

Cost recovery Analysis for water supply in peri-urban and low-income areas: Case study of Sector 28 -Burkina Faso

Thesis submitted to the International Institute of Infrastructure, Hydraulics and Environmental
Engineering (IHE) Delft, the Netherlands in fulfilment of the

award of the

**Master of Science in Sanitary Engineering
(Sector Utility Management)**

By

Eva KOUASSI-KOMLAN

Examination Committee Prof. Dr. Meine Pieter van Dijk
Dr. Patrick Moriarty
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Msc Thesis N° SE 03/02
March 2003

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The findings, interpretation, and conclusions expressed in this study do neither necessarily reflect the views of the International Institute of Infrastructural, Hydraulics and Environmental Engineering (IHE) nor the individual members of the Msc. Committee nor their respective employers.

DEDICATION

To my families Bastemeyer in the Netherlands
and
Schumann in Belgium.

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ABSTRACT

In many cities in Burkina Faso as in much of African cities, failure to properly operate and maintain has led to inability deliver good services and so to recover full cost. Tariffs are low and insufficient to cover with the production, distribution and expansion costs of the services. As a result in many urban areas, despite urban network service being assigned to a single citywide water authority, many residents do not have access to clean. Poor people in many peri-urban areas are not reached and even when the services exist it can be cut off due to either poor maintenance or unpaid bills. This leads to a situation in which in many peri urban areas Small Private Water Services Providers (SPWSP) are able to provide services at a higher price than the social tariff of ONEA, the national utility for Water and sanitation.

In this research, Sector 28 of Ouagadougou; the largest city of Burkina Faso, had been selected in order to analyse how the poor people living there are served, and in particular how SPWSP achieve cost recovery at their operational scale. Sector 28' SPWSPs were identified and a range of indicators of quantity, quality, distance, and price of water service were analysed at a household level. In addition revenue collection, expenditure and the accessibility at SPWSP level were analysed. The Results obtained show firstly in service level that Households who do not have enough earnings and cannot have credit to be connected to the city water network pay more than FCFA 550 per m³ more than the connected households while using less water of lower quality. The low quality resulted from many factors among them the technologies used for storing and carrying water. Secondly, although individual SPWSPs supplied only few households they did realise full cost recovery at their operational scale of production. Their turnover is enough to take care of their families and the monthly earnings are greater than Minimum Salary Guarantee in Burkina Faso.

The key recommendations include:

- *Decreasing water connection fees;*
- *Creating popular connections;*
"Popular" connections are the concept piloted in Burkina Faso. Stand post are provided with multiple taps each of which belongs to a household, or group of households, is metered and most importantly can be locked. Tariffs paid are the same as for households connected but without high connection fees.
- *Reinforcing credit system to access water;*
- *Set up legislation for the resellers*
Quality and prices of the resellers need to be regulated.
- *Create Water fund built on what has been done in Abidjan Cote d'Ivoire*

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LIST OF ABBREVIATIONS

PEA	Autonomous Post of Water
CREPA	Centre Regional pour l'Eau Potable et l'Assainissement
CFA	Franc de la Communauté Française d'Afrique (African French speaking countries franc (money) 1Euro= 655.957 F CFA)
ONEA	Office National de l'Eau et de l'Assainissement
NGO	Not Governmental Organisation
WHO	World Health Organisation
IFRANCE	French organisation working in Water and sanitation
SPWSP	Small Private Water Service Providers (water carrier, pousse-pousse)
HH	Household
WTP	Willingness to pay
CBO	Community based organisation
SDE	Senegalese Society of Water
SMIG	Minimum Salary guaranteed

CHAPTER 1

INTRODUCTION

1.1) WATER AND SANITATION CHALLENGES IN THE WORLD

Access to water and sanitation is a fundamental need and a human right. It is vital for the dignity and health of people.

The health and economic benefits of water supply and sanitation to households and individuals are important. Of special importance to the poor are the timesaving, productive potential, convenience and dignity that improved water supply and sanitation represent. Those without access are the poorest and least powerful. Access for the poor is a key factor in improving health and economic productivity and therefore an essential component of any effort to alleviate poverty (WHO, 2000).

Adequate water supply and sanitation are key elements in economic and social development. In recent years, much has been done in this area, with an enormous number of additional people gaining access to services between 1990 and 2000. 816 million people gained additional access to water supplies and 747 million additional accesses to sanitation facilities. Despite this, the percentage increase in coverage appears modest because of global population growth and the absolute number of people who lack access to water supply and sanitation services remained the same throughout the decade (WHO, 2000).

In the coming decades, water supply and sanitation services will face enormous new challenges due to urban population growth in most developing countries including Burkina Faso. The projected population growth in developing countries in general and particularly in Africa suggests that urban services will face a daunting task in meeting both the existing large service gaps and in reaching universal coverage by the year 2025 (Vision 21). Therefore, the increased tension between the need for social welfare provision of water and sanitation and the equally important demand for financially sustainable institutions to provide an acceptable level of service to all is still a challenge for the 21st century in Africa and other developing countries. As the costs for providing water and sanitation services are increasing in the world, new sources of water have proved to be more costly in real terms. In addition water utilities lacked funding or good cost recovery process to ameliorate and improve the existing service in developing countries including Burkina Faso.

1.2) WATER AND SANITATION SITUATION IN BURKINA FASO

1.2.1) Burkina Faso; General

Burkina Faso is located in the loop of the Niger River. It is the centre of the West African states. With Ghana, Togo and Benin to the south border (500 km from Atlantic ocean), Mali to the North and West and Niger to the East. The official language is French. The population growth rate is 2.7%/yr. In the urban cities, 2.5 millions are living whilst in the rural area 10 millions inhabitants are living. (WHO 2000)

The most important cities are Ouagadougou the capital and Bobo Dioulasso.

Burkina Faso has 274'000 km² as area, which are largely flat.

The climate is tropical with dry season from middle September to middle June. In this period, the Harmattan (dry wind) charged with dirt blows from the north to the south up to February.

1.2.2) Water resources

West Africa is particularly affected by the issues of water availability. Actually, water is a constant concern of populations, governments and professionals of the sector.

As far as water resources are concerned, Burkina, a Sahelian and landlocked country, faces several problems that are mutually reinforcing and which together lead to situations that are prejudicial to the social and economic development of the country: shortages, water related diseases, floods, etc. These water related problems have reasons that are intimately related to the physical constraints of a less enabling environment and human factors. The problems of water resources are located at different levels. The most important are:

- The increase of water demand related to demographic and economic growth and the rise of living standard;
- The decrease of the resources in quantitative and qualitative terms, because of the reduction of surface running water and the deficit in the filling up of the water table; the degradation of the quality of water following various pollutions (domestic, industrial, agricultural, etc.);
- The inadequacy of human and material means (WATAC, 2002).

The United Nations Specialised Agencies consider that the availability of renewable water resources will move from 3,000 m³/capita/annum in 1990 to 1,000 m³/capita/annum in 2025. This means that by 2025 the country will be in a situation of water shortage (the reference value of water shortage being 1,000 m³/capita/annum) (WATAC, 2002). This situation is worsened by significant spatial variations of rainfall and the concentration of the entire rainfalls over 4-5 months in one year. With a population growth rate of about 3% per year, this situation will lead to a strong competition to access water. That the imbalance between supply and demand will impose to the country difficult choices for the distribution and exploitation of the available water resources is a true matter of concern.

The solving of so great and complex problems in their interaction requires the reconsideration of the national water policy and its restructuring on a new basis. That is why Burkina Faso has deemed it necessary to move to new forms of water management drawing on major internationally defined principles, but after interiorising and adapting them to its national context to make them operational.

The water resources are limited. Between middle June to middle September, the overall average rainfall is around 350 mm per year. The hydrography depends strongly on the Mohoun, Nazion, and Makabe, which are the most important rivers in the country. For the total water use, 28% are domestic, 5% are industrial and 67% are agricultural (WHO, 2000)

The limited resources of the country create a number of problems to water supply and also to the livestock.

The table below shows the water supply coverage in Burkina and illustrates that the urban area are basically more covered than the rural.

Table 1: Water supply coverage in Burkina Faso in ('000)

Water supply	Population	Pop with house connection	Pop with public water point	Population served	Population Unserved	%Pop served
Urban	2 204	276	1 575	1 851	353	84
Rural	9 733	16	6 926	6 942	2 791	71
Total	11 937	292	8 501	8 793	3 144	74

Source (WHO, 2000)

In terms of operational aspects, water supply is in theory available 24hrs/ day and the national water quality standards exist and are the same as the WHO standard. Drinking water quality is effective in urban network systems but not always effective in rural systems.

1.2.3) Population and water supply trends

In 2000, the population was estimated at 11,937 millions inhabitants. It is estimated that by 2020 it will double.

The water coverage trends related to the growing population in the table below emphasises that in 2020 the water coverage for the urban and the rural areas will probably double.

Table 2: Urban water supply coverage trends in Burkina Faso in ('000)

Year	Total Population	Population served	Population Unserved	% served
Urban				
1980	-	225	675	27
1990	1 229	909	320	74
2000	2 204	1851	353	84
Rural				
1980	-	1 612	3 587	31
1990	7 832	3 916	3 916	50
2000	9 733	6 942	2 791	74

(WHO, 2000)

As the population grows, the urbanisation problems are getting more serious and many squatters are settling around the largest cities like Ouagadougou and Bobo Dioulasso creating serious living conditions around these cities.

The Office Nationale de l'Eau et de l'Assainissement (ONEA), the public body responsible for water supply is the main water supplier office in Burkina Faso. It covers 35 cities and secondary urban areas. The Piped water reaches the households in the inner city and some in peri-urban areas. Most of the city's water supply is shared between water vendors from stand posts constructed by ONEA, Community stands posts constructed from bore-holes and supervised by NGOs, and private vendors using trucks and others means to distribute water. As a result, water quality and its access vary between providers. Water provisions are inadequate and water providers lack the strategies to make services sustainable let alone to recover costs to expand services.

Further more, among the general policy, planning and institutions of the government aim at:

- Increasing of water supply allocation from 10 to 20 litres per day per capita in the countryside;

- Establishment of water supply and sanitation fund. (WHO, 2000)

In addition the new approaches involving the private sector has been promoted in the water supply sector as well as the management of the facilities through water Vendors Corporation. But there are some major constraints to this sector development:

- Funding limitations;
- Inadequate or outmoded legal framework;
- Inadequate cost recovery framework;
- Insufficient health education efforts.(WHO 2000)

1.3) PROBLEM IDENTIFICATION

The lack of full cost recovery framework has pushed ONEA to adopt policies based on regional cross-subsidies of the tariffs to ensure its well off. Annex 1 illustrates the trends of water production cost per city in Burkina Faso and shows the disparity among the cities exploitation cost of production. Cities like Ambinda or Koudougou, cannot run alone their network according to the exploitation cost of the utility. Only Ouagadougou and Bobo Dioulasso can perform without balancing out of the tariff but using the cross subsidies approaches to ensure cost recovery. In most of the cities, the tariff charged by the water agencies is not sufficient to cope with the producing and distributing cost. An average of CFA 501 per m³ is needed but many secondary cities centres are charging less. (Annex 2 and 3)

This situation leads to poor maintenance of the existing services and lack of service expansion in most of the cities (using the benefit to balance out the others). As a result in Ouagadougou in 2001 of 78 700 ml of network pipes extensions estimated, only 23 640 have been realised; on the city pipes renewal between 2000 and 2001 respectively 32% and 15 % are realised from the overall estimated (ONEA, 2001).

Cost recovery is often seen as the capability to recover operational and maintenance cost and provision of future services, still the major constraint facing the water utilities in Burkina Faso. The process of decentralisation going on in Burkina Faso is giving more responsibilities to the communities and exposes them to the financing of the expansion of services in the low-income areas and to the poor maintenance of the actual services. But again effective cost recovery process avoid the failure to maintain and operate inadequately systems .It enhances the coverage of cost and permit to achieve the overall goal of water and sanitation in Burkina Faso (WHO, 2000)

▪ Cost recovery

In most of sub-Saharan African cities, water utilities and water service providers fail to properly operate and maintain their services due to the inability to recover cost of the services. Tariff set are low and insufficient, and water is mainly use as political power. As a result cost recovery is low and has an impact on the cost of maintenance of the service. This statement is true in Burkina Faso. In 2001 the average water sold cost were FCFA 396 per m³ (ONEA, 2001). As Mathys (2000), inadequate maintenance of the service leads to infrastructural degradation and so has a significant impact on the service quality.

Combining operational inefficiency and low service quality, means that many water service providers face low cost recovery and low investment for new infrastructure in the sector. Therefore the peri-urban and low-income areas are difficult to reach. As a result poor people suffer in particular. They are

unserved and likely remain so, suffering from problems of accessibility, quality and availability (shortages).

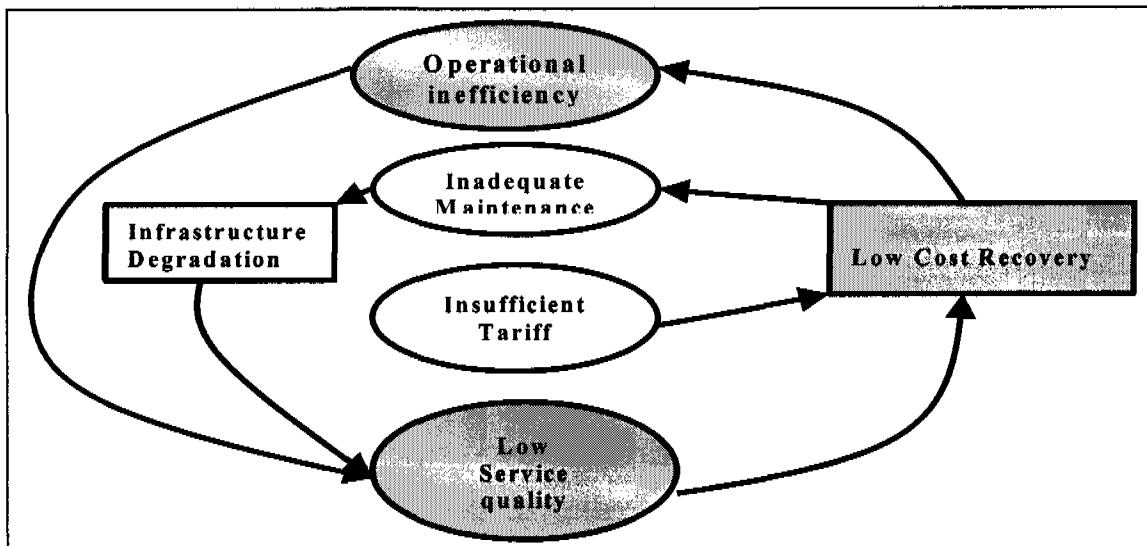


Figure 1: Cost recovery circle (Mathys 2001)

The lack of cost recovery is one of the main obstacles to sustainable water and sanitation services in developing countries despite the great efforts made during the past decade because it can no be easily achieved in low-income and peri-urban areas. In most countries in sub Sahara, this is made worse because water is cultural not seen as being for sale. But the access to water is difficult and many people are paying high price to get this basic need.

Many major problems are highlighted concerning the implementation of cost recovery in developing countries as follows (Brikke, Rojas 2001):

1. Obtaining good data on water and sanitation,
2. The need to differentiate between capital and recurrent costs,
3. Lack of awareness by communities of the costs of safe water and sanitation and who is responsible,
4. Methodological problems with studies on willingness to pay and demand,
5. Knowing how to derive equitable tariffs from willingness to pay and demand studies,
6. Tariffs do not cover cost,
7. Equity objectives are rarely taken into account in existing cost recovery principles,
8. Poor regulation and enforcement,
9. Monopoly problems, political interference and cultures of non-payment,
10. Poor management capacity of communities,
11. Misuse of funds.

When considering cost recovery in the context of water supply and sanitation, most problems are local, and central governments are not able to respond as they already subsidise the service. Achieving coverage of operation and maintenance cost, and financing the coverage of expansion constitutes the principal way to make service sustainable.

▪ Equity

In many urban areas, however, where public water service is assigned to a single city-wide water authority, many residents have no direct access to clean, public water. Equity problems arise when the national water authority supplying the service cannot reach poor areas or when the services exist, it can be cut off due to poor maintenance or unpaid bills. There are also cases where the poor cannot pay the reconnection fees leading to permanent suspended connection.

This situation leads on the fact that Small Private Water Services Providers (SPWSP) at high price than the national utility one, each of which may serve only few families, but which together provide for the needs of more people than the city entire network o Burkina faso Burkina Faso. Therefore, the problem of reaching the poorest of the poor in the cities and peri-urban area still the main challenge to address.

This present research has selected **the problem of cost recovery's application in peri-urban and low-income area in Burkina Faso.**

1.4) PURPOSE AND OBJECTIVES OF THE RESEARCH

The purpose of this research was to analyse how peri urban and low-income people are served and how small private water service providers face cost recovery in their services.

Key Focus of the research:

- to analyse cost recovery in water service delivery in peri-urban areas.

1.5) SCOPE OF THE STUDY

The study had mainly focused on low income and peri-urban area served by water supply artisans

Though the water they sell may be drawn from the city piped water network, some other sources like private wells, small private networks, to satisfy the needs of the poor in these areas. The study had gone through the price paid by the unprivileged households and piped water connected households. The study had also analysed cost recovery at Small private water services providers level of scale.

1.6) REPORT PRESENTATION

This report is subdivided in eight chapters.

Chapter 1: Introduction and background information;

Chapter 2: Research Hypotheses; it consisted of hypotheses definition; research questions, and operational definition of variables identified.

Chapter 3: Literature on cost recovery. It consisted of the review of the small water providers, cost recovery and sustainability, tariff setting and tariff structures of water services.

Chapter 4: Research methodology; survey and interview realised, and the model of analysis.

Chapter 5: The description and the analysis of the research area; included situation analysis and hypothesis verification.

Chapter 6: The main finding and discussion.

Chapter 7: Conclusion

Chapter 8: Recommendation

CHAPTER 2

RESEARCH HYPOTHESES

In this research some hypotheses are tested according to the problem outline. The process follows three steps:

2.1) Hypotheses

- 1- Households depending on water provided by Small Private Water Service Providers (SPWSP) pay a higher water price in peri-urban and low-income areas than households connected to a piped water network.
- 2- Small Private Water Service Providers realized cost recovery at their level of scale.

2.2) Research questions

The hypotheses above lead to the following research questions:

RQ Hypotheses 1.

- 1- How much high is the price of the SPWSP?
- 2- What is the price for the HH connected?
- 3- What are HH characteristics?
- 4- Is there a link between piped water and water sold by SPWSP?

RQ Hypotheses 2.

- 1- How are the main costs at SPWSP scale?
- 2- What are the characteristics for the SPWSP?
- 3- What costs they recover?

To test these hypotheses, an operational definition of the variables Cost recovery and Small Private Water Service Providers was made.

■ Operational definition of variables

To operationalise these hypotheses, it is important to define, characterize and set up the relation between the variables and the household. Each variable has its own indicators feasible and reliable. At least the indicators had been categorized to facilitate the data collection.

Table 3: Operational definition of variables

Variables	Characteristics	Relation with household	Indicators
<p>Small providers: formal and informal water service sellers for all the social groups of the community.</p>	<ul style="list-style-type: none"> • Household connection selling • Community taps • Stand posts • Water kiosks • Door to door water sellers 	<ul style="list-style-type: none"> • Price on common agreement • Monthly/daily payment • Personal relationship with the seller <p>Adapted from Van Dijk (1974)</p>	<ul style="list-style-type: none"> • Number of service providers by type • % of served population by small providers • Price of water • Distance household sources of water (Price) • Reliability of the service • Ease of access • quality of water • Quantity of water
<p>Cost recovery: Ability to recover operation and maintenance cost and investment cost through users fee</p>	<ul style="list-style-type: none"> • Level of income • Tariff setting (payment of services) • Access to alternative financial sources • Subsidies for the poor <p>Adapted from Brikke (2000)</p>	<ul style="list-style-type: none"> • Payment of bills • Affordability of services • % of food amount used for water. • Social program developed 	<ul style="list-style-type: none"> • Revenue collection • Expenditure • Tariff of water

CHAPTER 3

LITERATURE REVIEW

Some relevant data from external sources has been carried out in the following:

- Identification, documentation and review of existing case studies and other literatures reflecting the current situation on sustainability and cost recovery, factors influencing cost recovery, tariff setting and Small Private Water Services Providers.

3.1) SUSTAINABILITY AND COST RECOVERY

Cost recovery is one of the condition sine-quantum for sustainability of service. Many studies; conferences and literatures have been carried out internationally during the past decade the importance related to it. Earlier in 1990, at Dublin the water and sanitation services has been identified to have an economic value. The way to reach the poorest of the poor is coming narrow and more strategies and mechanisms must be put into place to reach those peoples and make services sustainable.

To address properly cost recovery issue, many international organizations have focused their mechanism on demand driven (Demand Responsive Approach) which attempts to respond clearly to the expressed services needs. So that the demand will more focused on the willingness to pay of the population. In addition, the responsibility and the commitment for the use of the services can be known. It is agreed among the international organization working in water and sanitation sector that Cost recovery plays one of the mains roles in the water service delivery to make services sustainable (WHO 2000).

3.1.1) Sustainability

The concept of sustainability has gained more and more grounds in the formulation of policies, strategies and programs in water and sanitation sector. One of its aspects is to promote the participation of communities in the management of projects, while other aspects advocate for a greater participation of the private sector, NGOs and of local authorities in the management and provision of water supply and sanitation services. Therefore many service providers are being reformed in urban and semi-urban areas, with greater importance to the recovery of costs in an effort to reduce public subsidies. In many small areas, capital cost sharing between users and governments is increasingly successful, and recovery of operational cost from users has become much more common.

WHO (1990) defines ten key elements of sustainability:

- Enabling environment
- Health awareness
- Strong institutions
- Felt need
- Supportive attitudes
- Expertise and skills
- Appropriate service level
- Community Appropriate technology

- Materials Services
- Support services

Van Beers (2002) stated that without clear understanding of all costs of installation, operation and maintenance and how they are recovered (by payment, commercial activities and/ or subsidies) is not wise to start any service , so this also for water supply service.

For design of sustainability services many authors and contributions stated that costs coupled with willingness of users to pay with institutional appropriateness of services providers is one of the key success of sustainability.

Some argued that sustainability sounds nicer than "profitability at all level" but in reality it comes to that. Smet (2002) stated that Sustainability is a complex area, and many issues and conditions contribute to that. These may be technical, financial, community, organizational and institutional nature. According to Smet (2002), the institutional and organizational (including management) issues are keys towards sustainability.

But Jong (2002) argued that providing technology options that people can chose from is the third major component for sustainability, which is also key possible factor for possible cost recovery.

For the rest of the study, sustainability is defined as provision reliable (in term of continuity of service), efficient and safe services (quality guaranteed) to all the social groups of people in need at affordable price that enhance cost recovery. Cost recovery is still today one of the major obstacles to achieving a sustainable drinking water supply and sanitation in developing countries. As water supply and sanitation is not anymore "free" public services, Private and public institutions and organizations are evolving in a context where the provision of services has to respond to efficient management rules and processes, and productivity ratios, with adequate pricing policy and people focus marketing strategies. In that respect, strengthening methods and processes, which can lead to higher managerial efficiency and social equity, with sustainable cost recovery are required.

3.1.2) Cost recovery

Prospects for full cost recovery is particularly difficult in sub-Saharan Africa, where poverty is most acute (Evans 1992). Cost recovery is often seen as a problem for agencies, which must recover the costs of providing services. Showing why the agencies must recover their cost is one thing; ensuring that it is in the interest of communities to pay is quite another (Evans 1992). Most research and institutional reform processes address cost recovery either from a utility or agency perspective with emphasis on sound commercial practices, or from a community or poor people perspective emphasizing equity and achievement of social goals.

Cost recovery does not necessarily imply full coverage of capital and O&M cost from users, however on some level the expenditure and revenues have to balance. Regardless of ideological considerations, the hard reality is that, particularly in poor parts of the world, if communities do not raise at least some of the money to cover the maintenance of their schemes they will be left with no service. (Moriarty et al; 2002)

The principal arguments put forward to justify greater user payment are summarised in the box below.

Why users should pay for water and sanitation services

1. Available capital funds are inadequate to achieve full coverage
2. Available public funds are inadequate to meet recurrent costs
3. State intervention and control has proven to be inefficient and ineffective
4. Social and economic benefits of improved water and sanitation are too indirect to justify free services
5. Subsidies disempower users by denying them choice
6. Subsidies discourage cost-effectiveness and the development of low-cost solutions
7. Evidence of demand and willingness to pay is strong with many poor people already paying high rates for services
8. Properly regulated user charges would mean the poor pay less and get better service
9. Payment increase sense of value and commitment among users
10. User payment maximise the use of available resources
11. User payment improve quality and standards of service

Source Evans, 1992.

Since financial resources for the sector are extremely limited in most countries, and because radical shifts in sector allocations are unlikely in the foreseeable future, the conclusion is increasingly being reached that projected beneficiaries should participate in cost recovery if coverage in developing countries is to be extended. (Evans 1992)

Recovery of costs does not always have to be in the form of cash (WHO 1997). A very large number of water supply and sanitation projects recover at least part of their costs through user contributions of labour and local materials, a feature frequently found in programmes based on community participation. Such contribution may account for as much as 20-30% of capital costs, and an equally significant proportion of the costs of operation and maintenance.

Brikké (2001) noted that it is essential to determine how and what extent the community /or utility will cover or recover the costs. The question of which costs should be recovered is often a dilemma for the planners and communities. Are they full costs recovery means recovering O&M and replacement costs, as well as part or all of investment costs, and "O&M costs" means coverage of recurrent costs of operation and maintenance only.

The options of cost recovery are drawn blow:

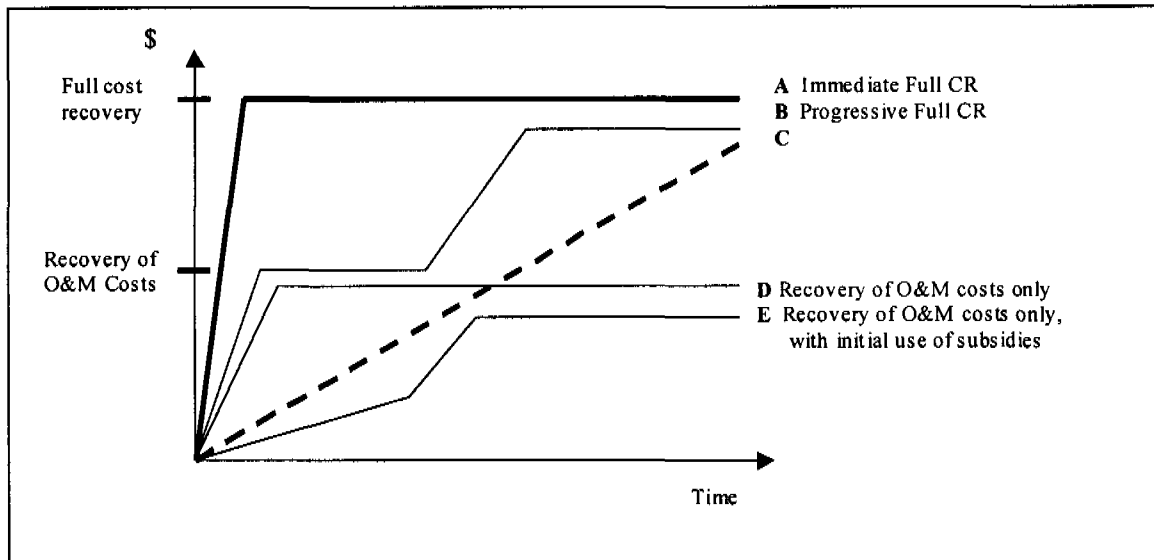


Figure 2: Cost recovery options (Brikke (2000))

Budds (2000) asked whether full cost recovery directly from the consumers- identified as a requirement for the private operator engaging in the PPP provision- benefits the poor. One view argues that full cost recovery will be detrimental to the poor due to the need to raise charges significantly, which may then exceed the affordability of the poor (Options A, B, and C). On the other hand, it is also suggested that cost recovery is beneficial to the poor, because the generation of funds for investment allows the operator to improve and extend services to greater number low-income users. However, it is also often asserted that one of the reasons why the water and sanitation sector is generally unattractive to the private sector is precisely that tariffs fail to generate enough revenue for future investment (Options D and E). (Budds 2000). In most of the developing countries the most useful options are the D and E. It is also the case in Burkina Faso.

In practice, there appears to be very little information on how levels of charges influence cost recovery, and how cost recovery affects the poor.

Moriarty et al (2002) proposed seven key factors for cost recovery:

- | |
|--|
| <p>Seven key factors for cost-recovery</p> <ol style="list-style-type: none"> 1. Assessing the impact of projects characteristics and environment cost recovery; 2. Maximising willingness to pay; 3. Clarifying financial responsibilities; 4. Optimising operating and maintenance costs; 5. Setting appropriate and equitable tariff structure; 6. Developing an effective financial management system; 7. Organising access to alternative financial sources. |
|--|

Cost recovery is widely influenced by the technology choice which has an impact on the O&M costs. Communities and users should be aware of the financial implications of operating, maintaining, managing, rehabilitating and replacing a given technology. The emphasis should not always be on minimising investment costs, but also on analysing the O&M costs that community can afford and are willing to pay. (Brikké 2000)

Literatures showed also that non-technical issues play also a considerable role in determining the effectiveness of O&M.

Cost recovery is finally defined as the ability to recover capital cost and operation and maintenance (O&M) costs. It emphasises on the needs of the users and their access to the benefits of the improvement of the services proportionally to their needs.

■ Factors influencing cost recovery

From the discussion above, it is clear that the bulk of financing can and should come from the users. For this to happen, attention has to be given to both demand-side and supply side factors. On the demand side there must be a rigorous focus on providing the services that people want and are willing to pay for. On the supply side the focus must be on developing institutional arrangements that provide services at least cost and in a way that is responsive and accountable to consumers. (Serageldin 1994)

In this paragraph, the literature review of some basics factors financing strategy for cost recovery with regard to equity will be discussed.

- *Willingness to pay (WTP)*

Evans (1994) stated that being able to pay for something and being willing to do so, however, do not always go hand in hand. He noted that willingness to pay is always accompanied by the demand. It can be in cash, or king, for the goods or services. He ends on the fact that demand is not different to the willingness to pay and the must be consider in the process of "felt need"

As Evans, Brikké (2000) defined the Willingness to pay as an expression of the demand for a service, and it is a strong pre-requisite for cost recovery because it is a measure of user satisfaction of service and of the desire of users to contribute to its functioning. He notes that there is no systematic correlation between the willingness and the ability to pay.

In the low-income area, Lyonnaise des Eaux (1998) emphasis a demand-responsive and consumer – oriented approach, which reconciles the needs and means of people with the service provided in order to produce solutions that are in line with users' requirement and capacities. In many cities, poorest of the poor are paying more for water than the water pay by the better-off community. WTP is the basic element of tariff setting.

It is therefore necessary but more complicated to create demand to improve services than just getting the right price. Investigating for the demand and the willingness to pay are important understand what level of services people want and how much the can pay for it.

Evans (1994) suggests factors influencing the willingness to pay as follow:

Factors influencing the willingness to pay
• Service level
• Service standard
• Perceived benefits
• Relationship to production
• Level of income
• Price
• Relative cost
• Opportunity cost
• Characteristics of existing resources
• Reputation of services agency
• Community cohesion
• Policy environment
• Socio-cultural factor
• Perception of relationship and responsibility
• Transparency of financial management

Brikké(2001) identified the WTP influencing factors in two categories: **community factors and service factors**.

Community factors are linked to an attitude or a characteristic of the community and they can be subsided as follows: demand and participation of the communities, prevailing local customs and legislation, perceived benefits derived from improved services, level of incomes.

Service factors are linked to the nature and characteristic of the water supply and can be subdivided as follows: presence of the alternative sources of water, costs of an improved water supply system, management efficiency of the service.

Both authors are saying the same thing but Evans point out the institutional framework, which is important to have the view of the community for the management of the system.

As seen above, WTP is a determinant factor for sustainable cost recovery. It is recommended at the beginning of all projects in order to ensure the sustainability. Many project and programme use the water vending as start point of the WTP. Studies of water vending show that available resources are not being put to the most productive use. They provide only limited evidence, however, of what people can really afford to pay.

It can be assumed that wherever people are already paying for water supplies they will always be happy to pay less. Studies of water vending, however, rarely tell us how to persuade people who do not yet pay that should do so. In the process of WTP, it is important to consider the user at household level who paid the bill. Women can be in some area the one.

- *Subsidies*

Tariff system in most of developing countries as in Burkina Faso is to promote the rational use of resources and necessary to provide a good service to all social groups (Ouibéiga 2002). Tariffs are mainly based on subsidies.

Subsidies to the poor can be distinguished in two ways: cross-subsidies within the users (within the utility/or provider) and subsidies using the government subsidies as social programme (mechanism outside the utility/the providers).

With regard to cost recovery and equity, the subsidies in most of the cases

- are limited to the poor to promote the basic consumption and facilitate access to service,
- are ascertained on the basis of the willingness to pay (the amount paid to the water vendors can be a starting point) to measure it,
- should cover , at least, all variable costs, including the costs of metering, billing and collection,
- should be designed to include eligibility criteria and set up in close co-operation with the municipality/government and the providers,

Care should be taken to cross-over price above which some subsidising users will opt to build their own supplies and stop buying from the utility.

- *Micro credit*

Micro credit is the extension of small loans to very poor people for self-employment projects that generate income, allowing them to care for themselves and their families (WSSC 1999). Wheat (1997) defines Micro-credit as the principle of giving small loans to the very poor to help them generate an

income of their own. Micro-finance incorporates savings as well as credit. It has proven an effective and popular measure in the ongoing struggle against poverty, enabling those without access to lending institutions to borrow at bank rates, and start small business. But with the current explosion of interest in micro credit issues, several developmental objectives have come to be associated with it, besides those of only "micro" and "credit". Of particular importance is that of savings - as an end in itself, and as a guarantee for loans.

Micro credit has been used as an 'inducer' in many other community development activities, used as an entry point in a community organizing programme or as an ingredient in a larger education/training exercise. It is also used in water and sanitation in order to enhance cost recovery. In Burkina Faso, the CREPA project created in 1994 in collaboration with the University of United Nation based in Canada had included in the program micro credit. The fact was that the user, or the cooperatives of users can borrow money generate by the sell of water to make another activities that ameliorate the living conditions of the households (CREPA 1999).

Several factors have led to increased interest in micro-credit in promoting growth with greater equity. There has been a growth in the recognition of the importance of empowering all people by increasing their access to all the factors of production, including credit. In addition, the value of the role of non-governmental organizations in development process is receiving more attention.

In West Africa, where micro-finance institutions are still in their infancy, a World Bank case study of nine microfinance programmes - the Pride, Credit rural and credit mutuel de Guinee; Credit mutuel du Senegal and Village Banks Nganda of Senegal; Reseau des caisses populaires and Sahel Action Project de promotion du petit credit rural of Burkina Faso; and Caisses villageoises du pays dogon and Kafo Jiginew of Mali - concluded that all nine of these programmes are very much in the mainstream of best practice in the field of micro-finance. Interest rates need to be based on the cost of funds, administration and labour costs, loan loss allowances, margin for inflation and a return on capital. Cost recovery is central to the financing mechanisms used. In this way a sustainable financial system is achieved.

- *Other financing options*

Evans (1994) summarized some other financing options in Voluntary funds, General community revenue in addition as well as co-operative funds.

3.2) EQUITY

Equity is related to something equitable, fair and reasonable in a way that it gives equal treatment to everyone for the same service. (Dictionary Collins 2000)

Brikké (2001) defines the equity in community context of water supply and sanitation as all social groups in a community can have access to the benefits of an improved water supply and sanitation system, proportionally to their basic needs. He notes that the potential benefits of an improved water supply and sanitation are as follows:

- accessibility (both physically and financially)
- convenience (comfort and cultural acceptance)
- continuity (both in quality and quantity)
- impact (on health and possibly income generation)

Brikké (2001) stated that the financial accessibility means that the amount of water needed for drinking, cooking, essential hygiene and production of subsistence food should be affordable.

Social group of a community means everyone, rich and poor, women and men including the vulnerable groups as well as elderly people, people with disabilities, children and indigenous groups. Some literatures show that men and women participate unequally in decision-making, implementation and management and transfer of know-how. Women often have, for socio-cultural and economic reasons, limited access to resources for the construction and maintenance of water supply and sanitation.

Given access of water supply and sanitation to all group means that social dimension is recognized in cost recovery strategy, so re-evaluate the basic needs of all groups and define their priorities of the most vulnerable groups. Therefore cancel the difference within the community and promote gender issue, which can help strongly to promote and improve equity in the community.

So far, cost recovery with regard to equity is related to the way all groups of the community contribute to the sustainability for the best distribution of the services.

To reach equity, Brikké (2001) proposes three approaches:

- *Application of a social targeted policy* by using cross-subsidies, using the government subsidies as social programme and setting a minimum basic tariff (lifeline)
- *Participation in service management* by involving the poor at all stages of the project as well as the cost recovery system best suited to their needs
- *Improving payment facilities* by facilitating access to the payment site (too far from many communities), allowing phase payment, allowing the communities to pay in kind within the local economy, developing or improving access to alternative financial sources, such as micro credit schemes and developing income generating activities.

These approaches concord with the point set by Budds (2000) to improve the accessibility of the resources to the poor in term of mechanism to lower connection fees for example.

Table 4: Mechanism for reducing connection fees

Cheaper connection fee	Lower charges for connection to low-income household
Welfare connections	Free or subsidised connections for low-income household
Labour contribution	Option to contribute free labour to help with the connection in lieu of payment
Grants	Government-funded free connections to low-income household
Spread payments	Option for low-income households to spread the cost of the connection over a longer period of time (e.g 5 years) so the full charge is not required up-front
Micro-credit	Access to small-scale finance for the initial connection charge
Pooled investment	
Cross-subsidies with revenue from all users	Connection charges are financed from revenue from all users and not only those making new connections

Whatever, public sectors are also keen to reduce direct government subsidies into water and sanitation services in low-income groups, Budds (2000) believes that people need to choose the standard of service they want and are willing to pay for, and any available public funds should be reserved for communal services that benefit a greater proportion of the community.

WHO (2000) considered Equity like one of the issues to be addressed with improved sector monitoring and sustainability. WHO rises the question of the portions of District, city which are not served at all; the portions of the city's population paying from private vendor selling water obtained from the utilities and also the social groups with access to different sources like wells or taps.

To ensure sustainable services there is a need to develop mechanism that ensure equity and revenue collection. So equity can be defined like the use of services, which meet the minimum acceptable standard for all the social groups.

3.3) TARIFF SETTING

3.3.1) Context of Burkina Faso

The context of the tariff is characterised by:

- At physical level

Limited natural resources, tropical climate dry and hot, low precipitation per annum (between 300 to 600 mm) badly sprayed in the country. The water stress defined as the quantity of water available per year in the country expressed in percentage of natural resources available. (ONEA 2002)

- At social demographic level

The main challenges in Burkina Faso are to satisfy the growing populations in the future in the basic need like potable water in the context of poverty growing from 44.5% in 1994 to 45.3% in 1998 and more with the actual 2002'situation in Ivory cost.

- At institutional level.

A three years memorandum of understanding namely "CONTRAT PLAN" fixed the engagements between the State and the Office Nationale de l'Eau. The actual agreement in its article 10, indicated the financial policies. It projected the financial autonomy for the growing of the sector through tariff politics based on long run marginal cost and the mastering of technical and financial charges.

In this context, ONEA had introduced in the design of the processes of tariff:

- 1- Cost of resource mobilisation,
- 2- Cost of management
- 3- The efficiency taking into account the willingness and capacity to pay of the consumers, the existence of the heterogeneous demands in distinguishing all social classes with low revenues and riches classes sensible to the variation
- 3- Financial balance
- 4- The high cost of investments and most importantly the growing in the investments in the future.

All these aspects set up in the CONTRAT PLAN, leads to the global objectives of the tariff that can be stated like:

Search for the optimum that ensure COST RECOVERY and guarantying safe access to the populations included the poor.

It has also to bear in mind that, tariff is economical message to the users, it must be clear and understandable and tariff must permitted to the society to generate revenues in other to ensure the financial balance.

3.3.2) Methodology

Based on the Contract plan, cost recovery is the main element to achieve the objective defined by the national water service provider. For the design of the water tariff two main tools are used:

- **Long run Marginal cost:** allow a good distribution of cost of infrastructures that the one done by the accountancy through the amortisement. The balance between cost and revenues settles at long term and takes into account the under used available capacity of the big consumers at the beginning of the service. The marginal cost shows the real cost of m3 resulting from the programme.
- **Financial projections:** they are made at current price for the short period of time (5 years) and permitted the tariff definition.

The actual tariff is determined based on plural annum balance principle at cash flow level included the debt of ONEA. Tariff is determined that all the expenditure and the revenues are balanced within a period of reference 2006 (Ouibega, 2002).

3.3.3) Necessary data for tariff setting

- *The long run marginal cost* is by definition the additional cost of the adjustments of the optimal capacity following the future offer for one additional sustainable unit.

The formula used:

$$P = \frac{\sum_{t=0}^{T-1} C_t(1+q)^{-t} - R(1+q)^{-T}}{\sum_{t=0}^{T-1} Q_t(1+q)^{-t}}$$

Source (ONEA 2002)

C_t = total of the investment in time t and the running cost, evaluated in current Francs at $t=0$

Q_t = the volume of water sold in every period t

R = Remaining value of the assets at the end of the period T

q = internal rate of discount

P = Marginal cost in long term

And also:

$$\sum P_i Q_i = \text{Normative revenue}$$

$$\sum_i P_i Q_i = \sum_j T_j Q_j \quad (j=1, \dots, n)$$

$T_j = \text{tariff}$

$P_i (i=1, \dots, 3) \neq T_j$: water cost

For the calculation of the cost, the investments and the running cost are distributed as follow:

- Harnessing and boosting
- Treatment
- Distribution
- Billing and collection

- Valorisation of the assets
- Programmed investments and renew
- Variables charges
- Prevision of demand
- Technical losses and rate of recovery
- Cost of the capital

3.3.4) Tariff definition

The fact of Knowing the long run marginal cost can allow defining the optimal tariffs policies of water (Structure and tariff) that takes into account the politics of water access and the financial sustainability of ONEA, with regard to the different specificities of the users and the water scarcity.

- Analysing the current structure applicable;
- Analysing the phenomenon of elasticity;
- Defining social level as transition point which is the frontier of subsidies;
- Identifying tariffs and their progress in order to maintain the capacity to pay of the poor people.

From these schemes, the following principles are derived:

1. sell under the marginal cost for the consumers using the stand post and the households connected using less than the social level ;
2. sell more than the marginal cost for the other consumers.

Many scenarios have been studied. The appropriate one is below:

Table 5: Main elements of tariff policy period 2001-2006 (Long run marginal cost) in F CFA

Rate of discount	Investment	Renewal	Running cost	Total
5%	191.9	12.4	230.6	435
10%	326.6	12.2	235.9	574.7
15%	460.3	12.1	241.0	713.4
5-10%	232	12	257	501

Source Ouibeiga (2002),GKw consult (2000)

For the rest of the study the content of the last rows of this table will be use based on some modification according to the discount rate in Burkina Faso fluctuating between 8 to 12%

The production and selling cost of water is about CFA 501 per cubic meter, shared between investment costs FCFA 232, the renewal of the equipment FCFA 12, and the running cost F CFA.257.

3.3.5) Water price in Burkina Faso

The pricing is based on the cost of production (ONEA). The tariff takes into account:

- The satisfaction of the poor people
- Financial viability of the sector
- Stimulation of water economy
- Enhancing of the development of regional balance budget per water unit (ONEA 2002).

Water is sold with subsidy. The Ministry of Water and the Ministry of trade fix the price of water conjointly.

The prices of water sold at the Stand posts are fixed by ONEA note of service. The costs of the different containers (barrel, bucket, bowls...) guarantee a benefit to the stand post sellers and do not reduce the subsidies accorded significantly.

Table 6: Trends in Water price at stand posts and PEA Burkina Faso (F CFA) From 1991 to 2002

Modes	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Stand post	90	107	127	151	174	174	174	178	182	182	186	186
Post Autonomous (PEA)	46	54	64	76	87	87	87	89	91	91	91	93
Bucket (20l)	5	5	5	5	5	5	5	5	5	5	5	5
Bowls (40l)	10	10	10	10	10	10	10	10	10	10	10	10
Barrel (200l)	35	35	40	40	55	55	55	55	60	60	60	60

Source (ONEA 2002)

As noted in table above, the water price at stand post had varied from 1991 to 2002 (1 to 2 ratio). In the same time the sell price of barrel had increased in the same range. But the price of buckets and bowls remain the same since 1991.

3.3.5.1) Structure of tariff for households connection

For a long time ago, tariff setting in Burkina Faso was based on block tariff in order to make balance between the consumptions. Annex 3 presents the trend of the evolution of the tariff since 1969. For the period 2002 the block tariff applicable by ONEA is as follow:

Table 7: Tariff household and big consumptions

Consumption (m ³)	Price /m ³ (F CFA)
0 to 6	180
7 to 30	377
+30	998

Source (ONEA 2002)

The social tariff is F CFA 180 per m³. The first range of this tariff is based on the assumption that at the rate of 20l/day, the monthly is 6 m³.

3.4) SMALL PRIVATE WATER SERVICES PROVIDERS

Whether they are operators or water carters, resellers of water, these self-employed individual entrepreneurs and small businesses are the ones who distribute water for most families in the poor neighbourhoods. Though the water they sell may be drawn from the city piped water network, these private operators rarely have any official status. Most of the time they work for themselves, independent of the city water agency or concessionaire of the modern formal sector (Savina, 1999).

- **SPWSP market area characteristics**

The consideration of the increasing phenomenon of peri urban and low-income area in Africa's cities is a significant issue. These areas constitute the excessive weight of the capitals, in which the new comers occupy the bottom of the social scale and live in the poorest district without much hope for rapid improvement.

These districts are characterised by: (adapted from Moriaty et al ,2001):

- constantly expanding,
- dormitory settlements scattered around larger urban area,
- production of increasing population density in a number of rural settlements, which start to merge into a frequently unplanned town like structure
- heterogeneity of the population, many cultures and religion,
- lack of clear institutional arrangement,
- diversity in water provision,
- people with limited income and spending power that affects ability and willingness to pay for increased services

Low-income and peri-urban areas can be grouped together in this study as they can be seen where the density of the population is too low and services provision difficult to be managed efficiently. These areas required a legal framework for the land tenure. Illegal settlements exist where population density and illegal construction considerably hinder the development of piped systems. The difference between low-income and peri-urban according to Le Jalle (2000), peri-urban areas are too far away from the central water authority and too dispersed for adequate sustainable cost recovery. It is why small water providers play an important role in water delivery.

In Bamako for example, the independent water providers and others operators supply 110.000 households (about 84%) of the city with 32.400 m³ at an average price of 94 CFA (15\$cents). In Dakar 85% of the city population is served by the independent providers closing the gap between La societe des eaux du Senegal (SDE) national water supplier and the low-income area (Bernard Collignon et al, 2000). In most of African cities including Ouagadougou, there is a wide variety of water suppliers. People can get water from households wells, from the neighbors' wells, from collected rainwater, from carriers, hand carters, carters using animal traction, standpipes, boreholes with manual pumps, or even individual connections to the city water network.

Households choice to get water from the most more expensive, better quality sources such as standpipe or neighbour's household connection, or less expensive, sometimes less clean ones such as wells, springs, rivers, or stored rainwater depends on how much household income and time are available, and on where water is available. It is cost more to get water from door to door carrier but using the time save to earn money may more than cover the difference in water cost. And water supply from different sources will vary depending on the rainfall, network down time, and other factor. Quality factors also influence the access to the source of water (Bernard Collignon et al, 2000).

In this study, the equity is related to the objective factors facing the poor such as price, quality, quantity, reliability, and easy access to the water source and the Small Private Water Services Providers are grouped: Independent small providers (well, boreholes, and national network water resellers).

CHAPTER 4

RESEARCH METHODOLOGY

The research was based on the knowledge and experiences of some small water providers and utilities in peri urban area in West Africa. The methodology consists of the following 3 phases: Literature study (chap 3), Field data collection and data analysis.

4.1) FIELD DATA COLLECTION

The data were collected in 3 different ways as follows:

- **Participation in Cost recovery workshop in December 2002** in Burkina Faso, which carried out synthesis of the experiences on, cost recovery problem of 11 participants from Africa.
- **Identification of location** for study in peri-urban and low-income areas in Burkina Faso. This was followed by survey in 300 households not connected, 100 households connected to piped network, 150 small water providers (50 water kiosks keepers and 100 resellers) in the area. The surveys assessed briefly the system, the institutional form, the expenditure and the collection systems and the effort to improve services with the small private water service providers. The format of the survey is in Annex 7 and 8
- **Interviews with 5 staff of ONEA and 5 managers of PEA.** The interviews were based on formal and informal questionnaires, focused on the service level delivered, the quality of the service, the connection and the disconnection legal status, the degree of satisfaction of the users, the revenue collections, the expenditure in order to study the different perception of the cost recovery (*Annex 7 and 8*).

Key formal interview

Representatives of national water supply company covering the area, water sellers associations, NGO and users association were interviewed to have a good picture of the area.

The aim of the interview were:

- To access the current knowledge, perceptions among these stakeholders on cost recovery, Small Private Water Service Providers
- To understand their attitudes in designing and implementing project and promoting the SPWSP in the area.

The questions of the interview involved:

- Types of water sellers
- Populations served
- Water quantity sale
- Type of technologies used
- Appreciation of water quality
- Price of water

- Mode of water payment by the populations
- Revenue collection
- Expenditure
- Connection fees

4.2) DATA ANALYSIS

The results of data collected in sector 28 of Ouagadougou were analyzed and compared to other data in Ouagadougou. The choice of Ouagadougou was determined by the fact that the researchers is working in Burkina Faso.

4.3) DATA ANALYSIS FOR THE HYPOTHESES

Having identify the indicators, and make sure that they were feasible and reliable they were categorized.

■ Categorization of indicators

Two types of indicators depending on Households and Small Private Water Service Providers factors were categorized:

Household indicators

- P % of population served by small providers
 - high if $P > 50$
 - medium if $20 < P < 50$
 - low if $P < 20$
- Distance (m) of water source from household
 - low if $D < 200m$
 - Reasonable if $200 < D < 1000$
 - high if $D > 1000$
- WHO standard
- Quantity of water
 - high $Q > 45l/day/c$
 - Medium if $30 < Q < 45l/day/c$
 - low if $Q < 30/day/c$
- Quality of water
 - Clarity
 - Taste
- Adapted from Schippers (2002)
- Price of water
 - Low if less than 10% of daily amount of food
 - Medium if between 20 to 30% of daily amount of food
 - High if more than 30% daily amount of food

Small Private Water Service Providers indicators

- Number of services provider
 - high if 80% hh used stand posts/ PEA and water resellers

- Medium if 50-80% hh used stand posts/ PEA and water resellers
 - low if less than 50% hh used stand posts/ PEA and water resellers
 - Price of water
 - low if < 150 CFA/m³
 - Medium 150<Pr>300CFA/m³
 - High if > 300CFA/m³
- Based on the actual price in the countries*
- Revenue collection
 - High if 90% bills collected
 - Medium 70 to 90%
 - Low below 70%
 - Expenditure
 - Low if less than 40% of revenue collected
 - Medium if 40<E>80%
 - High if > 80%
 - Easy of access
 - High if open area 24hrs/day situation
 - Medium if open 10 to 24 hrs
 - Low if often close less than 10hrs/day

■ **Control of variables/analysis**

For the whole variables defined, the factor time and the distance to the main water sources are the main elements controlling the choice of the use of models of SPWSP.

• **Model to testing hypothesis 1:**

Households depending on water provided by small private water service providers pay higher water cost in peri-urban and low-income areas than those connected to piped network.

HH depending on SPWSP		HH depending on PN	
Indicators	Degree	Degree	Indicators
Price (HH)	High	Low	Price (HH)
Quality	Low	High	Quality
Quantity	Low	High	Quantity
Easy of access	Low	High	Ease of access

• **Model to testing hypothesis 2**

Small Private Water Service Providers realise cost recovery at their level of scale

Small private water service Providers	
Indicators	Degree
Price (HH)	High
Quality	Low
Collection	High
Expenditure	Low
Investment	Low

Data collected were analysed in descriptive and explanatory ways. The descriptive analysis will give the percentages of the actual situation related to #3.2.2. The explanatory analysis will give more deductions about what was expected from the data in Chapter 5.

CHAPTER 5

DESCRIPTION AND ANALYSIS OF RESEARCH AREA

5.1) Ouagadougou: the largest city

In Burkina Faso, the growing size of the cities creates many socio-economical problems. In Ouagadougou for example, there are 1,3 million inhabitants (AMBF 2000). The massive flux of the rural population to Ouagadougou (growth rate of 5%) has led to the creation of many spontaneous quarters in which the living conditions do not meet the urban norms (Merki 1999). The amelioration of these quarters are important due uncomfortable sanitation condition existing in these areas where the average density is around 6249 inhbits/km².

For this purpose, Ouagadougou had known many improvements in the urbanization of the city. The main objectives of the improvement of the urbanisation are the amelioration of the living condition of the poor population living in the city. In this particular case, this amelioration had led to the moving and resettlement of the populations. As a result the inhabitants of Saint Camille (quarter in the Sector 14) have been moved and resettled in sector 28. It is to be noted that Ouagadougou has 30 sectors, some of the most populated are the ones around the city centre like sector 28; subject of our present study.

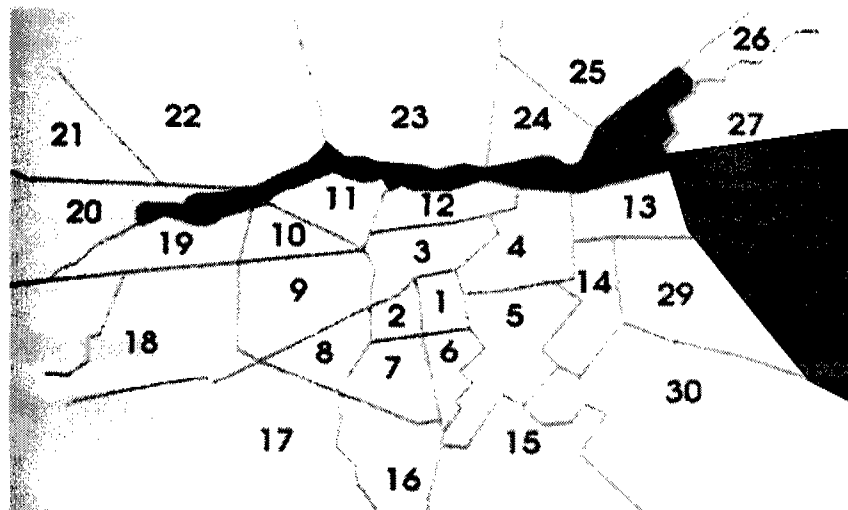


Figure 3: Map showing the sectors Ouagadougou (Extract from Merki (1999))

In terms of water consumption, 14 500 000 m³ have been billed in 2000; and 15 500 000 in 2001 included the water consumed at the stand post and PEA in Ouagadougou. The table 8 below shows the

trend in access to water by categories. Around 36 000 from the 120 000 households of Ouagadougou are connected (30%). The Industries and the administrations represent 2.5% of the total connection in the city.

Table 8: Trends of water connection (Access to water in Ouagadougou) 1998-2001

Class	Categories	1998	1999	2000	2001
1-2	Households	27 276	30 354	33 130	35 871
3-4	Big cons/ ind	379	403	379	365
5-6	Commune	43	45	50	54
7*	Raw water	6	6	6	6
8	Administration	552	504	496	500
9	ONEA	11	11	11	11
Total 1-9		28 261	31 317	34 066	36 801
Stand post		477	519	544	532
PEA		5	5	4	4
7		6	6	6	6
Total		488	530	554	542

Source (ONEA, 2001)

Due to the big number of unconnected Households (70%), most of the citizens used stand post. The figures below indicate the repartition of water at stand post related to the overall consumption in Ouagadougou. In 2000 water consumption at stand post were 40% of the total water consumption in Ouagadougou and in 2001, 36% were consumed.

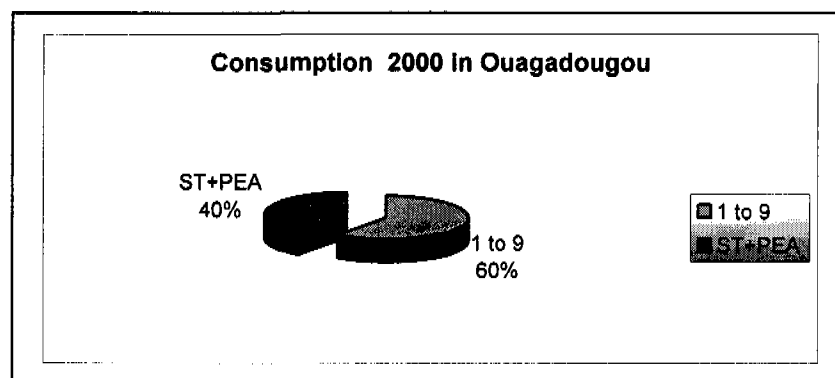


Figure 4: Water Consumptions by modes in Ouagadougou Source (ONEA 2000)

In 2001 and 2002 the amount collected at stand post and PEA represented respectively 15% and 11,5% of the over all collection of Ouagadougou showing that the price at stand post are subsidised in most of Ouagadougou sectors as explained above.

5.2) SECTOR 28 OF OUAGADOUYOU

Sector 28 is characterised by a variety of inhabitants, diversity of cultures and living standards. Based on 2000 INS's data, 79,200 inhabitants are living in sector 28 on 12.5 km². Water scarcity is still a big problem in the sector due to unconnected households and the existence of few stand posts and PEA.

Within 36 000 households who are connected to the water supply network in Ouagadougou, only 3 544 households were in Sector 28 representing 10% of Ouagadougou overall connected and 27% of the households connected in the mentioned area. The average number of people per household is 7 according to the survey realised in 2002. This number was confirmed in the study done earlier by Merki (1999).

Three criteria have guided the choice of this sector:

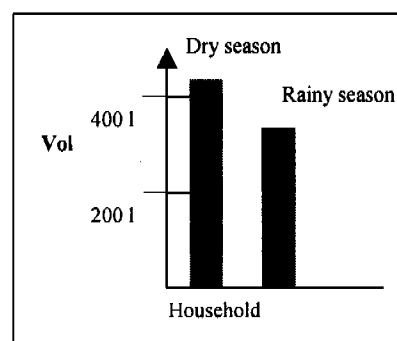
1. CREPA is working in the sector for a long time;
2. All the social standard (poor, middle income and some rich people) exist in the sector
3. With 79 200 inhabitants, sector 28 can be manage as small centre independently according to ONEA's doument (cities and communities more than 10 000 inhabitants can be supplied productively and cost recovery can be achieved) (GWK, 2001)

Based on General data provided above, around 15 000 households can be identified in this sector within which only 3 544 are connected to ONEA network. The remaining 11 456 households, used stand posts, SPWSP (Resellers) and sometimes the combinations of stands posts and resellers (table 9). The ratio stand post/households is 1 to 150 households. This ratio is too low and often leads to long queues for access to the stand posts.

5.2.1) Variation of the demand with the seasons:

The water demand of the sector 28 varies during the seasons (figure 5). In rainy season, water supply is usually done from surface water and the roof water. In many households, the use of corrugated sheet metal is current to catch roof water for the household supply.

In order to know the consumption of the population of sector 28, a survey has been conducted in 300 households within the sector and in different quarters. Two combined methods have been used: a/ asking question when women are getting water directly from the stand post; b/ house holds survey. Both methods come up with the same result: 85% used more than 2 barrels during dry seasons and 15% less than 2 barrels. In rainy season, 15% used more than 2 barrels, 80 % more than 1 barrel and 5% less than 1 barrel.



5: av. HH consumption

5.2.2) Revenue per inhabitant in sector 28

It is difficult to know how much people earned. The best way adopted is to ask about daily expenditure. The term 'Nasongo' the daily amount of money for food is one of the indicator for this analysis. Based on this approach, the following result can be drawn:

- 30% used CFA 1000 per day
- 60% used CFA 1000<X>500 per day; depending the meal (maize, rice, couscous...)
- 10% used less than CFA 500 per day

It is important to mention that, the households used part of this money to buy water from resellers, stand post etc. As result;

- 80% used between 10 to 30% of the Nassongo for water
- 20% used between 30 to 40% of the Nassongo for water.

But, it is also important to notice that the price of water depends strongly on the distance of the household to the stand post.

5.2.3) Distance Household to water post

Most of the women of the Households interviewed mentioned that it is difficult to accede to the water posts not because of the distance, but most often because the streets are not straightforward. Most of the stand posts are not so far from the households. More than 90% agreed on the short distance from household to stand posts and less than 5% sometimes went to the other stand post or PEA where the low is low.

5.2.4) Water quality

There was total satisfaction about the quality of water (clear, good test). But around 2% of the households interviewed have noted dirt at the bottom of water after 2 days storage. And only 2 of them went to borehole (PEA) to get groundwater.

In Sector 28, water from the SPWSP has been analysed. The results have shown the big variations between the residual chlorine from the stand post to the houses. After only 4 hours of storage in the earthenware the residual chlorine disappears. So the percentage of contamination of the water stored increased during the time (CREPA 1999).

5.2.5) Water supply by the Small Private Water Service Providers (SPWSP)

The SPWSP in the sector 28 are diversified; many types of transport coexist in the sector 28, among them: Selling from Stand post, Resellers, Selling From PEA. The table 9 below summarises the main water supply modes in sector 28.

Table 9: Main water supply modes used in sector 28

Modes	Sector 28	Remarks
Well	0	When there is no moneys, in mosque, few wells exist
Stand post	40%	Using their own carriers
Resellers	25%	Usual
Stand post + Resellers	2%	Time keeping when children are at school
PEA	6%	Although price is cheap difficult to reach.
Private connetions	27%	Estimated based on 7 inh per HH

From this table, more than 70% of the Households get water from the resellers and only 27% are connected to the main network. Within the 70%, 40% use d their own barrel and pay the same price as the SPWSP.

- **The resale by barrel**

This technique of water supply has been used for a long time in many sectors of Ouagadougou. Thus resellers constitute the informal/Formal sector around the stand post and serve the poor households. The resellers are most of the time recognised and pay annual taxes to the municipalities. Around 576 'Pousse Pousse' selling water are operating in sector 28 (average of 7 per stand post).

In some households, the private barrel is often used in order to diminish the cost of water. The price of a barrel is F CFA 60 000 and the cost of the accessories depends on the type of traction to be used (human or animal) F CFA 50 000 or 70 000. But the human traction was the most popular.

The resellers using this type of techniques in sector 28 can supply on average 5 to 8 households per day.

The figure 6 shows the average barrel of water sell per reseller during the season. It can be noted that the most important range is between 0 and barrels per day in all season.

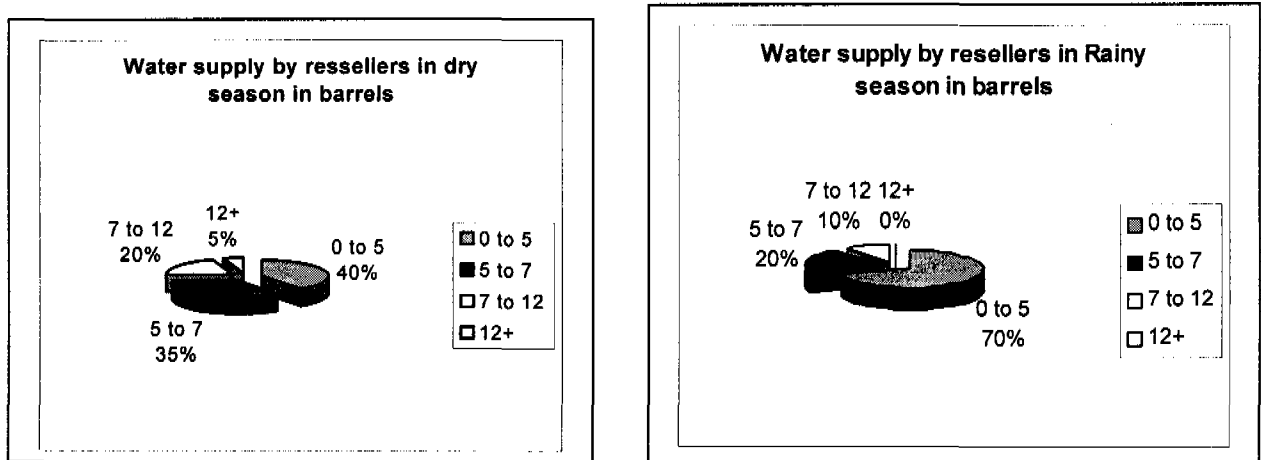


Figure 6: Number of barrels sold per SPWSP.

From the 150 resellers interviewed, 75% supplied households in dry season with no more than 7 barrels per day. The same suppliers provided less than 5 barrels in rainy season.

In dry season, the increased demand is diversified and the demand households are not concentrated. The resellers had difficulty to supply at the same rate as in the rainy season. In the same period, water scarcity becomes a serious problem. Although the demand is high at the households level, the resellers cannot satisfy all of them.

The resellers with more than 12 barrels are mostly the suppliers of the local beers industries/ or local food industries. In the rainy season the local bier demand also decreased and local breweries demands are between 7 to 12 barrels per day.



Photo 1: animal traction system

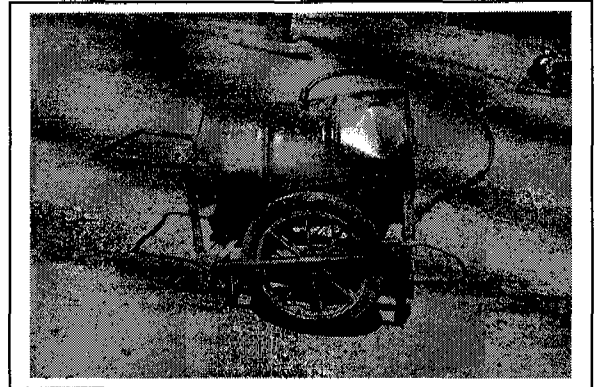


Photo 2: human traction system

- **The sale from stand post**

The national office for water distribution (ONEA) has implemented in the sector, 78 stand posts from which the underprivileged people can be served. ONEA has delegated the management of the stand posts to the private persons. They can be shopkeepers/ teacher/s policemen... and they often use another member of their family to look after the stand post. The contract with this specific person mentioned his responsibility and the amount of CFA 25 000 required that he pay as guarantee for the whole contract.

The options of using associations and Community Based Organizations are not currently used by ONEA because of the negative past experience. But within the sector 28, some associations using the PEA are managing the water. All the 78 stand post are active and distribute in average 25 m³/day. In correlation with households' water consumption that varies during the season, figure 7 shows that between may to October, water consumption is low due the used of other sources of water mainly the water colleted from the roof. When the dry season starts again, the consumption increase (between Novembre and May).

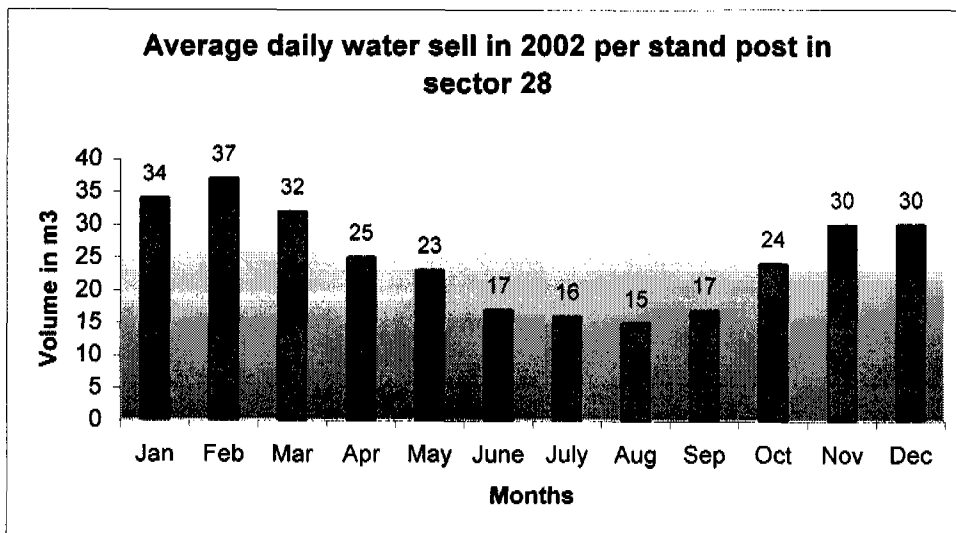


Figure 7: Average water sold at stand per year (Source ONEA 2002)

It is to bear in mind that the investment cost of the stand post is around F CFA 1 million. (equivalent to 200 m of network extension). See annex 5

The survey carried out in sector 28 come up with the conclusion that, the quarter is under catered when the points given the high demand.



Photo 3 : PEA with electrical energy

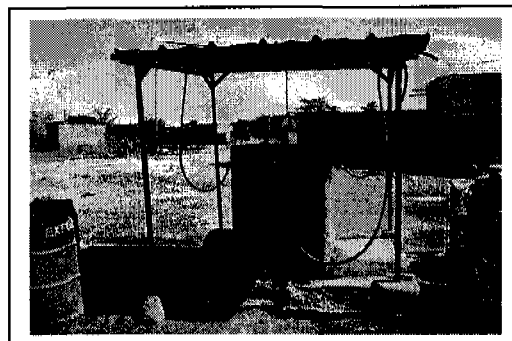


Photo 4: Stand post connected to water network

- **Sale from autonomous water posts (Poste d'Eau Autonome)**

The system is simple based on the existing water boreholes, equipped with pump and reservoir to keep sometimes the extra water pumped. In Burkina Faso water laws, boreholes with flows more than 3m³ per hour must be use by the ONEA for national purpose. So among the 5 PEA in the Sector 28, four are from ONEA and only one is managed on an association basis with solar pumping technology.

Although ONEA is selling water in the sector, the water pumped was under used and they noticed that they could inject the extra production in the network. According to ONEA, owner of the PEA, they are autonomous and auto financed (sustained).



Photo 5: Electrical pumping PEA

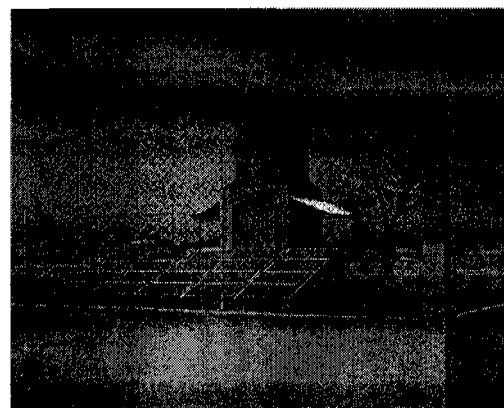


Photo 6: Solar pumping system

- **Institutional aspect**

The stand posts are belonging to ONEA. They are billed based on 2 weeks consumption. The bills are sent at weekly based and the deadline of payment cannot exceed one week. At this point the recovery of the collection is around 99% for the Stand post and PEA of ONEA and represent around 36% of the total of water sell in Ouagadougou

Table 10 : % of water sells at Stand post and PEA from 1990 to 1998 in Ouagadougou over all sale

Modes	1990	1991	1992	1993	1994	1995	1996	1997	1998
Stand post and PEA	21	21	27	30	30	33	34	34	36

5.2.6) Household piped connection

Among the 3544 connected households in the sector 28, hundred had been interviewed. The following questions were asked:

- Cost of connection
- Monthly consumption
- Monthly payment
- Size of the family

Cost of connection

The connection fees included:

- Piped water connection,

The piped connection fees depends on the diameter on pipe passing in front of the house, the last point from which the network had stopped.

90% had paid between F CFA 200 000 to 275 000

10% had paid bit more than F CFA 300 000

- Dossier fees

It included most of the time ONEA administration fees, the format; the identification of the place and the estimation of the cost.

All the households interviewed had paid more than CFA 30 000.

Monthly consumption

The size of the family played an important role in the consumption of water as well as sanitation facilities at household level. Upon the 100 households interviewed;

- 70% had 5 permanents people in the house (father, mother, 3 children) and time from time some elders coming from village
- 20 had 7 permanents people in the house
- 10 % had more than 7 permanents people

From this derive the water consumption in the table below:

Table 11: Consumption per households in sector 28

P%	Consumption in m ³	Remarks
30%	4-6	Use of yard connection: or no water sanitation facilities in the house.
50%	6-12	House with sanitation facilities
20	12-15	Sanitation facilities with small garden

The table shows the variation of water consumption between 4 to 15 m³. It had to be noted that in this case houses with many people were not interviewed. But it is to notice that the consumption goes rapidly and as result the tariff goes over the social tariff structure.

Monthly payment

Water bills included most of time in addition of water consumed, sanitation fees, fix charges. Annexe 6 shows the water bill form in Burkina Faso. It is mainly composed of quantity of water consumed, the

price related to the category, the fix charges, and the sanitation charges. In table 12, a calculation have been done to carry out the average taking into account all the parameters indicated above based on the survey realised in Sector 28 in the 150 households. It ca be noted that 50% o these Households used between 6 and 12 m3 an only 20% more than 12 m3. So the average prices per m3 of water sell is between 451 and CFA 378.

Table 12: Average monthly payment

P%	Consumption in m ³	Amount (F CFA)	Remarks	Price per m3 (CFA)
30%	4-6	1804 2206	$4*21+4*180+1000$	451
50%	6-12	2206 4594	$12*21+6*180+6*377+1000$	368
20%	12-15	4594 5788	$15*21+6*180+9*377+1000$	383
Subsidy level	30	11758	$30*21+6*180+24*377+1000$	392

F CFA 21 is applied per m3 for sanitation purpose

F CFA 1000 is Fix charge.

The real water costs are in bold and are not high. In real term the average of water alone vary from CFA 180 to 368 assuming an average consumption between 4 to 12, representing 80% in the sector 28.

5.2.7) Price of water from the resellers sector 28 Ouagadougou

The water policies price seems not to benefit to the poor in sector 28. In the paragraphs 5.2.5 above, it was indicated that 27% of the households are supplied by the water resellers. The water resellers use water from the stand post at low price with the principle of cross-subsidies (the big consumers pay for the poor).

The price of water sold by the reseller varies strongly according to the seasons. The following tariffs are applied in sector 28 as well as in some zones of Ouagadougou:

Table 13: Price of water vs transport distance

Distance	Rainy season		Dry season	
	<500 m	>500m	<500 m	>500 m
Barrel (200 l) Price	200 F CFA	250 F CFA	250	350

This table is based on the survey realized in the sector 28. One hundred and fifty resellers using barrel were interviewed. The price depends also on the flow at the stand post and often on water shortage at the stand post.

5.3) HYPOTHESIS VERIFICATION

The following hypothesis were fixed in the beginning of the study:

1. Households depending on Small Private Water Service Providers pay higher price of water than the households connected to the piped water in per urban and low income area;
2. Small water service providers realize cost recovery at their level of scale in low and peri urban area.

To verify these hypotheses we looked at the models developed in chap§ 4.2

Model 1: Hypothesis 1

In sector 28, the average of 150 households depended on one Stand post and more than 7 households depended directly on Small Private Water Service Provider. More than 50% of the population depended directly on these two types of service provision.

This scheme showed that the coverage in water is low and the dependence from the other water suppliers is high leading to high price of water charged by the SPWSP.

Table 14: Water consumption comparison between Households

HH connected with piped water		HH depending on SPWSP			
Consumption (m3)/month	Price/m3 F CFA	Consumption (m3)	Price/m3 F CFA		
6 (ONEA)	≤501	4-15	<451	4.950*	1000

*Needs of water 27.5-l/ inh/day (based on survey 2002)

This table illustrated that although, people connected to piped water network in sector 28 consumed more water, they pay less than the people depending on small water service providers consuming less water. The difference between the services is higher than F CFA 550 (Figure 9). The cost of water at household level represented 30 to 40% of the total amount assigned to the daily food to the HH depending on the SPWSP.

One of the factors influencing the price is the distance (Table 13)

- **Water quality**

Water quality in real term is not a problem to the HH in sector 28. Water scarcity is more crucial. The table below compared the situation.

Table 15: Water quality comparison

		HH connected with piped water network		HH depending on SWSP	
Clarity	Probability of contamination	Clarity	Probability of contamination	Clarity	Probability of contamination
High	Low	High	Low	Middle/high	High due to storage and volatility of chlorine

Further more, some analysis realised in the sector 28 (CREPA 2000), illustrated that many of the storage tanks in households depending on small private water service providers were highly

contaminated, most of them had dirt at the bottom. For the bacteriological contamination, it had many causes among them the barrel of the supply, which is not often washed with detergents.

The experimentation done by CREPA had concerned new systems of water carrier, had proven its efficiency in term of water quality and price lowering. But unfortunately these techniques received less agreements of the 'pousse pousse' the first users.

The table 15 above shows that, HH connected to the piped had **better water quality** than the HH depending on small-scale water providers of whom the service systems are subject to contamination.

In term of **reliability**, HH depending on SPWSP had a higher constraint of supply from one or another thus source ensuring their service but in there is a need to assess the quality of this water. While Households with connection suffered frequent shortage due to pressure problems.

From this paragraph above; **the model1** previously built in the beginning of the research can be verified.

Model 2: Hypothesis 2

Many SPWSP realized full cost recovery in sector 28. Small Private Water Service Providers technologies exist in sector 28. More than 70% used the services of stand posts, water resellers. Water price at the stand post is in the range medium but high if this service is provided by the resellers (>1.5 US\$). The revenue collection is high (99%) and the expenditures (few repairs for the wheel sometimes) very low very and less than 20% of the turnover.

Most of the stand post are opened 13 hrs a day (6 to 20hrs) demonstrating the easy of access to these stand posts.

Most of the breakdowns corresponded to the period of water scarcity.

Figure 8 illustrates the earnings of the resellers and it can be concluded that they do realize full cost recovery at their level of Scale. This is effective in sector 28. Table 16 illustrates the repartition of m3 sold to the unconnected Households.

The model 2 is effective in sector 28.

CHAPTER 6

THE MAIN FINDING AND DISCUSSION

6.1) HOUSEHOLDS AND SMALL PRIVATE WATER SERVICE PROVIDERS LINKS

It can be realised that, the poor population unconnected in sector 28 pay high price, more than the cost of production.

A surveys realised in 20 cities and peri urban area West Africa, come up also with the similar conclusion that poor people paid more than the rich for water (Savina, 1988). The figure below is the illustration of the subdivision of water price in the peri-urban area in Ouagadougou. As the price of water per m³ is CFA 1000, the subsidy tariff per m³ at stand post is CFA 186. The CFA 1000 is shared between the buy from Stand post (CFA 60 per 200l= 300/per m³) and the net benefit of the reseller (CFA 700).

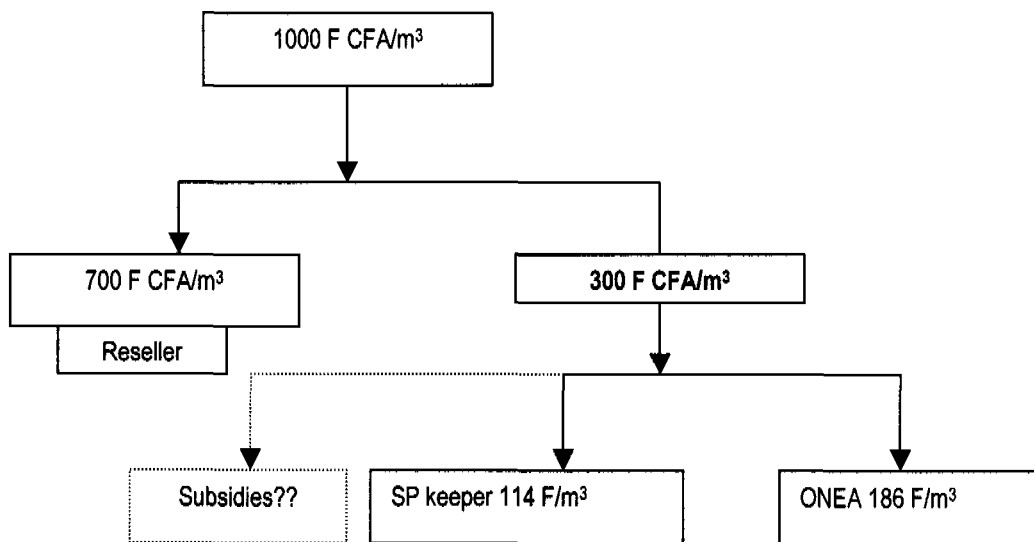


Figure 8: Repartition of the price of water from the reseller (2002)

Households paid water on daily basis. Their revenues are so low that they cannot keep enough money or get credit to have water connection at their houses. The daily base buy of water cancelled big amount of water wastage.

The private water resellers in developing commercial practices managed to mobilise financial resources within the sector 28 and provides a service of water for ONEA by using different techniques (variables tariff, rate of payment, quantity of water during seasons). On the figure 9 , below they can recover all the cost of production and have profit. This is important to know and so emphasis the process of water supply in peri urban area as the adjustments between national water supplier and the resellers.

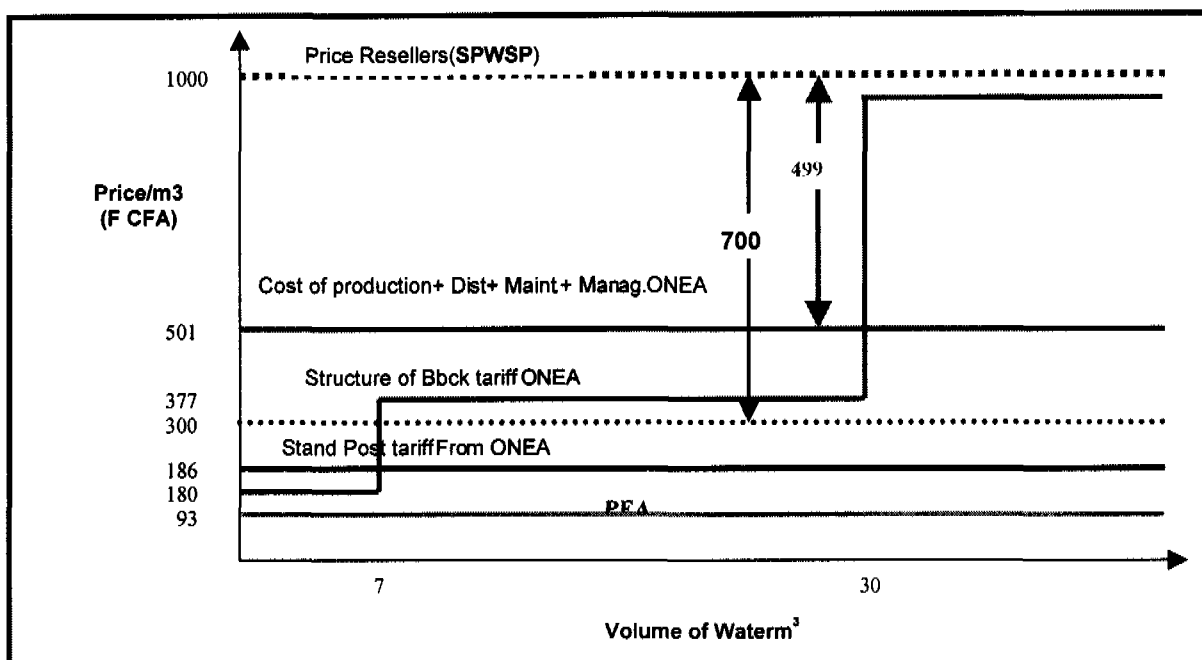


Figure 9: Analysis of tariff of water per m3

From the figure above, it is clear that the populations in sector 28 finance their own subsidies that benefit the well off of Ouagadougou. This confirms some studies in Kumassi in Ghana, Conakry in Guinea and some other cities. (Savina 1998).

There is a need to ask about equity of social politics of water distribution that the poor cannot have benefices.

6.2) COST RECOVERY AT STAND POST AND RESELLERS LEVEL OF SCALE

- **Stand post level of scale** (in F CFA)

The table below shows that there is an important cash flow for the Stand post keepers and this amount is two to three time more than SMIG in Burkina Faso.

Table 16: Stand post cash flow table

N° SP	Period	Volume (m3)	Unit Price	Bills (ONEA)	Sale	Expenditure	Cash flow
292	01/2002	1476	191*	281 916	391 363	15 000 **	94 447
	02/2002	1232	191	236 458	328 258	15 000	76 800
505	01/2002	1372	191	262 062	363 788	15 000	86 726
	02/2002	1073	191	210 308	284 508	15 000	59 200

- *F CFA (186)+5/m3 for sanitation
- ** Stand post keeper monthly salary

- 1m3 cost F CFA 300 at stand post (1 barrel 200l = F CFA 60 at sale)

From the table above, it is agreed that the Stand post price is not really benefit for the society selling water but help the delegated water supplier or the small scale water provider to recover the investment he made in the beginning of the contract (F CFA 25 000) in the first month running.

From the analysis made among the stand post keepers, 90% recovered more than CFA 45 000, twice the Burkina Faso' minimum guaranteed inter professional salary (SMIG) which is quite good showing that water business can be benefit.

- **Water resellers level (in F CFA)**

Table 17: Cash flow analysis

N° Res.	Period	Volume (m3)	Unit Price	Bills (SP)	Sale	Expenditure	Cash flow
1140	01/2002	46,20	265,15	12 250	46 200	-	33 950
	02/2002	39,60	265,15	10 500	39 600	-	29 100
2005	01/2002	33,00	265,15	8 750	33 000	-	24 250
	02/2002	26,40	265,15	7 000	26 40	-	19 400

85% of the 'pousse pousse' resellers have a monthly cash flow more than CFA 25 000. The Burkina Faso' minimum guaranteed inter professional salary (SMIG). For the remaining 15% of the SPWSP, the reselling of water constitutes for them occasional jobs.

It is important to notice that at small scale, the resellers have an important profit at unit price but small amount of money at the end. And they do not have access to credit to improve their service. In terms of covering of their investment, 3 to 4 months are sufficient.

CHAPTER 7

CONCLUSION

In Sector 28 of Ouagadougou, the water distribution network has little improved during the past three years. Less extension had been made as a result of inequality in supplying water to the users at a relatively expensive rate, poor population had difficulty to have the basic water and when the quantity is available the price remains high and prohibited in those households not connected to the national network.

In addition to this inadequacy of services of ONEA in this sector with 78 stand posts (1 stand post for 150 households) and only 3544 households connected there is bad quality of water supply to the poor household depending on the supply systems of the resellers because of storage.

According to literature, WATAC (2002), this inadequacy of water services is the result of many factors among them:

- Water resource availability;
- Difficult extension of the network;
- Hazardous urbanisation of the sector 28;
- Little financial resource available in sector 28.

These factors are the main causes of incapability of water supply in the sector; households unconnected to the national water network had low water quality and little quantity than those connected but pay higher price than the connected households.

From the ONEA's policies, sector 28 is one of the sectors where subsidies are desirable for inhabitants because they consumed less than 6 cum per month. The 2 main modes of collecting water are from stand post and from the resellers (water carriers). In the rainy season occasional rainwater collection is done by some of the households. The water demands vary during the season; from 1.5 to 2.5 barrels at household level. At the stand post the consumption increased during the dry season with an average of 35 m³ and 25 m³ during the rainy season. As a result water price increased in the dry season from CFA 1000 to CFA 2000/2500 per cum for the unconnected household.

Water was billed at high price for these inhabitants in the same sector. Poor household usually paid CFA 1000 per cum from the reseller, which is 3 to 5 times the price per m³ of the households supplied by the piped water network and this poor household paid more than 30 to 40% of the "Nasongo," the daily food amount for water. This situation is not unique in this sector 28 of Ouagadougou, in sector 5, the scarcity of the water resource itself created a sort of confusion among household connected as well as the unconnected households and both often used stand post services. This situation is also confirmed by IFrance; in Abidjan (Côte d'Ivoire) unconnected households paid more than 5 times what the connected households pay, in Tunis 10 times; 40 times in Cairo and 1 to 100 times in Port au France (Haiti)

So, from the figure 9, it can be concluded that households depending on small water providers **pay more than the cost of water production**. Water resellers covered the unserved space of the sector, with low investment, using light material with human or animal energy, providing important services to the population and water allowing the use of water for unconnected households.

This particular relation between resellers and households, and many arrangements can be done without contract (arrangement for daily, weekly, monthly payment). They recover all the selling water cost and apparently they do earn enough profit based on the monthly sales volumes. These profits helped them in repairing their material and sustaining their services. The profit at the unit cost is important but cannot be integrated in global business.

Cost recovery cannot always be seen in the process of recovery full cost. It depends of the option adopted by the supplier (5 options) and the way to apply it.

In sector 28, the resellers recover full costs. At resellers economy of scale it can be agreed that is well done and they have capacity and ability to scale up fund within the area. On ONEA site many improvements have to be done to create competition among the resellers to decrease the price of water, ameliorate the quality and give access to every one. These recommendations are compiled in the following Chapter 8.

CHAPTER 8

RECOMMENDATIONS

The recommendations derived from this study are mainly for the national water supplier ONEA and concern organization, management issues, policy and regulation. It is also important to make a shift in the financial relation between ONEA and resellers to cover the costs while taking into account equity considerations. The recommendations are:

1. Extend and diversify the water network in the sector by

- *Decreasing water connection fees;*

At the moment, connection fees are more than CFA 100 000 when the pipe is close to the yard. When the pipe network is far, there will be a need to extend the pipe, which is basically a costly exercise for the poor population living in Sector 28.

- *Creating popular connections;*

"Popular" connections are the concept piloted in Burkina Faso. Stand post are provided with multiple taps each of which belongs to a household, or group of households, is metered and most importantly can be locked. Tariffs paid are the same as for households connected but without high connection fees.

- *Reinforcing credit system to access water;*

In some of the area covered by CREPA, micro credit system are applied not to give access for water to the users but to help them buying "Poste d' eau Potable" to ameliorate water conservation in order to maintain water quality in the households.

2. Fix the resellers price of water

- *Set up legislation for the resellers*

? ~~Quality and prices~~ of the resellers need to be regulated. To arrive to do so there is a need to develop Sector 28 hygienist and community regulator. Some important experiences exist in Lome according to hygiene practice which can be useful in Sector 28.

3. Create sector water fund at sector level to help poor household increasing the number of connection.

This statement is the concern of the municipality, as decentralization process is going on well in Ouagadougou. Water fund will be useful. It can be build in what ha been done in Abidjan Cote d'Ivoire, where the state Water fund had allowed SODEC to connect Households without connection fees.

Annex

Annex 1: Water production cost per city

Annex 2: Cost of Water produced/per m³/sold

Annex 3: Trends in tariff 1969 to 2002

Annex 4: Methods of collection from stand post

Annex 5: Some results in the management of stand post and Post

Annex 6: Example of ONEA water bill

Annex 7: Households questionnaire

Annex 8: Stand post and resellers questionnaire

Annex 9 : List of people met during the study

ANNEX 1: WATER PRODUCTION COST PER CITY IN BURKINA FASO

Names of exploitation	Investment cost. (FCFA/m3)	Renewal. (FCFA/m3)	Running Cost (FCFA/m3)	Total (FCFA/m3)
Ouagadougou	232	12	257	501
Bobo Dioulas	185	12	262	459
Banfora	125	9	239	373
Gaoua	71	5	224	301
Orodara	102	6	232	340
Niangoloko	208	10	183	401
Arbinda	406	29	399	834
Bogande	158	13	386	557
Boromo	147	11	239	396
Dedougou	132	8	224	363
Djibo	81	4	135	220
Dori	348	20	239	607
Fada N'Gourma	472	24	152	648
Garango	165	8	125	299
Goram	200	16	197	413
Gourcy	345	17	268	630
Kaya	225	13	250	487
Kombissiri	71	4	180	255
Kompiega	229	13	193	434
Koudougou	352	25	337	714
Koupela	121	10	193	323
Léo	131	8	124	263
Manga	113	7	180	301
Nouna	121	7	231	359
Ouahigouha	116	8	248	372
Po	81	6	216	303
Poura	163	12	277	453
Pouytenga	133	9	107	249
Réo	385	27	394	805
Sabou	134	9	138	281
Tenkodogo	76	6	212	294
Tougan	99	6	228	334
Yako	142	8	171	321
Zabre	66	5	184	255
Small expl.	192	12	231	435
All	213	12	253	478

Source (GKW, 2001)

ANNEX 2: WATER PRODUCT PER M3 SOLD

	Units	1995	1996	1997	1998	1999
Quantity of Water sold	Billions m3	17.80	19.32	21.09	21.87	22.47
Amount of water sold	Billions F CFA	7.793,86	8.443,35	7.793,86	8.088,69	8.738,01
Product/m3		437,74	436,98	369,52	369,81	388,96

Source: technical report ONEA 1999

ANNEX 3: TRENDS IN TARIFF FROM 1969 TO 2002 (BURKINA FASO)

Beginning of application	1969	1978	06-1979	08-1981	07-1983	04-1991	06-1992	06-1993	01-1994	04-1994	01-1995	12-1997	01-1999	03-2000	02-2002	
End of application	1978	05-1979	07-1981	06-1983	03-1991	05-1992	05-1993	12-1993	03-1994	12-1994	11-1997	12-1998	02-2000	01-2002		
0 to 10 (m3)	69	70	70	70	90	113	123	134	147	164	164	168	172	176	m 3 0 to 6 180	
11 to 25 (m3)	69	70	74	74	95	120	158	209	276	320	320	338	356	375	7to30 377	
26 to 50 (m3)	69	70	74	145	200	250	312	390	486	840	800	860	924	993	+30 998	
51 to 100 (m3)	69	110	120	185	255	320	376	441	517	840	840	860	924	993		
+ 100 (m3)	69	153	170	255	280	350	402	461	529	840	840	860	924	993		
Societies												860	924	993	998	
Stand post			70	70	90	90	107	127	151	174	174	178	182	186	186	
Post autonomous					46	46	54	64	76	87	87	89	91	93	93	
Brute water			108	150	150	186	194	202	211	333	333	358	385	414		

Source (ONEA, 2002)

ANNEX 4: METHODS OF COLLECTION (ONEA)

- For the Households connections

After the deadline of payment the following steps are applied:

- Step 1:** 1st late penalty F CFA 2000 for one bill
2nd late penalty F CFA 4000 for the same bill
- Step 2:** letter and note for suspension/courting

2 stages:

- State of furniture's suspension
- State of meters lay down

Step 3: suspension of water supply

Step 4: Removal of the meter

Step 5: Cancellation by the office

But the modalities of the payment can be negotiated

- For the stand post

The conditions of the management are included in the agreement ONEA/ Water reseller. The cancellation of the contract took place after the non-payment of the first bill. (Late for 2 weeks). The stands post investment is done by ONEA and the post keeper pays a caution of CFA 25 000. Conditions of water delivery are in the service contract article 8.

**ANNEX 5 : SOME RESULTS IN THE MANAGEMENT OF STAND POST AND POST AUTONOMOUS
IN OUAGADOUGOU**

N°	Years	1990	1991	1992	1993	1994	1995	1996	1997	1998
1	Stand posts	183	188	376	385	385	411	417	433	450
2	Post autonom.	28	28	28	28	28	28	11	11	11
3	Sell at SP ('000) m3	1452	1374	1964	2891	3041	3254	3703	4133	4325
4	Sell at PEA '000) m3	300	296	281	201	180	185	206	86	110
5	Sell SP+PEA	1752	1670	2245	3092	3221	3439	3909	4219	4435
6	Sell HH con.m3	6785	6464	6161	7270	7557	6892	7515	8015	8046
7	% Sell SP+PEA	21%	21%	27%	30%	30%	33%	34%	34%	36%
8	Rate of recovery of bills at ST+PA	95%	95%	95%	95%	95%	95%	98%	99%	99%

ANNEX 6 : EXAMPLE OF WATER BILL

Numéro I.F.U. :
79 300 762 J

OFFICE NATIONAL DE L'EAU ET DE L'ASSAINISSEMENT

SIEGE SOCIAL : Face stade du 4 août - 01 B.P. 170 - OUAGA 01 - Tél. 34.34.59/60

OUAGA AGENCE 4 200

FACTURE
104112237162

N° ABONNÉ	N° POLICE	CR	N° COMPTEUR	ANCIEN INDEX	NOUVEL INDEX	CONSUMMATION	TOTAL
01013451227	00046856	010	652851	4458	4471	13	13

CREPA.
LOT 07 FLE 01



In. PDU :

11/2002

TRANCHE	QUANTITÉ	TARIF EAU	MONTANT EAU	TARIF ASS	ASSAINISSEMENT
1	6	180	1080	21	126
2	7	377	2639	21	147

EAU	ASSAINISSEMENT	REDEVANCE	MONTANT H.T.
3719	273	1000	4992
ABATTEMENT	BASE TVA	MONTANT TVA	MONTANT T.T.C.
			4992

Période : 11/02

Remise le :

TOTAL A
PAVER

4992

31/01/03

En cas de règlement espèces, ajouter le montant du timbre soit : 0030 FRANCS

Date limite de réclamation 20 jours à compter de la date de remise de la facture.

NO PAYABLE A TOUT GUICHET

N° Abonné :

01013451227

N° Police :

00046856



1 041122 371622

4478

ANNEX 7:HOUSEHOLDS QUESTIONNAIRE

HOUSEHOLDS QUESTIONNAIRE

Name of the investigator

Date

Sector /City

I/ Identification of the HH

Name :

Surname :

Sex : F M

Matrimonial Situation

Single :

Married : Widowed

Number of Children :

Total number living in the HH :

Others :

Professional Situation :

Ethnic : Zone of the sector

Religion:

1.1 : Sources of water provision ?

Stand Post (SP)?

Resellers (SWSP)

Private HH connection (PHHC)?

Well/Boreholes ? Others .

1.2 :Why do you pref this sources ?

Distance :

1- D< 200m

2- 200m<D<1000m

3- D>1000m

Water quality

1- taste

2- clarity

Services :

1- Very Good

2- Good

3- Middle

4- Special relations

II / Water needs

2.1 : how do get water ?

- By subscription at ST
- Daily buy at ST
- Buy From 'Pousse pousse' .
- By subscription from the resellers
- Private HH connection
- Other

22 : Is there any differences during the seasons ?

Rainy season?

Dry season?

2.3 : Please estimate the consumption during the seasons ?

Rainy season ?

Dry season ?

2.4 : what quantity of water do you use per day ?

1- One barrel

2- Two barrels

3- < one barrel

4- other .

III/ Water price

3.1 : How much do you pay for water?

- 1- One barrel :
- 2- One bucket of 20 l :
- 3- One bucket of 10 l :
- 4- Other

3.2 : How is the water price?

In dry season ? .

- 1- Reasonable
- 2- High
- 3- Low ..

In Rainy season?

- 4- Reasonable ?
- 5- High
- 6- Low

3.3 : How much do you use for daily food?

- 1- Is water cost included ?

Oui Non

if yes how much do you pay ?

In rainy season/

- a- 0-100 F CFA
- b- 100-500
- c- 500-1000

In Dry season?

- d- 0-200
- e- 200-1000
- f- 1000-2000

IV/ services

4.1: Are you satisfied with the services?

Yes No

3.5 : Are service continue ?

yes Non

3.6 : Are you ready to pay for HH connections ?

3.7: How much .

3.8 :Combien souhaiteriez-vous réellement payer l'eau ?

- 1- One barrel :
- 2- a bucket of 20l :
- 2- A bucket of 10 l :

3.9 : What do you suggest ? ?

ANNEX 8: QUESTIONNAIRES FOR STAND POST KEEPERS AND SPWSP

QUESTIONNAIRES FOR STAND POST KEEPERS AND SPWP

Name of the investigator
Date
Sector /City

I/ Identification vendors/SP keepers

Name :
Surname :
Sex : F M
Matrimonial Situation
Single :
Married : Widowed:
Number of Children :
Total number living in the HH :
Others :

Professional Situation
Ethnic : Zone of the sector
Religion :

II / Populations served

2.1 : Number of Households served ?

- 1- Number of Households
 - a- >50
 - b- 20<N>50
 - c- <20
- 2- Number of resellers:

3- Number of SP Keepers

4- others

2.2 : what modes do you use for the supply ?

- 1- Stand post :
- 2- Hand cart :
- 3- Other :

III / Water price

3.1 :how much is the water price ?

- **Buy at Stand post**
 - One barrel
 - bucket of 20 l :
- 3. other :
 - **Buy from resellers**
 - One barrel :
 - One bucket of 20 l :
 - 5- Other :
- **Private HH connection**
 - 1. m 3 :

3.2- Do they pay at by credit ?

How much you recover?

- 1- 90% payent :
- 2- 50<P>90% :
- 3- moins de 50% payent :

How long ?

Is there some rule if the non payment occurred ?

How much do you collect per day ?

3.4- It is equal to which quantity of water ?

3.5- How much remain after deducting all expenditures ?

3.6- How much is used ?

3.7- Why people prefer your water source ?

Often open

Continually open

3.8 : is there some break down ?

How do you repair them ?

3.9- Break-down frequency ?

1- one per day

2- one per week

3- One per month

4- One in tree months

5- Not often

6- Water court ?

3.10- Which improvement do you suggest to improve the services ?

3.11- IS there some time you pay late your bills ? ?

Give the reason ?

Has ONEA already court the service? ?

3.12- What is your daily/ weekly profit ? ?

3.13- How much do you use for the improvement of the service ?

3.3.14- How much have you paid for the settlement ? ?

3.15- Have you a contract service ? ?

3.16- How much have you paid for the whole settlement ?

3.17- In how many time did you recover the cost ?

3.18- What do you think about your work ?

ANNEX 9: LIST OF PEOPLE MET DURING THE STUDY

- 1- M. H. **Ouibeiga**, Deputy Director of exploitation ONEA
- 2- M. O. **Diallo**, consultant Small scale water and sanitation developer
- 3- M. Z. **Boukary**, Director ONEA Ouagadougou department;
- 4- M. E. **Sawadogo**, Director of exploitation ONEA
- 5- M. T. **Bastemeyer**, Senior program officer IRC;
- 6- M. D. **Mogbanté**, Coordinator WATAC/ GWP;
- 7- M. C. **BATIONA**, Chef service GIS ONEA
- 8- M. M. **Coulibaly**, Chef agence ONEA Dassasgo
- 9- M. A. **ZAGRE**, PEA keeper sector 28
- 10- Mme A. **KOMBOGO**, PEA keeper sector 28
- 11- M. A. **OUEDRAOGO**, President Solor pumping committee sector 28,
- 12- M. A. **BANGRE**, cashier Solor pumping committee sector 28,

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