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Cost Recovery Options for the Sambizanga Community Water Programme

A Report Prepared for Development Workshop

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EXECUTIVE SUMMARY

This report is designed to fulfil a terms of reference prepared by Development Workshop (DW), an international non-governmental organization (NGO) working in Angola. DW wished to employ a consultant to assist their Angola-based team and local programme partners in developing a strategy to ensure the sustainability of their investments in the Sambizanga Community Water Programme (SCWP), a component of Project Sambizanga, a peri-urban renewal programme in Luanda.

The paper synthesizes some of the recent literature on cost recovery and community management in water supply projects, presents the results of a field investigation into the potential for implementing a cost recovery scheme at public standposts in Sambizanga, and makes recommendations for incorporating a cost recovery system in the SCWP.

From the recent literature, most experts agree that requiring users to pay for the recurrent costs of water supply systems is a crucial element in ensuring the sustainability of water supply systems. This is true of systems in both so-called developed and developing countries. In developing countries, evidence suggests that user payment in water supply projects leads to more efficiency and greater sustainability. However, cases where full cost recovery has been achieved remain the exception rather than the rule.

The paper also outlines a "resources coverage" framework for examining the sustainability of water supply projects. This framework explicitly acknowledges that financial costs are only resource that must be covered over the long term. Other resources that need to be provided include labour for maintenance and supervision of the standposts, relevant skills for repairs and administration, appropriate organizations, and a monitoring and reporting system.

There are many options available for organizing the cost recovery of water supply systems, most of which have been used previously in developing countries. Christine van Wijk-Sijbesma has compiled what appears to be a comprehensive list of the cost recovery options that have been used in developing countries around the world. She groups these options into four categories: community options, rating options, commercial options, and indirect taxation options. Each of these options is reviewed for suitability to the Sambizanga case.

The main issues raised by the key stakeholders during interviews, meetings and informal discussions during the course of the field investigations are presented in section 4. From the residents of Sambizanga, the main opinions given were: it is "unacceptable" to sell water from public standposts for profit; it is reasonable to expect people to pay for the maintenance of public standposts; the standposts constructed by the SCWP are being confused with the standposts constructed by EPAL; people are fearful of their user fees being embezzled; people support the idea of a card identification system for standpost users; people are reluctant to pay for water when the service is as irregular as it was during June 1994 (twice during the month); and clandestine connections are identified as a very serious problem, but it is usually seen as the responsibility of the state to eliminate them;

Local administrators appear to: support the concept of user fees being used for maintaining public standposts; reinforce the view that water should not be sold at public standposts for a profit;

identify clandestine connections as the single biggest problem at the public standposts and support (in principle) taking action to eliminate them; believe that the local administration structure should be directly involved in any cost recovery scheme implemented; and supported the idea of a card identification system for standpost users.

From an interview with the provincial water authority's technical director, there appears to be support for the concept of user fees being used for maintaining public standposts within the state structure. He identified clandestine connections as a major problem at the public standposts and stated that local residents must be encouraged to help eliminate them. He also supported the idea of a card identification system for standpost users.

Based on the field investigations, it is fairly clear that voluntary funds are not likely to be successful in the peri-urban environment of Sambizanga since it is unlikely that sufficient social pressure could be exerted to persuade all standpost users to contribute voluntarily. It is also reasonably clear that the commercial options should not be introduced at the standpost already constructed on public land, since selling water for profit from *public* standposts was considered unacceptable by most of the people interviewed. However, the commercial options appear feasible at the standposts not yet constructed, provided they are constructed on private land.

Of the other options, which all involve mandatory user fees, unmetered flat rates appear to be the most suitable option for the standposts in Sambizanga for three reasons: a) because it is the simplest option, it is the easiest to explain to standpost users who are not already used to a user fee system; b) at the moment, community-management of standposts is a new concept in Sambizanga and there are no appropriate *existing* organizations to assume a management role; and c) the disadvantage usually associated with flat rates, that they force low income households to pay a greater proportion of their income for water, does not appear to be a major factor in Sambizanga because existing water rates are already so high.

It is recommended that the flat rate be charged monthly since this strikes a reasonable balance between: a) limiting the administrative work involved with collecting the fees; and b) collecting fees frequently enough to limit the impact of high inflation. It is also recommended that, for administrative simplicity, a uniform fee of 50,000 NKZ (US$ 0.42) be implemented all the existing standposts. This will cover 100 per cent of the predicted costs of maintaining a public standpost if there are at least 103 users.

There do not appear to be any major obstacles to women's participation as caretakers. And, based on experience thus far, both men and women are likely to be able to be effective in the position of water monitor (caretaker).

Other key recommendations made in the report are: that at least four full-time, salaried positions be created for the community development component of the programme (water mobilizers); that the decision on which cost recovery option to implement at the new (yet unconstructed) standposts be delayed until initial feedback on experience with the flat monthly rate system is available; that at the new standposts, the community mobilization process should be well on its way before the standpost construction begins; and that at the new standposts, the water monitors should be elected by the standpost users at public meetings. Section 6 contains a summary the 32 recommendations contained in the report.

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LIST OF ACRONYMS

DNA	National Directorate for Water
DW	Development Workshop
EPAL	Luanda Provincial Water Company
ESA	external support agency
NGO	non-governmental organization
NKZ	New Kwanza (currency of Angola - all NKZ values in this paper are also given in US$, converted using the official exchange rate of 120,000 NKZ = US$ 1)
SCWP	Sambizanga Community Water Programme
WHO	World Health Organization

1. Terms of Reference

This report is designed to fulfil a terms of reference prepared by Development Workshop (DW), an international non-governmental organization (NGO) working in Angola. DW wished to employ a consultant to assist their Angola-based team and local programme partners in developing a strategy to ensure the sustainability of their investments in the Sambizanga Community Water Programme (SCWP), a component of Project Sambizanga, a peri-urban renewal programme in Luanda.

The objectives of the consultancy, as defined in the terms of reference, were as follows:

a) to document and assess experience gained in similar projects in other countries for lessons which may be appropriate for the SCWP;

b) to assess the work of the SCWP to date in terms of potentials, limiting factors, and experience gained which may be appropriate to the development of a management system for the infrastructure built by the SCWP;

c) to consider options in relation to strategies including: state or local government management, private sector participation, community participation, and combinations of these;

d) to develop a sustainable model for community-based management and cost recovery for maintenance of the standpost network in Sambizanga which may be replicable in other peri-urban musseques; and

e) to involve users and other local partners in the process of the "model" development, and in the testing the "model".

The full terms of reference, found in appendix A, provides a more detailed plan for the consultancy.

2. Background

This section provides some background to the SCWP as well as some background on the current thinking amongst development practitioners regarding cost recovery in community water projects.

2.1 Background to Sambizanga Community Water Programme

Development Workshop has developed a community-based water programme as a key component in their peri-urban upgrading programme in Sambizanga Municipality. Water is articulated by almost every musseque resident as their number one priority problem. Due to geologic factors virtually no ground water is available in the Luanda area, and all water available to the city is from surface sources, namely the Rivers Bengo and Kwanza. The pumping and treatment installations for the city of Luanda were built during the pre-independence years to serve a population

of about 250,000 - 400,000. These facilities have not been extended or upgraded for about 20 years. Maintenance of this equipment and the distribution network has been minimal and much of the original system works below its original capacity.

While the original water system principally serviced the "urbanized" or formal sector of the city, there existed in 1976 a network of about 600 standposts serving a musseque population of about 250,000. Due to poor maintenance, lowering pressure and illegal connections only about 30 standposts exist today. The musseque population at the same time has grown to well over two million people.

Most water used in the peri-urban areas today is sold by private water dealers who in turn buy from tanker trucks who draw water from the Bengo River. Despite water chlorination posts set up on the roads into Luanda by the Ministry of Health and Medicin Sans Frontiers (Belgium) much of the water reaches Luanda untreated, carrying with it cholera and diarrhoeal diseases.

As part of Project Sambizanga, DW has undertaken a programme of upgrading access to potable drinking water within the pilot project area of the comuna (urban district) of Ngola Kiluanje with a population of over 100,000. The water project consists of two components, the rehabilitation of an existing network including construction of new standposts on this system, and the construction of a new network in a previously unserviced area.

The project to date has built approximately 20 standposts on the old network and is nearing completion of the basic engineering work on the new system, but has not yet started the construction of standposts or distribution lines. The community development programme linked to the project fields 70 community development workers, or "activistas", within the pilot zone and a small group of them form the nucleus of a Community Water Committee. Each of the standposts completed has a water monitor who is responsible for cleaning and maintenance of the water point. The SCWP technical team is responsible for standpost installation, working in conjunction with volunteers from the community who assist with labour. The technical team remains on call to assist with repairs.

2.2 Cost Recovery as a Component of Community Water Projects

Approaches to planning and implementing water supply projects have changed markedly over the last twenty years. During the 1970s, prior to the Drinking Water Supply and Sanitation Decade, external support agencies (ESAs) began to realize that rural and peri-urban communities in developing countries required simple, low-cost technological solutions for their water supply problems (Lauria 1990). "Appropriate technology" was the primary focus. In the 1980s, attention shifted towards community management and maintenance of these systems, and more resources were devoted to the institutional components of water supply systems.

In the 1990s, many of the technological problems of bringing water to people have been overcome. The primary challenge now is finding effective means of organizing people in rural and peri-urban communities to finance and manage local water supplies effectively (Rondinelli 1991).

Most of the recent literature on water supply projects in developing countries (late 1980s and 1990s) calls for a more participatory and community-based approach to water supply projects[1]. The rationale for increased community participation is usually:

a) too many past projects have fallen into disrepair and/or disuse because they did not meet the needs of the people they were intended for; and

b) it is clear that there are insufficient government and ESA resources available to provide services to all who need them using traditional, top-down approaches.

In fact, the rationale for increased community participation in water supply projects is similar to the rationale for increased participation in all development projects, infrastructure or service-based.

Focus on Cost Recovery

The aspect of community participation that tends to be unique to water projects is the recent concentration on cost recovery. While some people argue that, as a basic human need, clean drinking water should be a governmental responsibility, most experts agree that requiring users to pay for the recurrent costs of water supply systems is a crucial element in ensuring the sustainability of water supply systems. This is true of systems in both so-called developed and developing countries. For example, a review of a number of studies of British, American and Canadian water supply systems in the late 1970s and 1980s indicated "the need for water utilities to be fully metered and to set rates so as to be self sufficient financially" (MacLaren 1989: 9). The report also states that "only by a user pay program can adequate system conditions be maintained and the water resource properly conserved" (Ibid).

Furthermore, in developing countries, evidence suggests that user payment in water supply projects leads to more efficiency and greater sustainability. For example, studies in Tanzania, Thailand and elsewhere suggested that "the water supply systems which provide the most reliable service were those where communities not only contributed to operation and maintenance costs, but met them in full" (Evans 1992: 4).

However, cases where full cost recovery has been achieved remain the exception rather than the rule. For example, a WHO document published in 1987 states that cost recovery in the water supply sector "is generally ineffective" (WHO 1987 quoted in Evans 1992: 6). Other case studies have also demonstrated that inappropriately designed or implemented cost recovery mechanisms can undermine rather that enhance the sustainability of water supply systems. For example, a study of water supply systems in Lesotho determined that the method of voluntary user contributions for water were ineffective and led users to rely more heavily on government operation and maintenance services (Feachem et al. 1978).

These studies underscore the fact that cost recovery schemes must be planned and implemented in a manner appropriate for their social, technical and economic environment.

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[1] See for example: Donnelly-Roark 1987; Wijk-Sijbesma 1989; McCommon et al. 1990; UNDP-World Bank 1990; Tamm 1991; Cairncross 1992; Wegelin-Schuringa 1992; and Choguill et al. 1993.

2.3 Factors to Consider When Designing a Water Management System

Clearly, a cost recovery system must be designed as a component of a larger water management system. After reviewing a number of internationally funded water supply projects in developing countries, Rondinelli (1991) identifies six sets of factors that he claims affect the success of community water systems:

- appropriate *incentives* for people to participate in and manage community water systems;
- appropriate *skills and resources* for people to participate in and manage community water systems;
- appropriate and effective *processes for system operation and maintenance*;
- appropriate *organizational relationships* for people to participate in planning and managing water systems;
- appropriate and efficient *technology* which allows people to participate in and manage community water systems; and
- *monitoring and evaluation systems* to ensure effective and efficient community management.

Perhaps the most significant conclusion to be drawn from Rondinelli's analysis is that effective community management requires far more than user contributions to cover the cost of operating and maintaining the system. This appears to be consistent with other recent publications on the management of water supply systems which almost invariably advocate a "resources coverage" approach to sustainability[2]. This approach recognizes that financing is only one factor which contributes to the long-term sustainability of improved services.

[2] It is unclear where the term "resources coverage" was first used. However, see Evans (1992) and van Wijk-Sijbesma (1989) for detailed discussions of this concept.

2.4 The Resources Coverage Approach to Sustainability

Following the "resources coverage" approach, Evans (1992) lists ten key elements of sustainability for water supply systems which are based on the model developed by the WHO Working Group on Cost Recovery:

- *Enabling environment* - Seen as almost entirely the responsibility of government, an enabling environment is created by establishing a legal and policy framework which explicitly supports the development of sustainable services.

- *Health awareness* - Both the implementing agency and the community should recognize the health benefits to be realized from improved access to potable water.

- *Strong institutions* - This is a critical requirement at the implementing agency level and the community level. At the community level an institution is required with: formal, legitimate and legal status; strong leadership; and backing from women.

- *Felt need* - Improvements in water supply must be a high priority for people within the community.

- *Supportive attitudes* - Both the implementing agency and the community must have a genuine desire to work as partners.

- *Expertise and skills* - The community should develop: technical skills for minor repairs and maintenance; skills for collecting and managing money; and organizational skills. The agency should have the necessary technical, administrative and managerial skills, and should be able to strengthen these same skills within the community.

- *Appropriate service levels* - The level of service should match the technical, financial and organizational resources within the community. It is important to design the system with future improvements in mind to encourage maintenance of the system until it can be improved.

- *Appropriate technology* - Similar to the appropriate level of service, the technology chosen should match the resources within the community.

- *Materials and equipment* - It is imperative to ensure that all necessary inputs are available in the area.

- *Support services* - The community must be able to rely on the agency for support in clearly agreed-upon areas. These services will be more important at the beginning of the project.

According to the resources coverage approach, all of the above elements need to be resourced from either the state, the ESA or the community. As part of the process of planning and implementing a cost recovery scheme for the Sambizanga Community Water Programme, this

document reviews the extent to which each of these elements already exists in the project environment and makes recommendations for resourcing the missing elements.

3. Cost Recovery: Experience from Around the World

There are many options available for organizing the cost recovery of water supply systems, most of which have been used previously in developing countries. Christine van Wijk-Sijbesma has compiled what appears to be a comprehensive list of the cost recovery options that have been used in developing countries around the world. She groups these options into four categories: community options, rating options, commercial options, and indirect taxation options. These four categories are explained below with some comments about their suitability for the SCWP. More detailed analysis of the suitability of these options for Sambizanga, based on field investigations, is given in section four.

3.1 Community Options

Community options refer to those cost recovery options where the financial costs of operation and maintenance are paid for directly by a community group which acquires the funds either from voluntary donations by community members, from fund-raising events, or from another commercial activity such as a community-owned cooperative. Using general community revenue or cooperative funds to finance a water supply project assumes that such a source of revenue exists, and that it is sufficiently adequate and reliable to cover the project's costs.

In the case of the SCWP, there is no indication that any community group with an established source of revenue already exists. Therefore, it appears that using community revenue to finance the water supply system is not an option in Sambizanga. Rather, the only community option available for the project is the use of a voluntary fund specifically for the water scheme, collected directly from households or indirectly through fundraising events. There are a number of documented examples where each of these options has been used successfully.

Community fund raising events have been used successfully in Southern Kenya, for example, where families are able to make cash or in-kind donations (van Wijk-Sijbesma 1989: 22). All of the donations are recorded and publicized to encourage social pressure to contribute. In an example from Indonesia, voluntary contributions are reportedly collected at harvest time when cash is more readily available (White 1981: 58). In Latin America, the collection of community funds through lotteries and entertainments is apparently popular (Ibid: 58; Evans 1992: 30).

The primary advantages of this option are that it facilitates flexibility in the collection of funds and that it can reduce the workload of the community group charged with collecting the funds. For example, annual voluntary fund-raising for operation and maintenance can be used in communities with seasonal income such as farming communities. Voluntary contributions also allow households to contribute according to their ability to pay.

The main disadvantages of voluntary funds is that contributions are not linked to actual water use. Large water users may not pay in proportion to their water use (or may not pay at all).

Furthermore, experience has shown that voluntary funds only work when the operation and maintenance costs are very low and where the intervals between required inputs are quite long (Evans 1992: 30).

> In general, voluntary funds appear to be most appropriate in those communities where successful or better-off members may wish to impress others and, thus gain in social status (Ibid: 57). In fact, voluntary funds are only suitable for situations where there is enough social control to ensure that all user households make a voluntary contribution is accordance with their capacity and benefits received (van Wijk-Sijbesma 1989: 22).

3.2 Rating Options

One popular alternative to community funds is a system in which user households make *mandatory* regular payments for their water supply. Cost recovery options of this type are often called rating options. There are many rating options available including: unmetered flat rates, unmetered graded rates, and metered rates. All three of these options are potentially suitable for the SCWP.

Unmetered rates mean that water users pay a flat rate (weekly, monthly or annually) regardless of their water use. Graded rates refer to systems where different water users pay different flat rates depending on the size of their household, their level of income, or some other relevant criteria. Unmetered flat rates have the advantage of being the simplest of the rated options, and thus the easiest to administer by a community organization. The major disadvantage of the ungraded flat rates is that they are more burdensome for low-income households than for better-off households since all households pay the same flat rate. Past experience has shown that flat rates are easiest to organize with private taps or group connections where all the users are readily identified (van Wijk-Sijbesma 1989: 29).

Graded rates have been used to make payments more closely related to household income. For example, in one community in Indonesia the poorest 19 households (out of 640 households) in the community did not have to pay water charges. Other Indonesian communities have exempted old couples and female-headed households with young children (Ibid: 31). In a community in Southern Columbia, the water users agreed on a division of rates into four categories according to household wealth. The rates were set in accordance with these categories: 20, 30, 60 and 90 pesos per month (Ibid: 32).

The major advantage of graded rates is that they can make water charges more closely related to water use and ability to pay without introducing more complex metered systems. However, the introduction of graded rates represents a cost recovery scheme of a qualitatively higher level of complexity than flat rates, thereby increasing the administrative and management demands. As a result, institutional capacity and management efficiency are key factors in deciding on an appropriate rating option (Evans 1992: 32).

Metered systems have an advantage in that users pay in direct proportion to the volume of water they consume. In this sense, metered rates are the most equitable way of all to cover costs. However, water meters are not only expensive to install, they also need to be read regularly, and thus require large administration and management investments when compared to unmetered systems. In fact, introducing metering has, in some cases, outweighed the benefits gained (Ibid; van Wijk-Sijbesma 1989: 39).

One particularly interesting case of a successful metering system comes from Malawi. In this case, 20 to 30 families together form a tap-users' group and request their own tap connected to a piped system. The group consents to pay an agreed monthly rate for the water drawn from their tap which is metered. The meter is read every month by a system operator who prepares the bill directly after reading the meter and hands it to the chairperson of the users' group. To pay the bill, each users' group has a choice of three types of rate systems: a flat rate for every member household, regardless of the household size or composition; a graded rate based on family size; and a graded rate based on the household's intended level of consumption. Originally, most groups in the system chose the flat rate, but the tendency is now towards differential rates for member households (van Wijk-Sijbesma 1989: 40-1).

> From past experience, the type of rating system which is most appropriate in a given situation is dependent on a number of factors including: the costs of employing a full time water point attendant, the degree to which households tend to use similar amounts of water, inter-household differences in income, and the management capacity within the user group (Evans 1992; van Wijk-Sijbesma 1989).

3.3 Commercial Options

Commercial cost recovery options refer to those options which entail some sort of water vending at the point of distribution. This is the kind of cost recovery scheme in operation in most of Luanda, with private vendors selling water for significant profits. Unlike the previous two categories of options, commercial options usually shift primary responsibility for water point maintenance and operation to individuals or groups outside the water agency or community group. The financial costs are borne by the water users, while most of the administrative resources are provided by the water vendor.

Because of difficulties in collecting water charges at public standposts, some organizations have turned to water vending systems for on-the-spot revenue collection. Water vending options are more common in situations where a piped distribution network does not exist (van Wijk-Sijbesma 1989). However, there are a number of cases where water vending has also been used as part of a piped distribution system (Ibid). Water vending options include: water kiosks, concession sales and coin-operated taps. Coin-operated taps, however, have proven too vulnerable to breakdown and are not recommended (Ibid).

At water kiosks, the most common of these options, water is sold by operators who are either employed by a central water agency (or community group) or are licensed to operate the kiosk as an independent franchise. If the kiosk is operated as a franchise, the vendor is usually expected to purchase water from a central water agency at a pre-determined rate and sell the water to users at a controlled price. The difference in the water price paid by the vendor and the price paid by users represents the profit for the vendor. In cases where the vendor obtains water from a standpost, the vendor is often responsible for maintaining the standpost.

The primary advantage of kiosks, when compared to public standposts, is that it facilitates full-time supervision of the water source, thereby reducing water wastage and vandalism, improving hygienic conditions around the water source, and assuring user payments (Ibid). Another benefit of kiosks (in fact, any water vending system), especially where the vendor is a salaried employee of a user-controlled organization, is that it creates employment opportunities in the community. The employment that water vending makes possible must be included as a benefit for the community when evaluating this option.

The major disadvantage of the kiosks, or any other vending system, is that it usually means higher water costs for consumers when compared to public standposts. The users' payments have to cover the added costs of the water vendor either in the form of a salary or, in the case of franchised kiosks, a reasonable profit. In some cases, the cost of the vendor has been higher than the other operation and maintenance costs combined (Ibid). Another potential problem with water vending options is that users are vulnerable to exploitation by vendors, especially where few alternative water sources are available.

The need for a strong user-controlled organization is not eliminated by selecting a vending cost recovery option. Rather, the role of the organization becomes more of a regulatory body than one of direct operation and maintenance of the water supply system. Therefore, the organizational capacity of the community is still an important factor to consider when evaluating the potential appropriateness of a water vending option. In particular, careful consideration should be given to the users' ability to hold water vendors accountable to rate restrictions and regulations.

Two interesting examples of community-managed water vending from standposts are described in van Wijk-Sijbesma (1989). The first example comes from a low-income urban neighbourhood in Tegucigalpa, the capital of Honduras. Women in the neighbourhood have formed a water cooperative which buys water in bulk from the municipality. The water is sold to users at two kiosks in the neighbourhood at a fixed price of 10 cents per 10 litres. The standposts are operated by two women from the community who are paid by the cooperative. Every three months the operators are changed to share the employment benefits amongst the cooperative's members.

The second example, is from two peri-urban communities in South Africa, each with its own water committee which manages the local water distribution system. Because of low social cohesiveness in the communities the committees decided on a water vending system in which local operators sell water from standposts. The operators are paid by the water committees. Users purchase plastic tokens valid for one unit of water (25 litres) from shops near the standposts. The price per token is three times the price paid by the water committees for bulk

water. The profit is used to pay the operators and the committee secretaries who do all the administrative work. The success of this system is evidenced by the fact that the system was reportedly operational 99.9 per cent of the time over a three year period (van Wijk-Sijbesma 1989: 48). Other community-managed vending systems are reported to be successfully operating in Burkina Faso, Indonesia and a number of Latin American countries.

> From all of these cases, it appears that the most important factor to consider in water vending options, especially where kiosks are being operated as franchises, is the degree to which sufficient institutional capacity exists to control vending prices in the interests of the consumers.

3.4 Indirect Options

The last category of financing options are called indirect options. Under an indirect cost recovery option the financial costs of the system are covered by general taxes collected by another agency and transferred to a water management group. Given the reportedly low capacity of the state to collect property, income, and sales taxes at this time these options are considered inappropriate for the SCWP.

3.5 Summary of Potential Cost Recovery Options for the SCWP

Option	Advantages	Disadvantages
<u>Community Options</u> (voluntary fees) Voluntary funds	• facilitates flexibility in the collection of funds • reduces administrative workload for community group • can mean contributions are matched to ability to pay	• contributions not linked to actual water use • some users may not pay at all • difficult to collect large amounts • difficult to collect frequently
<u>Rating Options</u> (mandatory fees) Unmetered flat rates	• payments are mandatory • simplest of the rated options and easiest to administer	• low-income households pay greater portion of their income for water
Unmetered graded rates	• payments are mandatory • payments can be linked to household income	• more complex and harder to administer than flat rates
Metered rates	• payments are mandatory • users pay in direct proportion to amount of water used • most equitable payment method	• most complex and hardest to administer • costliest of the rating options
<u>Commercial Options</u> Vending by paid operators	• enables a full time attendant to regulate water use • ensures user payments • allows community to retain some of the benefits of vending	• usually means higher water rates than other options
Vending from franchised kiosks	• enables a full time attendant to regulate water use • ensures user payments • transfers most maintenance to the private sector	• usually means higher rates than other options • users are vulnerable to exploitation from vendors

4. Cost Recovery: Results of Field Investigations in Sambizanga

Having reviewed the relative advantages and disadvantages of different cost recovery options in the previous section, this section of the report presents the results of the field investigation into the suitability of each option for the SCWP. The field work was conducted during June 1994. During this time interviews were conducted with: the provincial water authority (EPAL); staff at all levels within the SCWP; local government administrators; church leaders; local and international NGOs; and, community members, specifically those people using public standposts as a water source (community meetings were held at four standposts).

The main purpose of the field work was to determine which cost recovery scheme could best resolve the tradeoffs inherent in each of the different options described in the previous section. In other words, which option is likely to provide the maximum benefit to water users at minimum cost? Viewed from a "resources coverage" approach, this means determining the appropriate level of involvement of the state, the community, the private sector, and the external support agency (DW).

4.1 Objectives of Cost Recovery in the SCWP

A meeting was held with the management staff of Project Sambizanga on June 2, 1994 to present the findings from the literature review conducted in Canada. During this meeting it was agreed that the ***primary objectives*** of any cost recovery scheme for the Sambizanga Community Water Project should be:

- to collect funds for the operation and maintenance of standposts constructed by Development Workshop in the project area; and

- to develop and demonstrate a model of cost recovery which could be used at public standposts constructed by EPAL, the state water authority.

It was also agreed during the meeting (on June 2) that a ***secondary objective*** of the a cost recovery scheme was:

- to use the issue of water as a point around which to mobilize communal activity in the project area, with the hope that this would facilitate the development of other "community" initiatives in the future.

Agreement on these objectives has important implications for the selection of a cost recovery scheme. First, there was agreement amongst the project staff that the most important criteria were that the cost recovery scheme should be sustainable in the long term, and that it should be technically and politically feasible for the scheme to be replicated by EPAL. Furthermore, establishing the secondary objective of encouraging "community" initiatives, meant that administrative efficiency should not be the only criteria used for selecting a cost recovery option. Efficiency, which may be best obtained using a commercial vending option, should be balanced with the potential long-term benefits to be gained by community management options which are likely to require greater short-term investments by DW.

4.2 Opinions of Key Stakeholders

The following sections summarize the main issues raised by the key stakeholders during interviews, meetings and informal discussions during the course of the field investigations. Since the vast majority of these meetings and discussions were conducted in Portuguese (through an interpreter), direct quotations are not used here. Furthermore, while the views presented here are necessarily simplifications of the discussions that took place, an effort has been made to reflect the overall views of the majority of respondents.

4.2.1 Opinions from Residents of Sambizanga[3]

Many people stated that would be "unacceptable" for the SCWP to sell water from public standposts in the same way as the existing private vendors sell water. This was a topic about which many people felt quite strongly and appears to be based on past experience with public standposts, which were constructed by the state for those people who could not afford private taps. The strong aversion to paying for the water from a public standpost, however, does not extend to an aversion to paying for the maintenance of the standpost. In fact, almost everyone interviewed appeared to understand the need for the users of the standposts to contribute in some way to maintaining the standposts. People appear to separate the concepts of paying for the maintenance of the standposts (which is acceptable) and paying for the water itself (which is unacceptable).

A common conception amongst residents living near the standposts constructed by the SCWP is that the standposts were constructed by the state. Even though there is some recognition of Project Sambizanga and Development Workshop, both are often thought to be part of the state structure. Once the non-governmental status of DW and the SCWP was clarified, residents appeared better able to understand the necessity for contributing to the maintenance of the standposts.

From discussions of various user payment options at community meetings, there is considerable concern within the community that their user fees will not be used to maintain the standpost, but will be embezzled by whoever collects the fees. Building up some trust amongst standpost users will be one of the greatest challenges of implementing a cost recovery scheme in Sambizanga.

Almost everyone interviewed thought some sort of card identification system for standpost users was a good idea. People have had experience carrying ration cards in the past which were required for the purchase of most consumer goods.

At every community meeting the issue most frequently raised by residents was the need to eliminate clandestine connections to the standpost supply pipes. The issue was nearly always raised in a manner suggesting that local residents assume that eliminating clandestine connections

[3] During the field investigations opinions were gathered from a number of the existing water monitors and people who attended community meetings at four different standposts. It is these people who are referred to here as the residents of Sambizanga.

is a state responsibility (or perhaps the responsibility of DW). While it appears that nearly everyone recognizes clandestine connections to be a major problem, they also seem unable or unwilling to take action to eliminate them.

Another important issue raised at every community meeting was the fact that people are worried about the irregularity of the water supply from the standposts, particularly recently (May-June 1994). Many people stated that they did not mind paying for the maintenance of the standpost, but that they would only do so if the supply became more regular. It should be noted that the community meetings were held during a period of particularly irregular service. During June of 1994 (the time when the meetings were held) water flowed for only two days from most standposts in the project area. Furthermore, the flow rate on these two days was particulary low.

From Sambizanga Residents

- It is "unacceptable" to sell water from public standposts for profit.
- It is reasonable to expect people to pay for the maintenance of public standposts.
- The standposts constructed by the SCWP are being confused with the standposts constructed by EPAL.
- People are fearful of their user fees being embezzled.
- People support the idea of a card identification system for standpost users.
- People are reluctant to pay for water when the service is as irregular as it was during June 1994 (twice during the month).
- Clandestine connections are identified as a very serious problem, but it is usually seen as the responsibility of the state to eliminate them.

4.2.2 Opinions from Local Administrators

All of the administrators interviewed supported the concept of user fees being charged for the maintenance of public standposts. However, they also reinforced the view, presented in the previous section, that user fees must not be used to create profits for private individuals. Their view is that because the standposts are on public land, the water they supply is a public good.

All of the local administrators interviewed stated that one of the most important problems with public standposts were clandestine connections to the standpost supply pipes. All of the administrators expressed a desire to try and eliminate these connections, but were unsure about

the best way to do so. The strongest support for taking action against clandestine connections appears to be from the administrator of Sambizanga Municipality (Sr. Napoleon).

The second issue on which there was a reasonable consensus was that the money collected through a cost recovery scheme should be collected by the local (either quarter level or sector level) administrator. Each level of administration stated that the money should then be passed up the hierarchy to their level (i.e., the municipal coordinator said that the money should be controlled at the municipal level, while the sector coordinators generally said that the money should be passed up from the quarter level to the sector level, but not higher). Moreover, all the administrators interviewed stated that the local administration should be directly involved in cost recovery and standpost management. This appears to be a result of the fact that the administrators below the municipal level have virtually no discretionary budgets at present, and any initiative which would increase their budgets are seen as unusually good opportunities.

All of the administrators interviewed also supported the idea of using a card system to identify all the standpost users.

From Local Administrators

- Supported the concept of user fees being used for maintaining public standposts.
- Reinforced the view that water should not be sold at public standposts for a profit.
- Identified clandestine connections as the single biggest problem at the public standposts and supported (in principle) taking action to eliminate them.
- Stated that the local administration structure should be directly involved in any cost recovery scheme implemented.
- Supported the idea of a card identification system for standpost users.

4.2.3 Opinions from the Provincial Water Authority (EPAL)[4]

EPAL is supportive of the concept of cost recovery at public standposts. EPAL recognizes its limitations in maintaining public standposts and is genuinely supportive of initiatives to reduce its maintenance responsibilities. However, it appears that the main rationale for supporting user fees at public standposts is the feeling that they are likely to encourage more responsible use of the standposts. EPAL's technical director feels that the majority of standpost maintenance is a

[4] The information in this section was obtained during an interview with the EPAL technical director on June 9, 1994.

direct result of vandalism (including clandestine connections) and improper use, both of which could be reduced if user fees were introduced and people were encouraged to take more personal responsibility for standpost maintenance.

From its experience with public standposts in the musseques, EPAL feels it would be impossible for a standpost caretaker to identify all of the people using a particular standpost. Therefore, a card identification system (or something similar) would be necessary if regular fees are introduced.

From EPAL's Technical Director

- Supported the concept of user fees being used for maintaining public standposts.
- Identified clandestine connections as a major problem at the public standposts and stated that local residents must be encouraged to help eliminate them.
- Supported the idea of a card identification system for standpost users.

4.3 Potential for Involvement by Key Stakeholders

Having summarized the opinions collected from the main stakeholders in section 4.2, the following sections discuss the stakeholders' capacity for, and interest in, a cost recovery and standpost management scheme.

4.3.1 Potential for State Involvement

In Luanda, water distribution and infrastructure maintenance is the responsibility of EPAL, the provincial water company which is under the jurisdiction of the provincial government. At the same time, overall sectoral responsibility for water supply belongs to the National Directorate for Water (DNA) within the Secretary of State for Energy and Water. While the division of responsibilities in Luanda between EPAL and DNA is somewhat unclear, it appears that DNA's mandate is limited to providing planning and technical assistance to water projects and coordinating the exploration for new water sources. Execution and management of water projects is in EPAL's mandate.

Regardless of which state institution has direct responsibility for maintaining public standposts, the reality is that the standposts have not been adequately maintained in the past. In 1976, there were about 600 standposts serving the musseques. Today, only about 30 public standposts are

functioning, and the majority of those were rehabilitated by Development Workshop. There is no indication that either DNA or EPAL have the resources to adequately maintain public standposts at the present time.

However, this does not mean that EPAL has no role to play in the maintenance of the standposts. As described in the previous sections, two of the most serious problems at the existing public standposts are the irregularity of the water, and clandestine connections. Since all connections to the pipe network are supposed to be authorized by EPAL, it is the logical agency to control the clandestine connections. The two main obstacles to controlling clandestine connections at present are: a) the majority of residents in Sambizanga do not appear convinced that it is their responsibility to watch for illegal connections; and b) there is no established protocol for informing EPAL when illegal connections are suspected.

The other main task that EPAL should be encouraged to assume is ensuring that a minimum amount of water is provided to the public standposts. Without being able to provide a reasonable level of service to standpost users, any attempts at cost recovery and standpost management appear doomed to fail. This minimum level of service may be as little as two days per week (6-8 hours per day). In fact, if people could count on collecting water even one day per week, on a regular basis, they may be willing to pay a user fee. A regular system for lobbying EPAL in this regard needs to be established as part of the standpost management system.

4.3.2 Potential for Private-sector Involvement

The potential for private-sector management of the standposts is indicated by the number of successful private water vendors already operating in Sambizanga. While most of these vendors sell water from tanks filled by tanker trucks, there are also cases of individuals selling water from taps connected to the city water lines. Some of these connections are illegal, but many others are legal connections with water meters, which in theory are read regularly by EPAL. In practice, the meters are rarely read, and when they are the rates charged by EPAL are ridiculously low, too low to cover the real cost of the water.

Case 1 - Private Water Vendor Using a Flat Monthly Fee

Description: Jochim has a tap in his yard in Cacuaco which is connected to EPAL's main water line. The tap is not metered. He charges 40,000 NKZ per month to people who want to collect water from his tap which entitles them to collect as much water as they like. At the time of our visit there was a list of 23 names beside the tap which represented all the regular users. Beside each name was an indication of whether or not they had paid for the month. Jochim expects to get a bill from EPAL once per year, but since the tap is only six months old, he has not yet received one. He has operated the tap without maintenance for six months.

Comments: First, the system of collecting flat fees on a monthly basis appears to be working well in this situation. The key factor appears to be that this tap is located in a semi-rural area and all 23 users are well-known to the tap owner. It is unlikely that similar conditions will apply in Sambizanga. Second, since the tap is unmetered, it is unlikely that Jochim will receive a bill from EPAL in the future. Therefore, the water he is selling is essentially free. Even so, people do not seem to mind paying him for the water they collect from his tap. The key issue appears to be that the tap is on private land. People's perception appears to be that ownership of the tap entitles one to sell water regardless of the source of the water.

Case 2 - Private Water Vendor Using Pay-by-the-bucket Payment System

Description: Manuel lives in Sambizanga and has a private, metered tap in his yard which is connected to the EPAL water line nearby. EPAL is supposed to read his water meter every three months, but over the last 20 years this rarely happens more than once per year. When he does receive a bill, he is charged 60,000 NKZ per 20 m^3 (about 2 NKZ per litre). He charges people to collect water at the tap by collecting a fee each time they collect water. The fee varies depending on how much water is available in the area, but averages about 800 NKZ per litre. He says he collects a per-bucket fee because he does not know all the people who come to collect water from his tap.

Comments: This case seems to emphasize the point made is case 1 - that it is difficult to identify all the standpost users in Sambizanga. This case also emphasizes the point that having a private tap entitles one to sell water regardless of the source of the water or how much the water costs the tap owner.

As illustrated in the cases above, selling water, even at extremely high mark-ups, is not considered by most people as a disreputable or dishonest business. In fact, all the water vendors interviewed were happy to discuss the details of their business. Furthermore, people in Sambizanga have had to pay for water for so long that they are used to the idea of water being a commodity. All of these factors seem to imply that private-sector management of standposts is an attractive option for the SCWP.

However, from interviews with local administrators and community members, there is strong resistance to the idea of selling water from "public" standposts. Most people are aware that public standposts were originally constructed for people who could not afford private household taps. The simple fact that all but one of the standposts constructed by the SCWP are on *public* land, and are considered as *public* standposts, makes the idea of selling water from these standposts unacceptable to most of the people interviewed. For standposts constructed in the future (eg. in the new project area of Val Saroca) private-sector management may be possible if the standposts are constructed on private land.

The private sector could also be involved in providing maintenance services for public standposts regardless of whither they are on public or private land. The potential for contracting local plumbers and masons to do repair work on the standposts was not explored in detail during the field work. However, this will have to be done in the future, especially as DW's involvement in the SCWP comes to an end. From maintenance cost estimates (see appendix F for more details on standpost maintenance costs), contracting local tradespeople would cut maintenance costs considerably by reducing transportation costs, which can amount to 23 to 45 per cent of the maintenance costs when the maintenance is done by the DW technical team (depending on the maintenance job).

4.3.3 Potential for Community Involvement

Community involvement in the management of public standposts in Sambizanga is almost an entirely new concept, and as such, there is little practical evidence of its potential effectiveness. During the field study, one example of a community-managed standpost was discovered which appeared to be quite successful (see Case 3 below). However, the standpost was located in a rural area on the outskirts of Cacuaco, 20 km north of the centre of Luanda. Even the leader of the community group managing the standpost felt that the voluntary payments they had used successfully would not be successful in Sambizanga, where inter-household linkages are not nearly as strong.

Case 3 - Community Group Using a Voluntary Payment Scheme

Description: Arlindo is a fisherman living on the edge of Cacuaco, 20 km north of Luanda's city centre. Because of his basic skills as a plumber, he was selected by the local fishing organization to maintain the local public standpost. He receives no salary, but was helped by local residents to make a connection to the standpost supply pipe for his irrigated vegetable garden. When something breaks (eg. a tap) he goes house-to-house in the community to collect enough money to buy the required materials and makes the repairs himself. All families in the area are asked to contribute, but payment is voluntary (some families that are considered very poor are not expected to pay). A similar collection is made by the coordinator of the fishing group to pay the annual water bill from EPAL (last year's bill was 72,000 NKZ).

Comments: One reason that this system is successful appears to be because it tapped into an existing organization (a successful organization of local fisherman) with a dynamic leader. This system also depends on social pressure to persuade all families to make contributions when asked. This is a rural area and all households are well known to one another.

4.3.4 Potential for Women's Involvement

From interviews with residents, the existing water monitors and the activistas, there is a perception amongst many people that the person selected to maintain the standpost should be a man. The most common explanations for this view were: a) that only men have enough authority to ensure that people use the standpost properly; and b) that a woman would be unable to go out early in the morning or late at night to open and close the valve on the standpost if it was required. This corresponds with a survey conducted for DW in 1992 during which 68 per cent of respondents said that a man should be selected as the standpost caretaker (Cruz Cohen 1993).

However, during this field study, when respondents were pressed for more details on why women could not perform the duties of a standpost caretaker, most people conceded that it might be possible for a woman to fulfil the requirements. Rarely did people feel very strongly that a woman could not do the job. It is possible that many of the respondents who said that a man should be selected as the caretaker did so because nearly all authority figures have traditionally been men.

Of the thirteen existing water monitors, nine are currently women (69 per cent). However, since these monitors were selected by SCWP staff and not elected by the standpost users, this does not indicate a preference amongst the community for women as caretakers.

No systematic monitoring of the existing water monitors' performance has been carried out. Therefore, it is difficult to make any statements about the relative performance of men and women within the existing water monitors. However, during brief inspections at nine of the thirteen standposts in the project area during the field investigation, only four were in satisfactory condition. Three of these four had male water monitors. In fact, all three standposts visited that had men as caretakers were in good condition, with all taps and valves in working order. This sample size is certainly too small to make the conclusion that men are better caretakers than women, but it certainly shows that men may make good standpost caretakers in Sambizanga. Therefore, it appears that both men and women could be recruited as standpost caretakers in Sambizanga. There do not appear to be any major obstacles to women's participation as caretakers. And, based on experience thus far, both men and women are likely to be able to be effective in the position of water monitor (caretaker).

4.4 Existing Capacity of the SCWP

The previous section (section 4.3) discussed the potential involvement of the key stakeholders in a standpost management system without discussing the potential involvement of the SCWP and the programme staff. This section reviews the capacity of different aspects of the SCWP and comments on how the SCWP could improve its involvement in the management of public standposts, both the ones it has already constructed and the ones it is planning to construct in the next eighteen months.

4.4.1 Technical Team

The technical team of the SCWP has demonstrated the ability to design, construct and maintain standposts to high quality standards. This is the component of the programme where the greatest capacity exists and where the most success has been achieved. This is also the component of the programme to which the greatest resources have been devoted.

There are, however, areas in which the technical team could improve. The main areas for improvement appear to be:

- introducing a system for monitoring the real costs of constructing and maintaining the standposts, including vehicle operation and material transportation costs;
- introducing an improved tap design; and
- improving their coordination with the community mobilization component of the programme.

As discussed in section 4.1, one of the primary objectives of the SCWP is to develop and demonstrate a model of standpost management (which includes cost recovery to a point covering maintenance costs) which could be replicated in other parts of Luanda. To make any statements

in the future regarding the degree of cost recovery achieved, it is important for the SCWP to have a clear idea of the real costs involved in constructing and maintaining the standposts in the project area. Moreover, without monitoring the real costs of each component of the project, one cannot be sure that the project is, in fact, optimizing its inputs. For example, without knowing how much it costs to make concrete blocks at the project's workshop, one cannot be sure that it would not be more efficient to purchase blocks in the local market.

Calculating the "real" costs of standpost construction and maintenance in Luanda is complicated by such issues as hyper-inflation, fluctuating exchange rates, the sensitivity of the overall costs to transportation costs, and the combination of wage and food-for-work labour being used within the project. However, the desire to demonstrate the project's replicability makes it imperative that sufficient resources are devoted to getting reasonably accurate estimates of these costs. The spreadsheets in appendices C-G provide a basis for estimating these costs.

More detailed recommendations for improving the tap design are given in section 5.1.

During the field study it became quite clear that there is a lack of consistent coordination between the technical team and the activistas, who represent the community mobilization component of the SCWP. This does not seem to be because neither component appreciates the importance of the other's work. In fact, from discussions with the technical team leader, he clearly understands the importance of community mobilization to the success of the programme. The problem seems to a lack of an established system for coordinating the efforts of the two components. The recommendations in section five are designed to provide a basis for improved coordination.

4.4.2 Water Monitors

All of the thirteen standposts that have been constructed in the project area have a registered water monitor. The monitors have, in practice, been selected by the SCWP staff, sometimes by the technical team during the construction phase, and sometimes by one of the activistas after the construction phase is completed. In theory, the duties of the water monitors are:[5]

- clean the standpost before people collect water;
- organize people while water is flowing to ensure that a few people do not monopolize the standpost;
- inform the activistas when any repairs are needed; and
- keep an eye on the standpost to prevent theft and vandalism of taps and valves.

[5] This list was provided by two activistas, Carlos Domingos and Maria Andre Domingos during an interview on June 7, 1994.

For completing these tasks, the monitors are given a monthly food package with a local market value of 1.4 million NKZ (US$ 12).[6]

There has been very little monitoring of the water monitors' performance up to this point. Consequently, it is not possible at this time to give an accurate idea of how well each of the monitors is performing the above list of duties. This is unfortunate, because within the current group of monitors there is a good mixture of men and women, as well as young, old, literate and illiterate people. Better monitoring of the monitors' performance in the future will provide some good information in how factors such as gender, age and literacy affect the performance of the water monitors.

What is clear about the existing water monitors is that they have very little accountability to the standpost users. While they have some accountability to Development Workshop, through the monitoring (albeit limited) being done by the activistas, the water monitors are not being held accountable by people in the community. In fact, many people interviewed in the vicinity of the standpost during the field work did not know who the water monitor was, or even that there was such a person. It is vitally important to develop some mechanisms to build some accountability between the water monitors and the standpipe users as soon as possible.

4.4.3 Community Development Workers (Activistas)

The activistas represent the community development or "software" component of the SCWP. There are three activistas that, in theory, are supposed to be working full time of the SCWP. Their duties are:[7]

- completion and submission of work orders to the technical team as standpost maintenance is required;
- presentations on water-related issues at the health centre in Ngola Kiluanje;
- weekly meetings with each water monitor (inspections of each standpost); and
- mobilization of residents to participate in the construction and maintenance of the standposts.

From the field investigations it is clear that the three activistas are not performing these duties adequately. Part of the problem appears to be that their job descriptions contain too many duties in addition to their duties for the SCWP. In practice, it appears that the three activistas spend, at most, two days per week working specifically on duties related to the SCWP. The remainder

[6] Based on market estimates on June 20, 1994.

[7] Extracted from written job descriptions, as well as interviews with two activistas, Carlos Domingos and Maria Andre Domingos on June 7, 1994.

of their time is spent on the health and education programme of Project Sambizanga. Clearly, achieving the objectives of the community development component of the SCWP requires more than six person days per week.

The second main difficulty with the role of the activistas within the SCWP is that the specific tasks involved in the "mobilization of residents to participate in the construction and maintenance of the standposts" are inadequately defined. The activistas themselves appear to have only a vague idea of how this might be accomplished, and understandably, they have rather concentrated on tasks which are more easily defined (eg. house-to-house visits for the health programme during which short survey forms are completed).

The third problem appears to be inadequate support, supervision and monitoring of the activities of the activistas. Although each activista receives a monthly food package with a local market value of about 3.8 million NKZ (US$ 32)[8], the activistas are considered volunteers. As volunteers the activistas appear to have made a very significant contribution to mobilizing public interest and support for the SCWP. In fact, they appear to have been instrumental to the success that the programme has achieved thus far. However, the activistas' volunteer status also makes it difficult to hold them accountable for achieving objectives. It appears that creating some full-time, salaried positions within the community development sector of the programme would compliment the work of the volunteer activistas. Section 5 provides more details on possible job descriptions for these new positions.

5. Implementing Cost Recovery and Water System Management in Sambizanga

The following sections provide recommendations for implementing a cost recovery and standpost management system as part of the SCWP. The recommendations are based on the lessons extracted form the literature (see section 3) as well as the field investigations in Luanda (see section 4).

5.1 Recommended Technological Changes

According to the project's technical team leader, over 80 per cent of the maintenance requests at the standposts are related to the taps. The taps themselves are locally made and cost about US$ 2 each. However, the transportation and labour costs of replacing a tap make these repairs quite expensive. Clearly, an alternate tap arrangement which is more robust needs to be found.

One viable solution is to replace the taps with a robust valve similar to the one used as the main isolation valve on some of the standposts. The following table compares the costs of the two alternatives.

[8] Based on market estimates on June 20, 1994.

Table 1: Comparison of Two Alternative Tap Arrangements[9]

Existing Tap Arrangement		Proposed New Arrangement Using Isolation Valve	
Cost of Replacement:		Cost of Replacement:	
Materials	US$ 5.36	Materials	US$ 10.02
Labour	10.19	Labour	10.19
Transportation	15.00	Transportation	15.00
Total	30.55	Total	35.21
From past experience the existing taps need replacement every 2 months (6 times per year), for an annual cost of US$ 183.30		It is estimated that the valve will likely require replacement once per year for an annual cost of US$ 35.21	

5.2 Recommended User Payment System

When considering the cost recovery options for the SCWP it is sensible to consider the standposts in two separate categories: those already constructed, and those to be constructed in the future. The main reason for doing this is that all but one of the standposts already constructed have been built on public land. As discussed in sections 4.2 and 4.3, this virtually eliminates the commercial options, since selling water for profit from *public* standposts was considered unacceptable by most of the people interviewed. However, the commercial options appear feasible at the standposts not yet constructed, provided they are constructed on private land.

5.2.1 Standposts Already Constructed on Public Land

Referring back to the summary table in section 3.5, there are four potential cost recovery options once the commercial options are eliminated: voluntary funds, unmetered flat rates, unmetered graded rates, and metered rates. Based on the field investigations, it is fairly clear that voluntary funds are not likely to be successful in the peri-urban environment of Sambizanga; it is unlikely that sufficient social pressure could be exerted to persuade all standpost users to contribute voluntarily.

The remaining three options, which all involve mandatory user fees, are listed in order of increasing complexity, with unmetered flat rates being the simplest option, unmetered graded rates being the next simplest, and metered rates being the most complex. All of these options are also well suited to community management, provided that the level of complexity does not

[9] More detailed estimates of standpost maintenance costs are given in appendix F.

exceed the community's management capacity. Unmetered flat rates appear to be the most suitable option for the standposts in Sambizanga for three reasons: a) because it is the simplest option, it is the easiest to explain to standpost users who are not already used to a user fee system; b) at the moment, community-management of standposts is a new concept in Sambizanga and there are no appropriate *existing* organizations to assume a management role; and c) the disadvantage usually associated with flat rates, that they force low income households to pay a greater proportion of their income for water, does not appear to be a major factor in Sambizanga because existing water rates are already so high. In fact, during discussions with residents many people stated that the amount of the monthly fee was not a critical factor compared to the reliability of the water supply and financial accountability for the water monitor.

Selecting a Cost Recovery Option for Standposts on Public Land

Voluntary funds	• Most people interviewed agree that in the peri-urban environment of Sambizanga, it is too difficult to identify all users to facilitate the collection of voluntary funds.
Unmetered flat rates	**• Being the simplest of the rating options, it is well suited for communities without an *existing* organization to assume a management role.** **• The potential disadvantage of forcing poor households to pay a greater % of their income is not really an issue where people are already paying so much for water.**
Unmetered graded rates	• Too complex to be implemented at the moment. • No real added benefit over flat rates since the amount of the rate is not the critical issue, even for poor families.
Commercial options	• Considered inappropriate for standposts on public land.

Monthly Fee

Having decided on a flat rate system, it is recommended that the flat rate be charged monthly since this strikes a reasonable balance between: a) limiting the administrative work involved with collecting the fees; and b) collecting fees frequently enough to limit the impact of high inflation.[10] The actual amount to be charged each month should depend on the cost of maintaining the standpost and the number of users at each standpost. However, instead of

[10] Inflation was roughly 30 per cent for the month of June 1994.

calculating a separate fee for every standpost, for administrative simplicity it is recommended that a uniform fee be charged at all standposts. Later, as local administrative capacity increases, different rates for each standpost may be introduced.

Based on the calculations in Table 2, a flat fee of 50,000 NKZ (US$ 0.42) is recommended. This will cover 100 per cent of the predicted costs of maintaining a public standpost it there are at least 103 users. A higher rate, to achieve 100 per cent cost recovery (of maintenance costs) at standposts with fewer than 103 users, is not recommended at this time because the maintenance costs are higher now than they will be in the future, once the DW technical team is able to hand over the majority of the maintenance tasks to local tradespeople (see section 4.3.2).

Table 2: Calculations for the Monthly Fee

Predicted monthly cost of maintaining a standpost (see appendix F for details)	5.2 million NKZ		US$ 4.80	
Number of users	103	90	75	60
Percent cost recovery assuming 50,000 NKZ per month	100	87	73	58

As discussed in section 4.2.1, Sambizanga residents are very suspicious that their user fees, if controlled directly by the water monitor, will not be used only for the maintenance of the standpost. Therefore, for an initial period after the user fees are introduced, the water monitor should submit the fees collected to DW (to one of the water mobilizers). DW should control all funds and pay the water monitors a monthly salary. Eventually, as trust is established between the water monitor and the standpost users, the fees can be controlled either by the water monitor or another local water committee.

Benefits to Standpost Users

The monthly user fee of 50,000 NKZ represents about 60 L of water purchased from existing private water vendors. Therefore, for the residents to receive a net benefit from the standpost, they must be able to collect more than 60 L of water each month. Based on calculations in Table 3, this represents approximately 1.3 days of water flow per month (assuming 90 users). It is recommended, at least while the user fee system is being introduced, that DW provide some sort of guarantee to users that they can expect at least two days of water per month, or their monthly fee will be rolled over to the following month.

The other issue which must be considered when calculating the net benefits to standpost users, is the time involved in collecting water at the standpost. Line-ups at the private water vendors are generally quite short (less than 30 minutes). The line-ups at the public standposts are likely to be considerably longer (perhaps up to 4 hours). Therefore, the cost of water must be significantly lower at the standposts. This probably means that users should, in fact, be guaranteed a minimum of three days of water per month from the standpost.

Table 3: Calculations for Benefits to Standpost Users
(assuming flow rate = 10 L/min, 7 hours/day)

Number of days per month	1	2	4	8
Total litres produced	4200	8400	16800	33600
Litres per user per month (assuming 90 users)	46	93	187	374
Litres per user per month (assuming 75 users)	61	112	224	448

Card Identification System

As discussed in section 4.2, most people interviewed during the field study supported the idea of introducing a card identification system for standpost users. The sample card, shown below, includes a place for the water monitor to endorse the card on a monthly basis as the user fees are paid. All users should be required to carry valid cards in order to collect water from the standpost. While it is probably not necessary for the water monitor to check all users' cards each time they collect water, random checks should be made often enough to encourage people to pay their monthly fees.

FRONT

Cartao No._____

CARTAO DA MANUTENCAO DO CHAFARIZ

Chafariz No._____

Nome da Familia: _____

Monitor da Agua: _____

BACK

Jan	Feb	Mar	Apr
May	Jun	Jul	Aug
Sep	Oct	Nov	Dec

5.2.2 Standposts to be Constructed in the Future

There are more cost recovery options possible for the standposts yet to be constructed, since the choice is still open as to whether to build them on pubic or private land. However, since cost recovery is to be introduced at the existing standposts first, it is recommended that the decision

on which cost recovery option to implement at the new (yet unconstructed) standposts be delayed until initial feedback is available on experience with introducing the flat monthly rate system.

The most important point to be made here is that even if one of the commercial options is selected for implementation at the new standposts, some form of community mobilization will still be required; the community will still have to monitor the prices charged by the vendors. Therefore, all experience gained during the implementation of the flat rate system at the existing standposts will provide valuable information on community mobilization strategies for the new standposts. In other words, any investments made in community mobilization at the existing standposts will not be wasted, regardless of which cost recovery option is selected for implementation at the new standposts.

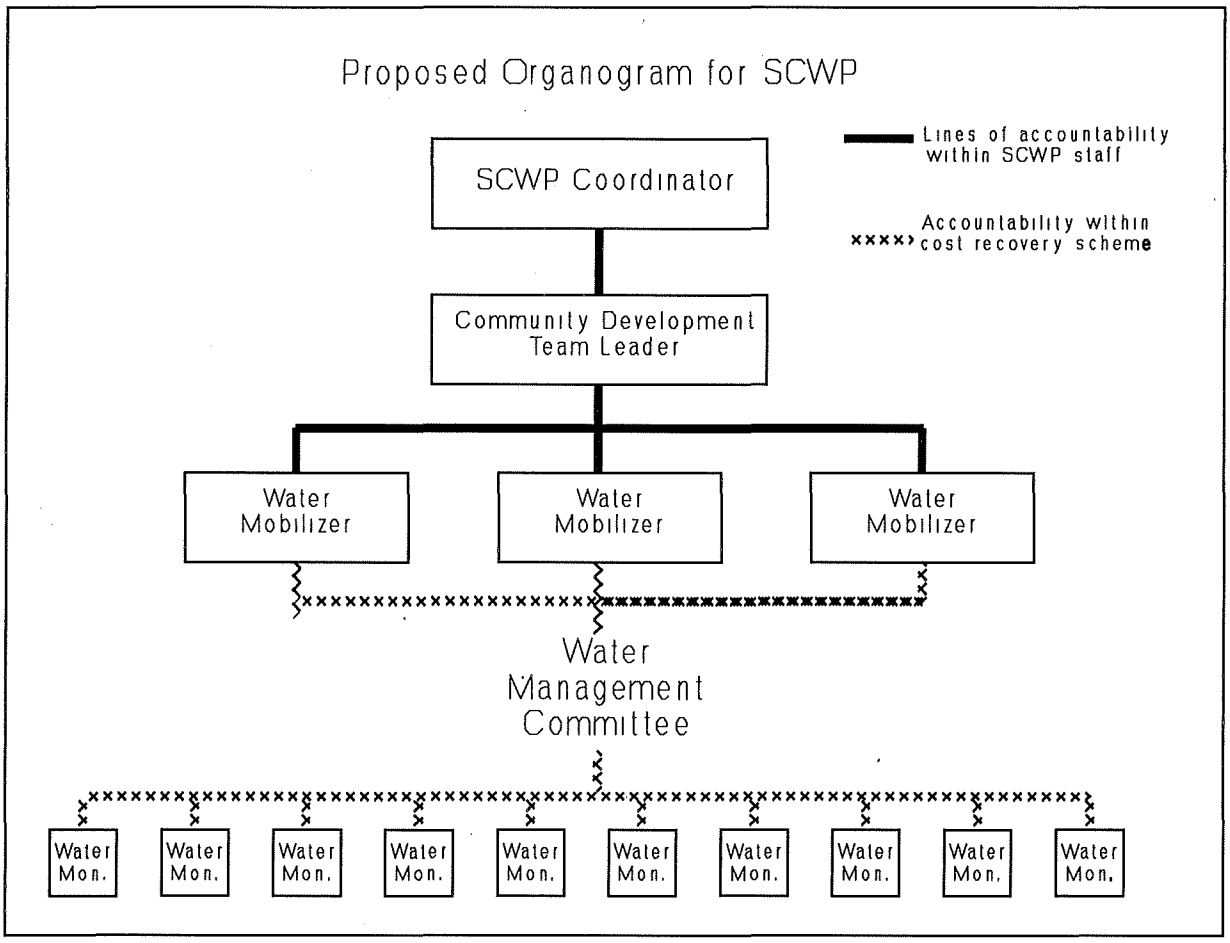
It is also recommended that for the new standposts, the community mobilization process should be well on its way before the standpost construction begins. Ideally, a water monitor and/or water committee should be elected, and a cost recovery scheme clearly agreed upon before construction begins. See section 5.7 for more details on initiating the cost recovery system.

5.3 Organization Structure

The existing organizational structure of the water project has the potential to fulfil all the tasks required for implementing the recommended cost recovery option with only minor modifications. In practice, however, it is unclear whether the current personnel will be able to make the structure work effectively. The organization structure presented here is based partly on the principle that it is usually more desirable to modify the existing structure than to introduce a completely new one.

Clearly the activities of the current personnel will have to change significantly from what they are doing at present. Therefore, it is recommended that the new job descriptions presented here be clearly explained to the activistas currently working on the water project and that they be given an opportunity to apply for the new positions along with other applicants.

The following sections describe each of the positions outlined in the organogram below.



5.3.1 Water Monitors

As mentioned in section 4.4.2, while the capacity of the existing water monitors varies considerably, in general they appear to have the capacity to perform many of the community mobilization tasks required at the standposts. It is important to use this capacity to its full potential and the monitors should be given as many tasks and as much responsibility as possible. The following is a recommended list of tasks to be performed by the water monitors[11]:

1. Record when water flows as the standpost.

2. Make daily inspection of standpost and supply pipe.

3. Make random checks that users cards are valid when water is collected.

[11] A full job description with performance indicators is given in appendix J.

4. Open taps at the beginning of the day when water is supposed to flow and close again at night.

5. Clean standpost when water starts to flow.

6. Clear drain on a weekly basis.

7. Collect payments from users at the beginning of the month.

8. Hold a monthly community meeting at the standpost.

9. Publicize the monthly community meetings when the water is flowing.

10. Attend monthly meeting of all water monitors.

11. Make a presentation at the monthly meeting regarding water treatment and storage.

12. Report clandestine connections to the local coordinator the day they are discovered.

Some of the tasks listed here clearly require the monitors to have basic literacy and numeracy skills. Most of the water monitors interviewed already possess these skills. Special allowances will have to be made for the existing monitors that do not have these skills, but for the future selection of water monitors, it is recommended that these skills be a prerequisite.

It is improbable that most of the monitors will be able to complete all of the listed tasks without considerable support in the early stages from the water mobilizers. However, the monitors should be able to perform these tasks independently in the long term.

As described in section 4.4.2, the existing water monitors have all been selected by SCWP staff. At the standposts constructed in the future, it is recommended that the water monitors are elected by the standpost users at public meetings.

5.3.2 Water Mobilizers

It is recommended that the water mobilizers be assigned to work full-time on the SCWP. The existing activistas working on the programme appear to be, in practice, spending approximately one day a week on tasks associated with the water programme. This is clearly insufficient time to perform the tasks required. The recommended tasks for the water mobilizers are[12]:

1. Prepare weekly work plans for approval.

[12] A full job description with performance indicators is given in appendix K.

2. Conduct weekly inspections of standposts.

3. Prepare a monthly monitoring report for each standpost.

4. Provide training support to water point monitors as required to help them keep their log books up to date.

5. Organize and attend a monthly community meeting at each standpost (each mobilizer 4-5 standposts per month).

6. Facilitate a monthly meeting of water monitors (each mobilizer once every 3 months).

7. Record minutes for monthly meeting of water point monitors (each mobilizer once every three months).

8. Participate in the weekly water project meeting.

9. Provide the standpost technical team with work orders at the weekly project meeting.

These tasks are to be carried out at standposts where initial community mobilization has already been done. In addition to these tasks the mobilizers will also be required to:

10. Organize and facilitate "community mobilization" meetings, during which the cost recovery and management system will be introduced to the community. This will include making contact with all households who are likely to use the standpost to inform them about the meeting, as well as making arrangements for the theatre group to make a presentation.

At this point in the project cycle, this last task will, in fact, demand the majority of the mobilizers' time. The community mobilization meeting is described in more detail in section 5.7.1.

The main skills required by the water mobilizers are: the ability to make public presentations, the ability to facilitate meetings, and the ability to organize a weekly work plan. All of these skills appear to be those that are presently being encouraged amongst the activistas, so it should be possible to find suitable candidates. However, effort should also be made to ensure that the successful applicants also possess maturity and a sense of responsibility.

From the field work, it is clear that Saturday is the most appropriate day for holding community meetings. Many people are away at work during the week and many people attend church on Sunday. It should also be made clear to the candidates for the water mobilizer positions that they will be expected to work a full day on Saturday (every Saturday). One alternate day-off during the week should be arranged.

Table 4: Weekly Work Plan for Water Mobilizers

Sunday	Off
Monday	Off
Tuesday	8:30 Meeting with community development supervisor to review weekly workplans. Weekly standpost inspections.
Wednesday	9:30 Weekly project meeting. Contingency time.
Thursday	Organizing community mobilization meeting at one standpost (eg. house-to-house visits, contacting churches, coordinators etc.)
Friday	Organizing community mobilization meeting at one standpost (eg. house-to-house visits, contacting churches, coordinators etc.)
Saturday	Attend 3 community mobilization meetings (eg. 9:00, 10:30, 2:00). All three mobilizers to attend together (one records minutes, one makes presentation). Attend 1 monthly community standpost meeting. Each mobilizer attends separate meeting.

5.3.3 Community Development Team Leader

As described in section 4.4.1, the SCWP is suffering from a lack of coordination between the technical and community development components of the programme. One of the main reasons for this lack of communication appears to be that the community mobilization team lacks consistent leadership. While there is an existing staff member supervising the activistas, her duties include supervision for all the other community development components of Project Sambizanga. She has not been able to provide enough direct supervision of, and support to, the activistas working on the SCWP. Therefore, one of the key recommendations in this report is that a full-time community development team leader be hired specifically for the SCWP.

The new team leader will initially have to spend the majority of her time introducing the cost recovery system at standposts. This will involve organizing and facilitating community meetings, making presentations to standpost users and training the water mobilizers. As the system becomes operational at more standposts, the time requirements will shift to monitoring and supporting the water mobilizers. The recommended tasks for the community development team leader are:[13]

[13] A full job description is given in appendix L.

1. Help mobilizers prepare work plans at the beginning of each week.

2. Accompany one mobilizer each week during their weekly inspections of standposts.

3. Approve the water mobilizers' monthly monitoring reports for each standpost.

4. Help the mobilizers organize and facilitate "community mobilization" meetings, during which the cost recovery and management system will be introduced to the community.

5. Attend one (1) monthly community standpost meeting each week.

6. Collect all money collected by mobilizers each week.

7. Prepare a weekly financial statement.

8. Prepare a monthly financial statement summarizing accounts for each standpost.

9. Certify the financial report on each monthly standpost report prepared by the mobilizers.

10. Provide funds to technical team as requested (at the weekly project meeting).

11. Attend the monthly meeting of water point monitors.

12. Facilitate the weekly water project meeting.

13. Prepare a monthly report summarizing all mobilization activities.

5.4 Promoting Women's Involvement

It was stated in section 4.3.4 that there do not appear to be any major barriers to women's participation as water monitors within the proposed cost recovery system, other than the fact that most positions of authority in Angola have traditionally been held by men. Therefore, although it is possible for women to perform the tasks required of a water monitor, they are less likely to elected than men. The project can attempt to decrease this attitudinal barrier for women by consciously promoting the idea of women as water monitors in the material prepared for public presentations, and in the language used to describe water monitors. Using women in theatre performances in the role of water monitor, referring to water monitors as she instead of he, and using women in all pictures of water monitors, are all possible strategies for promoting the idea of women being water monitors.

Another strategy is to monitor the performance of existing water monitors (69 per cent of which are women) and publicize the success of the women who perform well. It appears that people

(particularly men) will need to be talked into the idea that women can perform the duties of a water monitor successfully, and successful examples can make a strong impact.

5.5 Monitoring and Reporting

From the discussions with programme staff in Luanda, it is clear that the importance of effective project implementation is understood. Without an appropriate implementation plan even the best cost recovery scheme is likely to fail. Monitoring and reporting plans are essential to effective project implementation since they help pinpoint problems requiring action. The monitoring and reporting plans presented here will ensure that unforeseen difficulties are identified and corrected quickly and efficiently.

The challenge in designing an appropriate monitoring plan is developing a reporting system to collect sufficiently detailed information without over-taxing management personnel with endless reports to write. It will be necessary to review the reporting system after an initial trial period to determine if an appropriate balance has been found between the amount of information being collected and the time required to collect the information. In short, it will be necessary to review if the time spent preparing reports is justified.

At this time, it is recommended that the following reports are prepared:

- log books maintained by each water monitor;
- weekly inspection forms for each standpost (by the water mobilizers);
- monthly report sheets for each standpost (by the water mobilizers); and
- a monthly community mobilization report (by the community development team leader).

Table 5: Summary of Reports to be Prepared

Report	Written by Whom	Reviewed by Whom
Log book for each standpost	Water monitor (with assistance from mobilizer)	Water mobilizer
Weekly inspection sheet for each standpost	Water mobilizer	Community development team leader
Monthly report for each standpost	Water mobilizer	Community development team leader
Monthly community mobilization report	Community development team leader	Project Sambizanga Committee

To simplify the system, the weekly inspection forms to be completed by the mobilizers have been designed as part of the monthly report sheets. The reporting system is summarized in Table 5. Examples of the reports listed are included in the appendices.

5.5.1 Standpost Log Book

The standpost log book contains the basic information for each standpost. Although they will not be submitted to anyone, it is important that the log books be kept up to date and well organized since they will be extremely useful to the mobilizers in completing their monthly reports, and can be presented for inspection by standpost users at monthly community meetings.

The log book should contain a list of all families that use the standpost, as well as a record of which families have paid their monthly user fee. The log book should also contain a record of how much, when and for how long water flows at the standpost. It is estimated that the water monitor will have to spend about ten hours each month maintaining the log book. A sample of what the log book might look like is given in appendix H.

5.5.2 Weekly Standpost Inspection Sheet

The weekly standpost inspection sheet should be completed by the water mobilizers for each standpost during their weekly inspections. The sheet is similar to one already being used by the activistas and records the physical condition of the standpost as found by the mobilizer. The components inspected should include: the tap(s), the grille on the drain, the drain pipe, the inspection box cover, the fossa cover, and the plastering on the standpost. The cleanliness of the standpost should also be checked.

The weekly inspection sheets have been incorporated in the monthly standpost report, a sample of which is given in appendix I.

5.5.3 Monthly Standpost Report

A monthly standpost report should be completed for each standpost. It should contain the following information:

- the physical condition of the standpost;
- whether the standpost users are satisfied with the water monitor's performance;
- the number of people in attendance at the monthly standpost meeting;

- the nature and quality of the presentation given by the water monitor at the monthly standpost meeting;
- the number of days of water flow during the month;
- the total amount of water supplied by the standpost during the month;
- the number of families currently registered as standpost users; and
- the current financial situation of the standpost, including how much money was collected during the month.

A sample monthly standpost report is given in appendix I.

The standpost report should be designed to act as a guide to the water mobilizers on what they should be doing on a day-to-day basis. In other words, completion of all their monthly standpost reports should, in itself, be an indication that the mobilizers are completing the majority of their tasks. The community development team leader should review each of the standpost reports, together with each mobilizer, on a monthly basis.

5.6 Building Accountability to Standpost Users

One of the most critical elements of implementing a successful cost recovery system is ensuring that the water monitors are accountable to the standpost users. Once DW's involvement in the SCWP comes to and end, the only people who can ensure that the water monitor is performing her duties are the people who pay her salary - the local standpost users. One strategy for encouraging this accountability is to make the duties and actions of the water monitor as transparent as possible to the community. This can be achieved by:

- ensuring that the standpost log book is kept up-to-date and that it is open for inspection by all standpost users;
- requiring the water monitor to hold a monthly public meeting during which complaints of standpost users can be discussed;
- establishing a protocol for replacing the water monitor if she is not performing her duties adequately; and
- requiring the water monitor to stand for re-election periodically (perhaps every two years).

5.7 Initiating the Cost Recovery System

The majority of the recommendations made thus far have dealt with what the cost recovery system should look like once it is up and running. The next three sections provide some recommendations on initiating the cost recovery system.

5.7.1 Community Mobilization Meetings

Initiating the cost recovery system will require a series of meetings with local residents at each of the standposts. From the field study it appears that most local residents know very little about the SCWP, despite the fact that the project has built a standpost in their neighbourhood. Therefore, these meetings should start from the premise that the SCWP is completely new to the area. The meetings should cover the following items:

- background to the project with particular focus on the fact that Development Workshop and the SCWP are not part of the state structure;
- that the SCWP will come to an end in eighteen months, and noone other than the users themselves is likely to take responsibility for maintaining the standpost;
- that DW will provide assistance with initiating a maintenance system;
- a detailed explanation of the cost recovery scheme;
- a detailed explanation of the duties of a water monitor (including the fact that women can perform these duties); and
- election of a water monitor and/or water committee.

One should not expect to be able to cover all of these items in a single meeting. It is recommended that the election of the water monitor not be held until at least the second, and preferably the third meeting.

5.7.2 Using Theatre Productions

During the field study, a local theatre group (made up primarily of activistas from Project Sambizanga) was asked to develop a short theatre piece that could be performed in conjunction with the community mobilization meetings. Only one performance was given during the field study, but initial indications are that theatre could be a very powerful mobilization tool in Sambizanga. The SCWP should follow up on the initial experiment with the theatre group and develop a play that could be performed at every standpost. Performing the play at the first

community mobilization meeting would be a very good way to raise the profile of the SCWP, and to introduce the concepts of community standpost management and cost recovery.

5.7.3 Coordination with Project Sambizanga's Community Health Programme

As part of the community health component of Project Sambizanga, DW has developed a successful system of house-to-house visits using the activistas. These visits could be used to introduce the SCWP in areas where standposts have not yet been constructed. The activistas, during their house-to-house visits, could distribute printed information regarding public standposts and inform people about upcoming community meetings without significantly altering their programme for the community health sector.

To maximize the impact of these visits for the SCWP, they would have to be conducted shortly before the first community mobilization meeting in that area. This will require careful planning and coordination between the SCWP and the community health component of Project Sambizanga.

6. Summary of Recommendations

Recommendation	For details see section:
1. Unmetered flat rates appear to be the most suitable option for the standposts in Sambizanga.	5.2.1
2. The flat rate should be charged monthly.	5.2.1
3. Instead of calculating a separate fee for every standpost, charge a uniform fee at all standposts.	5.2.1
4. A flat fee of 50,000 NKZ (US$ 12) is recommended.	5.2.1
5. DW should control all funds and pay the water monitors a monthly salary until trust is established between the water monitor and the standpost users.	5.2.1
6. While the user fee system is being introduced, DW should provide some sort of guarantee to users that they can expect at least three days of water per month, or their monthly fee will be rolled over to the following month.	5.2.1
7. Introduce a card identification system for standpost users.	5.2.1
8. Random checks should be made often enough to encourage people to pay their monthly fees.	5.2.1
9. Delay the decision on which cost recovery option to implement at the new (yet unconstructed) standposts until initial feedback on experience with the flat monthly rate system is available.	5.2.2
10. At the new standposts, the community mobilization process should be well on its way before the standpost construction begins.	5.2.2
11. At the new standposts, the water monitors should be elected by the standpost users at public meetings.	5.2.2
12. Literacy and numeracy skills should be promoted as a prerequisite for new water monitors.	5.3.1

Recommendation	For details see section:
13. Require the water monitor to hold a monthly public meeting during which complaints of standpost users can be discussed.	5.3.1
14. Establish a protocol for replacing the water monitor if she is not performing her duties adequately.	5.3.1
15. Require the water monitor to stand for re-election periodically (perhaps every two years).	5.3.1
16. Create at least four full-time, salaried positions for the community development component of the programme (water mobilizers).	4.4.3 and 5.3.2
17. Make it clear to the candidates for the water mobilizer positions that they will be expected to work a full day on Saturday (every Saturday).	5.3.2
18. Hire a full-time community development team leader for the SCWP.	5.3.3
19. Promote the idea of women as water monitors by using women in theatre performances in the role of water monitor, referring to water monitors as she instead of he, and using women in all pictures of water monitors.	5.4
20. Monitor the performance of existing water monitors (69 per cent of which are women) and publicize the success of the women who perform well.	5.4
21. It is recommended that the following reports are prepared: log books maintained by each water monitor; weekly inspection forms for each standpost (by the water mobilizers); monthly report sheets for each standpost (by the water mobilizers); and a monthly community mobilization report (by the community development team leader).	5.5
22. Initiating the cost recovery system should be done through a series of meetings with local residents at each of the standposts (community mobilization meetings).	5.7.1
23. The election of the water monitor should not be held until at least the second and preferably the third meeting.	5.7.1

Recommendation	For details see section:
24. Follow up on the initial experiment with the theatre group and develop a play that could be performed at every standpost.	5.7.2
25. Use the activistas' house-to-house visits (of the community health component) to introduce the SCWP in areas where standposts have not yet been constructed.	5.7.3
26. Standpost users need to be convinced that it is their responsibility to watch for clandestine connections.	4.3.1
27. Develop a protocol for informing EPAL about clandestine connections as soon as they are made.	4.3.1
28. Establish a regular system for lobbying EPAL for improved water supply to public standposts.	4.3.1
29. Develop a system for monitoring the real costs of constructing and maintaining the standposts.	4.4.1 and App. C-G
30. Replace the taps with a robust valve similar to the one used as the main isolation valve on some of the standposts.	5.1
31. Improve the coordination between the technical and community development components of the programme.	4.4.1
32. Introduce an improved system for monitoring the water monitors' performance to develop a database on the importance of criteria such as gender, age and literacy.	4.4.2

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APPENDIX A - TERMS OF REFERENCE

Executing Agency: Development Workshop

Project: Sambizanga Community Water and Sanitation Project

Location: Luanda, Angola

Date: June 1994

Time Frame: 6 weeks

Consultant Qualifications: Water Engineer or Public Health Professional with overseas experience in peri-urban or rural development programmes. Good research and writing skills are essential. Sensitive to gender issues related to water and community development.

Summary: The Development Workshop wishes to employ a consultant to assist their Angola based team and local programme partners to develop a strategy to ensure the sustainability of investments made in their water upgrading programme in Sambizanga.

Background: About 80% of Luanda's 2,750,000 people live in poorly serviced bairro neighbourhoods called "Musseques". Luanda has experienced a large influx of population into Musseque bairros due to fighting in provincial areas, further adding a strain on the limited water and sanitation services. Densities in some bairros have reached from 500 to 1000 people per hectare. Lack of services and overcrowding has lead to a high incidence of environmentally related disease.

The Problem: Development Workshop has developed a community based water programme as a key component in their peri-urban upgrading programme in Sambizanga Municipality. Water is articulated by almost every Musseque householder as the number one priority problem. Due to geologic factors no ground water is available in the Luanda area, and all water available to the city is from surface sources, namely the Rivers Bengo and Kwanza. The pumping and treatment installations for the city of Luanda were built during the pre-independence years to serve a population of about 250,000 - 400,000. These facilities have not been extended or upgraded for about 20 years. Maintenance of this equipment and the distribution network has been minimal and much of the original system works below its original capacity.

While the original water system principally serviced the "Urbanized" or formal sector of the city, there existed in 1976 a network of about 600 standposts serving Musseque populations of about 250,000 in the informal sector. Due to poor maintenance, lowering pressure and illegal connections only about 30 standposts exist today. The Musseque population at the same time has grown to well over 2 million people.

Most water used in the peri-urban areas today is sold by private water dealers who in turn buy from tanker trucks who draw water from the Bengo river. Despite water chlorination posts set up on the roads into Luanda by the Ministry of Health and MSF(Belgium) much of the water reaches Luanda untreated carrying with it cholera and diarrhoeal diseases.

As part of the Sambizanga project DW has undertaken a programme of upgrading access to potable drinking water within the pilot project area of the Comuna (urban district) of Ngola Kiluanje with a population of over 100,000. The water project consists of two components, the rehabilitation of an existing network including construction of new standposts on this system and secondly the construction of a new network in a previously unserviced area.

The project to date has built approximately 20 standposts on the old network and is nearing completion of the basic engineering work on the new system but has not yet started the construction of standposts or distribution lines. The community development programme linked to the project fields 70 community development workers "Activistas" within the pilot zone and a small group of them form the nucleus of a Community Water Committee. Each of the standposts completed has a water monitor who is responsible for cleaning and maintenance of the water point. The Sambizanga Project technical team is responsible for standpost installation, working in conjunction with volunteers from the community who assist with labour. The technical team remains on call to assist with repairs that the monitors can not resolve themselves. A check list system has been developed to monitor maintenance problems on a weekly and monthly basis. The Activistas of the Water Committee provide a focal point for all water activities and link the technical and the community aspects of the programme.

Justification: The state water company has allowed hundreds of public waterposts to deteriorate and fall into disuse from lack of maintenance. The weakness and lack of capacity of state structures suggests to DW that a community based management model will be the most sustainable. DW has gained valuable experience in the implementation of the community water project to date but is concerned that significant work must still be done before the present project can be considered to be community managed and sustainable. DW wishes to employ a consultant to review the experience gained to date on the project, analyses the objective
factors which influence the choice or design on a water management system, consider options or organizational models and make systems-design recommendations after consideration of the above factors.

Objectives:

1) To document and assess experience gained in other similar projects in other countries for lessons which may be appropriate or adapted to the Sambizanga Project.

2) To assess the work of the Sambizanga Community Water programme to date in terms of potentials, limiting factors and experience gained which may be appropriate to the development of a management system.

3) Options are to be considered in relation to strategies including; state or local government management, private sector participation and community participation and combinations of these.

4) Develop a sustainable model for community based management and cost recovery for maintenance of the standpost network in Sambizanga which may be replicable in other Peri-Urban Musseques.

5) To involve users (particularly women) and other local partners in the process of the "Model" development, and in the testing or evaluation of the "Model".

Programme Plan:

Phase I (in Canada)

1) The Consultant is to familiarize him/herself with the experience and strategy of the project to date by reading and analysing documents, proposals, study papers and other materials produced by DW related to the peri-urban sector and the project.

2) The Consultant is to analyze the objective factors,(social, technical and economic) relating to community water projects which will influence appropriate design and water systems management in the context of peri-urban Luanda.

3) The Consultant is to do a documentation and resource review with the aim of extracting experiences and lessons which may be appropriate to the peri-urban situation in Luanda. Both successes and failures of case studies are to be noted and information synthesised in a form which can be analyzed for lessons learned and measured against the Angolan context.

4) A report is to be prepared presenting Phase I work including an annotated bibliography.

Programme Phase II (in Luanda)

1) The Consultant is to become familiar with printed documents in DW's documentation centre in Luanda, project files, and other relevant documents such as government plans and policy papers or documents from international organizations (WB, ADB, EEC) for the water and sanitation sector.

2) To visit the project, interview staff, users, activistas, water monitors and programme partners to familiarize him/herself with all aspects of the project.

3) The consultant is to work closely with (a) designated counterpart(s) who will assist the consultant and also participate in the consultancy in order to upgrade experience. The consultant's responsibilities also include the transfer of information and counterpart training.

4) To discuss individually and in groups the project strategy and experience in order to draw out the ideas of the various programme partners which may be usefully applied in meeting the programme objectives.

5) To assess gender factors related to existing collection and use of water to highlight issues which could affect the design of the system.

6) To reassess the results of Phase I research and recommendations based on the field experience.

7) To test the test the hypothesis drawn from 4) using techniques to be developed in the field. (ie micro-pilot experiences using 3 or 4 standposts; workshop seminars; questionnaires etc).

8) To develop a management "model(s)" for implementation and maintenance of a community based water programme based on DW's existing experience and development work of the Consultant, which is appropriate to the conditions of peri-urban Luanda.

9) Design a 6 month programme of monitoring and assessment to test the validity of the proposed "model". Plan follow-up visit.

10) Prepare a detailed report of the above process which can serve as a "working document" on Community Water Programmes in Peri-Urban Luanda.

11) Present the mission results in a seminar for staff and project partners.

Documents to Consult:

1) Bairro Upgrading in Luanda's Musseques, DW/IYSH-Nairobi, 1987

2) Emergency Sanitation for Luanda's Musseques, DW-Luanda, 1989

3) Results of Sanitation and Water Survey, DW-Luanda, 1989

4) Angola: Country Gender Analysis Vol.1, DW-Luanda 1991

5) Proposal for a Community Water Project, DW-Luanda 1991

6) Sambizanga Community Sanitation & Upgrading Project, DW - 1992

7) Project Sambizanga - Annual Reports 1992 & 1993

APPENDIX C - SPREADSHEETS FOR TRANSPORTATION COSTS

See Lotus 1-2-3 spreadsheet TRANSCOS.WK1

APPENDIX D - SPREADSHEET FOR COST OF MATERIALS

See Lotus 1-2-3 spreadsheet MATCOST.WK1

APPENDIX F - SPREADSHEET FOR COSTS OF STANDPOST CONSTRUCTION AND MAINTENANCE

See Lotus 1-2-3 spreadsheet COSTBEN.WK1

APPENDIX G - SPREADSHEET FOR STANDPOST COST/BENEFIT ANALYSIS

See Lotus 1-2-3 spreadsheet COSTBEN.WK1

APPENDIX H - SUGGESTED FORMAT FOR STANDPOST LOG BOOK

(to be maintained by the water monitor)

Standpost Number:

Sector:

Quarter:

Name of Water Monitor:

		Amount Paid (1994/5) (in '000 NKZ)											
Family Name	Card No.	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Number of Families Paid Each Month													
Total Amount Collected Each Month													

Date of Water Flow	No. of Minutes to Fill Standardized Bucket	Starting Time of Water Flow	Finishing Time of Water Flow	Number of Hours of Water Flow

APPENDIX I - MONTHLY STANDPOST REPORT
(to be completed by the water mobilizer for each standpost
with input from a technical staff member)

Name of Mobilizer: _____ Month: _____

Standpost No. _____ Name of Water Monitor: _____

WEEKLY INSPECTION INFORMATION

Component Inspected (O = okay / X = damaged)	Date of Inspection				
Tap(s)					
Grille					
Drain Blocked?					
Standpost Clean?					
Inspection Box Cover					
Fossa Cover					
Plastering					

INFORMATION FROM THE MONTHLY COMMUNITY MEETING

Date of Meeting: Time of Meeting:	Number of People in Attendance Men: Women:

	Opinion of Community (O=done/X=not done)	Presentation Given By Mobilizer
Daily inspections of standpost		Subject:
Checking for validity of cards		Quality (O=good / X=poor):
Opening and closing tap(s) on schedule		Comments:
Cleaning the standpost		

APPENDIX I (page 2)

TECHNICAL INFORMATION

No. of days of water flow this month:	No. of hours of water flow this month:
Average flow rate:	Total amount of water supplied:
Number of litres supplied per family:	

FINANCIAL INFORMATION

Number of Registered Families in Log Book:	
Monthly fee for this month:	
Number of families paid for this month:	% of registered families:
Total NKZ collected:	
Total NKZ per litre of water supplied:	

OTHER INFORMATION

Did the water monitor attend the monitor's meeting this month? YES / NO

Is the standpost log book up to date? YES / NO

Other comments:

APPENDIX J - JOB DESCRIPTION FOR WATER MONITORS

General Responsibilities:

1. Maintain hygienic conditions at the standpost.
2. Do preventative maintenance at the standpost on a regular basis.
3. Make minor repairs to the standpost when required.
4. Monitor the regularity of the water supply from the standpost.
5. Collect sufficient contributions from the standpost users to eliminate the need for contributions by Development Workshop.
6. Reduce vandalism and improper use of the standpost.
7. Prevent new clandestine connections to the standpost supply pipe.

Prerequisites:

1. Basic literacy and numeracy skills are important.
2. Must be well respected within local community.
3. Must be responsible and mature.
4. Must be able to attend a monthly meeting on one Saturday per month at the health centre without assistance with transportation.
5. Must live within 100 metres of the standpost.
6. Must be able to commit enough time to the job to fulfil all of the tasks outlined.

Specific Tasks:

1. Record when water flows as the standpost.
2. Measure and record the flow rate at least once when the water flows.
3. Make daily inspection of standpost and supply pipe.
4. Make random checks that users cards are valid when water is collected.
5. Open taps at the beginning of the day when water is supposed to flow and close again at night.
6. Clean standpost when water starts to flow.
7. Clear drain on a weekly basis.
8. Collect payments from users at the beginning of the month.
9. Hold a monthly community meeting at the standpost.
10. Publicize the monthly community meetings when the water is flowing.
11. Attend monthly meeting of all water point monitors.
12. Make a presentation at the monthly meeting regarding water treatment and storage.
13. Report clandestine connections to the local coordinator and the community water mobilizer the day they are made.
14. Send a letter to EPAL once per month reporting the amount of water flow at the standpost for the month.
15. Appoint someone to perform any of these tasks that cannot be carried out personally because of illness, or other emergencies.

APPENDIX J - JOB DESCRIPTION FOR WATER MONITOR (page 2)

Equipment Supplied:

- wrist watch
- plastic water container (1 litre)
- log book
- pens
- cash box
- 2 valve handles
- long piece of wire for clearing blocked drain

Salary:

The water point monitors are to receive a salary (cash) with no supplementary food package.

Disciplinary Action:

It should be made clear to the monitor that his/her salary at the end of the month depends on whether their tasks were performed adequately. The water mobilizer should summarize the performance of the monitor at the monthly meeting (eg. records up to date, money accounted for, taps turned on, etc.). If any of the tasks have not been performed adequately then one week's salary should be deducted for each item not completed.

It is also vitally important to reinforce at the monthly community meetings that the water monitor is working for the community and not for DW. The role of DW at this point is to help the monitor do his/her job better.

APPENDIX J - JOB DESCRIPTION FOR WATER MONITOR (page 3)

Evaluation Framework:

Tasks	Indicators of Performance	Data Sources
1. Record when water flows as the standpost.	•records kept regularly	•standpost log book
2. Make daily inspection of standpost and supply pipe.	•users believe that daily inspections are done regularly	•opinions of users at monthly standpost meeting
3. Make random checks that users cards are valid when water is collected.	•percentage of local households paid for each month •users believe that checking is being done	•standpost log book •opinions of users at monthly standpost meeting
4. Open taps at the beginning of the day when water is supposed to flow and close again at night	•taps are opened and closed according to the agreed schedule	•informal/periodic inspections by mobilizer •opinions of users at monthly standpost meeting
5. Clean standpost when water starts to flow.	•standpost is clean when water is flowing •users believe that cleaning is being done	•informal/periodic inspections by mobilizer •opinions of users at monthly standpost meeting
6. Clear drain on a weekly basis.	•drain is not blocked	•weekly inspection forms by mobilizer
7. Collect payments from users at the beginning of the month.	•amount of money collected •record of payments is up to date	•monthly financial records •standpost log book
8. Hold a monthly community meeting at the standpost.	•meeting took place	•monthly standpost report
9. Publicize the monthly community meetings when the water is flowing.	•number of people attending the community meeting	•monthly standpost report
10. Attend monthly meeting of all water point monitors.	•number of meetings attended	•monthly standpost report
11. Make a presentation at the monthly meeting regarding water treatment and storage.	•quality of the presentation given	•monthly standpost report •feedback at meeting
12. Report clandestine connections to the local coordinator and the community water mobilizer the day they are made.	•local coordinator informed about clandestine connections	•opinions of coordinators during informal/periodic meetings with mobilizers and technical staff.
13. Send a letter to EPAL each month reporting water flow.	•letter sent	•monthly meeting with EPAL

APPENDIX K - JOB DESCRIPTION FOR COMMUNITY WATER MOBILIZERS

The Sambizanga Community Water Programme is looking for three (3) community water mobilizers help implement the programme. These positions are full-time, salaried positions requiring five (5) full working days per week. These positions are all for a period of 18 months only.

General Responsibilities:

1. Ensure that the water point monitors are performing their tasks adequately.
2. Support the water point monitors in eliminating new clandestine connections to the standpost supply lines.
3. Help water point monitors send a monthly letter to EPAL stating the number of hours water flowed at the standposts.
4. Help water point monitors facilitate monthly community meetings at each standpost.
5. Provide training support to water point monitors as required.
6. Provide the technical team with information on maintenance work required at each standpost.

Prerequisites:

1. Must be able to work a full day on Saturdays (every Saturday).
2. Must be able to work five full days per week.
3. Should have sufficient accounting skills to prepare simple financial statements.
4. Must have very good communication, listening and inter-personal skills.
5. Should have good organization skills.
6. Must have a keen interest in community development work.
7. These positions are open to anyone regardless of whether they live in Sambizanga or not.
8. Will not be able to assume any other responsibilities within Project Sambizanga (eg. house-to-house visits for the health programme, tree planting, etc.).

Specific Tasks:

1. Prepare a work plan at the beginning of each week for approval.
2. Conduct weekly inspections of standposts.
3. Prepare a monthly monitoring report for each standpost.
4. Provide training support to water monitors as is required to help them keep their log books up to date.
5. Organize and attend monthly community meetings at each standpost (one per week for each mobilizer).
6. Facilitate a monthly meeting of water point monitors (each mobilizer once every three months).
7. Record minutes for monthly meeting of water monitors (each mobilizer once every three months).
8. Participate in the weekly water project meeting.
9. Provide the standpost technical team with work orders at the weekly project meeting.

APPENDIX K - JOB DESCRIPTION FOR WATER MOBILIZERS (page 2)

These tasks are to be carried out at standposts where initial community mobilization has already been done. In addition to these tasks the mobilizers will also be required to:

10. Organize and facilitate "community mobilization" meetings, during which the cost recovery and management system will be introduced to the community. This will include making contact with all households who are likely to use the standpost to inform them about the meeting.

Workplan:

1. Approximately one day per week will be spent conducting weekly inspections of 4-5 standposts.
2. Approximately two days per week will be spent making house-to-house visits around a single standpost and visiting local leaders. The purpose of these visits is to organize a community meeting.
3. Each Saturday, all three water mobilizers together will conduct community meetings (3 per week).
4. Each Saturday, all three water mobilizers will separately conduct one (1) community meeting a standpost to update the community on the month's activities.

Equipment Provided:

- bicycle
- wrist watch
- electronic calculator
- clipboard
- stationary supplies as required
- hat
- knap sack

Salary:

APPENDIX K - JOB DESCRIPTION FOR WATER MOBILIZERS (page 3)

Evaluation Framework:

Tasks	Indicators of Performance	Data Sources
1. Prepare weekly work plans for approval.	•work plans are completed and approved	•presentation of work plans at weekly project meetings.
2. Conduct weekly inspections of standposts.	•weekly inspections are completed regularly	•monthly standpost reports
3. Prepare a monthly monitoring report for each standpost.	•monthly reports are completed for each standpost	•monthly standpost reports
4. Provide training support to water point monitors.	•improved capacity of monitors	•log books •monthly standpost reports
5. Facilitate a monthly meeting of water point monitors (bi-monthly).	•number of meetings held •number of monitors attending meetings	•minutes of monthly meetings
6. Record minutes of monthly meeting of water point monitors (bi-monthly).	•quality of the minutes taken	•opinion of the water project coordinator
7. Attend monthly community meetings at each standpost.	•number of meetings attended	•monthly standpost reports
8. Participate in a weekly water project meeting.	•number of meetings attended •quality of participation at meetings	•minutes of meetings •opinion of the water project coordinator
9. Provide the standpost technical team with work orders at the weekly project meeting.	•number of work orders submitted	•technical team data base

Disciplinary Action:

The performance of the water mobilizers will be based on whether the tasks they are responsible for actually get done or not. Each mobilizer's performance will be reviewed on a monthly basis. Salary deductions will be implemented in cases of repeated poor performance.

APPENDIX L - JOB DESCRIPTION FOR COMMUNITY DEVELOPMENT TEAM LEADER

The Sambizanga Community Water Programme is looking for community development team leader to help implement the programme. This position is a full-time, salaried position requiring five (5) full working days per week. This position is for a period of 18 months only. The responsibilities of this position are divided between: initiating community mobilization at standposts, and supporting and supervising the follow-up mobilization.

General Responsibilities:

1. Identify appropriate outreach channels to the communities.
2. Plan and supervise "community mobilization meetings" at standposts.
3. Ensure that the community water mobilizers are performing their tasks adequately.
4. Provide coordination support and training to the community water mobilizers to improve their performance.
5. Handle all money collected from standposts.
6. Prepare weekly and monthly financial statements.
7. Work with local theatre group to prepare effective community mobilization presentations for the programme.
8. Work together with the technical team leader to plan construction schedule and community input during construction of standposts.
9. Provide on-going monitoring of all community development aspects of the programme.

Prerequisites:

1. Must be able to work a full day on Saturdays (every Saturday).
2. Must be able to work five full days per week.
3. Must have sufficient accounting skills to prepare simple financial statements.
4. Must have very good communication and leadership skills.
5. Must have good organization skills.
6. Must have a keen interest in community development work.
7. This position is open to anyone regardless of whether they live in Sambizanga or not.

Specific Tasks:

1. Help mobilizers prepare work plans at the beginning of each week.
2. Accompany one mobilizer each week during their weekly inspections of standposts.
3. Approve the water mobilizers' monthly monitoring reports for each standpost.
4. Help the mobilizers organize and facilitate "community mobilization" meetings, during which the cost recovery and management system will be introduced to the community.
5. Attend one (1) monthly community standpost meeting each week.
6. Collect all money collected by mobilizers each week.
7. Prepare a weekly financial statement.
8. Prepare a monthly financial statement summarizing accounts for each standpost.

9. Certify the financial report on each monthly standpost report prepared by the mobilizers.
10. Provide funds to technical team as requested (at the weekly project meeting).
11. Attend the monthly meeting of water point monitors.
12. Facilitate the weekly water project meeting.
13. Prepare a monthly report summarizing all mobilization activities.

Workplan:

1. Approximately one day per week (probably Tuesday) will be spent accompanying mobilizers on their weekly standpost inspections.
2. One to two days per week will be spent training mobilizers by accompanying them on their house-to-house visits and meetings with community leaders.
3. Each Saturday will be spent attending community mobilization meetings (3 per week).
4. Each Saturday you will likely accompany one mobilizer at his/her monthly standpost meeting.

Equipment Provided:

- vehicle for transportation 2-3 days per week
- safe for keeping money (at Cacuaco)
- stationary supplies as required
- electronic calculator
- 2-way radio

Salary:

Performance Evaluations:

The performance of the community development coordinator will be based on whether the tasks they are responsible for actually get done or not. Performance evaluation meetings will be conducted every three (3) months.

TABLE 1
VEHICLE FINANCIAL ANALYSIS: CARGO TRUCK. 10 TON

A: BASIC CHARACTERISTICS

MAKE, SIZE:	Used Cargo truck. 10 tons (10,000kg.), 6.25 m3 (i.e. 1.6:1 weight to volume ratio). Bed Size: 4.27m (14') * 2.75m (9') = 11.72m2 (126ft.2)	
Expected service life of vehicle:	150000 km	
No. of kilometers per month:	4100 km =	49200 km/year
Predicted length of service:	3.0 years	

B: EXPENDITURES

	US$	YEARS OF USE	ANNUAL VALUE $	HOURS /YEAR	VALUE /HOUR $	%
CAPITAL COSTS						
Purchase Price	30000					
Spare Parts	5000					
Insurance	1000					
Shipping to Luanda	7000					
Other						
	43000	3.0	14104	137.5	8.55	55.3
OPERATING COSTS \1						
Petrol, oil etc			1258		0.76	4.9
Repair, maint.			3400		2.06	13.3
Insurance			4420		2.68	17.3
Other						
			23182		14.05	90.9
+10% overhead			2318		1.40	9.1
TOTALS			25500		15.45	100.0

Sources: For capital costs - Relief & Development Services International Inc. Ottawa, Canada. For operating costs - A.Cain 5/94, as follows: Total annual operating costs for 2 trucks, 2 land-rovers apportioned among vehicles by purchase price of each vehicle as % of total fleet purchase price (Trucks = 34%, Land-rovers = 16% each of total fleet purchase price). Total and apportioned operating costs as follows: Total running costs (petrol, oil etc) $3700 (Trucks = $1258, Land-rovers = $592 each); Repair, maint. $10000 (trucks = $3400, Land-rovers = 1600 each); Insurance $13000 (Trucks = $4420, Land-rovers = $2080 each).

C: AMOUNT OF USE CALCULATIONS

CAPACITY USE	175 Hrs/mth	7 hrs/day	25 days/mth
ACTUAL USE	137.5 Hrs/mth	5.5 hrs/day	25 days/mth
% CAPACITY USE	79%		

OPERATING COST	15 USD/HOUR

TABLE 2
VEHICLE FINANCIAL ANALYSIS: DUMP TRUCK.10 TONS.

A: BASIC CHARACTERISTICS

MAKE, SIZE:	1994 Dump Truck. 10 tons (10,000kg.), 6.25 m3 (i.e. 1.6:1 weight to volume ratio). Bed Size:	
Expected service life of vehicle:	100000 km	
No. of kilometers per month:	1500 km =	18000 km/year
Predicted length of service:	5.6 years	

B: EXPENDITURES

	US$	YEARS OF USE	ANNUAL VALUE $	HOURS /YEAR	VALUE /HOUR $	%
CAPITAL COSTS						
Purchase Price	62000					
Spare Parts	5000					
Insurance	1000					
Shipping to Luanda	7000					
Other						
	75000	5.6	13500	60	18.75	54.4
OPERATING COSTS \1						
Petrol, oil etc			1258		1.75	5.1
Repair, maint.			3400		4.72	13.7
Insurance			4420		6.14	17.8
Other					0.00	
			22578		31.36	90.9
+10% overhead			2258		3.14	9.1
TOTALS			24836		34.49	100.0

Sources: For capital costs - Relief & Development Services International Inc. Ottawa, Canada. For operating costs - A.Cain 5/94, as follows: Total annual operating costs for 2 trucks, 2 land-rovers apportioned among vehicles by purchase price of each vehicle as % of total fleet purchase price (Trucks = 34%, Land-rovers = 16% each of total fleet purchase price). Total and apportioned operating costs as follows: Total running costs (petrol, oil etc) $3700 (Trucks = $1258, Land-rovers = $592 each); Repair, maint. $10000 (trucks = $3400, Land-rovers = 1600 each); Insurance $13000 (Trucks = $4420, Land-rovers = $2080 each).

C: AMOUNT OF USE CALCULATIONS

CAPACITY USE	147 Hrs/mth	7 hrs/day	21 days/mth
ACTUAL USE	60 Hrs/mth	4 hrs/day	15 days/mth
% CAPACITY USE	41%		

OPERATING COST	34 USD/HOUR

STANDPOST MAINTENANCE PATTERNS & COSTS

file: COSTBEN.WK1

(costs in US$)	MONTHS => 1	2	3	4	5	6	7	8	9	10	11	12	ANNUAL TOTAL	% OF TOTAL
Monitor's salary	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	144.00	28.0
Tools & equip.	55.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	110.00	21.4
REPAIRS														
1.Replace Tap												35.22	35.22	6.9
2.ReplaceGrill												57.11	57.11	11.1
3.Replaster												44.81	44.81	8.7
4.Valve Cover												61.41	61.41	11.9
5.Fossa Cover												61.41	61.41	11.9
6.Clear Drain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
													259.95	50.6
													513.95	100.0

A: REPAIR & MAINTENANCE COSTS (assuming US$1 = 120000 NKZ)

1: REPLACE TAP	US$
Valve	3.75
Nipple	2.92
Elbow	2.92
Teflon Tape	0.42
Pipe Wrench	0.01
Brush	0.01
Tech 2 (1.5 hr)	4.46
Skilled (1.5 hr)	1.20
2 Semi (1.5 hr)	1.83
Driver (1.5 hr)	2.70
L.Rover (1.5 hr)	15.00
	35.21

6:CLEAR DRAIN
By water monitor

2: REPLACE GRILL	US$
Grill	26.00
Cement (25kg)	2.47
Sand (0.3m3)	7.43
Water (20L)	0.17
Hammer	0.01
Trowel	0.01
Float	0.01
Shovel	0.01
MortarBox	0.01
Skilled (1.5 hr)	1.20
2 Semi (1.5 hr)	2.10
Driver (1.5 hr)	2.70
L.Rover (1.5 hr)	15.00
	57.11

3: REPLASTERING	US$
Sand (0.5m3)	12.38
Cement (50kg)	4.93
Water (100L)	0.83
Shovel	0.01
Mortar Box	0.01
Trowel	0.01
Level	0.01
Clamps	0.01
Form Board	0.01
Float	0.01
Skilled (2 hrs)	1.60
Semi (2 hrs)	1.40
Driver (2 hrs)	3.60
L.Rover (2 hrs)	20.00
	44.81

4: VALVE COVER & 5: FOSSA COVER	US$
Cover	18.75
Cement (25kg)	2.47
Sand (0.3m3)	7.43
Water (20L)	0.17
Hammer	0.01
Trowel	0.01
Float	0.01
Shovel	0.01
MortarBox	0.01
Tech 2 (2 hrs)	5.94
Skilled (2 hrs)	3.60
Semi (2 hrs)	1.40
Driver (2 hrs)	1.60
L.Rover (2 hrs)	20.00
	61.41

B: COST ASSUMPTIONS FOR REPAIR & MAINTENANCE

1: LABOUR	US$/HR
Driver	1.80
Technician 2	2.97
Skilled	0.80
Semiskilled	0.70
Unskilled	0.61

2: TRANSPORT	US$/HR
Bedford	15.00
Land Rover	10.00

3: TOOLS
Tools costed at a rental of US$ 0.01 per job each.

TABLE 3
VEHICLE FINANCIAL ANALYSIS: LAND ROVER

A: BASIC CHARACTERISTICS

MAKE, SIZE:	1994 Land Rover 4WD, long wheel base. 7-9 seater including back area of 2 bench-seats, side-ways, folding seating 4 or cargo-space	
Expected service life of vehicle:	150000 km	
No. of kilometers per month:	2300 km =	27600 km/year
Predicted length of service:	5.4 years	

B: EXPENDITURES

	US$	YEARS OF USE	ANNUAL VALUE $	HOURS /YEAR	VALUE /HOUR $	%
CAPITAL COSTS						
Purchase Price	30000					
Spare Parts	3000					
Insurance	1000					
Shipping to Luanda	3384					
Other						
	37384	5.4	6879	99	5.79	56.1
OPERATING COSTS \1						
Petrol, oil etc			592		0.50	4.8
Repair, maint.			1600		1.35	13.0
Insurance			2080		1.75	17.0
Other						
			11151		9.39	90.9
+10% overhead			1115		0.94	9.1
TOTALS			12266		10.32	100.0

Sources: For capital costs - Relief & Development Services International Inc. Ottawa, Canada. For operating costs - A.Cain 5/94, as follows: Total annual operating costs for 2 trucks, 2 land-rovers apportioned among vehicles by purchase price of each vehicle as % of total fleet purchase price (Trucks = 34%, Land-rovers = 16% each of total fleet purchase price). Total and apportioned operating costs as follows: Total running costs (petrol, oil etc) $3700 (Trucks = $1258, Land-rovers = $592 each); Repair, maint. $10000 (trucks = $3400, Land-rovers = 1600 each); Insurance $13000 (Trucks = $4420, Land-rovers = $2080 each).

C: AMOUNT OF USE CALCULATIONS

CAPACITY USE	168 Hrs/mth	7 hrs/day	24 days/mth
ACTUAL USE	99 Hrs/mth	4.5 hrs/day	22 days/mth
% CAPACITY USE	59%		

OPERATING COST	10 USD/HOUR

MATERIAL COSTS INCL. TRANSPORTATION

FILE: MATCOST.WK1

ANALYSIS DATE: 05/07/94 using 120000 NKZ/USD

ITEM	UNIT	LOCATION	COST/UNIT (NKW) at source	/UNIT (USD) at source	/UNIT TRANS COST (USD)	TOTAL /UNIT COST (USD)
Water	L	Everywhere	1000	0.008		0.01
Sand	m3	River	750000	6.25		6.25
		Cacuaco		6.25	18.51	24.76
		Site		24.76	12.34	37.10
Gravel	m3	River	2500000	20.83		20.83
		Cacuaco		20.83	18.51	39.34
		Site		39.34	12.34	51.68
Cement	50 kg bag	Factory		4.50		4.50
		Warehouse		4.50	0.43	4.93
		Cacuaco		4.50	0.43	4.93
		Site		4.93	6.51	11.44
Blocks (7x20x40cm)	each	Kikolo	25000	0.21		0.21
		Cacuaco				
		Site		0.21	0.14	0.35
Blocks (15x20x40cm)	each	Kikolo	75000	0.63		0.63
		Cacuaco				
		Site		0.63	0.29	0.91
Roof Sheet (Zink 2m)	each	Kikolo	1700000	14.17		14.17
		Cacuaco		14.17	1.24	15.41
Roof Sheet (Zink 3m)	each	Kikolo	2500000	20.83		20.83
		Cacuaco		20.83	1.45	22.28
Re-bar (12 mm)	12m len.	Kikolo	1000000	8.33		8.33
		Cacuaco		8.33	0.05	8.38
Tubo (1" G.I.)	m	Kikolo	200000	1.67		1.67
		Cacuaco		1.67	0.05	1.71
Clamps	each	Kikolo	75000	0.63		0.63
		Cacuaco		0.63	0.04	0.67
Pipe (1" PE)	m	Kikolo	100000	0.83		0.83
		Cacuaco		0.83	0.22	1.05
Pipe (2" PE)	m	Kikolo	180000	1.50		1.50
		Cacuaco		1.50	0.43	1.93

MATERIAL TRANSPORTATION COSTS

FILE: MATCOST.WK1

ANALYSIS DATE: 05/07/94 using 120000 NKZ/USD

ITEM	UNIT	FROM WHERE TO WHERE	TYPE OF VEHICLE	No. UNITS /TRIP	No. HRS. /TRIP	VEHI. COST /TRIP	LAB. COST /TRIP	TOTAL COST /TRIP	COST /UNIT (US$)
Water	L								
Sand	m3	river-Cacuaco	Mercedes	6	3	102.00	9.06	111.06	18.51
		Cacuaco-site	Mercedes	6	2	68.00	6.04	74.04	12.34
		Cacuaco-site	Land Rover	1.5	2	20.00	6.04	26.04	17.36
Gravel		river-Cacuaco	Mercedes	6	3	102.00	9.06	111.06	18.51
		Cacuaco-site	Mercedes	6	2	68.00	6.04	74.04	12.34
		Cacuaco-site	Land Rover	1.5	3	30.00	9.06	39.06	26.04
Cement	50 kg bag	factory-w.house	Bedford	200	4	60.00	26.72	86.72	0.43
		factory-w.house	Rented truck	500	6	100.00	40.08	140.08	0.28
		w.house-site	Land Rover	10	5	50.00	15.10	65.10	6.51
		factory-Cacuaco	Bedford	200	4	60.00	26.72	86.72	0.43
		factory-Cacuaco	Rented truck	500	6	100.00	40.08	140.08	0.28
		Cacuaco-site	Land Rover	10	5	50.00	15.10	65.10	6.51
Blocks (7x20x40cm)	each	Kikolo-site	Bedford	300	2	30.00	13.36	43.36	0.14
		Kikolo-site	Rented truck	300	2	100.00	13.36	113.36	0.38
		Cacuaco-site	Bedford	300	5	75.00	33.4	108.40	0.36
Blocks (15x20x40cm)	each	Kikolo-site	Bedford	150	2	30.00	13.36	43.36	0.29
		Kikolo-site	Rented truck	150	2	100.00	13.36	113.36	0.76
		Cacuaco-site	Bedford	150	5	75.00	33.4	108.40	0.72
Roof Sheet (Zink 2m)	each	Market-Cacuaco	Bedford	35	2	30.00	13.36	43.36	1.24
Roof Sheet (Zink 3m)	each	Market-Cacuaco	Bedford	30	2	30.00	13.36	43.36	1.45
Tubo (1" G.I.)	m	Market-Cacuaco	Bedford	900	2	30.00	13.36	43.36	0.05
Re-bars (12mm)	m	Market-Cacuaco	Bedford	900	2	30.00	13.36	43.36	0.05
Clamps	each	Market-Cacuaco	Bedford	1000	2	30.00	13.36	43.36	0.04
Pipe (1" PE)	m	Market-Cacuaco	Bedford	200	2	30.00	13.36	43.36	0.22
Pipe (2" PE)	m	Market-Cacuaco	Bedford	100	2	30.00	13.36	43.36	0.43

ASSUMPTIONS FOR MATERIAL TRANSPORTATION COSTS:

LABOUR COSTS

ITEM	TYPE OF VEHICLE	PEOPLE REQUIRED	No.	COST /HOUR (US$)
Sand and gravel	Mercedes	driver	1	1.80
		loader	2	1.22
				3.02
Sand and gravel	Land Rover	driver	1	1.80
		loader	2	1.22
				3.02
Cement, blocks, roof sheets, tubes (1" G.I.), re-bars (12 mm), clamps, pipe (1", 2" PE)	Bedford	driver	1	1.80
		loader	8	4.88
				6.68
	Rented truck	driver	1	1.80
		loader	8	4.88
				6.68
	Land Rover	driver	1	1.80
		loader	2	1.22
				3.02

VEHICLE COSTS

Mercede	34.00 US$/hour
Bedford	15.00 US$/hour
Land Ro	10.00 US$/hour

see file: TRANCOST.WK1

PUBLIC STANDPOST COST - BENEFIT ANALYSIS

FILE: COSTBEN.WK

ANALYSIS DATE: 25/06/94 @ 120000 NKZ/US$

A: BASIC CHARACTERISTICS

Ground level type with 2 taps
10 metres from mains to standpost

B: CONSTRUCTION COSTS

ITEM	QUANT	UNIT	SOURCE	/UNIT (USD) at source	/UNIT (USD) at site	TOTAL (USD) at site	%
MATERIALS							
Water	200	L	Site	0.01	0.01	2.00	0.2
Sand	2	m3	Cacuaco	24.76	37.10	74.20	6.1
Gravel	0.2	m3	Cacuaco	39.34	39.34	7.87	0.6
Cement	7	50 kg bag	Cacuaco	4.93	11.44	80.08	6.6
Blocks (15x20x40cm)	140	each	Kikolo	0.63	0.91	127.40	10.4
Re-bar (12 mm)	1	12m leng.	Cacuaco	8.38	8.38	8.38	0.7
Pipe (1" G.I.)	12	m	Cacuaco	1.71	1.71	20.52	1.7
Pipe (1" PE)	10	m	Cacuaco	1.05	1.05	10.50	0.9
Fittings	avg.	total	Cacuaco	14.42	14.42	14.42	1.2
						345.37	28.3
LABOUR							
Technician 1	1.5	days	DW		180.30	270.45	22.2
Technician 2	4	days	DW		20.80	83.20	6.8
Skilled (mason)	8	days	DW		5.60	44.80	3.7
Unskilled (helper)	8	days	DW		4.27	34.16	2.8
Digging	16	days	community		4.27	68.32	5.6
						500.93	41.1
TRANSPORT							
10 MT Bedford	5	hours	Cacuaco		15.00	75.00	6.1
Driver	5	hours	DW		1.80	9.00	0.7
2 Loaders	10	hours	DW		0.61	6.10	0.5
Land Rover	24	hours	DW		10.00	240.00	19.7
Driver	24	hours	DW		1.80	43.20	3.5
						373.30	30.6
TOTAL						1219.60	100.0

C: COST/BENEFIT ANALYSIS FOR THE FIRST 5 YEARS

	YEARS => 1	2	3	4	5	TOTAL COST	% OF TOTAL
CONSTRUCTION	1219.60					1219.60	34.0
MAINTENANCE							
Monitor's salary	144.00	144.00	144.00	144.00	144.00	720.00	20.1
Tools for monitor	110.00	60.00	60.00	60.00	60.00	350.00	9.8
Repair by DW	259.95	259.95	259.95	259.95	259.95	1299.76	36.2
						2369.75	66.0
TOTAL COSTS	1733.55	463.95	463.95	463.95	463.95	3589.36	100.0
BENEFITS							
Water (litres)	436800	436800	436800	436800	436800	2184000	
Water ($ value)	2912.00	2912.00	2912.00	2912.00	2912.00	14560.00	
NET BENEFITS ($)	1178.45	2448.05	2448.05	2448.05	2448.05	10970.64	

Notes:

1. The amount of water provided at the standpost was based on: 10 L/min, 7 hours/day, 2 days/week
2. Value of water = 800 NKZ/litre
3. All material costs include transportation