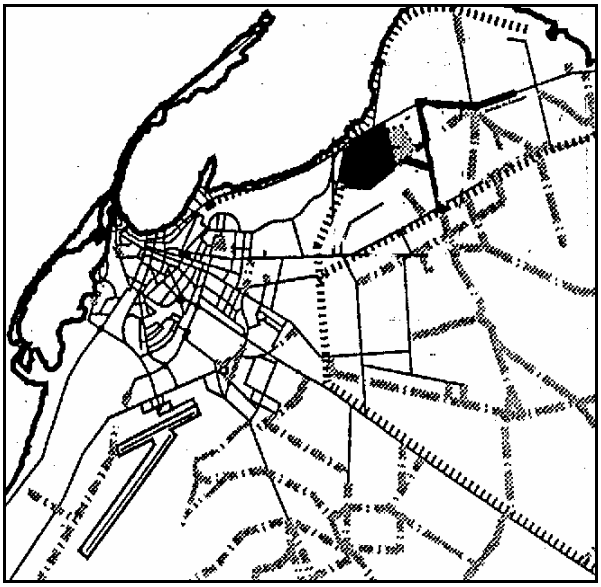
VAL SAROCA

1.1 General Indicators

Location:	Middle Belt
Description:	New Musseque
Density:	Medium
Access:	Poor
Water Source:	Vendors Primarily trucked
Diarrhoea: **(deaths / 1000 pop)**	1.32
Price USD/20 lit	$ 0.19

1.2 Discussion Groups

Water:	26 participants / 3 groups women / men / mixed
Sanitation:	28 participants / 3 groups women / men / mixed
Average Residence in Bairro:	8.5 years



2 WATER

2.1 Water Source / Distance / Regularity

Most people buy water from water vendors who are primarily supplied by water trucks; some people use "cacimba" water (salt water springs) to wash floors, put in the toilet and very poor people may use it to wash clothes. Distance was not an issue because they simply went to the nearest house which sold water. In Val Saroca, the participants referred to the "water seller" not to "my neighbour who sells water". People walked to a standpipe if they needed "clean water", if somebody were ill in the family.

The current supply was considered regular from the water sellers but the participants felt that the quantity of water available was insufficient. All groups referred frequently to the quantity of water available as a major issue.

2.2 Cost / Water Vendors / Quality

The cost of water depends on how tanks are filled; tanks filled from the mainline sell water more cheaply than tanks buying from water trucks. The mixed group felt that water selling was a "lucrative activity" and that water was "a bem sagrada" and nobody should have to pay for it.

Dirty water is clearly associated with diarrhoeal diseases. Truck water from Kifangondo is perceived as dirty and is frequently treated with "pedra uma". Tap water (standpipe) is considered "as always clean". But discussions of quality invariably reverted to issues of quantity. People valued clean water but put a priority on having enough water at an affordable price. Participants also felt that quality depended on whether owners cleaned their tanks regularly.

2.3 Proposed Improvements for Water / Resources

The improvement suggested by all groups was standpipe water connected to the main water lines. The advantages were clean water at low cost within walking distance of their houses. All groups felt that the community had very limited resources; they could contribute labour and specified financial contributions agreed before beginning work. They felt that it was the governments responsibility to solve their water problem but they could help. All groups suggested NGOs as a further source of resources.

2.4 Leadership / Management

Opinions on who could lead the process varied; some felt that it could be the local Administrator of the Comuna, others suggested the Churches. The mixed group suggested that either solution would require the support of an NGO (naming an NGO, Development Workshop, involved in local programs). Ideas on who should manage money included an older person, the local Administrator or the Church. Again, the mixed group suggested that the NGO could help set up the system and supervise it.

Illegal connections were felt to be the primary responsibility of the local administration. Community members could inform the local administrator who should then do something about it. Two groups suggested that the standpipes should have removable taps and be built near the church for security reasons.

2.5 Other Improvements

Chlorine treatment of water was discussed in detail by the mens' group. They suggested that the current program of community agents who test

water "with a special machine" should be extended to the whole bairro. The group thought that this was a Ministry of Health initiative; it is in fact a component of the Household Sanitation Program sponsored by Development Workshop in that area. The participants felt that the ultimate responsibility for chlorinating water should lie with the water vendor in the bairro.

2.6 Previous Experiences of Community Organisation

One group referred to a recent experience whereby a local business man proposed an initiative to supply electricity to the bairro. The residents contributed 10 million NKw initially and the initiative was successful. The mens' group described where the community petitioned the local administration to take action against bandits. They said the petition had no effect

3 SOLID WASTE - RUBBISH

3.1 Where it is disposed of / by whom / how?

Rubbish is buried and burned by some families; this is a man's job. Most families throw it in the many gulleys found throughout the bairro; throwing away is a women's or child's job. Rubbish is carried in old buckets, basins or bags.

Distance is not considered an issue. Rubbish is thrown out in the nearest place available.

3.2 Associations between rubbish and disease

The discussion groups made clear and specific associations between rubbish accumulation and disease. The disease transmission routes recognised were flies - food - diarrhoea
and the groups all spoke about children playing in the rubbish and contracting scabies and intestinal parasites. They also spoke about children cutting themselves on sharp objects.

4 SEWAGE & DRAINAGE

4.1 Stagnant Water / Access / Disease Associations

Stagnant pools were not presented as a problem "because the bairro is on an incline that permits run-off of water". Heavy rains close the roads into the bairro and during the rainy season the gulleys filled up with water. This was considered a health risk because children then played in the dirty water.

5 LATRINES

5.1 Use of Latrines

The participants considered that most people in the bairro had latrines. One group said that "those who did not have latrines had not given in their names". The reference was to an NGO sponsored Program for Household Sanitation, (Development Workshop) in their bairro. Latrines were considered a basic essential and it was felt by most groups that a family which did not have a latrine was probably very poor. The possible reasons for defecating in the open air were:

a) not owning a latrine
b) being far away from home and needing to go to the toilet urgently
c) having no water in the house

5.2 Preferences for Types of Latrines / Emptying Latrines

Participants preferred the Pour Flush model. The described advantages of this model were:

a) no smell and more hygienic
b) can be used as a bathroom
c) can be built inside the house
d) lasts longer

The major disadvantage associated with the Pour Flush model was it was more expensive than a dry pit latrine and it consumes scarce water.

Dry pit latrines were considered smelly and attracted flies; they lasted a shorter time but it was recognised that they were cheaper.

The solutions for full latrines were

- closing the pit and digging another one
- putting caustic soda and lime in the pit and then digging it out. Participants said that most families did this themselves because it was expensive to hire somebody to do it.
- hiring the ELISAL pit extractor. This was the most expensive option and only used by wealthy people.

Families who lived on the edge of gulleys normally had direct drains from the pit to the gulley. This had the distinct advantage of never blocking up.

6 IMPROVEMENTS

6.1 Proposed Improvements and Resources Required

The major community problem was water; in the context of sanitation the participants thought rubbish was the highest priority for action. The solutions proposed were

a) Placing containers in fixed places with access
b) Using rubbish to fill in erosions in access roads to the bairro.

Both solutions were recognised as requiring considerable resources. Provision of major resources such as heavy machinery and vehicles was considered the responsibility of the government or the

government in association with an NGO. The families would require handcarts and shovels (to be provided by an agent external to the community) and in some cases difficult access to the bairro would make any intervention impossible.

6.2 Organisation and Inspection

The steps towards improvement indicated by the participants were

- mobilisation and education of the community by the government, NGOs and Churches.
- the government should mobilise resources
- the community could contribute with labour and financial contributions. The community would have to assess what an acceptable contribution was for them.
- a community committee could be elected but the person controlling the money should be well-off, "ter poder economico", so that "he" might be less tempted to steal.

Putting money in the bank was generally felt to be a bad idea because it was so difficult to withdraw the money. Some participants in the mixed group felt that the Municipal Government should be involved in the management of money, so that in the event of money disappearing, the case cold be taken to the law courts.

Some people (not group specific) felt that people living near containers should oversee the correct use of the containers; most of the women participants felt that the overall running of the program, including the application of sanctions should be in association with the municipal government.

Annex 2 Questionnaire for water vendors survey

INQUÉRITO AOS OS VENDEDORES DE AGUA EM LUANDA

DATA: ____ / ____ /

NOME DO INQUIRIDOR:

A/ LOCALIZAÇÃO DO VENDEDOR:

1. Município:
2. Comuna:
3. Bairro:
4. Sector:

B/ INFORMAÇÃO PRESTADA PELO VENDEDOR

5. Qual a capacidade do seu tanque/reservatório? _____ m^3
6. Quanto é que paga para enche-lo? _____ NKZ
7. A quanto vende um balde de 20L? _____ NKZ
   (confirme o tamanho do balde)
8. Como é que enche o seu tanque/reservatório?
   (assinale com um X no espaço a frente)

   1 = água corrente
   2 = do camião cisterna
   3 = 1 + 2
   4 = outros

9. Se o vendedor enche a partir da cisterna, responda:
   (assinale com um X no espaço a frente)

   1 = se é sempre do mesmo camião
   2 = se é quase sempre do mesmo camião
   3 = se é sempre de diferentes camiões

10. Como é que o vendedor contacta os contristas de carros com água?

Annex 3 Details of field work for focus groups

Materials Used

A local artist accompanied the training workshop and a series of participatory tools were modified to facilitate the discussion groups. The tools finally used in the discussion groups were:

a) Photo Parade: A series of twenty photographs of Water and Sanitation themes, taken in Luanda musseques, were provided by the Department of Public Health, Faculty of Medicine, Luanda. These photographs were used as discussion starters, particularly for sanitation themes which were in practice more difficult to develop.

b) Who does this job? A series of nine drawings which were used to identify perceptions of roles in the community and what kind of people were considered appropriate for specific jobs.

c) What are our priorities? A series of seven drawings used to facilitate groups through the discussion of priority needs for their communities.

d) Good and Bad: This was a modification of the Three Pile Sorting Cards used to help larger groups categorise current hygiene practices and help researchers identify community knowledge of disease transmission routes.

e) Mapping was also used to describe stagnant water pools and current areas of rubbish disposal in the bairro.

The discussion guide was developed during the second half of training with the active participation of the group leaders. The final version was refined by the study coordinator. A day sheet was developed to be filled in every day by the research team.

Management of Field Work

A field manager and a driver who knew the musseques very well, were hired for 40 days to organise the discussion groups and provide transport and logistical support during the field work. Development Workshop contacted partner NGOs and community groups in the identified musseques.

On a first visit, the field manager explained the objectives of the discussion groups and how they would be conducted. The contact person provided by the partner organisation was requested to invite people to participate in three discussion groups on two consecutive days. They were requested to organise one group each of men, women and young people (mixed sex) for each day. In some cases there were separate groups for each day. In most bairros, some people who had participated in the discussion groups on day one came along again on day two and joined the day two groups. The contacts were also requested to identify suitable places for the discussion groups to take place. The places chosen included churches, schools and private houses.

On the second visit, the contacts provided the field manager with lists of names; an agreement was made for the places where the discussion groups were to be held and the places were visited and the dates were fixed for the discussion groups in that bairro. The contact person was paid approximately $10 for his/her services plus 20 kg of food from a food-for-work programme. The space for the discussion groups was also rented on a daily basis.

The discussion groups began normally at 09.30 and ran for a minimum period of one hour and twenty minutes and a maximum of two hours. Each research team brought pre-packed breakfasts to offer their guest discussion groups. Participants were not paid to participate in the discussion groups. No participant requested payment during the exercise, but many participants made it known informally that they strongly hoped that there would be some positive follow-up to the study.

During field work, the research teams operated in two groups of three teams in two different bairros. The bairros were twinned. On day one in Bairro A the discussion was on sanitation; the other group discussed water in Bairro B. On the following day, the discussion themes were exchanged. The research teams did not necessarily follow suit. Some team leaders felt comfortable only doing water or sanitation. Most team leaders were quite open to doing either. Some researchers did not like doing the same discussion theme all the time because they said they got bored.

The regular field day began with a complete group meeting at 08.00 hours. The research groups were organized and taken in pre-arranged transport to the bairros. Team leaders were allowed to re-arrange groups of participants if they wished, but they were requested not to send participants away. In the event that any one participant dominated the discussion, the reporter was requested to interview this person separately as a key informant. This was done on only two occasions. Following the discussion, the day sheet was filled in with all members of the research team present. Each researcher also filled in the daily evaluation sheet. The research teams had lunch together. At the end of each day the Study Coordinator met with the team leaders to review the previous day's work and clarify problems or discrepancies in the information provided.

The research groups were re-arranged on the basis of the daily evaluations combined with a daily assessment of field work submitted and discussions with group leaders. On one occasion, one researcher requested specifically not to be assigned to one group leader.

GUIA DE DISCUSSÃO – GRUPOS FOCAIS

TEMA	PERGUNTAS	INSTRUÇÕES
AGUA FONTE PRATICAS Preferencias	1.A onde que vão buscar agua? (Então uns voa ao ?..... chafariz, tanque, torneira, vizinho etc) Quais são as diferenças nestes diferentes sítios ? (sítios nos quais eles vão buscar agua) * Qual destes que eles acham melhor? Porque?	Deve aprofundar os problemas perguntando PORQUE (Picadelas) com provocações como por exemplo:
		* que achada distancia?
		* fazem bicha?
		* que acham da regularidade do abastecimento?
		* opiniões em relação aos custos?
		* os porquês de pagamento de um preço a um vendedor e outro preço a outro vendedor?
	2. Em que utilizam a agua nas vossas casas? Utilizam a mesma agua para todos os efeitos?	Deve aprofundar os assuntos abaixo assinalados sabendo sempre o PORQUE e COMO
		* agua limpa - agua suja
		* quais são os fontes de agua consideradas limpas e porque?
		* Acham que outros pessoas neste bairro estar ao dispostas a pagar mais por agua "limpa/tratada"
GESTÃO DE AGUA E MELHORIAS	1. Os problemas principais relacionados com agua que os pais/as mães nos tenham apresentados são:	PORQUE e COMO e QUEM deve aprofundisar
	2. Destes problemas que falamos, quais deles que vocês acham mais importante melhorar? Porque? Como?	* Como que deve ser a organização/gestão da melhoria especificada?
		* Quem serão os lideres? (Comités/ Indevidos/Governo Local/Vendedores/EPAL)
		* Qual será o papel da comunidade?
		* Recursos - Especificar recursos possíveis da parte do Governo / Comunidade / ONG / Sector Privado
		* Como mobilizar estes recursos?
		* Recolha de Dinheiro: Quem? Como? Quando? Quanto?
		* Quem devera ser responsável para contabilizar o dinheiro?
		* Fiscalização: Como que deve ser feito por a melhoria proposta?
		* Como combater ligações clandestinas?
LIXO	1. O que se faz com o lixo neste bairro?	PORQUE procura a saber
		* quem carta o lixo
		* Com quais meios de transportar
		* Andam que distancia para deitar-fora
	2. O lixo e um problema neste bairro? Porque	PORQUE procura aprofundaras
		* porque que o lixeira se encontra no sitio tal?
		* se eles acham que o lixo e relacionado com doenças?

DRENAGEM	1. O que se faz com agua de banho, de louca no bairro?	PORQUE deve aprofundaras
		* Porque deita fora? Aonde?
	2. Ha problemas com aguas estagnadas?	PORQUE deve procurar a saber
		* Se a agua estagnada e relacionada com doença? Como? Porque?
		* Se as aguas estagnadas sao relacionadas com outras dificuldades no bairro? Quais? Como?
LATRINAS	1. Aonde que e feito necessidades maiores? Porque?	PORQUE procura a saber se
		* fezes no ar livro e considerado um problema? Porque?
	2. O que se faz quando uma latrina e cheia? Porque?	* quanto custa?
	3. Quais as preferencias em relação ao tipo de latrina?	PORQUE procura a saber
		* se as preferencias são relacionadas com custos /hábitos de higiene/factores culturais.
SANEAMENTO GESTÃO DE MELHORIAS	1. Os problemas principais que as mães/pais/senhores nos tenham falado são:	Depois de ser esclarecido o PORQUE, COMO e QUEM deve aprofundar
	2. Destes problemas que falamos, quais deles que vocês acham mais importantes para melhorar? Porque?	* Como que deve ser organizado a melhoria proposta
		* Quem serão os lideres? ex. Comité, Indevidos, Governo Local, Vendedores, EPAL
		* Qual será o papel da Comunidade?
		* Quais os recursos necessários?
		* Como mobilizar estes recursos?
		* Quem pode fornecer os recursos identificados? (ex. Governo/Comunidade/ONG/Sector Privado)
		* Recolha de Dinheiro: Quem? Como? Quando? Quanto?
		* Quem deve ser responsável para contabilizar o dinheiro?
		* Como deve ser fiscalizado a melhoria/actividade?
CAPACIDADE DE ORGANIZAÇÃO DA COMUNIDADE	1. Como que a comunidade costuma resolver os seus previas problemas? (ex: agua, luz, escola, bandidos, estradas etc)	Tente saber o COMO e QUEM das perguntas apresentadas em baixo
		* Quais problemas eles ja se tenham organizado para resolver?
		* A preocupação/iniciativa começou com quem?
		* Como foram escolhidos os lideres?
		* Este comunidade já fez uma contribuição? Porque fim?
		* Quem tomou conta do dinheiro?
		* A comunidade ficou satisfeito com a organização da iniciativa? Porque?

Daily Review Sheet

FOLHA PARA GRUPO DE DISCUSSÃO

1. DATA _____

2. NOME E PAPEL DE CADA PESQUISADOR (Facilitador/Relator/Observador)

   LÍDER DE EQUIPE _____ ( )

   MEMBROS DE EQUIPE _____ ( )

   _____ ( )

   _____ ( )

3. LOCAL (Município/Comuna/Bairro)

(_____/_____/_____)

4. TÉCNICA UTILIZADA E TEMA PRINCIPAL DISCUTIDO

	Agua	Saneamento	Ambos	Outro
Grupo Focal				
Mapear				
3 montes de cartas				
Desfile de Fotografias				
Historia do Mal e Bom				
Entrevista Individual				
Outro				

O uso da técnica foi útil ou não?
Comentários:

Categoria da comunidade	Acesso	Homens	Mulheres	Jovens	Outro
Vendedores só					
Ambos(prin. camiões cisternas)					
Ambos (prin. agua canalizada)					
Outro					

PERFIL DOS ENTREVISTADOS

NOMES	M/F	BAIRRO ONDE MORA	TEMPO QUE MORA NO BAIRRO	LIXO	FONTE PRINCIPAL DE AGUA	OUTRO
1						
2						
3						
4						
5						
6						
7						
8						
9						

RELATÓRIO DE DIA

TEMA OPINIÕES DE COMUNIDADE CITAÇÕES

OUTROS TEMAS DISCUTIDOS

COMENTÁRIOS/OBSERVAÇÕES DOS PESQUISADORES:

GUIA DE AVALIAÇÃO DE GRUPOS DE DISCUSSÃO

Data: _____ Assunto:

Equipe:

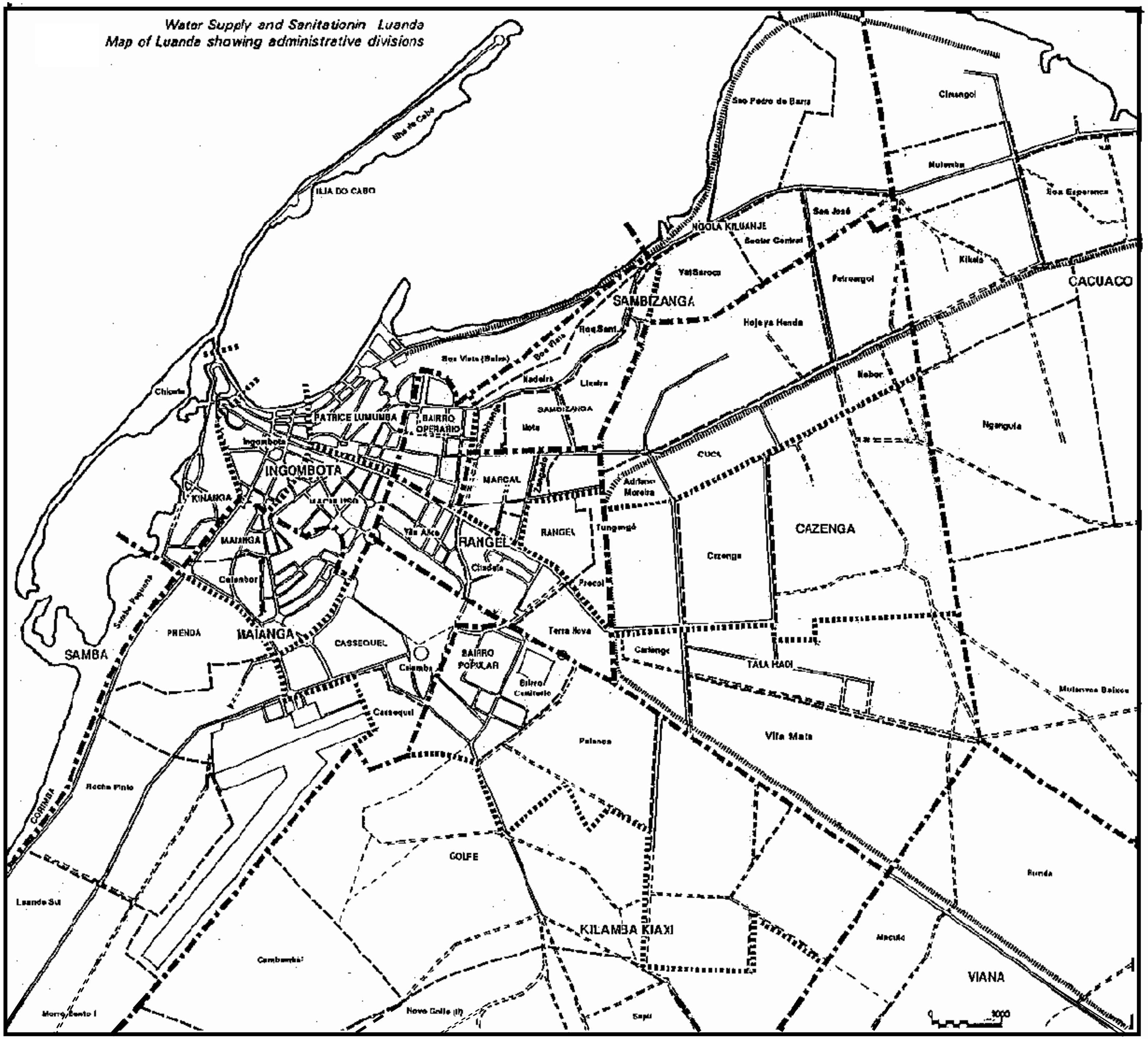
Duração da discussão:

Escala de avaliação: 1 = fraco 5 = muito bom

Circula o valor apropriado:

1. O ambiente foi agradável	1 2 3 4 5
2. Incluía-se todos participantes na discussão	1 2 3 4 5
3. Deixou-se o grupo desviar muito da linha de discussão	1 2 3 4 5
4. As perguntas foram abertas	1 2 3 4 5
5. Procurou-se a saber PORQUE e COMO	1 2 3 4 5
6. Membros da equipe falarem de mais	1 2 3 4 5
7. Procurou-se a entender divergências de opines no grupo	1 2 3 4 5
8. A equipe estava bem preparada	1 2 3 4 5
9. Tralhou-se bem como equipe	1 2 3 4 5

Annex 4



MUNICIPIO	COMUNA	[illegible]
INGOMBOTAS	ILHA DO CABO	Ilha do Cabo
	PATRICE LUMUMBA	Patrice Lumumba
	INGOMBOTA	Ingombota
	KINANGA	Kinanga
	[illegible]	[illegible]
MAIANGA	MAIANGA	Maianga
	CASSEQUEL	Cassequel
	PRENDA	Prenda
		Rocha Pinto
		Luanda Sul
RANGEL	RANGEL	Rangel
		Precol
	MARCAL	Marçal
		Zangado
	TERRA NOVA	Vila Alice
		Chabola
		Terra Nova
SAMBIZANGA	SAMBIZANGA	Sambizanga
		Mota
		Lixeira
		Boa Vista
		Roque Santeiro
	BAIRRO OPERARIO	Bairro Operario
	NGOLA KILUANJE	Val Sarroco
		Sao Pedro da Barra
		Sector Central
		São José
CAZENGA	CAZENGA	Cazenga
		Tunguenga
	CUCA	Cuca
		Hoje ya Henda
		Petrangol
		Nabor
	TALA HADI	Tala Hadi
		Cariango
KILAMBA KIAXI	BAIRRO POPULAR	Bairro Popular
		Palanca
	GOLFE	Golfe
		Novo Golfe (II)
		Sapu
		[illegible]
		Morro Bento I
SAMBA	CORIMBA	Corimba
	FUTUNGO DE BELAS	Futungo de Belas
		[illegible]
	[illegible]	[illegible]
CACUACO	CACUACO	Cacuaco
		Kikolo
		Mulenvos
		Cimangol
		Boa Esperança
		Ngangula
		Mulenvos Baixo
VIANA	VIANA	Viana
		Viana I

Development Workshop

Project: Beneficiary Assessment for Luanda

Client: The World Bank

Date: June, 1995

Map of Luanda by Bairro

Annex 5 FINANCIAL ANYLISIS FOR A WATER TRUCK

A: GENERAL INFORMATION

1996 "DAF" water truck, model FAT 75.240 (6x4) with 17 m3 capacity

Expected service life of vehicle:	300000	km
No. of kilometers per trip:	40	km
Number of trips per day:	2	
Number of days of service per year:	300	
Predicted length of service:	12.5	years

B: INCOME

Total volume of truck:	17	m3			
Selling price:	5.46	USD/m3			
Total gross income:	92.82	USD /trip	=	185.64	USD /day

C: EXPENDITURES

	USD	YEARS OF USE	USD /YEAR	USD /DAY	USD /TRIP	% OF TOTAL
CAPITAL COSTS						
Purchase price	169426					
Spare parts (@100%)	169426					
Shipping & insurance	12375					
Port clearance	5000					
Other	0					
	356227	12.5	28498	94.99	47.50	55.2
OPERATING COSTS						
Petrol, oil etc			1000	3.33	1.67	1.9
Repairs and maintenance covered by the 100% of vehicle cost as included above						
Insurance			0	0.00	0.00	0.0
Purchase of the water at Kifangondo			8160	27.20	13.60	
Driver's salary			9284	30.95	15.47	18.0
			46942	156.47	78.24	90.9
+10% contingency			4694	15.65	7.82	9.1
TOTALS			51636	172.12	86.06	100.0

D: SUMMARY

	USD /year	USD /day	USD /trip	USD /m3
Income:	55692	185.64	92.82	5.46
Expenses:	51636	172.12	86.06	5.06
Profit:	4056	13.52	6.76	0.40

E: NOTES

1. This spreadsheet is based on a model developed by Dr. Farokh Afshar (University of Guelph, Canada).
2. Capital costs are based on the cheapest of two proforma invoices obtained in June 1995. The capital costs have been annualized based on an assumed "service life" of the vehicle. At the end of the service life the vehicle the capital costs will be assumed paid. However, the operating costs will likely remain high because of increased repair costs.