

# Innovative Contracts, Sound Relationships: Urban Water Sector Reform in Senegal

**Clarissa Brocklehurst and Jan G. Janssens**



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Water Supply  
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Sector Board

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## CONTACT INFORMATION

Clarissa Brocklehurst, Water and Sanitation Specialist, Consultant. e-mail: [cbrocklehurst@sympatico.ca](mailto:cbrocklehurst@sympatico.ca)  
Jan G. Janssens, Program Manager, BNWP Water Supply and Sanitation, Energy and Water Department: 202-458-7247, e-mail: [jjanssens1@worldbank.org](mailto:jjanssens1@worldbank.org)

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# Innovative Contracts, Sound Relationships: Urban Water Sector Reform in Senegal

**Clarissa Brocklehurst and Jan G. Janssens**

**The World Bank, Washington, DC**



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## FOREWORD

*The Innovative Contracts, Sound Relationships: Urban Water Sector Reform* paper is the first in the new Water Supply and Sanitation Sector Board Discussion Paper Series.

The publication series targets cutting-edge water supply and sanitation practices, and offers an opportunity to present the knowledge gained and good practices developed by the World Bank's professional community and to keep the world-wide water supply and sanitation community up to date with the World Bank projects and operational research. The series is aimed at internal and external audiences, including practitioners and policy makers. All publications in the series are peer-reviewed.

The first paper in the series analyses a successful reform process in Senegal. The paper describes how several years of hard work on reforming the sector resulted in considerable improvements in services for existing customers and expansion to new customers. The reform included a broad package of measures, including the introduction of a public-private partnership in the form of a hybrid lease (affermage) contract. This has had a significant impact on the quality of water services for those in the private operator's service area. As the study documents, the design of the contract supported the government's objective of serving the poor, and, coupled with funding initiatives, resulted in many previously un-connected poor customers benefiting from water supply services.

In all of our borrowing countries effective delivery of water supply and sanitation services is essential for poverty reduction. A daunting challenge remains to improve water supply and sanitation services to the billions who are still unserved and to achieve the Millennium Development Goals.

The need for sector reform to meet the challenge is now widely accepted. The Senegal experience provides an example of how such reforms can be implemented in practice. This paper provides clear insight into complex issues of water supply and sanitation can be tackled in an African setting. It thus supports us in our efforts to scale-up infrastructure provision and in reaching the poor.

Jamal Saghir  
Director, Energy and Water  
Chairman, Water Supply and Sanitation Sector Board  
January 2004

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## LIST OF ACRONYMS AND ABBREVIATIONS

ACE	Actual Commercial Efficiency
ATE	Actual Technical Efficiency
CBAO	Compagnie Bancaire de l'Afrique Occidentale
CCE	Contract Commercial Efficiency
F CFA	Franc de la Communauté Financière d'Afrique
CTE	Contract Technical Efficiency
GDP	Gross Domestic Product
IDA	International Development Agency (of the World Bank Group)
KfW	Kreditanstalt für Wiederaufbau (German Development Bank)
MSG	Management Service Gambia
NGO	Non-government Organisation
ONAS	Office National de l'Assainissement du Sénégal (National Sanitation Office)
PPIAF	Public Private Infrastructure Advisory Facility
PPP	Public Private Partnership
PSP	Private Sector Participation
PVC	Poly vinyl chloride
RFP	Request for Proposals
SAUR	Société d'Aménagement Urbain et Rural (private French water company)
SDE	Sénégalaise des Eaux (Senegalese water utility)
SEEG	Société d'Exploitation des Eaux de Guinée (water utility in Guinea)
SHC	State Asset Holding Company
SODECI	Société de Distribution d'Eau de la Côte D'Ivoire (water utility in Ivory Coast)
SONEES	Société Nationale d'Exploitation des Eaux du Sénégal (state-owned water utility in Senegal prior to 1996)
SONEG	Société Nationale des Eaux de Guinée (state asset-holding company in Guinea)
SONES	Société Nationale des Eaux du Sénégal (state asset-holding company in Senegal)
UfW	Unaccounted-for Water
UHC	Utilities Holding Company
US\$	United States dollar
WHO	World Health Organization

NB:

One billion is equivalent to 1,000 million.

The F CFA was formerly pegged to the French franc, and is now pegged at 655.957 to the Euro. At the time of writing, one US dollar was approximately 550 F CFA.





## EXECUTIVE SUMMARY

In 1995, the Government of Senegal launched wide-reaching reforms in the urban water sector. The reforms consisted of dissolving the state-run water company and creating a new asset-holding company that owned all the fixed assets in the government's name and had a mandate to manage the sector. The distribution and production was delegated to a separate entity, and a private operator was engaged to run the system.

Eight years later, these reforms have resulted in significantly better services and financial health for the sector. There has been a 20 percent increase in the amount of water supplied, and the number of customers connected has increased by 35 percent. Consumers experience better service delivery in terms of response time to complaints, hours of service, and water quality. The utility is better run, with lower water losses and higher bill recovery. Both the private operating company and the state asset-holding company are healthy organisations, and their working relationship is good.

A series of contracts was formulated between the actors in the Senegalese water sector, including a concession contract mandating that the state asset-holding company manage the sector, a sector development contract outlining the planned investments to be made, and a contract with the private operator. This last – a 10-year affermage modified by the addition of strong financial incentives to reduce leakage and improve billing and collection efficiency – was innovative. It has proved to be a good fit for a country in which, on the one hand, leakage was high and system rehabilitation needed urgent attention, and on the other hand, the poverty alleviation objectives meant that customers had to be protected from dramatic price increases and coverage needed to be expanded.

The primary factors which contributed to the success of the reform process and the strengthening of the urban water sector can be summarized as follows: the use of a **particularly appropriate form of contract; strong political will and good leadership** within the government; a **well-designed process**; and **flexibility and innovation** when it was needed.

The Senegal water sector reform was also facilitated by the strategic use of private finance, both from the private operator (who financed some investments) and from local private banks who provided a line of credit to assist the state asset-holding company with its cash flow. A major shortcoming of the reform was the failure of the government to make agreed-upon investments in the network in a timely fashion, but this has now been resolved. The good relationship and effective dispute resolution process meant that the private operator and the state asset-holding company were able to reach agreement on how the operator was reimbursed for lost earnings due to the delay in investments.

The reform has had positive outcomes for the poor, in part due to the nature of the operator's incentives, and in part due to the government policy of subsidizing connections in low-income neighbourhoods. However, issues still remain due to tariff inequities and poor targeting of subsidies.



## 1 INTRODUCTION

In 1995, Senegal undertook major and groundbreaking reform of its urban water supply sector. The bankrupt public sector utility that had managed water supply in urban areas since 1983 was dissolved, and a new state asset-holding company was created to manage the sector. The government put the management of water services out to international competitive bidding, and engaged a French water company to run the production and distribution systems on a 10-year contractual basis.

Seven years later, there have been significant improvements to urban water service delivery, and the financial health of the sector is steadily improving. The reform in the water sector in Senegal has had wide-reaching effects, not only in Senegal itself, but in other countries as well. The Senegal case is perceived to be an example of well-planned and well-executed reform, which, unlike some of the other attempts at water sector reform of the same era, has stood the test of time.

This case study seeks to examine the reasons the reform was successful, and to look in detail at its components – institutional, contractual, and financial. The outcomes of the reform process are also examined, in particular how poor consumers have fared.

## 2 CONTEXT AND OBJECTIVES

### 2.1 Political and Reform Environment in Senegal

Reform in any one sector must be viewed in the context of the overall environment in the country. In Senegal, the dramatic changes in the water sector that occurred in 1995 were a product of a much larger series of reforms made necessary by a national financial crisis.

Senegal is a mid-sized country in West Africa, with a population in 2002 of approximately 10.5 million people. Three quarters of the country lie in the arid Sahel, severely restraining its development options.<sup>1</sup> When Senegal obtained independence from France in 1960, it had one of the most developed economies in West Africa. But by the late 1970s, Senegal was facing severe economic problems due to a combination of an uncompetitive economy, a huge public sector wage bill, and a habit of big government spending induced by a boom in export prices of groundnuts and phosphate.<sup>2</sup> Droughts in 1978 and 1980 added to the problems, and eventually led Senegal to seek World Bank adjustment credits.<sup>3</sup>

Adjustments were slowed by the resignation of the long-standing president, Leopold Sedar-Senghor, in the early 1980s and the reluctance of his successor to enact reforms until he had his own political mandate through reelection in 1983. However, after 1983 several structural adjustments credits were agreed upon, with objectives of macro-economic stabilization, agricultural marketing liberalization, trade liberalization, wage and labor market deregulation, and rationalization of public sector management, including public enterprises and the civil service.

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1 World Bank, *Republic of Senegal Water Sector Project, Staff Appraisal Report*, 1995.

2 Anne Marie Goetz and Armand E. Atomate, *Impact of IDA Lending on Institutional Development: Senegal*, World Bank mimeo, 2002.

3 All of Senegal's borrowing from the World Bank is through its concessional lending window, the International Development Association (IDA), which provides credits at zero interest, with long maturities

The reforms involved redefining the role of the state in the economy through public enterprises, including the water and sanitation utility. In the mid-1980s, there were 21 *établissements publics*, 7 *sociétés nationales*, and 59 *sociétés d'économie mixte*; these state enterprises were active in banking, mining, agriculture, telecommunications, and electricity and water, among other sectors. Nearly half of them were in a deficit situation in 1980, and government subsidies to them rose steadily throughout the 1980s.<sup>4</sup> In 1995, the World Bank estimated that Senegal's operating subsidies to state-owned enterprises totaled about 40 percent of the government education budget, and over 150 percent of the health budget.<sup>5</sup> As Senegal's liquidity crisis worsened, the government sought to end government investment in the parastatals, improve their efficiency, and prepare them for privatization – a significant shift from previous policy.

The government attempted to improve the relationship between the state and the parastatals by negotiating performance contracts (*contrats plans*) that clarified the mutual obligations of each party. However, this proved to be ineffective, as the government routinely defaulted on its financing obligations, and supervision was poorly carried out.<sup>6</sup> By the mid 1990s, the *contrats plans* had been abandoned, and though there was divestiture in some small operations, not a single major public enterprise had been privatized. In fact, the size of the parastatal sector had increased. Reform was urgently needed, and a high-profile and successful privatization transaction was required to break the impasse.

It was in this context that the urban water distribution company was, through a careful and systematic process, handed over to private sector management in 1996. The water utility was actually a relatively well-run parastatal from a technical point of view, which made it well-suited to private sector participation. As will be described below, considerable political will and competent, determined bureaucrats helped usher in the first example of private management of a former state-owned enterprise in the country.

This transaction thus set the stage for reform in other state enterprises (particularly public services such as telecommunications and electricity) and built up government confidence to explore more private sector partnerships.

## **2.2 The Water Sector in Senegal Prior to 1996**

At independence in 1960, the urban water utility was in private hands, run through a concession contract by the *Compagnie Générale des Eaux du Sénégal* with the majority owned by *Générale des Eaux*, a private French firm.<sup>7</sup> The company was nationalized in 1971 when the shareholders were required to sell their shares to the state.

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4 Goetz and Atomate, 2002.

5 World Bank, *Bureaucrats in Business*, 1995

6 Ibid. A 1995 World Bank report suggests that these performance contracts, which were used in many countries, did not improve, and in fact exacerbated in some places, the poor incentive structures facing government managers. The contracts rarely included rewards and penalties, promised managerial autonomy was often not delivered, and governments frequently renege on key promises. Where cash bonuses were offered, they were often unrelated to performance, and penalties for poor performance, such as firing or demotion, were seldom applied. The contracts did not reduce the managers' information advantage; instead, managers were able to use their knowledge of the firm to negotiate multiple soft targets that were easy for them to reach.

7 Generale des Eaux is now Vivendi Environment.

### Box 1. Private Sector Participation in the West African Water Sector

In West Africa in the mid-1990s, private sector participation in the water sector was not particularly new. At the time of independence, private companies were operating water supply systems in Côte d'Ivoire, Guinea Conakry, Mauritania, and Senegal. All these undertakings were nationalized in the 1960s and 1970s (with the noticeable exception of Côte d'Ivoire, where the water company sold 48 percent of the shares of the water system to private Ivorian investors). During the course of the 1980s and 1990s, the water sectors in these countries re-engaged with the private sector, and did so ahead of the electricity and telecommunications sectors. Even though the rationale for privatization might have appeared stronger in these other sectors, vested interests and rent-seeking in the water supply sector were comparatively limited and easier to overcome than in other utility sectors. In each country, there was a recognition that private sector participation could overcome two of the major ills of the water sector: poor operating performance leading to poor service, and lack of financial viability at a time when substantial investments were needed.

In the 1970s and 1980s, the water utility (which was responsible for supply to the capital, where approximately 30 percent of the population lives, and 41 of the 75 secondary towns), was plagued with problems which resulted from a lack of autonomy from government, chronic water shortages in the capital city, and piecemeal development of the assets. In 1983 the water utility was one of the first public enterprises to be the subject of a contrat plan (through the newly formed public utility, the Société Nationale d'Exploitation des Eaux du Sénégal – SONEES). Though SONEES was technically a well-run agency, with capacity to execute projects well (including a large World Bank-funded extension project in the late 1980s that expanded the system to 11 secondary cities), the government did not give it adequate autonomy.<sup>8</sup> SONEES was not able to exercise full control over planning for the sector, to set tariffs to recover costs, or to settle unpaid bills with clients in the public sector such as government departments, municipalities, and parastatals. A combination of tariffs that were too low and large uncollected accounts meant that SONEES was soon unable to settle its arrears with suppliers such as the state-run electricity utility (Société Nationale d'Electricité – SENELEC), and lacked funds for investment after the World Bank project ended. Private capital was difficult to obtain as a local capital market did not exist, and SONEES in any case lacked a credit rating.

In 1995, only 54 percent of Senegal's urban population had access to safe water,<sup>9</sup> and there were serious supply problems in Dakar. At the time, Dakar was supplied primarily with groundwater, but there were quality problems due to saline intrusion. Various scenarios were being considered to supplement supply with surface water sources, all of which were distant, making large-scale transfer costly.<sup>10</sup>

<sup>8</sup> Goetz and Atomate, 2002.

<sup>9</sup> World Bank, *Republic of Senegal Water Sector Project - Staff Appraisal Report*, 1995.

<sup>10</sup> One of these scenarios included the construction of the "Canal de Cayor" to transfer water from the Lac de Guiers to Dakar. A Build-Transfer-Operate (BTO) arrangement with a private firm was explored for this US\$100 million scheme. The scheme was highly controversial due to its high cost, which would have ultimately had a significant impact on tariffs, and there was uncertainty over whether the predicted water demand warranted such a large investment.

## Box 2. Snapshot of SONEES and the Senegalese Water Sector in the Early 1990s

In the early 1990s, SONEES was responsible for operation and investments in the capital city of Dakar and 41 of the 75 towns with more than 5,000 inhabitants, totaling almost 90 percent of the urban population of the country. The size of the cities and towns SONEES served ranged from several hundred thousand in Dakar to a few thousand for some of the small municipal centers – only a handful of the cities in Senegal have populations over 100,000. Water services in rural areas had historically been the responsibility of the national government, under the Direction d’Hydraulique. Many rural towns were incorporated into the territory administered by SONEES, either because they were villages that became too big for the Direction d’Hydraulique to administer, or because they were close to the pipeline bringing water to Dakar from the Lac de Guiers.

The World Bank estimated that the percentage of Senegal’s urban population with access to a safe supply of piped water was 54 percent in 1995. Another 42 percent had access only to public fountains, and the remaining 4 percent obtained water from traditional sources or from vendors. Only 20 percent of the urban population was connected to a waterborne sewerage system.<sup>11</sup> (While this situation was poor, it was still better than the rural situation, where in 1980 coverage was only 25 percent for water and 2 percent for sanitation. By 1990, these rates had risen to 60 percent and 38 percent respectively,<sup>12</sup> but in 1995 only 65 percent of rural dwellers had any access to a safe and reliable water supply.)

In 1994 SONEES supplied 94 million cubic meters to urban centers – about 257,000 cubic meters per day. The volume supplied in Dakar was only 128,000 cubic meters per day, while the demand was for some 210,000 cubic meters. The resulting deficit led to 16 hours of service per day on average, and intermittent supply had a detrimental effect on quality due to infiltration of soil water into the pipes during periods of negative pressure. Water losses from leakage and illegal connections were estimated at 27 percent of production in Dakar. While other cities did not experience such extreme problems of supply, it was estimated that significant investment was required to keep pace with demand. Drinking water quality in many cities was poor, with bacterial contamination present at the end of the distribution system, and inadequate chlorination. Public agencies were responsible for much of the losses and wastage in the system as they did not pay their bills. The bulk of Dakar’s poor did not have access to affordable water, except through public standposts.<sup>13</sup>

In summary, there was an urgent need for reform. The sector needed to grow, both to meet the immediate needs of urban residents, and to accommodate a growing population. Increased productivity and operational efficiency were imperative. In particular, sustainable improvements were needed in water and sanitation services in unserved and low-income urban areas.

11 World Bank, *Republic of Senegal Water Sector Project - Staff Appraisal Report*, 1995.

12 From WHO Water Supply & Sanitation Sector Assessment, 2000, as quoted in Sophie Trémolet, Sara Browning, and Charlotte Howard, *Emerging Lessons in Private Provision of Infrastructure Services in Rural Areas: Water Services in Cote d’Ivoire and Senegal* (Environmental Resources Management for World Bank/PPIAF), April 2002.

13 World Bank, *Republic of Senegal Water Sector Project - Staff Appraisal Report*, 1995.

The government recognized that greater managerial autonomy was needed in order to ensure both greater productivity and operational efficiency, and that some sector investments would have to come from sources other than the government. All these requirements pointed towards involving the private sector. With the stage already set through the other reforms then happening in the country, the government, with support from the World Bank and its other traditional development partners (Agence Française de Développement, the German Development Bank (KfW), and the European Investment Bank), began investigating options for private sector participation.

### **2.3 The 1995 World Bank Water Sector Project**

The World Bank, through its concessional lending window, the International Development Association (IDA), had been providing support to the Senegalese water sector for many years, and was now prepared to provide a credit to increase the capacity of the Ngnith water treatment plant on the Lac de Guiers and the 150 kilometer pipeline that served Dakar. However, it was deemed shortsighted to increase the amount of water reaching Dakar if there was still substantial leakage in the distribution system of the city. One of the key objectives of bringing in a private sector operator was thus to decrease Unaccounted-for Water<sup>14</sup> within the context of overall improvements in management.

The government wanted to continue to hold and control the assets, however, and was therefore not interested in either full divestiture or a long-term concession. This led the government and the World Bank to investigate other types of contract arrangements, but ones that had clear incentives to achieve a reduction in leaks and to improve revenue collection.

The World Bank Water Sector Project had, as its overall objective, the creation of an enabling government framework to attract private finance, increase efficiency, and improve service delivery, including rehabilitation of the network. It had a total budget of US\$290 million, of which almost 80 percent (US\$230 million) was to enhance supply by rehabilitating the Ngnith treatment plant and increasing the capacity of the pipeline, the number of boreholes, and storage. There was also to be capacity building of key institutions and institutional restructuring, including signing a contract with a private operator. Before any of this could be finalized, however, the World Bank and the government of Senegal embarked on a year-long process of planning and design in order to put in place an innovative arrangement of contracts, incentives, and institutions.

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14 Unaccounted-for Water (UFW) is the difference between the quantity of water supplied to a city's network and the metered quantity of water used by the customers. UFW has two components: (a) physical losses due to leakage from pipes, and (b) administrative losses due to illegal connections and under-registration of water meters.

## **3 PLANNING FOR A NEW ARRANGEMENT**

### **3.1 Setting the Parameters**

In 1994, the government created a steering committee (comité de pilotage) of the ministers of each government agency concerned with water supply and sanitation. These included the Ministry of Finance (a section of which – the Cellule de Gestion et de Contrôle du Portefeuille de l'Etat – chaired the committee), the Ministère de l'Hydraulique (which provided the permanent secretary to the committee), the Ministry of Industrial Development, the office of the President, and the office of the Prime Minister.

This committee analyzed all the reform options against the identified weaknesses in the sector. At a seminal workshop in July 1994, the committee concluded that SONEES should be dissolved, that a State Asset Holding Company (SHC) should be formed which would retain the assets and the right to extract water (water sources thus remaining in public hands), and that an operating company should be created to produce and distribute the water. It was decided that the operating company should be run by a private professional operator, which would own at least 51 percent of it, with the other 49 percent being owned by a mixture of Senegalese investors, former SONEES personnel, and the State. The committee also recommended that tariffs be structured so that cost recovery, and therefore financial sustainability, was ensured, and that the reform have a “social dimension”. This meant, among other things, ensuring that all SONEES staff were retained. (Although the fact that the labor code had been amended in 1994 to allow a private enterprise to lay staff off for economic reasons would have made retrenchments possible, they were in fact not needed on a large scale. SONEES, unlike its counterpart institutions in many other developing countries, was not significantly overstaffed.)

The technical sub-committee drew up a list of functions for the state asset-holding company and the operating company. This included recommendations that remuneration of the private operator be linked to efficiency of the network (measured by reduced UfW and increased billing and collection efficiency), and that there be some contribution by the operator to capital expenditures. The committee came to the conclusion that, in light of the needs and constraints in the sector, an affermage type contract was the preferred option (see Box 3.)

### **3.2 Learning from Other Transactions**

The committee members placed great emphasis on learning from the experiences of other transactions and reform processes. They had commissioned a series of case studies, conducted by a Dutch consulting firm, which compared three countries in the region where the private sector had been brought in through similar contractual arrangements: Guinea, the Gambia, and Cote d'Ivoire. Fact-finding missions, including members of the government and donors as well as the consultants themselves, had been carried out in April and May of 1994, and the lessons were summarized in a report submitted in August 1994<sup>15</sup> (see Annex 1).

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<sup>15</sup> Aquanet, *Institutional Reform of the Urban Water Sector, Volume 1 Main Report: Functional Relations*, August 1994.



### Box 3. Definition of an Affermage Contract

Under an affermage contract, a private company is paid a fee (referred to as the “operator’s water supply rate” or sometimes the “operator’s tariff”), which is the price (usually expressed per m<sup>3</sup>) for the volume of water produced and sold that the operator requires to cover all his costs for running the system. This price is the parameter that the bidders compete on. The operator’s payment is calculated according to a formula set out in the affermage contract, which may contain factors designed to reward performance in certain areas. The operator collects revenue from consumers on behalf of the government, according to the tariffs set by the state, retains the amount of his fee, and remits the difference to the government, who uses the balance to pay for the investments that the public authority has made.

It is important to note that under an affermage contract the operator does not have any decision-making role in setting tariffs, nor is his fee solely based on the tariffs he collects (the operator’s fee usually accounts for between 50 and 70 percent of the total consumer tariffs). In this an affermage differs from a concession, under which the operator invests in and runs the system in exchange for 100 percent of consumer tariffs. It also differs slightly from a similar contract form, the lease, in which a private firm leases the assets of a utility from the government and assumes the responsibility for operating and maintaining them. Because in a lease the lessor effectively buys the rights to the income stream from the utility’s operations (minus the lease payment), it assumes much of the commercial risk of the operations. In an affermage, the operator takes on less commercial risk, but there is still an element of risk due to the fact that the operator’s profits are related to volume of water sold – the less he sells, the less he makes. There is also risk associated with the fact that if the tariffs are so low that what he collects from consumers does not cover the payments due to him, the government will have to make up the shortfall. If there is a chance that the government will not have funds to do this there is a risk of delayed payments or even non-payment.

One advantage of an affermage contract is that it does not require a sophisticated regulatory framework; regulatory provisions are, theoretically, built into the contract itself. This is particularly desirable when the necessary foundations for utility regulation are lacking in national law, and regulatory capacity is either nonexistent or inadequate, though the expectation that any contract will be entirely self-regulating is somewhat optimistic.

Based on the lessons learned from other countries, the consultants who conducted the fact-finding missions proposed that an institutional framework be established for the Senegalese water sector which

- was transparent;
- was driven by three basic concepts: accountability, autonomy, and incentives;
- was centrally coordinated by an experienced and competent asset-owner (a State Asset Holding Company);
- would attract a professional private operator;
- was not overly regulated with too many conditions placed on the actors;
- ensured that the partners (asset-holding company, private operator) cooperated and maximized joint benefits.

The consultants concluded that, in the three other African countries studied, considerable problems had arisen due to the conflicting interests of the asset-holding and the operating companies; that is, that maintenance is the responsibility, and therefore at the expense of, the operating company, and renewal is the responsibility, and therefore at the expense of, the asset-holding company. Lack of investment in maintenance will mean more renewal is needed, and lack of renewal will increase maintenance costs.

The consultants recommended that the fixed assets be owned by the State Asset Holding Company, and the operating equipment, comprising all moveable assets, be owned by the privately-run operating company. Experience from other countries showed that a high degree of clarity was needed – the categorization of assets had to be clear, and it was suggested that all assets be listed in annexes to the contract.

The decision to create a State Asset Holding Company was based, to a large extent, on the lessons from Côte d'Ivoire, where such an institution did not exist. This had led to a lack of financial accountability and coordination. In Senegal, it was felt that only a financially autonomous agency would carry out the investment responsibilities, which were the responsibility of the public sector, in an accountable manner. Financial autonomy would create incentives to design a sustainable investment program and to lobby the government for adequate tariff increases. The holding company would be a small unit that would employ qualified staff under conditions distinct from the civil service and would have independent contracting authority. Finally, it was felt that the staff of an asset-holding company would be less likely to be exposed to capture by the private partner than a ministerial department usually deprived of basic operating resources.

The consultants concluded that there had to be a sound balance between the two operators and the State Asset Holding Company: "if the arrangement creates a giant and a dwarf, the outcome will be that the giant dictates to the dwarf."<sup>16</sup> As they put it in their report, even a solid contract will not prevent overruling if there is not a balance of power. They proposed that there be a balance in terms of the content of the assignment of each party, the allocated means (financial and physical), and status (see Box 4 The Prisoner's Dilemma).

The division of functions proposed for Senegal was designed to respect this balance. The government was to determine sector policy and to oversee the asset-holding company. Creating the asset-holding company signaled that the State intended to remain actively involved in the sector and would protect the interests of the public. The asset-holding company was to be assigned the responsibility for approving investments and overseeing the operating company. The asset-holding company was potentially in a vulnerable position and needed full autonomy and adequate remuneration, independent of whatever political debate took place over tariffs. The private operating company was to be allowed the independence to manage and to bring the advantages of professional private management to the utility, while being carefully monitored.

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<sup>16</sup> Ibid.

#### Box 4. The Prisoner's Dilemma

The consultants likened the relationship between the operator and the asset-holding company to the “prisoner’s dilemma”, a well-known problem in game theory. In the prisoner’s dilemma, each of two prisoners suspected of a crime, who are not allowed to communicate with each other, are offered freedom if one implicates the other; in this case the other will be sentenced to three years. If neither implicates the other, both will receive a 1-year sentence. However, if the prisoners implicate each other, then both are sentenced to 2 years. The dilemma arises as neither knows whether the other will choose opportunism or cooperation.

The consultant analyzed the relationship between the two parties to the contract, the State Asset Holding Company (SHC) and the private firm, as also being a choice between opportunism and cooperation. (The analogy differs in that the SHC and the firm have the opportunity to communicate and therefore cooperate – the true prisoner’s dilemma has no optimized solution.) If the private operator behaves opportunistically and the SHC decides to be cooperative, the firm will maximize profit at the expense of the public. If the firm is cooperative and the SHC opportunistic, the firm will lose money, possibly introducing instability. If both actors behave opportunistically, there is potential for endless haggling, disputes, and litigation, making excessive regulation of the sector necessary, and leading to higher costs and lower efficiency. However, if both partners cooperate, the outcome will be optimized. The dilemma is that each actor has the potential for highest gain if he is opportunistic and the other is cooperative.<sup>17</sup>

The fact that the operating company would likely be a large, well-established international water company (or a consortium) with extensive professional resources led the consultants to recommend that the holding company also have the means to mobilize professional support, particularly during contract negotiation and evaluation of the operator’s performance. This argued for a well-run organisation staffed with highly skilled and competent water sector professionals.

It should be noted that the selection of a contract type was deliberated in the context of substantial opposition to the idea of a concession contract. This was due in part to the fact that there was intense political pressure to preserve the “patrimoine” (heritage) of the country in public hands and maintain government autonomy, and also because there was some concern that because private sector participation was new to Senegal, the government should select a form of contract that would allow for learning and adjustment. However, it was also due to the fact that the government had successfully lined up funds from a variety of donors and development banks<sup>18</sup> to finance the improvements to the Ngnith treatment plant and the pipeline, and IDA funds to rehabilitate the distribution system.<sup>19</sup> There was thus no need for large-scale private sector investment at the time (though this was something the government wanted to have as an option later on) and a form of contract, which required this investment, was not necessary. The government had the advantage of retaining complete control over the assets and also borrowed the investment funds at a much lower cost than if these funds had been accessed through the private operator.

<sup>17</sup> Ibid.

<sup>18</sup> The donors who supported the urban water supply sector included the Caisse Francaise de Developpement (French bilateral assistance), which provided loans totaling 23 percent of the costs of the Water Sector Project, German loan funds through KfW, Belgian and Nordic bilateral aid, loans from the European Investment Bank, the West African Development Bank, and a grant from the Arab Bank for Economic Development in Africa.

<sup>19</sup> Madio Fall, Directeur de L’Hydraulique et d’Assainissement, Ministere d’Hydraulique, personal communication, June 2002.

The government had also determined that requiring the operator to provide substantial investment in the system through a concession contract would result in unacceptably high tariff levels due to the high return on investment a private company would expect. This analysis was available to the government because early in the planning process, a financial model was created which allowed planners to simulate the sector and determine the outcomes in a variety of hypothetical scenarios. This instrument is also used on an ongoing basis to determine tariff increases needed each year. The use of the financial model, and its underlying assumption of “financial equilibrium”, has proved to be one of the major elements contributing to the success of the reform process.

### **3.3 Establishing the Goal of Financial Equilibrium**

#### **3.3.1 Financial Objectives of Reform and Financial Policy of the Sector**

One of the major objectives of the reform of the institutions of the urban water sector in Senegal was to establish long-term financial viability through increased efficiency and effectiveness. This was necessary for four main reasons:<sup>20</sup>

- To alleviate the burden on the state of having to provide direct and indirect subsidies to the sector, and thus free resources to be used elsewhere;<sup>21</sup>
- To make it possible for the sector to generate enough resources to finance part of the future capital expenditures;
- To bring the level of indebtedness to a level compatible with the sector’s capacity to service it;
- To attract private investors to finance an increasing part of future investment needs.

The financial policy of the sector was defined on the basis of a few key principles set by stakeholders at a workshop in July 1994:<sup>22</sup>

- The only support to come from the State would be in the form of on-lending of donor’s financing; there would be no ongoing operating subsidies.
- There would be no excessive increases in water tariffs; tariff increases would be introduced gradually, set initially at a constant rate but adjusted upwards or downwards according to progress in reaching financial equilibrium (as shown by the financial model after updating with each year’s data).
- The social tariff (the subsidized first block of the tariff for consumption under 10 m<sup>3</sup> per month) would be retained in order to ensure affordability.

#### **3.3.2 Creation of the Financial Model to Track Progress**

A financial model was created in order to plan for financial viability and to track the progress of the urban water utility towards it. Financial viability was defined as the financial “equilibrium” of the utility, which was further defined as the point at which the accumulated cash deficit was reduced to zero and a sustained accumulated cash surplus was generated.<sup>23</sup>

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20 Claude Sorel, *Introducing Financial Sector Equilibrium through PSP in a Low Income Country*, mimeo, 1999.

21 These subsidies primarily took the form of unpaid electricity bills owed to the state-owned electricity company.

22 Sorel, 1999.

23 Other indicators of financial performance, such as return on net assets and annual cash equilibrium, were also considered, but rejected. The criterion “return on net fixed assets” was not used because it reduced the emphasis on one of the main objectives of the reform, which was to make the sector financially viable, i.e. not having to rely on cash transfers from the State. The second criterion, annual cash equilibrium, was unrealistic, because during the construction period of new infrastructure, a cash deficit would be inevitable, as certain donors would only fund 90 percent of the project components they financed.

The model used an iterative approach, allowing planners to define parameters such as the year in which financial equilibrium was to be reached, or the maximum tariff increase in each year. The model was designed to

- determine the annual tariff increase necessary to reach financial equilibrium within a reasonable amount of time;
- determine the size and profile of the cash deficit which would accumulate during the initial years;
- test alternative options to minimize the deficit and estimate the corresponding temporary financing requirements.

The model could also be used to calculate the financial and economic rate of return of investments such as those in the planned World Bank project, and to conduct sensitivity analyses on key parameters.

Creating a model also had some additional benefits. It made all assumptions transparent (as they had to be fed into the model), and helped the actors identify the key input parameters. It also provided a comprehensive view of the financial aspects of the utility and simplified the analysis of multiple scenarios. Finally, it provided an ongoing dynamic tool for financial management and oversight of the utility that would be of use to both the state asset-holding company and a regulatory agency if one were created in the future. The model could be used to monitor the utility's financial health on a continuing basis and to test various strategies and scenarios in the future.<sup>24</sup>

The model, a complex computer spreadsheet, was developed in 1995 under a contract with Ernst and Young, financed by French bilateral funds, and guided by members of the World Bank team. It was based on the common business approach of looking at cash flow projections in order to determine the potential cash deficit, and therefore the magnitude and cost of debt to be incurred. The model is essentially a simulation of the flow of funds of the sector, including a) funds generated from operations (revenues minus expenses), b) investments in fixed assets and net working capital, c) new long-term capital raised through new borrowing and equity capital increases, and d) debt service. A similar model has since been used in water sector transactions in Niger and Burkina Faso, and a generic cash flow equilibrium model has been developed which is more powerful and flexible<sup>25</sup> (see Box 5).

Prior to the reform, a range of scenarios was developed to test possible combinations of changes to water tariffs, new investments financed by the planned World Bank project, and improvements in management leading to better efficiency. In each case, the model was used to perform calculations to estimate the cash flow shortfall and the year that financial equilibrium would be reached.

Some of the scenarios tested were rejected, either because they did not achieve equilibrium in a reasonable amount of time, or because while they appeared financially desirable, they did not address the acute shortage of potable water facing Dakar. Another problem was that many

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24 However, it is important to note that the model is a financial model of the utility (that is, SONES and SDE consolidated), not an economic model of the sector as a whole. As such, it could not be used to assess such things as the situation in the towns outside the utility's service area, the nature of demand, or the effectiveness of targeting of subsidies delivered through the tariff.

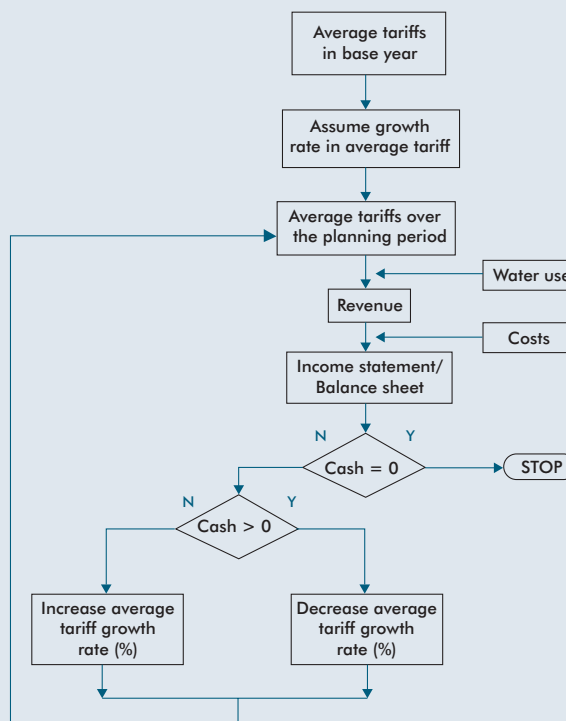
25 K. Komives, V. Prabhu, and D. Whittington, *Cash Flow Equilibrium Model for Water Utilities: User Manual for CFEM Version 1.01*, 2001. For more information on this user manual and associated software, contact Jan Janssens at [jjanssens1@worldbank.org](mailto:jjanssens1@worldbank.org) or Dale Whittington at [dale\\_whittington@unc.edu](mailto:dale_whittington@unc.edu).

scenarios required unacceptable tariff increases. Finally, a scenario was developed which predicted financial equilibrium in 2003 if the World Bank-financed investment project went ahead, network efficiency was improved, and consumer tariffs for water supply were increased at a rate of no more than 3 percent per year. This scenario, including the tariff increases, was accepted as reasonable by all parties, and became the “base case” upon which the financial projections were prepared. The balance of reasonable tariff increases and a practical target for financial equilibrium was important. Drastic price increases would have been politically difficult for the government, and an overly long horizon for measurable improvement in sector performance would have been unpalatable for the World Bank and the government, who were already looking ahead to larger water sector investments in the future.

The model had one final important function - it allowed the government to calculate a “ceiling rate” for the price to be bid by the private operators - that is, a price beyond which private sector management would be uneconomical. This was crucial information for the government to have when it evaluated the bids.

#### Box 5. Cash Flow Equilibrium Model<sup>26</sup>

The financial equilibrium of a utility is affected by three main factors: water tariffs, efficiency of water distribution, and investments. Using input parameters such as the target year of financial equilibrium, base year tariffs, and the information from the utility’s balance sheet, the model calculates the average tariff needed in the next year to reach financial equilibrium by the target year. Once the average tariff is determined, the increase is distributed across the various customer classes to reach the desired average figure. This of course requires assumptions to be made regarding the volumetric demand in each customer class. However, any unexpected deviations from the assumptions can be corrected when the model is run the subsequent year.



26 Ibid.

### 3.4 The Creation of SONES

The law implementing the institutional reform of the urban water supply sector was passed by the National Assembly in March 1995.

The law authorized the creation of a new asset-holding company, the Société Nationale des Eaux du Sénégal (SONES), to be governed by a 1990 law pertaining to parapublic sector enterprises. Also to be created out of the dissolved SONEES were the Office National d'Assainissement (ONAS), a national office under the Ministère de l'Hydraulique to manage urban sanitation,<sup>27</sup> and a new operating company for the distribution system, destined to be privatized.

During the parliamentary discussions preceding the passage of the law at the National Assembly, the government committed to guarantee employment for SONEES staff, defined as those with permanent staff status as of December 31, 1994. Thus, when SONEES was broken into the three new entities, the following allocation of staff took place:

- The operating company was assigned 1,394 staff members.
- ONAS took 96 staff members.
- SONES retained 50 staff to manage strategic development, long-term planning, and oversight in the sector.

At the point that the law was passed, the process of finding a private company to operate the water supply system was already well underway. Planning for the Water Sector Project was also well advanced and the US\$100 million IDA credit, representing 34.5 percent of the total US\$290.1 million cost of the project, was slated to go to the World Bank board in the summer of 1995, with credit effectiveness (meaning the funds could be disbursed) conditional on the establishment of a privately-managed operating company "satisfactory" to the Bank. On this point, the Bank showed some flexibility, contrary to its usual practice – instead of insisting that the contract be awarded prior to loan negotiation, the government was allowed to proceed with the bidding process after the credit was in place, potentially a substantial risk if the bidding and contract award procedure had not been successful. The Task Team and senior management at the Bank at the time felt that the "champions" of the reform process would not be able to continue if the credit was delayed, and that it would have been difficult to attract private sector operators if a source of financing for augmentation of supply was not available.<sup>28</sup> This level of uncertainty is one that the World Bank is seldom willing to accept, and would be even more unusual in today's more risk-averse climate. However, it was one of the aspects which, in Senegal, led to a successful process.

For several months, SONEES and SONES existed in parallel; SONES on paper, SONEES in practice. A new manager for SONES was appointed by the government, but not until May 1995, just in time for the negotiations for the Water Sector Project credit.

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<sup>27</sup> It was decided that including the sanitation sector in the responsibilities of the private operator would be too burdensome, given its poor state. This was a controversial decision, and the subject of much debate. However, ONAS was not completely ignored; within the Water Sector Project ONAS was strengthened and has progressively improved its financial and technical management. The new World Bank Long Term Water Sector Project includes measures to address the problems ONAS still faces.

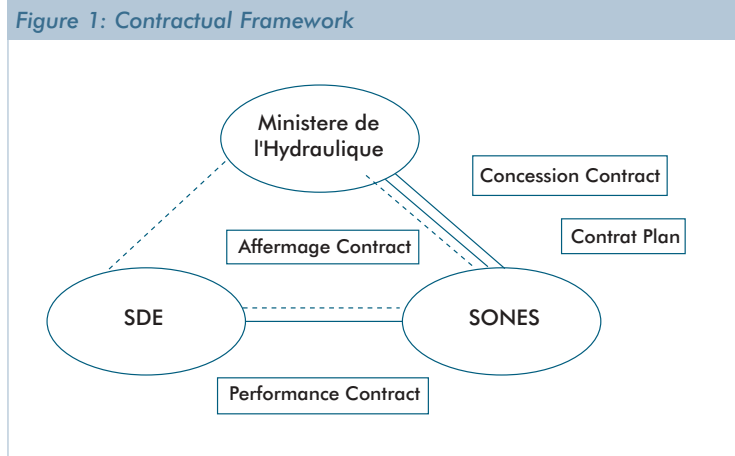
<sup>28</sup> Jan Janssens, personal communication, June 2002.

## 4 DESIGNING THE CONTRACTS AND ENGAGING THE PRIVATE SECTOR

### 4.1 Institutional and Contractual Structure

The process of learning from other countries, consultation and reflection had resulted in the conclusion that an affermage contract was appropriate, but one that included both investment obligations and strong incentives to improve Unaccounted-for Water and billing and collection. This meant that a new contract form would have to be developed. In addition, the government and donors decided upon a web of contracts that, though appearing complex, created a robust relationship between the actors.

It was determined that the urban water supply sector would be governed by four different contracts between three actors, as shown in Figure 1 below.



SONES, as the state asset-holding company, was authorized to manage the sector through a 30-year **concession** contract signed with the State, represented by the Ministère de l'Hydraulique. SONES also signed a **sector development contract** (*Contrat Plan*) with the Ministry, which outlined its investment obligations (and was included in the Request for Proposals for the affermage contract).

The 10-year **affermage contract** governing operation of the system was signed between three parties: the Republic of Senegal, represented by the Ministère de l'Hydraulique, SONES, and a private operating company formed specifically for this purpose, Sénégalaise des Eaux (SDE).

SDE also signed a **performance contract** with SONES that was included as an annex to the affermage contract and was to take effect on the same date as the affermage contract and run for the same duration (10 years). The contract was renewable every five years after the first ten years, and contained provisions for review of the performance targets every two years. This contract outlined SONES's responsibilities with respect to

- ensuring infrastructure was available to the operator, and investments made (including a requirement to prepare a 3-year investment program, adjusted each year, which takes into account the proposals of the operator);



- prompt execution of works relating to system investments;
- responsibility for obtaining financing for the works;
- adjustment of tariffs in accordance with the *Contrat Plan*.

The performance contract also listed SDE's obligations, including

- using the productive capacity of the infrastructure in an optimal manner;
- maintaining and repairing all infrastructure at its own cost;
- renewing a minimum of 14,000 meters and 6,000 connections a year;
- replacing any electromechanical equipment with a value below 15 million CFA (US\$25,000 equivalent) and with a lifespan of up to 10 years;
- preparing an annual maintenance plan and technical report;
- meeting WHO standards for water quality;
- responding within one hour to breaks in mains (with a maximum of 12 hours to repair the main and restore it to service);
- adhering to a renewal schedule including a requirement to install 17 kilometers of 100 mm ductile iron pipe annually, or its equivalent (a table of equivalents was provided) (this requirement echoes Article 50 of the affermage contract, which also stipulates the 17 kilometers per year);
- supplying monthly data to SONES on consumption, billing and collection,
- meeting performance targets with respect to leakage and collection (these were also enshrined in Annex 3 of the main affermage contract, which sets out the operator's remuneration formula).

While the contractual framework may seem complex, and the contracts are in some cases repetitive, it actually provides for much-needed stability. A simpler and perhaps, on the surface, more logical approach would have been for the Ministry to sign a concession with SONES, and then SONES alone to have signed the affermage contract with SDE. There were concerns, however, that SONES (made up as it was of former staff of SONEES who did not necessarily agree with the restructuring, nor with the introduction of the private sector) might have a change of heart regarding the contract with SDE, and eventually cancel it, intending to bring the water distribution operator back into public management. As the Ministry was clearly resolved not to let this happen, it was decided that the Ministry would sign the contract with the private operator. This created a more robust and "irreversible" situation, and also sent a message that there was political commitment to reform at the highest levels.<sup>29</sup> The donors involved were very supportive of this decision. The performance contract was created between SONES and SDE in order to explicitly set out the relationship between them.

The *Contrat Plan* was necessary to establish SONES's investment obligations, and was included in the RFP in order to inform bidders of what they could expect in terms of new investment in the system. However, there were no sanctions if SONES did not comply with these obligations. This has in fact turned out to be a point of contention – SDE has complained that SONES was so slow to make the necessary investments in system rehabilitation that the progress of the sector has been impeded.<sup>30</sup> A clear indication of this are the difficulties the operator faced in reaching the efficiency targets. This issue resulted in the most major renegotiation of contractual terms in the transaction to date, and is discussed in Section 5.4.2.

<sup>29</sup> The robustness of the new institutional arrangements was illustrated by the fact that the new government endorsed the institutional arrangements after the 2000 elections.

<sup>30</sup> Frederic Renaut, personal communication, June 2002.

## 4.2 The Affermage Contract Design

Under a traditional affermage, the operator is paid for every cubic meter of water sold – essentially the operator is paid for running the system on behalf of the government. There are thus no incentives to reduce leakage, and an operator could choose to ignore this issue, as the case of Guinea Conakry had shown.

The contract designed for Senegal incorporated incentives in the form of additions to the remuneration formula. The formula incorporated targets for two important parameters, leakage and bill collection, and the extent to which these targets were met resulted in either more or less revenue to the operator.

The operator's remuneration essentially consists of two parts; first, the bid price is applied to the amount of water that would be sold if the targets in the contract for technical efficiency (a measure of the technical and administrative losses in the system) and bill collection rates were attained. Second, the average tariff is then applied to the difference between the actual amount of water sold (based on the actual efficiency and collection) and the target amount. This part of the equation can be zero, a negative amount, or a positive amount, depending on whether the operator has met the targets, failed to meet them, or exceeded them. The amount is then added or (in the case of a negative amount) deducted from the first part. The operator thus realizes the *full monetary value* of any gain or loss resulting from either a failure to achieve the targets, or out-performance. (The full formula is presented and explained in Annex 2.)

The contract defined the targets for the two parameters as follows:

### *Technical efficiency*

Technical efficiency as it is used here essentially relates to Unaccounted-for Water – it is defined as the water billed divided by the water produced, and thus incorporates all losses related to leaks, misread meters, theft of water from the network, etc. (in most systems physical leakage will be the primary component of Unaccounted-for Water).

The starting point for technical efficiency in the base year of 1995 was taken from SONEES's data produced in 1994, and was assumed to be the same in 1995; that is, 73 percent (UfW of 27 percent). The contract stipulated that the operator was expected to reduce Unaccounted-for Water to 15 percent, and that this was to be achieved by year five of the contract (2000).

The intermediate targets were set as follows, based upon a base efficiency of TE0 of 0.73:

$$\text{CTE1} = \text{TE0} + 0.01 = 0.74 \text{ (74\% in 1996)}$$

$$\text{CTE2} = \text{TE0} + 0.04 = 0.77 \text{ (77\% in 1997)}$$

$$\text{CTE3} = \text{TE0} + 0.07 = 0.80 \text{ (80\% in 1998)}$$

$$\text{CTE4} = \text{TE0} + 0.10 = 0.83 \text{ (83\% in 1999)}$$

$$\text{CTE5} = 0.85 \text{ from year 5 (85\% from 2000 onwards)}$$

With respect to the efficiency in the base year, the contract stated that "this value should be confirmed in light of SONEES's 1994 annual report and the verification of these data which will be carried out jointly by SONES and the operator or, if necessary, by an expert. If the actual value of efficiency in the base year is less than 73 percent, the schedule that has been set in order to

achieve the goal of 85 percent will be consequently adjusted.”<sup>31</sup> The issue of the base value for technical efficiency did in fact turn out to be one of the controversial issues during implementation of the contract, and as we shall see later, was renegotiated, as was the year in which the final efficiency of 85 percent was to be reached (see Sections 5.4.1 and 5.4.2).

#### *Collection Efficiency*

The targets for the rate of collection of billed amounts were set as follows:

CCE1 = 0.95 (95% in 1996)

CCE2 = 0.96 (96% in 1997)

CCE3 = 0.97 from year 3 (97% from 1998 onwards)

In addition to setting the targets described above, the contract also set out a number of other requirements, including some investment obligations such as installing a certain number of kilometers of new pipe every year, and renewing a certain number of meters and connections. (See Section 4.1 on the contents of the performance contract between SDE and SONES that formed part of the affermage contract, and Section 4.5.1 on the private operator’s investment obligations.) However, the incentives created by the efficiency targets also meant that the operator could find that it made economic sense to make some investments in addition to those required under the contract.

### **4.3 The Bidding Process**

The government decided it wanted to publish the Request for Proposals widely, in order to attract a number of companies from different countries (instead of just the French companies who had dominated the market in West Africa for so long). Government officials visited several countries to stimulate interest in the bidding, including Belgium, England, Germany, France, and the United States.

In the end, however, all the bidders who responded were French: Générale des Eaux (now Vivendi), Lyonnaise des Eaux (now Odeo), the Société d'Aménagement Urbain et Rural (SAUR),<sup>32</sup> and CISE (which has since merged with SAUR).

The government adopted a two-stage bidding process. One of the objectives of this approach is to maximize the number of eligible bids at the time of evaluation. The process entails inviting pre-qualified bidders to submit a first-stage technical proposal that is evaluated, after which each bidder is invited to a meeting to discuss the shortcomings of their proposal. Those bidders invited to the second stage then submit revised proposals, accompanied by financial bids.

The bidders were invited to a meeting in Dakar in the spring of 1995, and all four attended. At this meeting the bidders were invited to comment on the draft request for proposals. The government then issued the final Request for Proposals (RFP) in July 1995, allowing the bidders two months to prepare their bids. All four bidders responded when the offers were finally submitted on August 31, 1995. The bids were opened and evaluated in September 1995, and

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<sup>31</sup> Author’s translation.

<sup>32</sup> A potentially difficult situation arose when SAUR was invited to bid, as SAUR already had a long-standing relationship with SONEES. SAUR had been working as an advisor to SONEES since 1980. The government considered eliminating them from the bidding, but the World Bank did not agree. Instead, SONEES was instructed to finish up all contracts, end all contact, and provide SAUR with no access to their operation four months before the bidding took place.

one bidder (Lyonnaise des Eaux) was eliminated as the submission was non-compliant. The government, represented by a Technical Evaluation Committee, then met with each of the remaining bidders in October. As a result of these meetings, the bid from Générale des Eaux was also eliminated, as they refused to entirely endorse some of the requirements of the RFP. The committee thus recommended inviting the two remaining bidders, CISE and SAUR, to present second-stage bids. When these were opened on October 25, 1995, SAUR was announced the winner, based on price. SAUR had bid a water supply rate of 236 F CFA per cubic meter, which at the time was 62 percent of the average tariff.

SAUR was then required to create the operating company in which it had at least a 51 percent ownership stake, with other investors from the Senegalese private sector, the government, and the former employees of SONEES owning the rest. If not enough buyers had come forward, SAUR would have been obliged to assume the rest of the ownership, but in fact, there was considerable interest in purchasing the shares. The new operating company was officially established on December 26, 1995 as Sénégalaise des Eaux (SDE), majority-owned by SAUR. The State took a nominal and symbolic 5 percent share, and former SONEES staff were granted 5 percent of the shares.<sup>33</sup> Of the remaining 90 percent, SAUR owned 57.84 percent, and private Senegalese investors owned 32.16 percent (instead of the planned 51 percent and 39 percent).

The affermage contract was prepared in January 1996, and the final version signed in April 1996 by SDE, SONES, the Ministère de l'Hydraulique, and the Ministry of Economy, Finance and Planning, approved by the Prime Minister. SDE took up management of the services in the same month.

A final issue to be negotiated was the sale of the moveable assets by the asset-holding company to the operator. The value of these assets had been estimated by a consultant, but when SDE took over the management of the company, they found that there were inconsistencies in the inventory (the estimate showed 4.8 billion<sup>34</sup> F CFA worth of assets, but the actual figure was 4.1 billion F CFA). The value of the assets had been integrated into the operator's bid price, and if their value was lower it meant that the cost of amortization would be lower for the operator. Because of this, the parties agreed upon a revision of the bid price, from 236 to 234.985 per cubic meter supplied. This adjustment method is obviously prone to problems, as the water supply price only relates to operator's revenue according to the volume of water sold. This has in fact been a recurring issue, as volumes of water sold have not been as high as originally estimated. SDE has also had problems with the depreciation of the assets, some of which were almost worthless at the time of estimation, but had to be entered into SDE's books at the value set by SONES, and continue to be depreciated every year. In retrospect, a lump sum payment for the assets, or transferring the assets to the operator for no charge, would probably have been preferable.

#### **4.4 Building Understanding of the Institutional Structure and Contracts**

An interesting aspect of the Senegalese reform process was the series of workshops and capacity building events that formed an integral part of it. The World Bank team played a pivotal role in these workshops, helping to facilitate, moderate, and provide clarification on various issues. The workshops helped to gradually build understanding of and consensus on the issues, the

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<sup>33</sup> As the legal framework for former SONEES staff to own these shares did not exist at the time, SAUR still carries the shares on their behalf. However, the former staff are now organized and able to enter into a shareholder agreement with SAUR, so the shares will be transferred.

<sup>34</sup> 1000 million

institutional structure, and the contracts.

The most important of these workshops was the one mentioned earlier (see Section 3.1) which was held in mid-1994 (before reform was initiated) with a variety of stakeholders in order to determine basic parameters, analyze privatization models, and examine financing issues. The participants at this workshop included key government policymakers, staff of SONES, consultants, union representatives, and World Bank staff (though notably not civil society or the public at large). The objectives of the workshop were to

- initiate a participatory approach;
- obtain support from labor and employees;
- review conclusions of the fact-finding mission;
- inform clearly and communicate openly on objectives of reform;
- provide legal, financial, and technical directives for preparation of the bid document that would go out to potential operators.

A workshop was held in March 1996, before the affermage contract was signed and the World Bank Water Sector Project launched, in order to analyze the risks related to the reform and to find ways to address them.

After the affermage contract was signed, two more workshops were held within the first year. The objective of the first, in November 1996, was to have SONES and the private operator jointly “re-read” the contract in order to gain a common understanding of its provisions. The World Bank served as a moderator and offered clarification where appropriate. The second workshop, in December 1996, was on contract monitoring, and the objective was to provide SONES with guidance on how to undertake such tasks as reading bulk meters in order to calculate water produced, and what information to request from the operator.

After several months of operation by SDE, the Minister de l’Hydraulique commissioned an “Institutional Audit”, which was financed by the World Bank and carried out by a consultant who played the role of “*conciliateur*”. This audit was followed by a review meeting to discuss the issues it raised, attended by the Ministry, SDE, and the consultants. After the meeting, a Memorandum of Understanding was drafted to outline the agreements reached, and this was signed jointly by the government, SONES, and SDE.

#### **4.5 The Role of Private Finance**

Private finance played an important role in the Senegalese water sector reform process. There were two types of private finance, one coming through the operator in the form of investment in the network, and the other through a commercial bank in the form of financing of the cash flow of SONES.

##### **4.5.1 Financing Distribution Network Investments**

The affermage contract included an obligation on the part of the private operator to finance some of the investment needed in network renewals, connection renewals, and electromechanical equipment. These obligations were defined in the performance contract (see section 4.1) in terms of kilometers of network to be laid, number of connections and meters to be renewed, and the requirement to replace electromechanical equipment. The obligations mean that the operator, over the 10-year contract, will invest approximately US\$20 million. The affermage contract has thus been an effective instrument to allow public resources and donor finance of US\$230 million

(of which US\$100 million is an IDA Credit) to leverage substantial private financing, while avoiding the major investment obligations and risk (and therefore cost) inherent in a concession contract.

The World Bank required that the water sector (through the state asset-holding company SONES) fund about 10 percent of the US\$100 million being provided by the Bank for the Water Sector Project without recourse to the donor community. (This requirement was necessary in order to conform with the World Bank's rules regarding borrowers' contributions to projects it finances.) Although financing by the Senegalese Treasury would have been allowed, it was ruled out due to the precarious situation of state finances at the time. The World Bank agreed that the operator's contribution towards capital investments through the affermage contract (paid for by the government through the operator's fee) met the 10 percent self-financing requirement.

#### 4.5.2 Financing the Cash Shortfall

The financial projections generated by the model showed that a significant cash shortfall would build up during the construction period of the Water Sector Project. When this cash shortfall was added to debt service on existing debt and other cash requirements, the model predicted a total peak cash shortfall of US\$21 million in 1998.

Using the financial model, several options for raising the necessary temporary financing were analyzed. Four emerged as feasible and potentially having a significant impact on the reduction of the cash shortfall:

1. Obtaining a commercial bank loan
2. Structuring some of the World Bank and KfW financing as equity instead of loan
3. Sale of equipment by the state asset-holding company to the private water company
4. Re-scheduling the existing sector debt

Structuring debt as equity (meaning giving investors an ownership stake in the sector) had a major advantage – it meant that there would be no debt service on this capital. However, it raises questions for the future as to whether the sector should pay an annual dividend on the money invested this way. The sale of the equipment was a way to provide cash to the state asset-holding company, but it meant that the contract had to be designed to require this type of investment by the private operator.

While the sale of equipment to the private company was fairly common in this type of transaction, the second — structuring debt as equity — was not the usual practice of the Bank or other agencies, and the first — a commercial bank loan to a water utility — was unheard of in sub-Saharan Africa at the time.

Of the four options, the first three were adopted. The operator was required to buy the moveable assets, 60 percent of World Bank and 50 percent of KfW financing was structured as equity, and in mid-1996, SONES approached Citibank, a US-based bank with an office in Senegal, and requested a line of credit ("*droits de tirage*").

Citibank took the lead in organizing a pool of local banks to provide the loan. Eventually what emerged was a line of credit provided in part by the Compagnie Bancaire de l'Afrique Occidentale (CBAO) and in part by Citibank itself. The two banks agreed to provide a maximum amount of 21.4 million US dollars (11 billion F CFA) over six years, at an interest rate of 10 percent, with the condition that the state asset-holding company agreed to make deposits directly

from remittances made by the private operator into a special account out of which debt service payments would be made. The banks also asked for a letter of comfort from the government of Senegal, and made the line of credit available only after the World Bank credit for the water sector project was effective.

The decision to obtain a commercial line of credit was an innovative departure from usual government practice in Senegal, and while it resulted in some delay to disbursement of the water sector project credit, it became one of the key components of the reform. SONES's ability to successfully attract and negotiate private finance was an important indicator of its new status as an autonomous, credible, and bankable entity.<sup>35</sup>

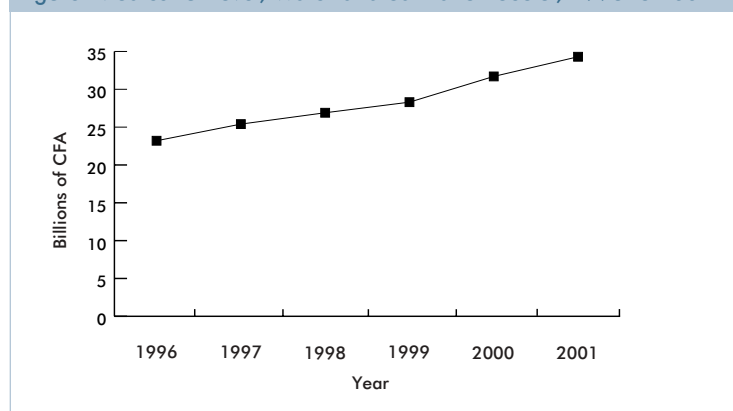
## 5 OUTCOMES

### 5.1 More Water, to More People

Since the reform process began, the volume of water produced for use in the urban water sector has risen each year, from 96.3 million cubic meters in 1997 to 114.6 million cubic meters in 2002, a 19 percent increase.<sup>36</sup> Approximately 74 percent of this water is used in Dakar.

The impact that the availability of more water had on consumers can be seen clearly from the sales turnover (what consumers paid for services) between 1996 and 2001. Sales turnover increased steadily from 23.2 billion F CFA to 34.3 billion F CFA, an increase of 47.8 percent (see Figure 2). (Note that these figures include sanitation as well as water.) During the same time period, water and sanitation tariffs increased by just under 20 percent.

Figure 2: Sales Turnover, Water and Sanitation Sector, 1996 to 2001<sup>37</sup>



There has been a substantial increase in the number of clients, from 241,671 in 1996 to 327,501 in 2001, an increase of over 35 percent.<sup>38</sup> In the Dakar region (which represents about 75 percent of the total service area), the number of private water connections increased from 135,414 in 1995 to 181,824 in 2002 (a 34 percent increase; exceeding the planned target). Over the same period, the number of public standpipes in Dakar rose by 5 percent, from 940 in 1995 to 1424 in 2002.<sup>39</sup>

35 A separate technical note on the subject of the commercial loan is currently under preparation.

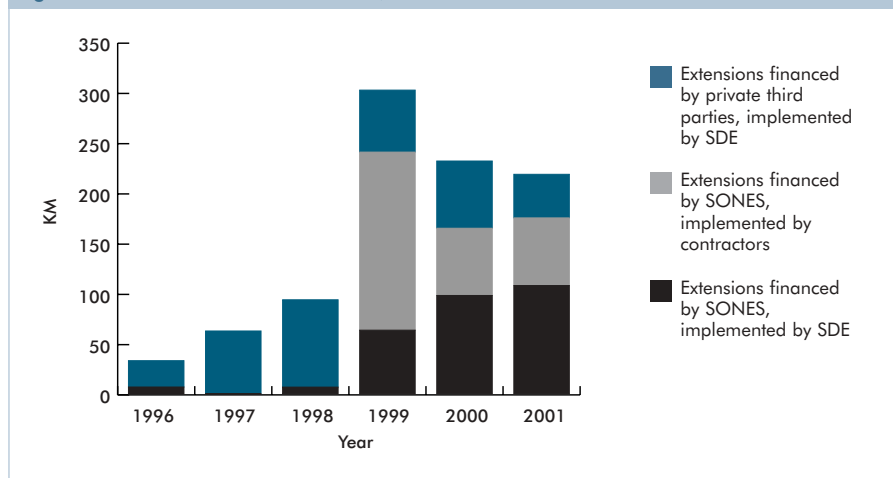
36 SONES

37 Cooperation Financiere Allemand, 2002.

38 SDE

One of the reasons that more people were connected to the network was that the system was substantially expanded during the last seven years, reaching into areas which had not been served before. Extensions to the network were initiated on a small scale in the first three years, and then increased significantly after 1999. Extensions financed by SONES and carried out by SDE amounted to a total of 284 kilometers between 1996 and 2001.<sup>40</sup> Starting in 1999, SONES itself implemented 311 kilometers of network extensions<sup>41</sup> (see Figure 3). In addition, private third parties financed some 347 kilometers of extensions (in the case of housing developments, for instance, or areas outside the government-sponsored extensions). The entire network increased from a length of 4319 kilometers in 1996 to 5330 kilometers in 2001, a 23 percent increase.

Figure 3: Extensions to the Network, 1996 to 2001<sup>42</sup>



Coverage figures for the Dakar region (which represents about 75 percent of the total service area) show that the proportion of the population served increased from 80.3 percent (1.63 million) in 1995 to 89.5 percent as of the end of 2002 (2.25 million people).<sup>43</sup>

SONES has performed, by and large, as an effective asset-holding company in terms of managing the investments in the sector. SONES has managed not only the World Bank Water Sector Project (US\$150 million) but also several other investment projects totaling over US\$40 million. Under these projects, the water treatment plant in Ngith has been rehabilitated, new boreholes have been developed, and water supply systems have been completed in 14 secondary towns. SONES investments in social connections and standposts have been substantial, in accordance with its mandate and the poverty alleviation goals of the government.

39 World Bank, Aide Memoire from the Water Sector Project Supervision Mission of Nov 25th to Dec 11th 2002, Annex of Performance Indicators, 2002.

40 SDE

41 Cooperation Financiere Allemand, 2002.

42 Ibid.

43 World Bank, Aide Memoire from the Water Sector Project Supervision Mission of Nov 25th to Dec 11th 2002, Annex of Performance Indicators, 2002.



## 5.2 Better Financial Health

The staff of SONES predicts that financial equilibrium will be reached in 2003, as planned. The cash balance for December 31, 2002 was 2.4 billion F CFA. Of this, 1 billion F CFA was made up of funds from Citibank, leaving a net cash balance of 1.4 billion F CFA. The projected cash balance for December 31, 2003 is 900 million F CFA, of which 500 million F CFA will be made up of funds drawn from Citibank, leaving a cash balance of 400 million F CFA.<sup>44</sup>

SONES is honoring all its payment obligations, including 10 billion F CFA of debt service payments for the year 2002, which represents 75 percent of its income in this year (SONES's income being the amount transferred to it by SDE after SDE's operator's fee is paid out of the tariff revenues). In 2003, SONES's revenues are projected to be 13.5 billion F CFA, and debt service 11.0 billion (81 percent of revenues).

The problem of the accumulation of arrears from public sector water customers has proved, in other countries, to be one of the most significant obstacles to the success of private sector participation. These arrears do not automatically disappear with the arrival of the private sector operator – it takes more than this to make government pay its bills. In Senegal, the government agreed to implement, through time-bound action plans, corrective measures to reduce the high water usage of public sector clients, budget annual public agency consumption, and pay government water bills within two months of their being served. These efforts have met with success, and Senegal is one of the few countries in the region in which the government does, eventually, pay its bills. A significant problem, at least initially, was that authorities at the local level (mainly municipalities) did not necessarily respond to directives from central government, and delays in payments from them led in turn to delays in funds being transferred from SDE to SONES.<sup>45</sup>

The increasing health of SONES can be seen from the changes in profits and losses (see Figure 4). SONES recorded losses in each year since 1996 of between half and three billion F CFA, but since 2000 the loss has decreased each year, and is steadily approaching zero. The losses are in part due to the fact that, in accordance with good business practice, SONES continues to depreciate the assets on its books. SONES estimates that depreciation makes up about 50 percent of their expenses (see Figure 5) (The large dip in 1998 apparent in Figure 4 was due to the fact that SONES had to make some reimbursements to the operator – this is further explained in Section 5.4.2.).

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<sup>44</sup> SONES, May 2003.

<sup>45</sup> In order to comply with their recent ISO 9001:2000 certification, SDE is obliged to be up-to-date with their payments to SONES. They report that since late 2002 they sometimes borrow funds from local commercial banks in order to make up the shortfall due to delays in payments from government clients. Frederic Renaut, SDE, personal communication, March 2003.

Figure 4: SONES Profits and Losses, 1996 to 2002<sup>46</sup>

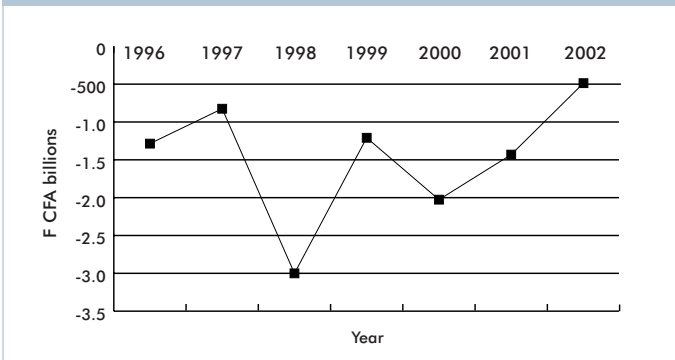
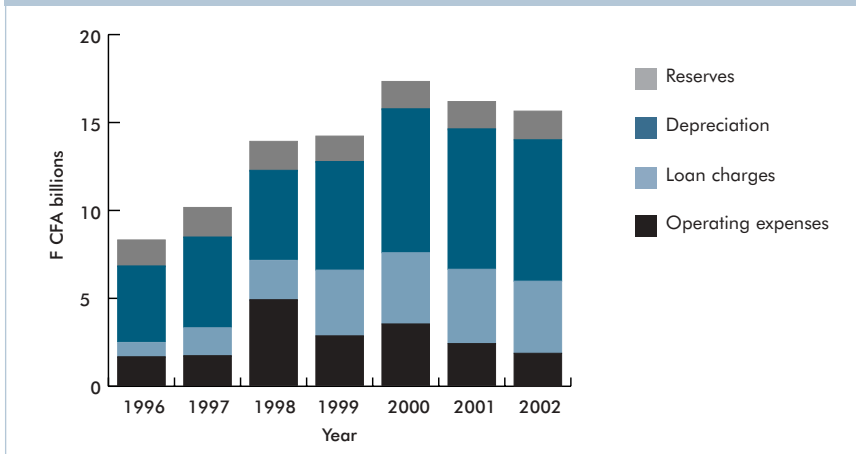


Figure 5: SONES Expenses by Category, 1996 to 2002<sup>47</sup>



The financial health of the sector can also be assessed by looking at cash flow. Profit and loss statements are based on accrual accounting, which means the flows represented in the income statement do not necessarily reflect the real cash generating performance of the organization. Cash generation is important, as it indicates that an organization will be able to pay its debts, and generate enough cash to finance its activities and make investments.

The cash balance of SONES has been positive in each year since 1996, but dipped significantly starting in 1998 - as predicted by the financial model - when major sector investments started. Drawings were made on the Citibank/CBAO line of credit starting in that year. However, the actual cash shortfall, and thus the amount drawn on the line of credit, has turned out to be much lower than that predicted by the model. SONES maintains that this is in part because the starting cash balance of SONES in 1996 was higher than estimated by the World Bank.<sup>48</sup> Other reasons include the fact that bids for investment sub-projects always came in lower than expected, and that the exchange rate changed substantially in favor of SONES (it was just over 500 F CFA per US dollar at the time the loan was secured, and approximately 700 F CFA when disbursements were made). This means that SONES has only had to draw some 2 billion F CFA from the line of credit, or 18 percent, of the 11 billion predicted in the model.

<sup>46</sup> SONES

<sup>47</sup> SONES

<sup>48</sup> SONES, Note sur l'utilisation de la ligne de credit du pool bancaire locale, mimeo, 2000

The cash flow equilibrium model has nonetheless proved to be a powerful tool for managing the financial aspects of the reform. The model continues to provide guidance to SONES, and is used annually to determine the increase in the tariffs and monitor progress towards financial equilibrium. SONES staff enter the data available at the end of each financial year into the spreadsheet, and calculate the average tariff required for the following year (this function was previously carried out by Ernst and Young in Paris, as SONES's advisors, but has now been transferred to SONES). Tariffs are then re-adjusted in January of each year.

One of the reasons that progress towards financial equilibrium and financial sustainability has been kept on course is that the government remained rigorously committed to ensuring that the cost of providing water was balanced against price – which has meant gradually increasing tariffs.

### **5.3 Changes in Tariffs**

At the time reform was initiated, water tariffs in Senegal were at levels that covered operations and maintenance, but they did not come close to meeting the investment needs of the sector. Given the precarious situation of the central government's finances at the time, it was imperative that the water sector be self-financing if the badly needed investments in network renewal and extension were to be made. The government has thus looked to consumers to finance these investments through tariffs, while trying to buffer the effects of this policy on the poor.

Senegal uses an "increasing block tariff" structure, with a subsidized "social tariff" for levels of consumption below 20 m<sup>3</sup> in a 60-day period, a regular tariff for consumption over this, and a "dissuasive" tariff for consumption above 100m<sup>3</sup> per 60 days, which is designed to be a disincentive for excessive water use.<sup>49</sup> The idea behind an increasing block tariff is that a cross-subsidy will be in effect – that consumption in the higher blocks will generate enough surplus to finance the subsidy delivered to customers consuming water in the lowest "lifeline" block, who are, in theory, the poor. (However, this is not always the case, and the social tariff and its shortcomings are further discussed in Chapter 6).

The tariff consists of several components: the rate the operator charges for operation and maintenance of the system, a component to cover the costs of SONES and ONAS (the state organization responsible for sanitation), and various taxes.

The average tariff has risen steadily, as planned at the beginning of the transaction. In 1996, the average tariff faced by consumers for both water supply and sanitation,<sup>50</sup> including all taxes and surcharges, was 380.42 F CFA/m<sup>3</sup>, and in 2002 it was 464.84 F CFA/m<sup>3</sup>, an overall increase of just over 22 percent.<sup>51</sup>

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49 Under the recently introduced new tariff structure, described below, the second tariff block ends at 40 m<sup>3</sup>.

50 Defined as the total amount billed divided by the total amount of water billed for.

51 SONES

Figure 6: Average Consumer Tariff, including Water, Sanitation, and all Taxes, 1996 to 2002<sup>52</sup>

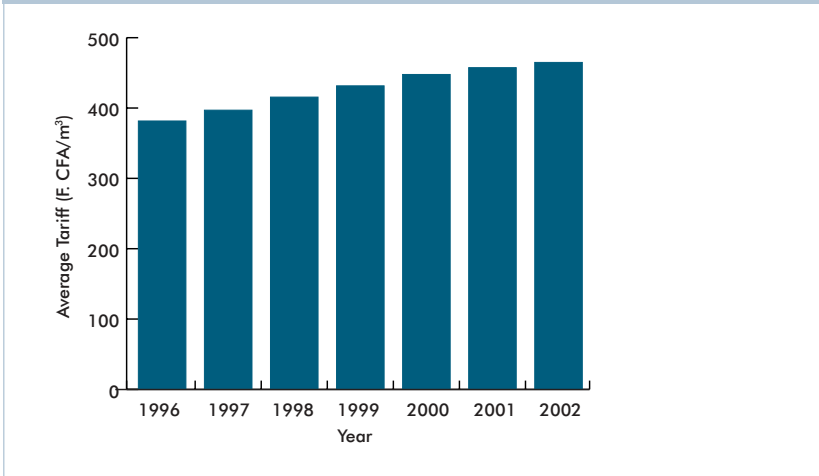
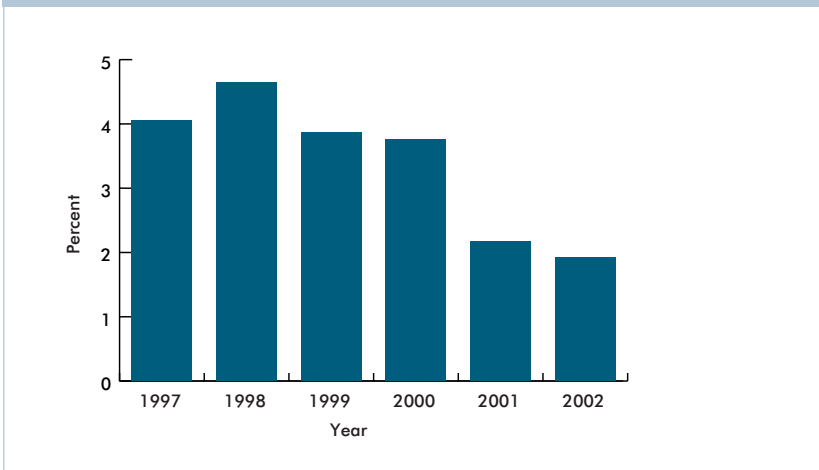


Figure 7: Percentage Increase in the Average Tariff (Water and Sanitation), 1997 to 2002



An analysis of just the water component of the tariff (*the prix du patrimoine*, or SONES charge, the operator's fee charged by SDE, and the taxes associated with the water tariffs) shows that it has risen steadily, and that apart from the first year, the annual increases have been very close to the planned 3 percent (see Figure 8 and Figure 9).

<sup>52</sup> SONES Note that these are nominal prices, not constant prices.

Figure 8: Components of Average Water Tariff, 1996 to 2002<sup>53</sup>

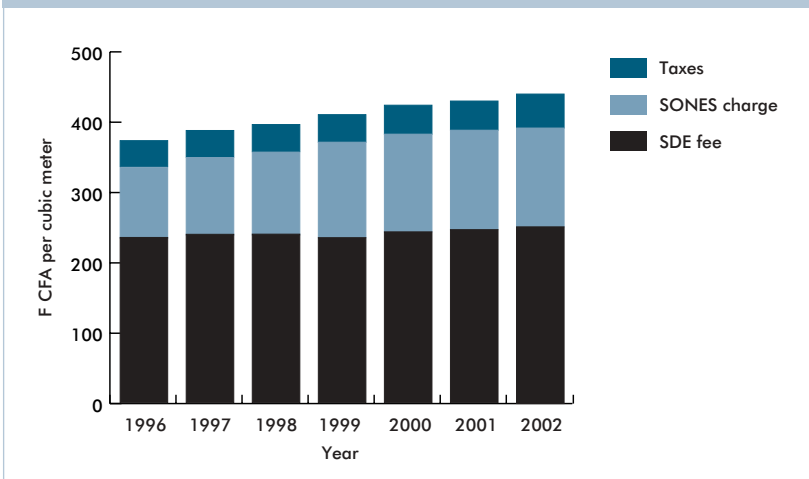
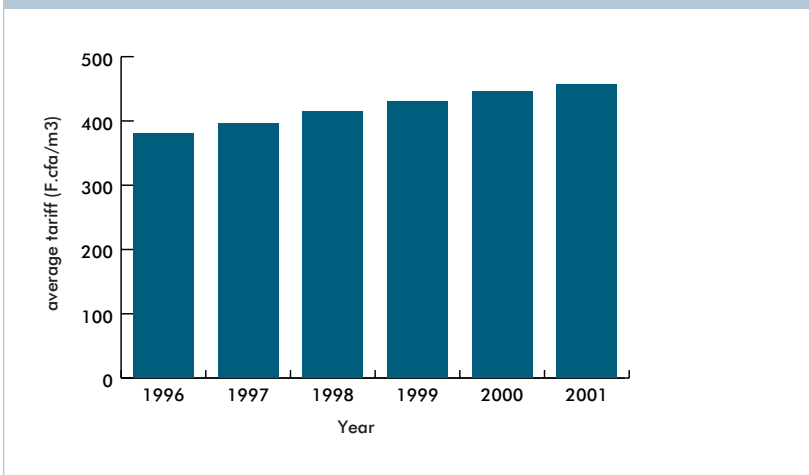
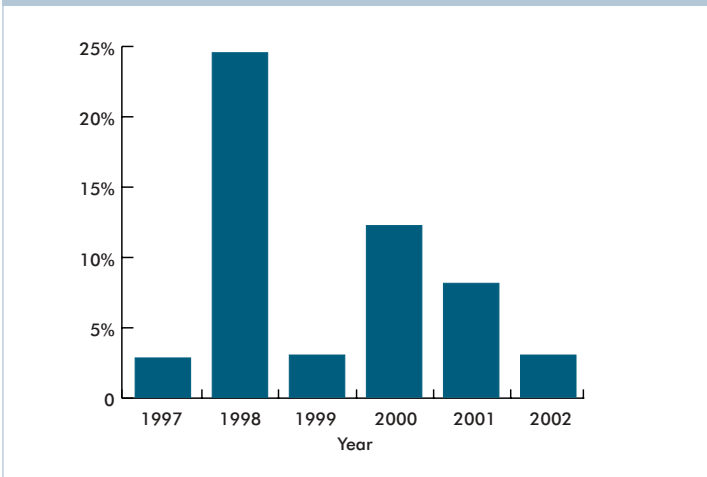


Figure 9: Annual Increase in the Water Tariff, 1996 to 2001



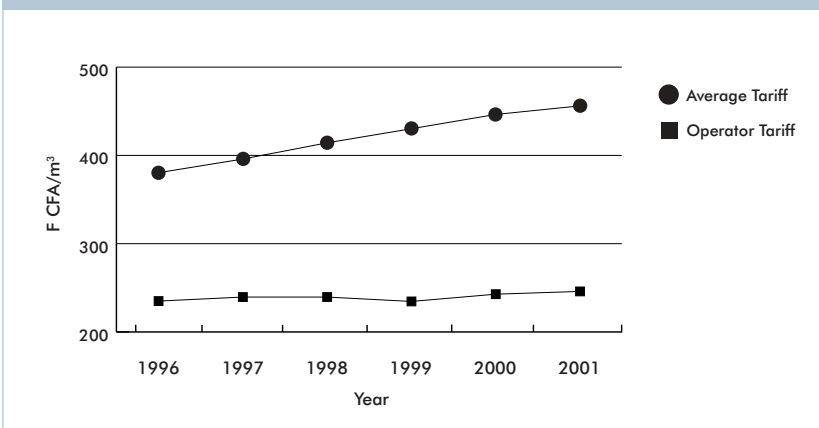
The charge levied by ONAS to cover the cost of providing sanitation services (levied only in cities with sewerage systems) has shown a much more significant rise, going from an average of 27.71 F CFA per cubic meter of water consumed in 1996 to 45.65 F CFA in 2002 (an increase of 65 percent). The increases in the ONAS charge in each year are shown in Figure 10.

Figure 10: Percentage Increase in ONAS Charge, 1997 to 2002



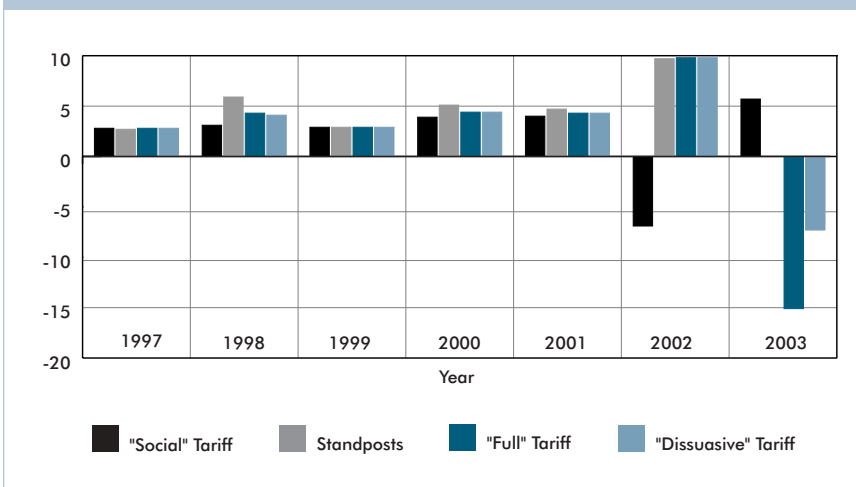
The greatest proportion of the tariff is the payment to the operator; this was 62 percent of the total average tariff in 1996 and decreased steadily until 1999, since when it has been 54 percent. It is interesting to compare the changes in the water supply rate charged by SDE with the changes in the average tariff -- the former, adjusted according to an indexation formula, has stayed essentially constant, increasing about 5 percent in total over the six years (see Figure 11).

Figure 11: Average Tariff and Operator's Water Supply Rate, 1996 to 2001



As can be seen from Figure 12, in most years, the tariff increase was applied more or less evenly across the domestic consumer categories (the "social tariff", "full tariff", and "dissuasive tariff"). There have been exceptions to this; for instance, in 1998, there was an exceptional increase in the amount paid to ONAS, which was not applied to the social tariff.

Figure 12: Increases in Tariffs in Each Tariff Category, 1997 to 2003<sup>54</sup>



More recently, however, there have been large variations in the revisions to the various tariff categories, partly due to an overall change in the tariff structure introduced in 2003. This new tariff structure (which actually took effect in November 2002) was introduced by SONES because of the need to streamline the system and to raise extra revenue for ONAS.<sup>55</sup> This structure preserved the increasing block tariff for domestic connections, but reduced the size of the second block (the “full tariff”) from 100 m<sup>3</sup> to 40 m<sup>3</sup>, so that the “dissuasive” tariff was applied for any consumption over 40 m<sup>3</sup>. A single tariff block was introduced for all non-domestic customers, including industry and government clients. In addition, the price of water purchased by market gardeners above a certain quota was substantially increased. (Until this point, market gardeners had benefited from very low prices for water. In fact, below the quota, the price they pay is still the lowest price within the tariff structure.) The objective was to reduce the reliance of market gardeners on network water and prompt them to find more appropriate and cost-effective water sources. This change, however, was extremely controversial and the new tariff for market gardeners was almost immediately suspended.

As can be seen from Figure 12, under the 2003 tariff the price for water in the “full” tariff block was decreased for the first time. The social tariff went up, but this merely reversed a decrease in the social tariff that had occurred in 2002. (The overall increase in the social tariff has been 16 percent over the seven years of the reform.) Of interest is the considerable increase in the price of water for standposts in 2002. This appears to have occurred in part due to the fact that, for the first time, a sanitation surcharge was added to the tariff category under which standposts are billed. In towns with sanitation systems, this resulted in a 9.7 percent increase in the prices charged to standpost operators. It can be assumed that this price increase was passed on to their customers. Overall, the price of water charged to standpost operators has increased by 35 percent over the seven years of the reform, compared to about 20 percent for other customers. The poverty impact of this is discussed in Section 6.5.1.

54 Grille Tarifaire, Villes Assainies, 1996 to 2002 provided by SDE. Note that the size of the tariff blocks is different in the 2003 tariff, and that the 2002 tariff structure includes a second “full” tariff block which is not shown on the chart.

55 République du Sénégal, Ministère des Mines, de l’Énergie et de l’Hydraulique Note d’Information sur La Nouvelle Grille Tarifaire de l’Eau et de l’Assainissement, December 2002.

In terms of the changes faced by consumers with connections, between 1995 (before the reform started) and 2003, consumers in all domestic categories would have seen their bills (for both water and sanitation combined) increase by just over 20 percent. For instance, a family with low consumption of 10 m<sup>3</sup> per month, falling in the social block of the tariff, would have paid a monthly amount of 1,567 F CFA in 1995, and 1,863 F CFA (about US\$3.40) in 2003 (an increase of 19 percent). A family with higher consumption of 30 m<sup>3</sup> per month would have paid 12,257 F CFA per month in 1995, and 15,689 F CFA (about US\$28.50) in 2003 (an increase of 28 percent).

#### **5.4 Performance of the Operator and Contractual Outcomes**

The performance of the private operator was crucial to the reform process, as many of the problems plaguing the sector related to such management problems as distribution efficiency and revenue collection. This section examines the performance of the operator, and also the behavior of the affermage contract in the context of both operator under- and out-performance. The contract proved to be powerful in incentivizing the operator to meet the performance targets, but much depended on the correct estimation of these targets. At the time some targets were found to be unreasonable in light of information available after the operator took over, the contractual relationship proved to be robust enough to ensure that renegotiation was carried out in a manner that left all parties satisfied and guaranteed sustained progress in the sector.

##### **5.4.1 Implications of the Technical Efficiency and Bill Collection Targets for Payments to the Operator**

The technical efficiency targets have been one of the central issues in the implementation of the contract, and were the subject of disputes relating both to the baseline data they were premised on, and the feasibility of meeting them given delays in capital investments on the part of SONES.

The original technical efficiency targets in the affermage contract were very ambitious, and required the operator to raise efficiency from an estimated 73 percent in 1995 to 85 percent in 2002, thus reducing technical losses (Unaccounted-for Water) from 27 percent to 15 percent.<sup>56</sup>

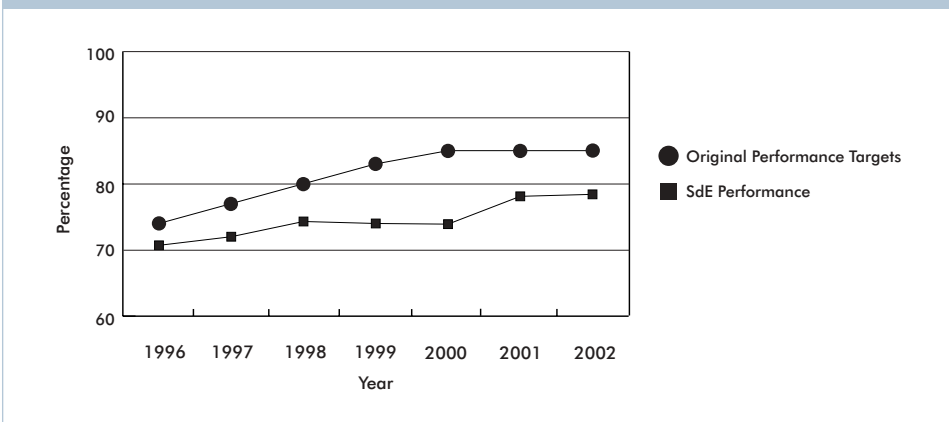
SDE found the targets challenging, in part because when they took over operation of the utility they discovered that the baseline figure of 73 percent was inaccurate. This may be because the SONES figure from 1994 was incorrect, or because during the several months that elapsed between the dissolution of SONEES and the takeover by SDE, the system deteriorated significantly. Whatever the reason, by 1997 SDE had only attained a technical efficiency of 72 percent, vs. a target of 77 percent (see Figure 13).

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<sup>56</sup> It has been suggested that the setting of these targets was influenced more by a desire to match the performance of the utility in Cote d'Ivoire than a realistic assessment of what could be achieved.

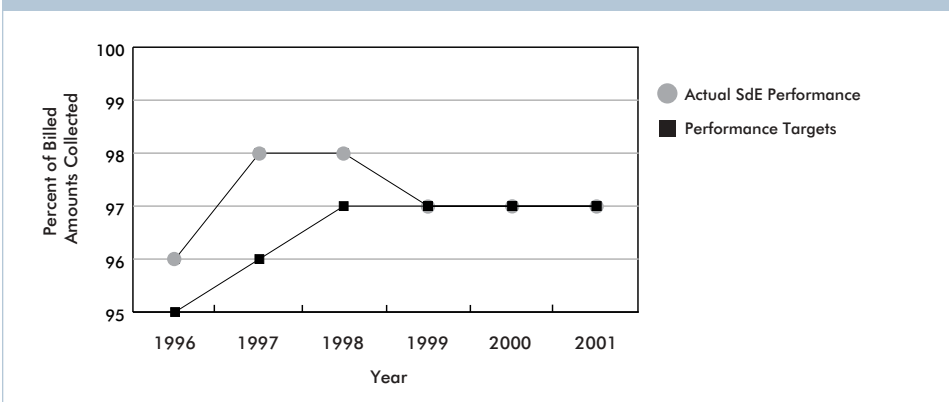


Figure 13: SDE Performance against Original Leakage Targets, 1996-2002<sup>57</sup>



In the area of bill recovery targets, however, SDE performed much better. Though the administration was often late in paying its own bills, it always did pay, and SDE matched or exceeded its performance target in each year. The final target of 97 percent has been sustained since 1999 (see Figure 14).

Figure 14: Bill Recovery Targets and SDE Performance, 1996-2001<sup>58</sup>



The failure to reach the efficiency targets had significant implications for SDE’s remuneration, due to the fact that this target was included in the remuneration formula (of course any effects were offset by the out-performance with respect to the target for bill collection, which was also part of the formula). As explained earlier in Section 4.2, the operator’s remuneration was made up of two parts: the bid price applied to the amount of water which would be sold if the targets for efficiency and collection in the contract were attained, and the average tariff applied to the difference between the actual amount of water sold (based on the actual efficiency and collection) and the target amount. This latter part of the equation could be either zero, or a negative amount, or a positive amount, depending on whether the operator met the targets, failed to meet them, or exceeded them. The operator thus realized the full monetary value of any gain or loss resulting from either a failure to achieve the targets or out-performance.

In the case of SDE, the amount that the remuneration would have been adjusted by, using the formula, was a substantial percentage of the fee the company would have received had they met the original efficiency target. For instance, in 1997, 1998, and 1999, using the data available

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(shown in the table below),<sup>59</sup> a calculation can be made of the remuneration that the operator would have received based on the formula (calculations have not been done for 1996 as the operator took over in April of that year, so data for a full year are not available).

	<b>1997</b>	<b>1998</b>	<b>1999</b>
<b>Lease Fee (OP) F CFA/m3</b>	<b>239.5437</b>	<b>239.5437</b>	<b>234.51</b>
<b>Volume Produced (Vp) millions of m3</b>	<b>98.45</b>	<b>99.09</b>	<b>100.37</b>
<b>Technical Efficiency according to the contract (CTE)</b>	<b>0.77</b>	<b>0.80</b>	<b>0.83</b>
<b>Commercial Efficiency according to the contract CCE</b>	<b>0.96</b>	<b>0.97</b>	<b>0.97</b>
<b>Average Tariff (water component only, without taxes)</b>			
<b>(Tavg) F CFA/m3</b>	<b>349.83</b>	<b>356.72</b>	<b>370.26</b>
<b>Actual Technical Efficiency (ATE)</b>	<b>0.72</b>	<b>0.743</b>	<b>0.74</b>
<b>Actual Commercial Efficiency (ACE)</b>	<b>0.98</b>	<b>0.98</b>	<b>0.97</b>

According to the author's calculations, based on these data, in 1997 the fee the operator would have received if all targets had been met would have been 17,433 million F CFA. Using the formula, this number would then have been adjusted to reflect the fact that technical efficiency was lower than required in the contract —72 percent rather than 77 percent— but commercial efficiency was higher at 98 percent rather than 96 percent. Based on these data and the formula, the adjustment would have amounted to -1,157 million F CFA, for a total remuneration for that year of 16,275 million F CFA. The adjustment would thus have resulted in a loss of about 7 percent of the unadjusted fee.

The calculations show that things would have become even more serious for the company in the next two years if the technical efficiency targets had not been renegotiated. As SDE's performance on bill collection efficiency leveled out at 97 percent, as the company continued to be unable to reach the technical efficiency target (achieving only 74.3 percent efficiency in 1998 against an original target of 80 percent, and then dropping back down to 74 percent in 1999 against a target of 83 percent), and finally, as the water component of the average tariff went up from 350 to 356 and then to 370 F CFA, the amount of the adjustment would have climbed from 9 percent of the fee in 1998 to 17 percent in 1999.

#### 5.4.2 Review of the Efficiency Targets

The situation described above was averted, however, through two separate recalculations of the efficiency targets. The first was initiated soon after the contract was signed, due to the discovery that the initial technical efficiency in 1995 was overestimated at 73 percent. The second, initiated in 1998 as part of the scheduled two-yearly review of the targets, was based on SDE's assertion that SONES had not made, in a timely manner, the investments in system rehabilitation committed through the performance contract and the *Contrat Plan*.

While there is broad agreement that the technical efficiency in the base year was overestimated, there are mixed opinions regarding SONES's failure to make timely investments in system rehabilitation. SONES maintains that they were required to make a certain amount of investment over the first five years, and that by the end of that period, those investments had in fact been made. SDE complains that almost three years passed before SONES started making investments

<sup>59</sup> Data provided by SONES.

in rehabilitation, and that a lack of investment in the first years of the contract impeded SDE's ability to reduce leakage quickly, and was shortsighted.<sup>60</sup> The Ministry points out that SONES was engaged in managing massive investments in order to improve bulk water supply over these same years, and that although these were funded from different sources of money, SONES's capacity was limited in terms of staff time, and that attention to rehabilitation was thus lacking. The Contrat Plan contained no direct sanctions for SONES if the investment targets were not met – instead it stipulated that the “Comité de Suivi” (a committee, formed of members from the President's office, the Ministère de l'Hydraulique, the Finance Ministry, and SONES, who were to follow the progress of the contract) would examine the reasons and propose appropriate measures.

Whatever the reasons or explanations, the important issue is that in 1998, SONES and SDE successfully renegotiated the targets without resorting to arbitration or litigation.<sup>61</sup> Thus by 1998 two major changes had taken place: the base year technical efficiency had been reduced from 73 percent to 68.5 percent, and the year in which the efficiency was to reach 85 percent had been delayed from 2000 to 2002. The interim targets were correspondingly recalculated.

The implication of changing the targets was, of course, that SDE had been unfairly penalized by the remuneration formula in the first two years of the contract, and would continue to be penalized if the remuneration was calculated using the formula in the contract. Thus, agreement was reached to reimburse the difference between SDE's remuneration in each year according to the old targets, and that according to the new targets. This amounted essentially to a renegotiation of SDE's bid price, but in a very transparent way, which did not require a complete renegotiation of the entire transaction.

The reimbursements commenced in 1999, and were retroactive to 1996.<sup>62</sup> Now, at the end of each year, two calculations are carried out, one to calculate the remuneration according to the targets in the original contract, and another to calculate the difference given the new targets. The total paid to SDE is the sum of the two.

The renegotiation of the targets had a dramatic effect on the financial health of SDE. In both 1996 and 1997, SDE recorded a significant loss (463 million F CFA in 1996 and 946 million F CFA in 1997).<sup>63</sup> In 1999, the financial performance of the company was much better, and a profit of 459 million F CFA was recorded. The Annual Report stated that the profit was partly as a result of “the 1998 agreement with SONES to reimburse the company for the difference relating to the initial efficiency of the network”.<sup>64</sup> In 2000 and 2001, SDE continued to post a profit: 491 million F CFA in 2000 and 495.7 million F CFA in 2001.<sup>65</sup>

The renegotiation of the targets between SONES and SDE – both in terms of the process and the nature of the final agreement – is a telling indicator of the maturity and strength of the new institutional structure in the Senegalese water sector. SONES's management was aware that a financially jeopardized operating company was not good for the sector, and was willing to accept

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60 SAUR also suggests that SONES artificially fast-tracked investments later in the period by installing larger-than-necessary pipes. SONES argues that these investments were decided and agreed upon with SDE during planning in 1997.

61 The contract did allow for a “conciliateur” – an objective sector professional who would be called in to help settle disputes – and this provision was used. A consultant who had been involved in the preparation of the transaction played this role. A separate technical note on dispute resolution in the contract is currently in preparation.

62 The dip in the chart of profits and losses (Figure 4 on page 15) in 1998 is partially a result of these reimbursements.

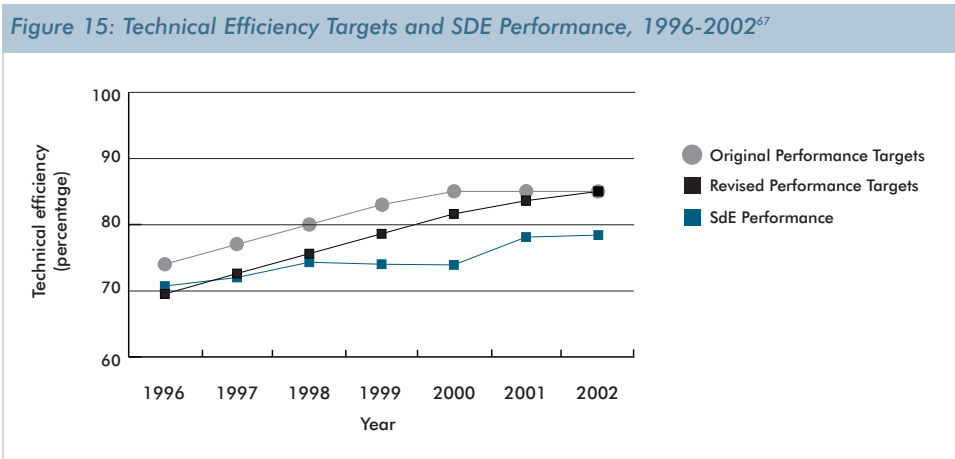
63 SDE Annual Reports, 1996 and 1997.

64 SDE Annual Report 1999, author's translation.

65 This represents a profit margin of approximately 1.2 percent on the 2001 turnover – a very narrow profit margin by the standards of the industry.

that mistakes had been made in setting the initial targets. SDE was willing to see through a renegotiation process without resorting to arbitration or threatening withdrawal. Although the process of renegotiation took a long time – about two years – it was a good example of everyone understanding everyone else’s position: the mutual cooperation outcome of the Prisoner’s Dilemma.

SDE’s performance against the revised targets is shown in Figure 15. It can be seen that SDE has also not reached the revised targets, and in fact, the representative of SDE in Senegal predicts that it will be extremely difficult to reach the objective of 85 percent efficiency.<sup>66</sup> The attainment of this target was set for 2002, but at the end of this year the efficiency was 6.6 percentage points below, at 78.4 percent. However, the 10 percentage-point gain in efficiency since 1996 represents a savings of 10 million m<sup>3</sup> of water each year, and the 4 percentage-point improvement in one year in 2001 is an impressive achievement.



### 5.4.3 SDE Performance

The affermage and performance contracts included several requirements that were not linked to the remuneration formula. In all of these, SDE has performed well.

The contract required the operator to renew 17 kilometers of 100 mm network each year (or its equivalent according to a table of ductile iron and PVC pipes of various diameters provided in the contract). SDE has met or exceeded this requirement in each year of the contract since 1997, and by 2001 had renewed over 97 kilometers of pipeline.

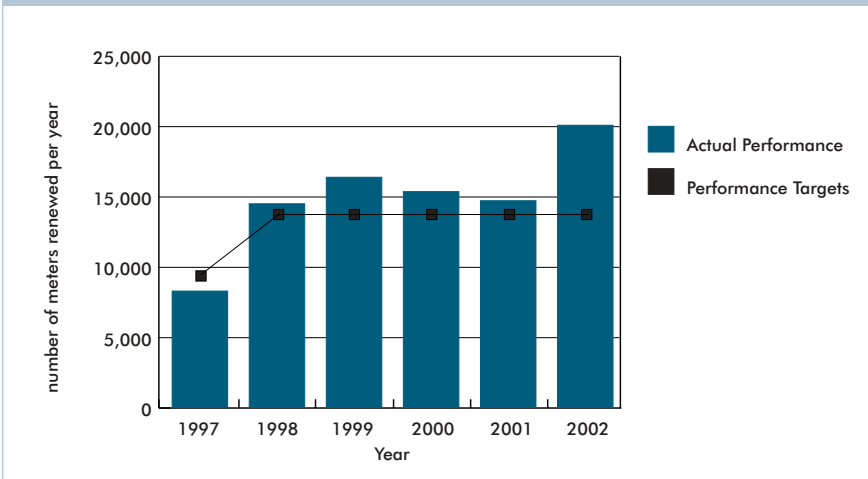
SDE has also, with SONES funding, installed a cumulative total of 89,000 new connections, achieving over 100 percent of its target in each year from 1998 onwards (see Figure 16). (SDE points out that despite the fact that they have met their targets, renewing 14,000 meters a year still means the average age of a meter is 20 years, when a reasonable lifespan for a meter

<sup>66</sup> Frédéric Renaut, Directeur Générale, SDE, personal communication, June 2002. M. Renaut also points out that although an efficiency of 85 percent is achieved in some cities on the individual distribution networks, an overall system efficiency this high, including bulk water transmission pipelines, is extremely rare in the sector.

<sup>67</sup> SDE

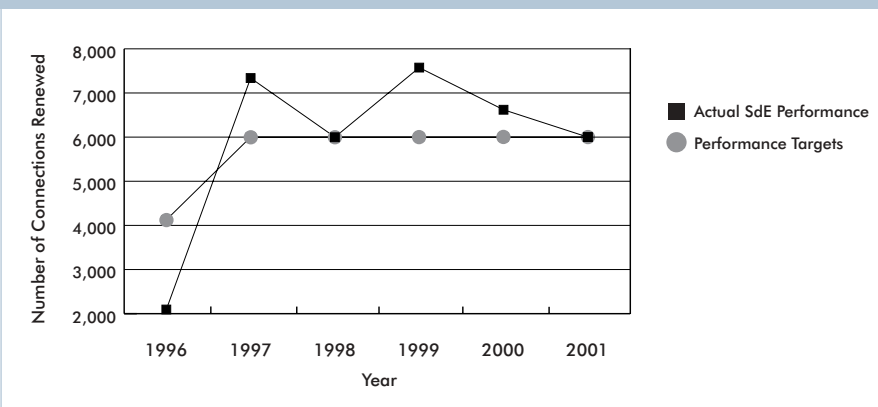
is considerably less than this.) Of these new connections, a significant number (76 percent) are “social connections” provided at low cost to poor households that meet certain criteria. The program of social connections is further discussed in Chapter 6.

Figure 16: Meter Renewal Targets and SDE Performance, 1996-2001<sup>68</sup>



In the area of connection renewals, SDE under-performed in the first year, but has since either met or exceeded the targets in each year (see Figure 17). By 2001, a cumulative total of over 35,000 connections had been renewed.

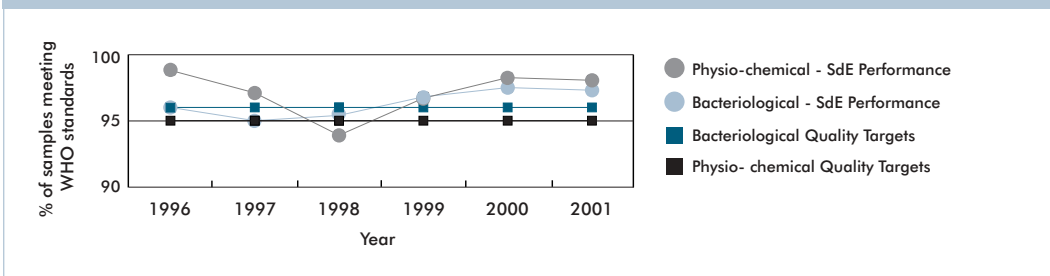
Figure 17: Connection Renewal Targets and SDE Performance, 1996-2001<sup>69</sup>



The performance contract required that 96 percent of water samples meet World Health Organisation (WHO) standards for bacteriological quality, and 95 percent for physio-chemical quality. As can be seen from Figure 18, SDE has largely met these targets, with at least 95 percent of samples meeting bacteriological water quality standards in each year. As of 2001, over 97 percent of samples meet both bacteriological and physio-chemical standards.

68 SDE  
69 SDE

Figure 18: Water Quality Targets and SDE Performance, 1996-2001<sup>70</sup>



At the same time that the system was being enlarged and renewed, SDE improved human resource efficiency. While there have been no retrenchments (an important policy agreed upon at the beginning of reform), attrition has allowed SDE to reduce its workforce from 1394 in 1996 to 1168 in 2001, a reduction of over 16 percent. This means the ratio of connections to staff has increased from 167 in 1996 to 247 in 2001, equivalent to 4.2 staff per 1000 connections. This is one of the lowest rates in Africa; by comparison, the utility in Guinea Conakry has 7.3 staff per 1000 connections and Uganda 21.1.<sup>71</sup> At the same time, SDE has made investments in training – in 2001, staff received a total of 61,000 hours of training, an average of more than 50 hours per staff member.

A significant indicator of SDE’s development into a world-class utility is the fact that in August 2002 the company obtained ISO 9001: 2000 certification. ISO 9001:2000 is a set of international quality management standards that has earned a global reputation as the basis for establishing quality management systems, particularly for organizations that consistently need to provide products that meet customer and applicable regulatory requirements and aim to enhance customer satisfaction. SDE is the first water company in Africa to achieve this certification.

## 6 SERVICE TO THE POOR

### 6.1 Water, Sanitation, and the Urban Poor in Senegal

A substantial proportion of the population of Senegal is poor. It is estimated that 54 percent of the population of 9.2 million lived below the poverty line in 2002.<sup>72</sup> Many of the poor live in rural areas, but urban areas also have high rates of poverty: in 1995 it was estimated that 16 percent of Dakar’s population was poor,<sup>73</sup> a percentage that is probably higher today.

These poverty statistics are reflected in water supply and sanitation coverage, which WHO estimated in 2000 to be 65 percent for water and 48 percent for sanitation in rural areas.<sup>74</sup> SONES’s estimates in 1996 were that urban coverage overall was 72.5 percent,<sup>75</sup> of which about 22 percent was through public standposts.<sup>76</sup> If approximately 46 percent of the total population of Senegal lives in urban areas, this translated at the time to over one million urban dwellers who

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71 Water Utility Partnership, Report of Performance Indicators – African Water Supply and Sanitation Utilities 2001, December 2001

72 Senegal Poverty Reduction Strategy, 2002.

73 “Senegal – An assessment of living conditions, 1995”, quoted in World Bank, Staff Appraisal Report, 1995.

74 WHO Water Supply and Sanitation Sector Assessment, 2000, as quoted in Trémolet, 2002.

75 Cooperation Financier Allemand, 2002.

76 Quoted in Trémolet, 2002.

were completely unserved, and over 850,000 who were provided water through public standposts only.

Improvements to water supply and sanitation for the poor were an important part of the reform process, and were identified as a priority by the government, bilateral donors, and the World Bank. Increasing accessibility to safe drinking water for the urban poor was identified as an important feature of the World Bank-funded Water Sector Project, and funds for connections for low-income households and public standposts amounting to US\$8.7 million were allocated in the budget. It was predicted that these funds would be sufficient to install 34,000 social connections and 400 public standposts over the three phases of the project. Using an estimate of 10 people served per social connection and 300 per standpost, this means 460,000 urban dwellers would be served— 57.5 percent of the estimated urban uncovered population.

## **6.2 Government Policy Regarding Service to the Poor**

The policy of the Senegalese government is to provide water service to all households through formal mechanisms, such as private connections and official, licensed vendors at standposts (“*bornes fontaines*”). The standposts themselves are seen as a temporary method of supply, and the goal is eventually to provide each household with a private connection.

The government has a policy of providing small diameter (15 mm) private connections to poor households at subsidized rates – these are referred to as “social connections” (“*branchements sociaux*”). There is an established set of criteria for determining which households are eligible. The government of Senegal also has a policy of subsidizing water consumption up to a certain volume. This is currently done through the “social” block in the tariff,<sup>77</sup> and this subsidy is, in theory, aimed at the poor.

The subsidies targeted at the poor in the water sector thus take three forms:

- Subsidized connections through the social connection program, financed by government funds (some of which are provided through the World Bank project)
- Construction of standposts in areas where there are people without private connections, financed by the government with funds from the World Bank project, and supply of water to these standposts at low rates (the standposts are managed by private operators recruited by SDE in consultation with the local community)
- Subsidized consumption at low levels of consumption, financed through a cross subsidy between customer categories and delivered through an increasing block tariff with a “social tariff” for household consumption under 10 m<sup>3</sup> per month

The government thus had a clear commitment to making service both *accessible* and *affordable* for the poor, and proved to have the political will to act upon this commitment. While each of the approaches had its flaws, as will be discussed below, Senegal was unusual among developing countries in recognizing that the State must go beyond simply subsidizing consumption, and make increasing access an important part of a pro-poor strategy, backing this up with the necessary investment funds.<sup>78</sup>

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<sup>77</sup> Consumption under 20m<sup>3</sup> in 60 days is billed at a low rate (about 30 percent of the price of water in the next block of the tariff). The underlying assumption is that poor families have low water consumption and will not exceed 20m<sup>3</sup> whereas wealthier households will (there are, however, no data in Senegal to confirm this assumption, and research in other countries has found that water consumption does not tend to be correlated with income).

<sup>78</sup> SODECI in Cote d'Ivoire has a similar program of social connections, with an interesting funding mechanism through a surcharge on regular billings.

### 6.3 Role of SONES and SDE in Improving Service to the Poor

At the time that the private operator entered the picture, increasing access for the poor was an important priority. However, the poor also faced an additional problem. The water shortages and pipe bursts that were common in the networks resulted in frequent service interruptions. These were both more common in poor neighborhoods, and also more keenly felt by the poor. Wealthy residents were able to install storage mechanisms, such as overhead tanks with electric pumps to fill them, but poor people had to wait for water or look elsewhere – these interruptions sometimes meant that poor neighborhoods would receive water only once in several days.

The solution to the problem of service quality was, of course, to improve the functioning of the system so that there were fewer interruptions and repairs were attended to quickly. However, as 24-hour supply was not achievable in the short term, the private operator – on his own initiative – pursued another strategy. This was to “distribute the deficit”. This meant evening out the interruptions so that they were no longer experienced more frequently in poor neighborhoods. This approach led to rapid improvements in service quality for poor connected households, and little change for wealthy households that already had storage tanks to ensure 24-hour supply within their homes.

There were no specific obligations or incentives within the contract or remuneration formula to encourage the operator to distribute the deficit. SDE reports that they did this in order to establish and protect their reputation for customer service, as it was an intervention that had a dramatic impact on customer well-being. However, it is important to note that an affermage contract, with a fixed water supply rate regardless of the type of customer served, did not provide the operator with a *disincentive* to do this. A concession contract, in which the operator makes his revenues and thus his profits directly from tariffs, would make an operator reluctant to divert water from customers in higher tariff categories to those in lower ones.

The issue of access was addressed by a combination of more standposts and more social connections. The government policy of extending network service to the poor meant that funds were earmarked for this purpose in the investment plans. Installing the facilities required a partnership between SONES and SDE, but first the bulk water supply problem of Dakar (where most of the unconnected poor lived) had to be solved. The Ngnith conduit bringing more water to Dakar was completed in 1999, and the number of social connections installed in each year increased dramatically after this date (see Figure 19). One of the reasons for this significant increase were the incentives created in the affermage contract for the operator to serve the poor.

As the operator was remunerated for water sold, he had a positive incentive to add more customers, including those who were poor. The operator was paid for making the connections out of the government-controlled investment fund at a rate that covered his costs and allowed for a margin of profit.<sup>79</sup>

In addition, as the operator is paid on the basis of a water supply rate that does not vary according to the type of customer served, he was “blind” to the tariff each customer paid. This meant there was no disincentive to serve the poor on the basis of tariff. The only exception to this would be if so many subsidized consumers were added that the tariffs collected on the

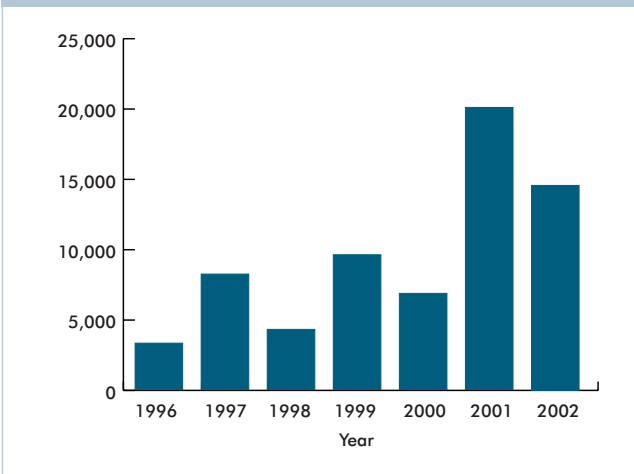
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79 Frederic Renaut, SDE, private communication, June 2002.



government's behalf were not sufficient to cover the operator's remuneration (which the operator keeps after remitting any surplus from the tariff revenue to government). However, in Senegal this was not the case. Firstly, the operator's water supply rate represented only about 50 percent of the average tariff, and secondly, the increase in the number of subsidized customers was outweighed by increased consumption by customers in the higher tariff categories. (This latter fact assuaged the government's fears that adding new social connections would bring the average tariff down and jeopardize progress towards financial equilibrium.)

Figure 19: Social Connections Installed, 1996 to 2002<sup>80</sup>



Extensions to the network, paid for by SONES and implemented by SDE, also benefited the poor when they were laid in low-income neighborhoods — which they largely were, as these were the only neighborhoods that remained unserved. These extensions averaged over 150 kilometers per year.

The affermage contract thus created incentives for the operator that were well matched with the government's stated policy of extending the network to the poor while maintaining a subsidized consumption tariff. It is interesting to note that under a form of contract in which the operator made profits directly from tariffs (such as a pure lease, or a concession), there would have been a powerful disincentive to add new, heavily subsidized customers. The operator would also not have had an incentive to add new customers if he had been expected to subsidize the connection fees himself, but the operator was fully reimbursed for these costs out of SONES's investment funds.

The incentives for the operator to address the problems of urban water supply for the poor are summarized in Table 1.

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**Table 1 Operator Incentives for Improving Service to the Poor**

<b>Problem</b>	<b>Solution</b>	<b>Incentives/Disincentives for the Operator</b>
<b>Service Quality</b> - frequent service interruptions meant that poor neighborhoods only had service once every few days	"distribution of the deficit" undertaken by operator	<ul style="list-style-type: none"> <li>• No direct incentives in contract, but operator wanted to establish reputation for customer service</li> </ul>
<b>Access</b> – many poor households not connected at all	<p>System of public standposts with private management undertaken by operator with SONES funds</p> <p>Program of social connections undertaken by operator with SONES funds</p>	<ul style="list-style-type: none"> <li>• Operator remuneration was linked to water sold, so there was an incentive to add new users but only after bulk water supply was improved</li> <li>• No disincentive to install social connections as all costs plus some profit covered, and operator blind to tariff category</li> </ul>
<b>Price</b>	Lifeline tariff set by government	<ul style="list-style-type: none"> <li>• Operator paid on the basis of fixed water supply rate, so is unaffected by social tariff, and may welcome it as it increases the number of people using network water</li> <li>• Many people paying low tariffs could bring down average tariff, resulting in too little money in the government account, and difficulties in paying operator; however this did not happen, as increased consumption in higher tariff categories provided balance.</li> </ul>

#### **6.4 NGO Partnerships to Serve the Poor**

SDE and SONES also work in collaboration with a variety of NGOs whose aim is to improve service delivery in poor areas. In most cases, these NGOs assist communities to request, install, and manage standposts. The NGO ENDA-Tiers Monde, for example, manages two different programs; through one, standposts funded by SONES are installed, and through another, infrastructure is financed by ENDA itself with the community contributing at least 25 percent through cash or labor. ENDA has installed over 500 standposts through these two schemes, which is a substantial number given that there is a total of approximately 3400 standposts in the SDE/SONES service area.

ENDA works with neighborhood associations, which are present in many poor areas. Typically, an association will liaise first with ENDA rather than SDE or SONES, and will take a major role in community mobilization activities. For each new standpost, approval is sought from SONES. SDE supervises construction of the standpost and installs any network or pipes required to make the connection. After the standpost is connected, SDE is responsible for billing for the applicable

tariff. The community chooses a standpost operator, and ENDA assists in establishing a water council or a similar structure.<sup>81</sup>

SDE has an incentive to work in partnership with organisations such as ENDA, as it allows a greater volume of water to be sold while reducing the risk of non-collection of bills due to the NGO's intermediation role.

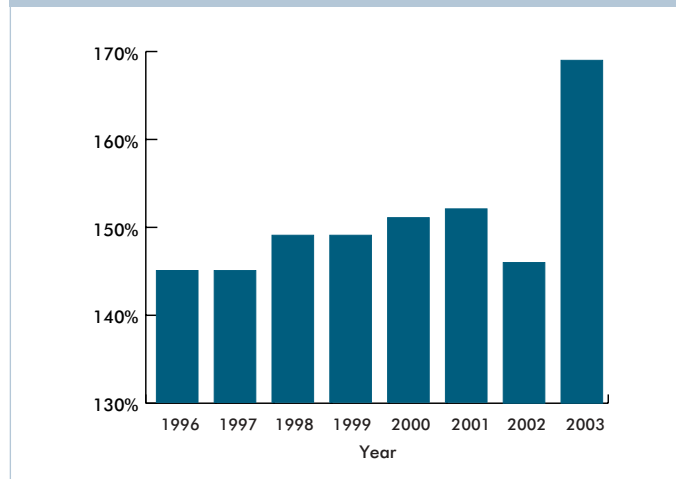
## 6.5 Constraints and Inequities in Service to the Poor

Despite the fact that government policy was oriented towards improving service to the poor, and that this was backed with funds for both consumption and connection subsidies, there are certain flaws in the way the government targets and delivers these subsidies. The constraints and inequities thus introduced are explained below.

### 6.5.1 High Effective Tariffs at Public Standposts

Public standposts have the advantage of providing service quickly to those living in areas where the piped network does not reach, but they do not necessarily provide the lowest-cost water to the poorest. For example, under the 2003 tariff, introduced in late 2002, the water at the *bornes fontaines* was sold to the licensed vendors who run the standposts for 315.09 F CFA per m<sup>3</sup>, while the "social tariff" block was priced at 186.32 F CFA per m<sup>3</sup>. As discussed in Section 5.3, the increase in the standpost tariff has been higher than any other category over the seven years of the reform (a total increase of 35 percent since tariff increases began), and has systematically been higher than the social tariff (see Figure 20).

Figure 20: Standpost Tariffs as a Percentage of the Social Tariff, 1996 to 2003<sup>82</sup>



Consumers using water from the *bornes fontaines* also have to pay the overhead of the licensed vendor, or re-seller, who manages the standpost. An example of the high prices standpost users thus pay was observed in November 2002 at a standpost run by the NGO AdEETels, a consumer association. There, users purchase water in 40-liter plastic basins, at 25 F CFA per basin. The volumetric cost of this water is thus 625 F CFA per m<sup>3</sup>. The tariff the NGOs pay for this water is 315.09 F CFA per m<sup>3</sup>, the official tariff category for public standposts, which means that users

81 Grille Tarifaire, Villes Assainies, provided by SDE.

are paying a 98 percent “overhead” on this water. Some of this is accounted for by the cost of paying the standpost attendant, and some goes towards running the organisation as a whole. Users at this standpost are therefore paying about 350 percent of the current social tariff, and about 2 percent more than the regular, unsubsidized tariff for private connections and commercial institutions.

Users of standpost water thus pay substantially more than the social tariff on a volumetric basis, even though it is easy to argue that they would be likely to be poorer than those targeted by the social tariff. In order to have a private connection and thus use social tariff-priced water, a householder has to have title to the land he lives on. The *bornes fontaines*, by their nature, are designed to serve the recent migrants living in the “*quartiers spontanés*”, or informal settlements, which spring up around the city.

### 6.5.2 Many of the Poor are Excluded from Social Connections

The *bornes fontaines* are seen as a temporary solution (even though their numbers have continued to increase), and the government intends to reach all the poor with private connections through the policy of providing subsidized “social connections”. However, this policy suffers from a major flaw: the very criteria that make a household eligible for the subsidy more or less guarantee that it is not poor. As Lauria and Hopkins point out in their examination of pro-poor subsidies in West Africa,<sup>83</sup> the poorest households are precluded from having subsidized connections because the social connection programs are intended for stable neighborhoods where the residents have established themselves. In order to obtain a social connection, an applicant must have title to the land, and an existing house must be located on it. The cost of a plot of land in the areas most squatters live is in the order of US\$500, equal to the GDP per capita for Senegal in 1999. A household that can afford this, and can afford to build a permanent house, is not among the poorest of the poor.

### 6.5.3 Increasing Block Tariffs Do Not Target Consumption Subsidies Well

There are many criticisms of increasing block tariffs as subsidy delivery mechanisms. Clearly, many poor people in Senegal are not benefiting from the subsidized block of the tariff at all, simply because they do not have a connection. In low-income areas where connections are few, many families may share a single connection, and thus consume most of their water in a higher block of the tariff. Ironically, these people would then be cross-subsidizing small families who used less than the 10m<sup>3</sup> per month of the social tariff, some of which might be wealthy. As 10m<sup>3</sup> is a fairly generous monthly amount, there may be many relatively well-off households in urban areas of Senegal who only consume subsidized water, thus benefiting from assistance intended for the poor. Subsidies delivered this way are thus not necessarily related to need; household water consumption is a notoriously poor proxy for poverty status.<sup>84</sup>

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83 Donald T. Lauria and Omar S. Hopkins, *Pro-Poor Subsidies for Water Connections: Cases from West Africa*. Submitted to Water Resources Research, February 2003.

84 For a longer discussion of the problems of increasing block tariffs, see John Boland and Dale Whittington, “The Political Economy of Increasing Block Water Tariffs in Developing Countries,” in Ariel Dinar, ed., *The Political Economy of Water Pricing Reforms* (Oxford: Oxford University Press, 2000).

## 6.6 Are the Poor Better Off?

In conclusion, it would appear that in general the reform has benefited the poor in that many more of them are connected to the network and the number of standposts has increased. SDE's practice of "distributing the deficit" means that poor customers experience better service. It is likely that SDE's improvements to the response time for leaks and network interruptions have also benefited the poor, as has better service at payment centers. These latter benefits are common to both poor and non-poor, but poor people with no storage facilities benefit more from a more reliable system which provides water over longer hours, and those for whom time lost means lost earnings, such as day-laborers, benefit from being able to make complaints and pay bills in less time. The government's policy of connecting everyone is far-sighted, and in theory means that all will eventually benefit from the investments the government has made in the overall system.

However, the lack of concurrent revisions to the policies for determining who is eligible for social connections and how the tariffs are structured means that not all the potential for benefits to the poor has been realized. In particular, the very poorest are disadvantaged by the fact that they are not eligible for social connections and pay more for water at the borne fontaines than customers with private connections pay for their water. Given the flaws in the Increasing Block Tariff structure, it would make more sense to direct consumption subsidies away from private connections and into water provided at the bornes fontaines, or by other re-sellers who serve the poorest.

## 7 CONCLUSION

Nine years after reform was initiated, and seven years after the creation of SONES and the engagement of a private operator, there have been major improvements to service levels in the Senegalese water supply sector, with more water, of better quality, getting to more people. The benefits appear to be relatively well-distributed, with many of the urban poor receiving service for the first time, and more reliable service in low-income neighborhoods. SDE is a healthy and well-managed company. SONES is well on its way to meeting the objective of financial equilibrium in 2003, and has proved itself capable of borrowing funds on private capital markets and repaying them in a timely fashion. Success in this latter regard is evidenced by the fact that lenders are ready to make SONES future loans.

One of the most important successes is the existence of a good working relationship between the players, and this relationship is perceived as a partnership. SONES concentrates on overall sector development and contract enforcement, and leaves the day-to-day operation of the system to SDE. SDE has created an efficiently managed system, increasing capacity through employee training, and has introduced state-of-the-art technology such as electronic leak detection and computerized billing.

Some of the success of the reform can be attributed to the fact that the utility was already performing relatively well at the time that it was initiated: the utility was not heavily overstaffed and was relatively well-run from a technical point of view, and the tariff levels were reasonably close to cost recovery of operation and maintenance costs (by contrast, current tariff levels in many Indian cities are less than one tenth of the cost of operation and maintenance).<sup>85</sup> There was also a conducive legal framework, which was already structured in such a way that private sector partnerships could be fostered.

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85 Usha P. Raghupathi, and Vivien Foster, *Water Tariffs and Subsidies in South Asia – A Scorecard for India*, 2002, World Bank, 2003.

What were the primary factors which contributed to the success of the reform process and the strengthening of the urban water sector? These can be summarized as

- the use of a **particularly appropriate form of contract**;
- **strong political will and good leadership** within the government;
- a **well-designed process**;
- **flexibility and innovation** when necessary.

The choice of contract was important. The contract chosen – an affermage modified by the addition of strong financial incentives to reduce leakage and improve billing and collection efficiency – was innovative. It has proved to be a good fit for a country in which, on the one hand, leakage was high and system rehabilitation needed urgent attention, and on the other hand, the poverty alleviation objectives meant that customers had to be protected from dramatic price increases and coverage needed to be expanded.

The contract addressed the practical needs of the government, as it was of a suitable duration and kept all the assets in government hands; both political imperatives. The contract did not require large-scale private investment, which would have been too costly, but required some contributions to capital expenditures on the part of the operator. Operations and maintenance functions were clearly defined, leaving little room for disputes, and the incentives encouraged the operator to produce at optimal capacity while reducing losses and improving bill collection efficiency. (The case of Senegal has illustrated that if a private operator takes over operations and is given some responsibility in the planning of the capital expenditure program, much more emphasis will be placed on the distribution system than water production. In a system such as Senegal's, with poorly maintained piped networks and high leakage, this is important.) The nature of the contract fostered a partnership between the government and the private operator as they both sought to make the water sector viable and healthy. The incentives in the contract proved to be powerful, and the private operator has had to work hard to meet the targets. In fact, some targets proved to be too onerous, and their successful re-negotiation can also be seen as a hallmark of the success of the contractual relationship.

Strong and competent leadership from the relevant Ministry was present throughout the reform process, and there was little, if any, interference from other parts of the government.<sup>86</sup> The World Bank and the other donors involved understood and appreciated the position of the government on certain aspects of the reform, and demonstrated flexibility. Communications were kept open through a planning process that was systematic and collaborative. The actors were always convinced they would be able to find a solution to the inevitable problems, and approached them with this constructive point of view. The series of workshops and meetings held over a period of three years allowed for mutual learning and the building of trust, and built on the already strong skills of the personnel involved.<sup>87</sup> There was willingness on the part of the Senegalese government to learn from global experience, and also to learn from the other countries of the region, as evidenced by the comparative study conducted early in the process that helped shape the form of both the state asset-holding company and the contract with the private operator.

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<sup>86</sup> The exception to this is that the government still influences the appointment of the Director General of SONES, although World Bank officials maintain that there was a commitment to avoid this.

<sup>87</sup> In fact, it has been pointed out that the World Bank put more emphasis on institutional development reforms in the roads sector than the water sector, yet the water sector has achieved greater success in terms of sustainable institutional development. This is attributed to the much greater human resource endowment of the water sector (Goetz *et. al.*, 2002, *op. cit.*)

The resulting network of contracts made for robust relationships and an institutional structure that has endured both a change of government and of president, but which has the disadvantage of being difficult to disentangle for any future reform of the institutional framework. The significance of this will emerge as the water sector evolves and new institutional structures are considered—for instance, an independent regulator.

An important feature of the Senegal case was the government's commitment to honor the contract and enact it according to its terms. (Other countries have not been so scrupulous in this respect.) The only shortcoming was the initial failure of SONES in meeting its own investment obligations. There has been much discussion of how a government agency can be held to the obligations of an instrument such as the sector development plan. Applying financial penalties is obviously self-defeating, as they would only raise the price of water for consumers. Providing incentives is more difficult – in the end this has to be done at the level of the individual staff in order to be effective. It has been suggested that engaging staff on performance-based contracts linked to the agency's goals may be effective, but this is an idea that is as yet untested, and the issue remains unresolved.

The fact that the regulatory framework was essentially built into the contract was a strong point, as it was not necessary to establish an independent regulator before reform could take place. The contract is largely self-regulating, and in the instances that an objective outsider is required, includes a provision for an independent "conciliateur". For many countries, this would be a major advantage, as it is often challenging, and risky, to try to establish an effective, fully independent regulator in the timeframe required by most reform processes.

The use of the cash flow equilibrium model to guide the sector to financial health was an important innovation, and its impact was felt not only through the reform process, during which it helped decision makers analyze the various options available, but also in the ongoing management of the sector.

The model, however, cannot help examine issues such as the economic cost of water, the rationale behind pricing, and the impact of the tariff structure on the poor. There are, in fact, indications that the tariff structure is regressive, and that poor people sharing connections or using standpost water are paying higher prices than many of the non-poor. This, coupled with the problems described earlier of the targeting of the social connection policy, means that the impact on the poor may not yet be as positive as the planners of reform hoped.

The main lessons learned in Senegal can be summarized as follows:

- There can be no sustainable reform without political commitment, stakeholder ownership, and strong internal leadership – these must be in place prior to starting the process and maintained during implementation.
- Sector investments must be planned in parallel or in synergy with utility reform, and these should be financed by external support agencies; it is feasible to include sources of private sector finance if certain conditions are met.
- Governments must remain committed to sector investments, and implement them in a timely manner, as delays in rehabilitation and extension works will jeopardize improvements in service, which will in turn hamper efforts to restore customer confidence and payment discipline; ensuring that government staff have incentives to ensure investments take place as planned may require special measures.

- Establishing a climate of trust and cooperation among the various key actors will make reform sustainable and robust – this can be done by undertaking capacity building activities, reinforcing the partners' common understanding of the new institutional arrangement, and creating a collaborative atmosphere and team spirit.
- The state asset-holding company must be institutionally autonomous, professionally competent, and have clear financial targets.
- Issues of employment and job security for utility staff must be addressed up front.
- The form of any contract with the private sector must be closely based on, and entirely consistent with, the development aims of the sector.

The sector's long-term needs are now the subject of a new World Bank Long Term Water Sector Project, which became effective in June 2001. This project will address the continuing need for an increase in production capacity (water demand is expected to grow by 30 percent over the next decade, and to triple over the next 30 years<sup>88</sup>), finance much-needed investments in sanitation, and support further institutional reforms, including the establishment of an independent regulator. The project is designed to span the period during which the current affermage contract with SDE will come to an end, and a new arrangement put in place. The government is already developing a vision for this "second generation" public-private partnership.

The success of private sector participation in the water sector "has helped to dissolve political resistance to it in other sectors",<sup>89</sup> and attempts to bring private sector partners into telecommunications and electricity through concession arrangements soon followed, though with mixed results. The government is currently considering a new set of reforms in the electricity sector, modeled on the SONES and SDE arrangement, which may include the creation of an asset-holding company and the signing of a similar affermage contract.

In the years since it was designed, the water sector reform in Senegal has not only improved water services to citizens of that country, but has also had a pronounced impact on the design of several World Bank transactions in other countries. For instance, the recently completed reform of the utility in Niger was closely modeled on the Senegal transaction. Planned transactions in Nepal and Sri Lanka are also being influenced by the Senegal experience.

In summary, the urban water sector reform initiated in Senegal in 1995 has proved to be a successful blend of both innovative contracts and robust relationships, and has helped the country achieve significantly improved performance in the water sector.

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<sup>88</sup> World Bank, *Republic of Senegal Long Term Water Sector Project - Project Appraisal Document*, 2001.

<sup>89</sup> Goetz et. al., 2002.



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## ANNEX 1 LESSONS FROM OTHER COUNTRIES

Summarized from Aquanet, Institutional Reform of the Urban Water Sector, Volume 1 Main Report: Functional Relations, August 1994.

### **Cote d'Ivoire**

The fact-finding mission found that water supply had been in private hands in Cote d'Ivoire since 1959, with 47 percent of the company *Société de Distribution d'Eau de la Cote D'Ivoire* (SODECI) owned by French companies (46 percent SAUR and 1 percent other private companies), and 53 percent by Ivorian stockholders. The relationship between the government of Cote d'Ivoire and SODECI was governed by a contract, which gave the company the exclusive right to produce and distribute water in the country (except for rural areas) and the responsibility for all repair and renewal work, plus new construction under specified circumstances. SODECI was entitled to collect tariffs from customers and keep a remuneration specified in the contract.

The consultants reported that they found SODECI to be a well-organized and efficient organization, and the sector to be performing well. The water sector was financially autonomous, with all operating expenses and investments financed from revenues. A major unresolved problem was the fact that government clients, who accounted for 25 percent of consumption, did not pay their bills; even though SODECI could claim for the non-payment of state accounts when it accounted to government, the situation sometimes forced the company to borrow from private banks to solve its cash problems. It also meant that the company did not remit the surcharge on the tariff designed to service old debt and finance new connections, but instead used it to offset the amounts owed by government. A significant weakness was that the contract contained no incentives to reduce leakage or improve billing and collection efficiency.

The absence of financial accountability and the lack of coordination between the public partners in charge of investments (Directorate de l'Eau , a ministerial department in charge of technical aspects and of investment planning, and the Water Fund, in charge of debt service) had resulted in water system investments coming to a standstill in 1985. A new contract with SODECI, signed in 1988, recognized that future investments in urban water supply would have to be entirely self-financed and that the private operator (SODECI) had a comparative advantage in planning and executing such investments. The role of the public sector in managing and planning investments was reduced, which meant there was no need to set up a state holding company. Thus, the only government department involved in the sector was the Directorate de l'Eau. The relationship between this Directorate and SODECI had always been very good, but this was in part due to excellent personal relationships between the members of the top-level management.

### **Guinea Conakry**

In 1989 the government of Guinea Conakry had collaborated with two French companies to create the *Société d'Exploitation des Eaux de Guinée* (SEEG). The government owned 49 percent of the shares of SEEG, and the French companies (SAUR and Générale des Eaux) owned 51 percent. The government had created a state-owned national water authority, *Société Nationale des Eaux de Guinée* (SONEG), which was designed to plan investments, finance the sector, and prepare investment projects. A contrat-plan was signed between the government and SONEG, and a 10-year affermage contract was signed between SONEG and SEEG. Under this contract, SEEG was assigned responsibility for operating the water supply services in 10 urban centers.

The fact finding mission found that between 1989 and 1994, the situation in Guinea had improved considerably, for in 1989 the situation was desperate with only a few hours of service a day and huge uncollected arrears. In 1994 there was 24-hour supply and better collection ratios, but Unaccounted-for Water was still very high and the national budget still provided a heavy subsidy to the sector.

SONEG was suffering from the delays associated with government and donor procurement, and rehabilitation and extension were not keeping up with demand. The operator's contract provided an incentive to add new connections in order to sell as much water as possible (as the operator's remuneration was based on water sold). SEEG had added as many new connections as the network would allow, but had now reached deadlock as SONEG was unable to carry out extension.

The private operator's contract did not provide incentives to decrease Unaccounted-for Water, and as raw water was abundant and transportation costs were low, the operator had not addressed the problem of leakage. The operator's remuneration was calculated as a percentage of the tariff; instead of grappling with the issue of reducing service delivery costs, it appeared that the operator had merely pressured government to increase tariffs.

### ***The Gambia***

Electricity supply, wastewater collection, and water supply in the Gambia had been contracted to a private firm under a 10-year lease in 1993. The government had created a state holding company (Utilities Holding Company, UHC) to plan investments, finance projects, and act as the employer of the private sector operator. The operator, Management Service Gambia (MSG), was 99 percent owned by SOGEA, a private French company. MSG was contracted to carry out operation, maintenance, billing and collection under a 10-year affermage contract.

The fact-finding mission determined that in the nine months since the contract came into effect, the water supply system had improved considerably, but that significant problems remained. In particular, some problems stemmed from the fact that the UHC was not in place at the time the contract was negotiated. The UHC was also not allocated enough resources through the tariff to cover the costs of existing debt servicing, much less new investments, and was not allowed to raise the tariff. UHC did not have resources to monitor water quality, and had to rely on the private operator's reporting. Any loans were passed through the central government, which on-lent to UHC at rates much higher than those of the original loan.

## ANNEX 2 THE FORMULA USED TO CALCULATE THE OPERATOR'S REMUNERATION IN THE AFFERMAGE CONTRACT

The amount to be paid by the operator to SONES in each year (n) is the average tariff minus the operator's fee, multiplied by the volume produced (at the head of the network) and the targets for efficiency and collection in that year:

$$\text{Amount to be paid to SONES} = (T_{\text{avg},n} - OP_n) V_{p_n} \times CTE_n \times CCE_n$$

$OP_n$  = operator's water supply rate in Rs./ m<sup>3</sup> (sometimes called "bid price" or "operator's fee"), adjusted annually according to the indexation formula

$V_{p_n}$  = water put into supply (volume of water produced) in m<sup>3</sup>/yr

$ATE_n$  = actual technical efficiency; water billed divided by water produced (equal to 1 – UfW)

$CTE_n$  = contractual technical efficiency; the target for water billed divided by water produced according to the contract

$ACE_n$  = actual commercial (bill collection) efficiency: actual amount of water paid for divided by water billed

$CCE_n$  = contractual commercial (bill collection) efficiency; the target for water paid for divided by water billed according to the contract

$T_{\text{avg},n}$  = average tariff ; sum of the amount billed in each tariff category divided by the total overall volume billed for in cubic meters: this is the weighted average of all tariffs (net of taxes),

The amount collected in each year by the operator is the average tariff multiplied by the volume produced and the *actual* technical and collections efficiencies:

$$\text{Amount collected} = T_{\text{avg},n} \times V_{p_n} \times ATE_n \times ACE_n$$

The amount that the operator makes in each year is thus the amount collected minus the amount to be paid to SONES. Rearranging the formulas we get:

Operator's remuneration =

$$\{T_{\text{avg},n} \times V_{p_n} \times ATE_n \times ACE_n\} - \{(T_{\text{avg},n} - OP_n) V_{p_n} \times CTE_n \times CCE_n \}$$

Or:

$$OP_n (V_{p_n} \times CTE_n \times CCE_n) + T_{\text{avg},n} \{ (V_{p_n} \times ATE_n \times ACE_n) - (V_{p_n} \times CTE_n \times CCE_n) \}$$







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**Water Supply  
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Sector Board**

The World Bank  
1818 H Street N.W.  
Washington, D.C. 20433  
USA