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Carmen Ledo García, Ph.D[1]

The declaration of the **Right to Development** emphasizes development as a “global economic, social, cultural and political process that seeks to constantly improve the population’s well-being based on active, free and significant participation as well as in the fair distribution of the benefits derived from it”. At the end of November 2002, the definition of access to drinking water is multidimensional. For water to be considered accessible it has be to available in “sufficient quantity, accessible price, to be physically accessible, safe and of acceptable quality for personal and domestic use”.

Access to drinking water is a fundamental Human Right. The right to have drinking water is part of the so-called economic, social and cultural rights. This integral vision of human rights constitutes in a step in advance. Due to its integral vision, the State and the population become allies in order to generate the mechanisms that guarantee the fulfillment of all the rights in question. Regarding the provision of water services, the State, through its actions, promotes and generates opportunities that provide the “individual the necessary material support to be able to exercise them efficiently.” Therefore, the concept of human rights becomes a politico-economic concept that integrates simultaneously: security in several aspects, the individual's protection, his material well-being, and means to satisfy basic needs. All this supposes a process of enhancement of citizenship allowing people to act upon their rights and civic duties. Therefore, governments should adopt the necessary measures in order to guarantee the right to the drinkable water as well as strategies that allow water access to the poorest and most vulnerable sectors.

It is then useful to approach the topic of access to water from the Human Right to Development standpoint, due to its integral and systemic perspective. It does not imposes hierarchies among the diverse and inseparable dimensions of development –democratic, economic, social, environmental, cultural - and it puts them all in function of the growth of human capabilities and freedoms, trying to break the false independence of the economic and the social aspects. An exclusively economist conception is not acceptable, and neither is an idea that promotes a social progress that sacrifices economic advances. In consequence, a good recommendation will be one of accepting integrative economic, social, cultural development policies, with the perspective of the promotion of a “virtuous” dynamics where the mutual influence of factors generates societies with higher rents and more complete and more sophisticated human capabilities (Yáñez César, 2001).

It is praiseworthy to point out that the adopted declaration ascertains that “enough water should not be interpreted in a restricted way by mere reference to water volume and technologies. Water should be treated as a cultural and social asset and not essentially as an economic commodity. This presents a different vision from the decisions taken in several international forums during the 90’s, when water was

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considered as a commodity. It represented a change towards market based policies to show the real cost of water, through the reduction of subsidies and with the involvement of the private sector in the provision of water services"(United Nations, 2003).

Bolivia has become emblematic when referring to water privatization issues. On one hand, the "water war" in Cochabamba is one of the most publicized cases of privatization failures. On the other hand, the case of the "Aguas de Illimani" the La Paz/El Alto water concession is known for the efforts to correct contract design in order to make the water concession "pro-poor". Efforts that so far have encountered a mild success. This chapter tries to unveil the condition of access to water being experienced by the population of these two cities several years after the reforms affecting the water sector.

Bolivia is a country with high population dynamics. In this context, the identification of the patterns of changing water, land use and the spatial distribution of poverty in La Paz and Cochabamba becomes a relevant challenge to show analyse the conditions under which the privatization process took place. The 'Water War' in Cochabamba during April 2000, showed the world the consequences of the unfair conditions of the processes of privatisation of the basic services in Bolivia. The main problem affecting water services in the country seems to be that there is less control over the companies that offer the service, because water is considered as an economic asset. Frequently the justification of its administrators be they private or public is that the concession areas do not coincide with the boundaries of the cities. It is frequently observed in Bolivia that the concession area only covers the spaces where the economically powerful groups live. Efforts to improve the quality of services being concentrated in the area of the concession deepen the pattern of inequalities and exclusion already existing in the cities.

The paper is organized as follows. In the first part, a brief introduction on the city of Cochabamba is presented, including the characteristics of urban expansion and quality of infrastructure. This part presents the main indicators of state of coverage of water and sanitation services before and after the failed privatization attempt of the public company SEMAPA. It concludes with an analysis of sustainability of the water company based on published financial indicators for recent years. The second part of the paper is devoted to the analysis in the case of the supply water system in La Paz/El Alto. Different from the Cochabamba case, the concession agreement signed with a private company in La Paz/El Alto has been pursued. The water supply is in hands of the private consortium Aguas del Illimani. The paper analyses the pattern of urban expansion and quality of infrastructure services. Then, it tries to match current developments in the expansion of the system with the targets set in the concession contract. Once again, financial indicators are shown leading to a reflection on the future sustainability of the company and the implications for the well being of users in the area.

PART I: Cochabamba

1.1. The City of Cochabamba

The City of Cochabamba is called "the city of eternal spring". It is found in the region of the valleys at a height of around 2500 metres above sea level. The City was founded at the end of the 16th century on the foundations of the previous pre-colonial village of *Canata*. Since then it has achieved importance due to the development of agricultural

estates, which had the purpose of supplying food to the mining industry in Potosi (Ledo, 1986; Solares, 1990).

Around five per cent of the Departmental area of Cochabamba is a valley. It is within this "small piece" of the territory that 85 per cent of the Departmental urban population lives and it is within this territory that the city of Cochabamba is found.

1.1.1. The Metropolitan area of the city of Cochabamba

The City has largely increased its weight within the total departmental population. In fact, it represented only seven per cent of that population in 1900, 16.5 per cent in 1950, 28.2 in 1976 and around 37 per cent in the last census in 2001. The central position Cochabamba has with borders with six other departments makes it the perfect place for the confluence of different human groups. In fact, more than half of the inhabitants are immigrants. In many senses Cochabamba is a reflection of Bolivia. It is an intermediate space, which provides a national meeting point where many of the contrasts prevailing in Bolivia can be found. Values of the main indicators for Cochabamba are usually the same as the average value for the country as a whole.

The metropolitan space of Cochabamba encompasses several municipal districts. Municipalities enjoy administrative and managerial autonomy. Municipal realities are dissimilar but taken altogether they represent great economic, social and territorial potential.

1.1.2. The Municipal Districts

Municipal authorities' lack of attention to the basic needs of the population, which lives in the suburbs, is generating important social tensions. The explosive growth of the city and of their surrounding towns has happened within a framework of a lack of political leadership, chaos and improvisation. The progressive expansion of the urban area over previously agricultural areas has created important problems for the urban planning.

Since 1994 the municipal administration has incorporated civil participation and decentralisation as an important element if its planning system, and to that end the city is currently divided into 14 Municipal Districts. The purpose of the Districts is to decentralise municipal activities with respect to construction, health and education, and to establish a context for popular participation in setting priorities. The attempt has proven ineffectual however, since financial resources are not decentralised and Districts have in effect no budget autonomy. Further, Department voice in Strategic Planning initiatives has been extremely limited.

An expression of the latter is that, after the publication in 1995 of District Development Plans, which in theory should have been the instruments for technical and political planning, nothing happened. These plans aimed at guiding the process of territorial organisation. Unfortunately, District Plans were not elaborated following the same methodology so they are not comparable. As a consequence, they can hardly be used as basis for the construction of the strategic vision for the city.

The City Council of Cochabamba issued the bases for the elaboration of the Strategic Plan of Development at the end of 1999, but only in 2002 was published officially. One of the more important aspects in the new document is the strong emphasis on the gender perspective. This aspect is the result of an arduous process of participation and

advocacy of the Institute of Integral Feminine Formation (IFFI), an NGO, to sensitise the municipal authorities.

Disregarding good intentions, the city of Cochabamba is growing fast. Segregation is increasing with respect to the use and ownership of urban spaces. Urban violence is growing, and there is more chaos and lack of urban planning for suburbs. Meanwhile, the municipality continues to invest in the aesthetics of the city, benefiting the residents of the northern (more affluent) part. Meanwhile in the southern (poorer) part people live in a world of dissatisfaction of most basic needs.

1.1.3. The urban expansion of the city of Cochabamba

During the twentieth century the city experienced a systematic demographic increase, increasing its size more than thirty times. This has been due to a high fertility rate but also to migration. For example in 1986, closure of the national mines combined with harsh economic policies resulted in an influx of more than 25,000 immigrants to Cochabamba, and a sectoral and geographical redistribution of the labour force that continued through the second half of the eighties.

The migration to the City of Cochabamba is mainly urban. Nearly three out of four immigrants come from urban zones. The main areas of urban origin are the three Departmental capitals of the Bolivian highlands: Murillo-La Paz, Cercado-Oruro, Frías-Potosí. One must also highlight the return migration and the migration flows to and from the city of Santa Cruz. The explanation of the urban origin of the flow towards Cochabamba is a real challenge; it has to do with the relationship between urban centres and the process of transformation of Bolivian cities in the last decades.

Cochabamba's population growth is unbalanced. There is a high demographic concentration in some neighbourhoods and very low in others. The highest concentration is in the Old City, around the central market place. These areas remain densely populated, despite that the rate of increase of population during the last decade was stagnant. This happens in stark contrast to the high population growth rate in the poorest districts.

The high price of the land in the north-eastern and central zones, which have better services provided by the State, and the increase of commercial activities which has happened in these areas have caused three types of response.

The first consists of the sector strategy for high income groups, to sell downtown properties and build new homes in cheaper zones. This has occurred mainly in the north-eastern zone of the City such as the wealthy districts Las Lomas de Aranjuez, El Mirador, and Villa Moscu.

The second consists of rent-sharing strategies that have been implemented in the large houses of the old city. Residents who sub-divide these properties have the benefit of access to better equipped houses and locations closer to their work.

A third response has been to invade lands in suburban areas close to activity centres such as the central market and the industrial sector of the south. These areas, formerly irrigated agricultural lands, lack basic services and basic urban structures and are characterised by a high level of internal heterogeneity.

These processes carry important consequences on the configuration of the urban landscape and the quality of the urban expansion. The urbanization of irrigated

agricultural lands, which are not intended for the construction of homes or other buildings, increases the vulnerability towards natural disasters of those living there, which are populations of lower incomes. A clear trend towards the increase of internal economic and social heterogeneity is depicted in the actual configuration of the city.

It is evident that a clear element of inequality and discrimination exists in the residential inter-urban space of Cochabamba; the place where the population establishes itself is an indicator of the social differentiation processes. There are important differences in terms of poverty and of unsatisfied basic needs which permit one to demonstrate the existence of segregation processes in the use and property of space.

These serious problems must raise the awareness of municipal authorities about the need to make conscious efforts to implement policies to achieve an ordered urban growth. It is also necessary that those in charge make serious proposals to provide for the basic needs of the population, rather than just plans that never get implemented. Also, the continuous expansion of the city, using the fertile agricultural lands in the valley to build houses puts the agricultural tradition and the livelihoods of many people at risk.

Productive activities, social institutions and ideological perspectives shape the configuration of the territory. Different styles of work organisation, technological means, judicial and political norms, cultural values and other elements which structure a society influence territorial parameters which determine specific ways of using the space. This way, one can say that the social demographic manifestations of the differences in geographical distribution of the population are not mere territorial issues. They obey structural rules, which respond to a combination of multiple factors including historical determinants.

1.2. Urban infrastructure and residential areas

One of the connotations of the city is the way the process of the reproduction of the labour force unfolds. This is a specific characteristic of the mechanisms of social appropriation of space. One expression of the said processes, in its daily and simple variant, corresponds to the situation of the households vis-à-vis collective consumption. This dimension refers to the degree of satisfaction of the minimal requirements associated with the subsistence of populations and how meeting them involves the whole of the social group inhabiting a given space (Castells, Manuel, 1977; Lojkine, Jean, 1981; Quijano, Singer: 1976).

One sees here something specific to the city, for, in order to meet the consumption demands of the whole, there needs to be organised intervention by the community. This supposes that the State plays an active role. For, in contrast to the countryside, in the urban setting, it is necessary to share the costs and benefits derived from the supply of certain elements that cannot be left to just to the arbitrariness of the forces of nature or the market. Given that they are areas that have been built up - at least in theory - for life together with others, cities require a joint process of decision making so as to ensure the provision of a whole series of elements. Two such elements are clean water and sanitation and should - in theory - be available to all urban dwellers. In fact, the availability (or not) of these services is part of the mechanisms that establish the differences in the appropriation of the social product. So, in the current situation, despite that everybody contributes in one way or another to pay for the costs, just a few reap the benefits, or those who benefit from them are far fewer than is fair.

Given scarce resources, the intervention of the State tends to be limited and to favour certain groups to the detriment of others. But, even if the City had water and sewerage network that covered its entirety, for each household there would still exists the issue of being connected (being able to pay for the connection) to that network and so to partake of the common benefits.

1.2.1. Social inequality in the access to the drinking water in Cochabamba: SEMAPA before and after the Concession

The Municipality of Cochabamba is responsible for providing basic services to the population. It provides potable water and sanitary services through SEMAPA. SEMAPA was created through the DS (Supreme Decree) 08048 on June 12th, 1967. It was reorganized by the DS 10597 of November 24th, 1972 and given administrative and financial autonomy. On August 25th of 1997, according to the DS 24828, SEMAPA was recognized as a decentralized company of the Honorable Municipal Governorship of Cercado. The responsibility for the provision of services included all the metropolitan area. After a brief and convulsive period (from 1999 to 2000) when SEMAPA was run as a private company, it is now back again as a public utility. The so-called 'water war' in 2000 that put an end to the concession agreement with a private provider, marks SEMAPA's return to be a public service entity.

Table 1: Neighborhood of residence according to Number of Connections, Water consumption per family and per member (day), size of household, monthly income, price of water, percentage of income spent on water, and infant mortality, 1996

Description	Neighborhood			Total
	Good	Regular	Bad	
Number of Connections				
Cases	18695	19884	7688	46267
Domestic	16249	18663	7552	42464
No Domestic	2446	1221	136	3803
Per cent of Consumption				
Domestic	45%	38%	17%	100%
No Domestic	59%	36%	5%	100%
Total	48%	38%	14%	100%
Domestic consumption daily liters				
For family	731	430	125	429
For person	165	99	22	95
Size of Household	4.4	4.4	5.7	4.8
Income Bs. Month	2500	814	576	1130
Price of Water	26.09	26.01	39.23	30.4
% of income to pay water	1%	3%	7%	3%
Life Expectancy Years	67	57	47	58
Infant Mortality (per 1000)	45	105	146	97

Source: Own elaboration using the database of the company SEMAPA in 1996 and the database of the *Survey of the Plan of Drinking Water for the City of Cochabamba*: SEMAPA-CONSORTIUM SEURECA/BRGM/SOGREAH / CGL, July 1993. The calculations of mortality were elaborated with the information coming from *National Census of Population and Housing of 1992*, INE.

The provision of piped clean water into the dwelling is an important indicator of the living conditions of a population. Not having piped water implies extra efforts whether it is to obtain it from a distant source - a community tap or well - or, to buy it from a water truck. Not having a regular supply of piped water in toilets and kitchens works against the health of household members and it is a causal agent linked to the high levels of infant mortality. Since water is a key requirement for human life. Lack of access to clean water must be considered a problem, which is social in nature. Table 1, presents

some general indicators on the status of network coverage, average consumption by household and the priced paid for water in 1996.

On the one hand, in the rich neighborhoods (northeast), drinking water consumption per person per day was 165 liters (or 731 liters per day per average family group) at an approximate cost of Bs 30 per month. On the other hand, the typical consumption of a person who lives in the periphery south was the 22 liters per day - if connected to the network - (or 125 litters per day per average family group), at a cost Bs. 39 (see Table 1). On average, rich households paid one per cent of the income for water. Poorer households paid about 7 per cent.

Before the short period in 1999 when SEMAPA was operated as a concession, it was estimated that the water deficit would take twenty years to be fixed. See table 2. As we will see in the following sections, back again as public service entity, currently SEMAPA, faces bankruptcy and is open to political manipulation. This makes it even more difficult to meet the demands of a growing population. In addition, SEMAPA is hindered by the lack of suitable plans of urban development. The population of the city tripled in the last twenty-three years. The need arises to implement strategic relief programs in those areas where the level of unsatisfied demand is alarming. But, this will not be possible other than with a collective and inter-institutional effort seeking to deal with the root problems of poverty and generalized deterioration of the living conditions of the population. Another related issue is the rational and planned use of the territory. So far, about one third of an urban plan has been developed. However, much of it without approved road or sanitation plans.

Table 2. Cochabamba: Volume of Drinking Water distributed according to consumption categories, estimate of the Deficit and the number of Years to arrive to the necessary Consumption, 1996

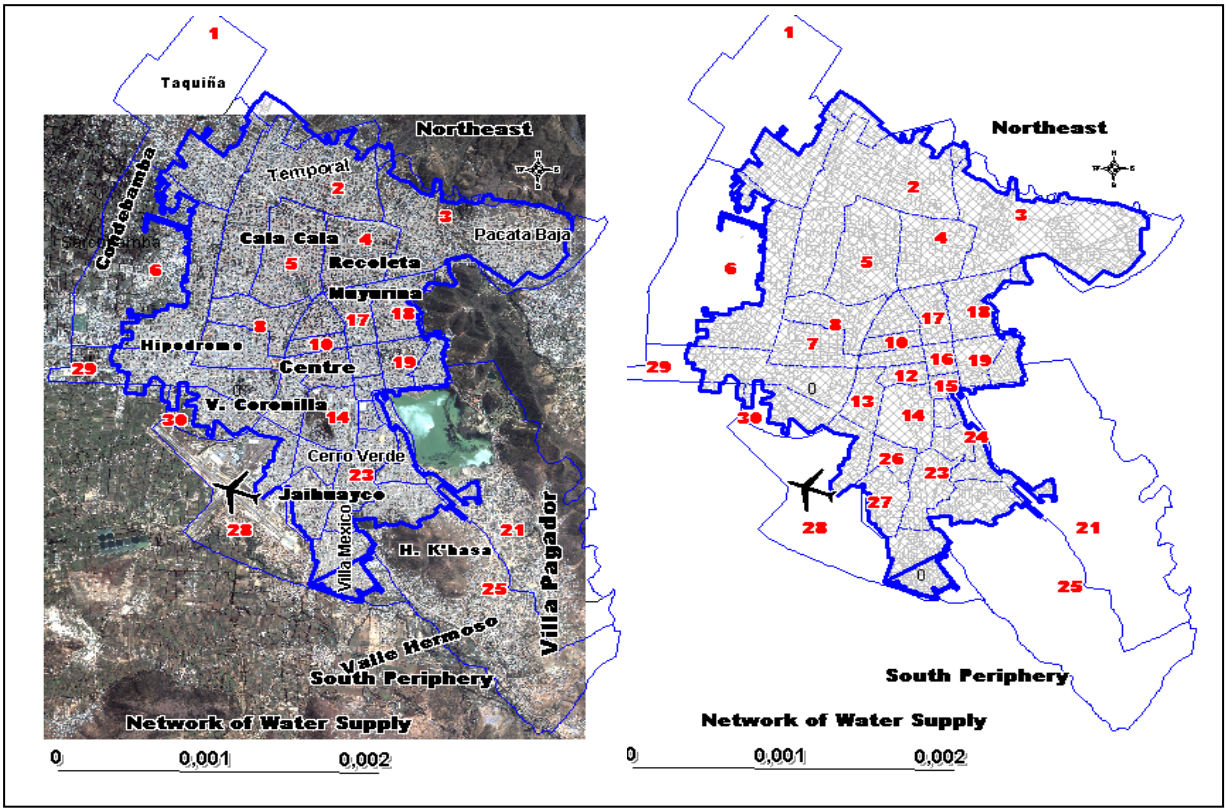
Description	Volume Liters / Day / Second		Total production in meters cubic year			Projection
	1996	Expected	Requirement	1996	1997	2017
Domestic Consumption	359	602	12364010	7746082	7965859	13939360
No Domestic Consumption	90	124	3353703	1945051	1921852	1511812
Total Consumption	449	726	15717714	9691133	9887711	15451172
Total Lost M3	203			10838084		
Total Production M3 in 1996	651			20529217		

Note: The estimate of the deficit was carried out using the relative questions on the population's unsatisfied consumption, and the projection was carried out based upon the production of water of the administrations 1996 and 1997.
Source: Own elaboration using the database of the company SEMAPA in 1996 and the database of the *Survey of the Plan of Drinking Water for the City of Cochabamba*: SEMAPA-CONSORTIUM SEURECA/BRGM/SOGREAH / CGL, July of 1993

Now, we turn to look at the issue of clean water in the city of Cochabamba, from both the supply and demand angles. We have used the primary data provided by SEMAPA for the period 1992 to 2004 and tried matching it with the SEMAPA's data regarding supply with the demand data collected in the surveys.

SEMAPA's supply network covers only around 50 per cent of the land – all of the downtown, the residential areas to the northeast and a sizeable part of the *La Cancha* area[2]. Other areas to the south and north are not yet served. The network serves, therefore, mainly those with greater economic power. This can be interpreted as the difficulty the State has had in meeting the demands arising from accelerated urban growth. But, it could also be interpreted as a State segregationist attitude,

[2] *What characterises most La Cancha area are commercial activities. It combines both whole and retail trade, being a meeting point for, mainly, food producers, wholesalers, retailers and consumers. Most of its streets are asphalted, but one notices some neglect in garbage collection.*



Map 1 Piped water supplies by neighbourhood of residence, 2000

Source: Own elaboration using the database of the company SEMAPA in 1996 and © Space Imaging) LLC , IKONOS Satellite Image of the City of Cochabamba, IKONOS II, 4 April 2000, International Institute for Aerospace Survey and Earth Sciences (ITC) Enschede, The Netherlands.

In 2001, only around 50 per cent of all households in Cochabamba had a good quality service. If we break this down by municipal districts, one sees marked differences. Thus, while more than 75 per cent of the households in the northeast and old city have piped clean water (Districts 10, 11 and 12) and just over 50 per cent of households in the northwest (Districts 2, 3, 4 and 5) and La Cancha and surrounding areas are served, more than 75 per cent of all households in the south lack piped water (Districts 7, 8, 9 and 14). See table 3.The alternative to piped water is water delivered by water trucks.

The old part of the city and neighborhoods in the northeast, which together house only 30 per cent of the total population use 48 per cent of the total water supplied by the public network. Accordingly, the remaining 52 per cent of total water supply has to meet the needs of 70 per cent of the population.

Table 3: Piped water supply by quality of neighborhood of residence, 2001

Districts	Good	Regular	Bad	Male	Good	Regular	Bad	Female	TOTAL
Cases	42788	21638	17389	81815	21420	11337	8819	41576	123391
1	64.0	23.1	13.0	68.8	63.0	25.2	11.8	31.2	100.0
2	52.4	34.8	12.7	67.9	51.4	35.7	12.9	32.1	100.0
3	63.3	29.3	7.4	70.8	62.3	29.6	8.1	29.2	100.0
4	66.1	29.6	4.3	69.4	63.6	31.8	4.6	30.6	100.0
5	54.6	35.3	10.0	66.8	54.4	37.3	8.3	33.2	100.0

Districts	Good	Regular	Bad	Male	Good	Regular	Bad	Female	TOTAL
6	41.5	42.3	16.1	64.4	40.7	43.2	16.1	35.6	100.0
7	18.3	19.3	62.5	69.6	19.3	20.0	60.8	30.4	100.0
8	7.1	7.9	85.0	67.3	8.9	8.2	82.9	32.7	100.0
9	18.5	32.5	49.0	66.0	17.3	36.5	46.2	34.0	100.0
10	82.0	15.0	3.0	62.6	83.9	14.0	2.1	37.4	100.0
11	78.4	17.1	4.6	63.2	77.5	18.6	3.8	36.8	100.0
12	86.0	11.0	3.0	67.1	85.8	11.0	3.2	32.9	100.0
13	23.5	32.6	43.9	66.1	24.6	33.8	41.6	33.9	100.0
14	9.1	14.5	76.4	58.2	8.6	15.3	76.2	41.8	100.0
TOTAL	52.3	26.4	21.3	66.3	51.5	27.3	21.2	33.7	100.0

Source: elaborated on own account from the reprocessed database of the National Census of the Population and Housing 2001, INE, La Paz, Bolivia.

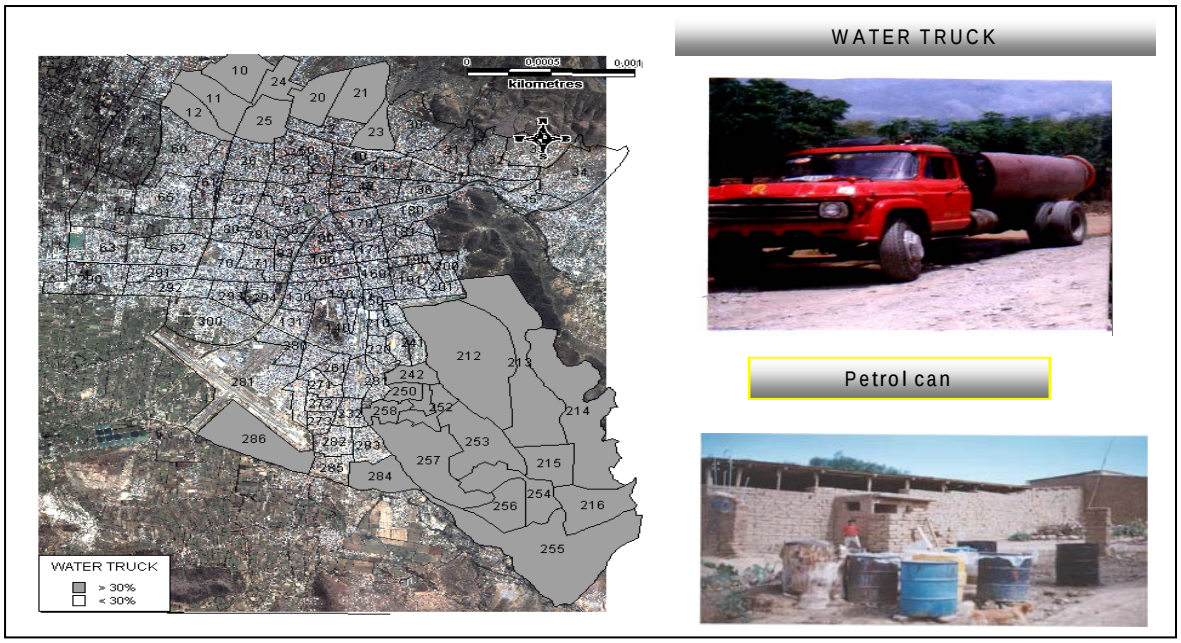
It is still the groups with the larger economic power that enjoy the use of a cheap service. For instance, the SEMAPA public network is a fixed charge 12000 liters as a minimum consumption for domestic service. In the high-income residential areas, the average of consumption is around 30000 liters per month. Charges for 30000 liters represent less than 2 per cent of the total family income. This is one of the most dramatic proofs of social inequality and injustice in the City of Cochabamba. In 2003, poor people spend between 7 to 10 per cent of their family income on this service. What is worse, good quality of the water provided cannot be guaranteed.

As an alternative to the municipal water network, people get their water from water trucks, wells and even community-built and run primitive networks. See table 4. Sometimes, the water truck becomes the only feasible alternative - especially when the house is built high up on a hill - as in some districts in the south and on the foothills, as in the north of the city.

Table 4: Origin of the Drinking Water of Districts of residence and gender of the family head, 2001

	ORIGIN OF THE DRINKING WATER				HEAD	ORIGIN OF THE DRINKING WATER				HEAD	
DISTRICTS	NETWORK	FAUCET	TRUCK	WELL	MALE	NETWORK	FAUCET	TRUCK	WELL	FEMALE	TOTAL
Cases	56909	3109	16089	5708	81815	28911	1826	8187	2652	41576	123391
1	73.2	3.8	12.9	10.2	68.8	74.8	4.1	10.7	10.5	31.2	100.0
2	79.2	2.9	12.0	6.0	67.9	79.3	3.6	12.1	5.0	32.1	100.0
3	77.0	3.1	4.2	15.7	70.8	77.3	4.0	4.7	14.0	29.2	100.0
4	87.7	2.8	2.6	6.9	69.4	86.9	3.9	2.5	6.7	30.6	100.0
5	86.2	3.0	9.3	1.5	66.8	87.4	3.7	7.7	1.2	33.2	100.0
6	77.0	6.9	15.2	1.0	64.4	76.9	7.2	14.7	1.2	35.6	100.0
7	21.9	4.6	62.7	10.7	69.6	23.8	5.1	60.6	10.6	30.4	100.0
8	7.3	2.0	88.5	2.2	67.3	8.0	2.1	88.2	1.7	32.7	100.0
9	34.4	6.9	41.4	17.2	66.0	38.2	7.9	36.9	16.9	34.0	100.0
10	89.4	2.4	1.1	7.1	62.6	89.8	2.3	0.5	7.4	37.4	100.0
11	89.4	3.6	3.6	3.5	63.2	89.3	3.8	3.5	3.3	36.8	100.0
12	88.3	1.9	1.9	7.8	67.1	87.2	1.8	2.4	8.6	32.9	100.0
13	43.5	5.6	36.9	14.1	66.1	45.5	6.7	38.4	9.5	33.9	100.0
14	15.8	5.1	77.2	1.9	58.2	15.3	6.3	77.0	1.5	41.8	100.0
TOTAL	69.6	3.8	19.7	7.0	66.3	69.5	4.4	19.7	6.4	33.7	100.0

Source: elaborated on own account from the reprocessed database of the National Census of the Population and Housing 2001, INE, La Paz, Bolivia.



Map 2. Distribution of people who get their water from truck by neighbourhood of residence

Source: elaborated on own account from the reprocessed database of the *National Census of the Population and Housing 1992*, INE, La Paz, Bolivia.

In general, water quality is a cause for concern. One element here is the storage of water. This is often done in metal or plastic drums - originally meant to contain oil or chemicals. Such containers tend to be kept at the entrance of the house - for easier and faster access to the water truck hose. So, in addition to being exposed to dust and heat, the metal drums suffer from internal rust, and since water is scarce and expensive, it tends to be re-cycled. This can also contribute to health problems. But, it is not only a problem of meeting the, as yet, unsatisfied demand - for the authorities also have to worry about those districts that are already connected and where the demand is expected to be over 7 million cubic metres by the year 2015. By this year, the city will have increased its population three times.

1.2.2. The concession of the municipal drinking water and sewer service system (SEMAPA)

From the beginning of the 90's, the World Bank had demanded SEMAPA's privatization, under the pretext of generating higher efficiency in SEMAPA's administration and as the only solution to Cochabamba's drinkable water supply problem. During the first months of 1996, the State had decided to begin the actions tending towards the privatization of SEMAPA. In that view, the Ministry of Capitalization of Bolivia subscribed, through the World Bank, a contract with Halcrow & Partners Ltd., to carry out technical studies regarding the transformation of the companies that offered water and sanitation services in the cities of La Paz – El Alto (SAMAPA) and Cochabamba (SEMAPA) in the territory of the Republic of Bolivia.

That same year, SEMAPA's privatization was put as a condition for a loan of 14 million dollars. Finally in 1997, the privatization of SEMAPA was again the condition to write-off another 600 million dollars debt. In the meanwhile, several companies had shown interested in the concession. The strange thing was that at the exact moment of the privatization, all those interested had disappeared and the only company that presented an offer was "Aguas del Tunari". Due to the regulations of the Bolivian legislation requiring at least three different offers, the process was declared null. But, after negotiations between the Government and the consortium "Aguas del Tunari" in April of 1999, the State proceeded to award the concession for forty years.

1.2.2.1 What did the contract with "Aguas del Tunari" say?

The contract signed between the Government of Bolivia and "Aguas del Tunari" established that the latter had exclusive rights to operate in the designated area in order to exploit water reserves and offer services. The contract promised the company a return rate on its investment of 16 per cent, guaranteed by tariffs increases, which were dollar- indexed according to the *official dollar exchange rate published by the Central Bank of Bolivia on the last day of the period that was to be charged.* Tariffs were also indexed to the United States Consumer's Price Index. In addition, *these reference tariffs should be applied to the sale of drinkable water and to water supply for irrigation. All water tariffs should be readjusted yearly*.

The contract said that the company could also use the water springs that had already been given in contract and any other water sources they considered necessary. These water sources could be out of their jurisdiction and no volume or place was established. In other words, it was a blank check to take over water sources that are normally used by irrigation organizations and other drinkable water systems in the rural areas.

In addition to all the advantages that the contract and the law gave "Aguas del Tunari", the company went further. A few weeks after the signing of the contract, right after the municipal elections, it decides to apply a rise in the water tariffs that went between 30 and 300per cent with the objective of raising capital for the necessary investments to extend the drinking water system, as well as starting works at the Misicuni Project.

Misicuni became an exclusively lucrative project only possible if the users cover the total cost of the investment, even before the company invested, that is to say that, with that excessive rise of rates, they would pay the costs of water connections and the expenses related with Misicuni. The company had found the formula to obtain funds for the projects, getting them from the "captive users, instead of getting them from their shareholders"(Palast, in Kruse, 2000).

The most serious and indignant element is that "Aguas del Tunari" enters the scene with very little capital, it didn't reach 10.000 dollars (Maldonado: 2002) and, thanks to the indulgence of the Government the company built a huge amount of capital. Notice that after a historical abandon form the part of the TGN (General National Treasure), precisely at the moment of the capitalization, the State granted SEMAPA the sum of 34 million dollars[3]. So the company became rich thanks to the people's sacrifice since the contract stipulated that future investments – such as improvement of water pipes and the extension of the connections – should be self–financed. The trans-national company hoped to make money investing money that came from

[3] See, SEMAPA Financial Statements (1997-2003)

Cochabambinos themselves. “If that’s what they want to do – said the people – we might just as well carry out the extension of the drinking water system and Project Misicuni ourselves” (CEDIB, 2000).

A document published by Jorge Karol has helped us think about the dangers and uncertainties that might emerge if those concession contracts don’t have clear rules, rules that are now called regulations. More than twenty years have gone by since the first capitalization process occurred, unfortunately many of the mistakes regarding clear rules in the process of privatizing companies have been repeated, as in the case of “Aguas del Tunari” concession in Cochabamba.

1.2.2.2. The Water War

With the social uproar, the beautiful city of Cochabamba had lived, between February and April 2000, one of the clearest manifestations of poverty growth and of the unequal and excluding character of its development, more exactly, the access, use and profit of drinkable water. Several international media named this movement as “The War for Water”. In the academic world, this movement is considered among “New Social Movements”. It is interesting to note, that the movement was started by several social, economic, cultural and political sectors and that it reflected how tired people felt with the increasing corruption and misleading information that exists in the context of structural reforms, and with the lack of vision for the future of the city. Even though “Water War” was a local phenomenon, its repercussions were global.

The “Water War” in Cochabamba was led by a new organization called “The Water and Life Coordinator” (La Coordinadora del Agua y de la Vida). Population's concerns were aggravated by two aspects. The first was the approval of Law Nº 2029. This law pertaining to private concessions excluded or was unclear about water source property, ignoring the effects that changes could cause on traditional use and management of water sources. The law was also unclear about the obligatory (and necessary) articulation of alternative water provides (cooperatives, committees, and associations) and the new private companies brought in as concessionaires. What was in discussion then, was the inclusion of water in a private (for profit) logic and to make it subject to market discipline. The second aspect touched upon several points that were detected in the contract with “Aguas del Tunari” Consortium (AT). For instance, the increase in rates at the beginning of its administration, without having improved the service. Another aspect was the exclusive rights of operation given to the concession, which was at odds with multiple alternatives of auto-administration of water distribution services already in place. These other forms of organization were created as a response to user's dissatisfaction and lack of services during SEMAPA's administration.

1.2.2.3. Participation in the water war

The empirical data come from the survey about Quality of Life (drinking water and housing) applied in 2003. The questionnaire had included a representative sample of the households around 500 cases, where it becomes special attention to the gender perspective, the survey allowed to obtain around 300 quantitative and qualitative variables that helped to clarify picture about the situation of the poor women in the marginal area in Cochabamba. The objective of survey was to understand, from a gender perspective, housing socio-economic conditions and life quality, an emphasis is inspect to the study of the access to drinking water and basic sanitation services to be able to identify, quantify, evaluate and predict the disturbances that occur in life quality in the absence of those services. One of the criteria to choose a representative sample in the South-eastern Commune was that in this area is the heavy concentration of

households suffering from chronic poverty; it is a sector of the city where the effects of labour insertion and urban policies have generated a landscape of unmet basic needs. But in addition to these unplanned areas have happened without any authorised building plans and without basic sanitation or infrastructures. In the last section of the survey was to find out about the motivation of people to take part, and how participation was organized (Ledo, 2004a).

Table 5: Knowledge about SEMAPA'S Privatization, according to the sex of the Head of Family, 2003

Did you know that SEMAPA was privatized in 1999?	Head of Family		Total
	Man	Woman	Col per cent
1 Yes	49,80%	44,00%	48,70%
2 No	50,20%	56,00%	51,30%
Total	100,00%	100,00%	100,00%

Source: Processed by us based on data coming from the Survey About Life Quality (Drinking Water and Housing) , CESU-PRINWASS – IFFI, 2003, Cochabamba - Bolivia.

About 50 percent of the population was not informed at the time that SEMAPA was privatized. The knowledge is slightly higher in the case of men head of household than in the case of women head of households[4]. This means, which the poor household, fought to have drinking water, inside their houses. See table 5

Table 6. Southeastern Commune: Knowledge about what "Aguas del Tunari" was, according to the sex of the Head of Family, 2003.

What "Aguas del Tunari" meant for you?	Head of Family		Total
	Man	Woman	Col per cent
Private company	46,40%	48,70%	46,80%
International company	20,30%	26,90%	21,50%
Doesn't know	33,20%	24,40%	31,70%
Total	100,00%	100,00%	100,00%

Source: Processed by us based on data coming from the Survey About Life Quality (Drinking Water and Housing) , CESU-PRINWASS – IFFI, 2003, Cochabamba - Bolivia.

Among those who know about the water reforms, around 33 per cent of male and 24% female household's heads informed that they didn't know what type of company "Aguas del Tunari" was. Around two thirds did have an idea that it was a private or transnational company. The household who live in the poorest neighborhoods, those have lacking access to the public network, because the public service is not available, maybe this situation explain their low level of knowledge about the changes in the water sanitation system. See table 6

More women than men found out about what was happening through the press, television or radio, while men did it in the organizations they participate in. Gender is an important axis of analysis for understanding water issues in Cochabamba, because women are responsible for water collection and uses. The participation of women in the water wars in this way was a key element in the failure of the privatization project in Cochabamba in April 2000 (Laurie Nina and Crespo Carlos, 2002). See table 7 and table 8

[4] In 2003, the head of the family was a male in 65% households. Thus a female is the head in just 35% of households.

Table 7. Southeastern Commune: How did you find out about “Aguas del Tunari”? according to the sex of the Head of Family, 2003

How did you find out?	Head of Family		Total
	Man	Woman	Col %
Press, T.V. and radio	59,39%	61,02%	59,66%
Civic/social organizations	40,61%	38,98%	40,34%
Total	100,00%	100,00%	100,00%

Source: Processed by us based on data coming from the Survey About Life Quality (Drinking Water and Housing) , CESU-PRINWASS – IFFI, 2003, Cochabamba - Bolivia.

Only 15 per cent of households in the sample declared not having participated in the water war. When the head of the household is a man, his participation is predominant (70 per cent). In these households, the participation of the wives and daughters was smaller, only 11 percent. On the contrary, in the cases of a woman head of household, feminine participation goes up to 25 per cent, which shows that women are also more active in this type of events when they are in a head of household situation. When a woman is head of household, participation of family members is more wide spread: children, nephews and nieces and brothers or sisters (Table 8).

Table 8: Southeastern Commune: Who participated in the War for Water from the family, according to the sex of the Head of Family, 2003

Who participated?	Head of Family		Total
	Man	Woman	Col %
Husband and son	69,18%	47,27%	65,57%
Wife and daughter	11,11%	25,45%	13,47%
Brothers and nephews	4,30%	12,73%	5,69%
Nobody	15,41%	14,55%	15,27%
Total	100,00%	100,00%	100,00%

Source: Processed by us based on data coming from the Survey About Life Quality (Drinking Water and Housing) , CESU-PRINWASS – IFFI, 2003, Cochabamba - Bolivia.

It is interesting to observe that the roles assumed by different members of the household during the water war correspond to "traditional" gendered division of labor, especially when it comes to male participation. Men (husbands and sons) were mostly involved in carrying force actions such as blockades, barricades and marches. See table 9.

Table 9. Southeastern Commune: How they participated in the War for Water, according to the sex of the Head of Family, 2003

How did they participate?	Head of family		Total
	Man	Woman	Col %
Collecting and preparing food	5,28%	36,84%	5,72%
Blockades	43,23%	34,74%	44,69%
Marches to the Main Square	51,49%	28,42%	49,59%
Total	100,00%	100,00%	100,00%

Source: Processed by us based on data coming from the Survey About Life Quality (Drinking Water and Housing), CESU-PRINWASS – IFFI, 2003, Cochabamba - Bolivia.

When women were asked why they participated in the War for Water they say they wanted water, that’s what they fought for. It’s also important to value the fact that women consider water a right, so they say that to fight for the defense of water is a duty. Among men, the most important reason to participate was to stop increases in

the price of water. See table 10. What is anecdotic is that people interviewed don't have drinking water coming from SEMAPA, so they fought against prices that were being implemented in zones that do have water. They defended the price of water without any benefit for themselves.

Table 10. Southeastern Commune: What was the reason your family participated in the War for Water, according to the sex of the Head of Family, 2003

Why did you participate?	Head of family		Total
	Man	Woman	Col %
So the price of water wouldn't rise	45,30%	40,40%	44,40%
To have water and sewer system	15,30%	17,00%	15,60%
Water defence is a duty	29,10%	36,20%	30,40%
Didn't participate	10,30%	6,40%	9,60%
Total	100,00%	100,00%	100,00%

Source: Processed by us based on data coming from the Survey About Life Quality (Drinking Water and Housing) , CESU-PRINWASS – IFFI, 2003, Cochabamba - Bolivia.

The majority of women and men head of households think that the best solution would be to have access to SEMAPA water. See table 11, Men give also some importance to self-solutions (drilling wells). Unfortunately, it seems that the cost of such solutions is too high. For instance, out of the 23 wells drilled in the zone, 21 have salty water, which requires additional costly treatment. In some cases, water committees were formed and every household paid up to 3.000 dollars in order to enjoy water from a well. The problem was that only 2 wells out of the 23 drilled had provided water of good quality. In absence of wells or the network water trucks fill the gap but prices are significantly higher than those charged by the public company.As a consequence, inhabitants of the area must adopt several strategies to lower costs, among them we can mention rationalization and recycling.

Table 11.Southeastern Commune: What would be the best solution to satisfy the needs of drinkable water in your family, according to the sex of the Head of Family, 2003

The best solution	Head of Family		Total
	Man	Woman	Col %
SEMAPA – net	80,40%	82,40%	80,80%
Cooperative or Water Committee	4,40%	3,90%	4,30%
None	1,80%	3,90%	2,20%
Self – solution	13,30%	9,80%	12,70%
Total	100,00%	100,00%	100,00%

Source: Processed by us based on data coming from the Survey about Life Quality (Drinking Water and Housing), CESU-PRINWASS – IFFI, 2003, Cochabamba - Bolivia.

The fact that reveals the dramatic situation is that more than 4 homes out of 5 dreams of having a SEMAPA water connection. But at present the water network finishes before it reaches the poor neighborhoods. The explanation given by SEMAPA is that they only have a concession for the area that already has service. This fact only deepens the division and segregation that exists in Cochabamba.

Four years have elapsed since the water war; people living in poor areas haven't seen any improvements in the access to clean water. There is a lot of distrust and

they are angry. During a workshop organized by… in November 2003 with people from 7, 8 and 14 districts women manifested more the fact that they feel cheated by the offers concerning water supply and that never come true and that they still have to go look for water everyday in order to subsist. They are aware that local authorities could help them with their water and sanitary problems. They know where they should go, but they doubt they will be heard since they say that authorities only look for them during elections periods and the actions that are carried out are according to the wishes of the governments in function.

1.3. SEMAPA: Economic and Financial Aspects

1.3.2. Tariffs setting

Cochabamba is located in a valley that is affected by serious hydrological problems. Urban expansion is creating serious water supply problems.

In 1997, SEMAPA registered 50 per cent of water losses. During that year, they produced a total of 20 million cubic meters of water and recovered the cost of 10 million, which reflected both physical and financial losses. The explanations for these were several. On the physical side, this was attributed to normal losses through water leaks in the distribution network; lack of lining of the natural canals, and the lack of waterproofing. On the financial side, there were around 5 to 10 per cent of illegal connections in addition to those users that do not pay for the service (municipality and public sector enterprises). All of them contributed to the great financial deficit. Towards the year 2001, 55 per cent of the households lack access to clean water and sanitation. Those homes get water through diverse sources such as water trucks and approximately 200 local or community drinkable water systems.

Table 12: SEMAPA, **Description of the Type of User by Category**

Category	Description of the Type of User by Category
Residential 1	Users whose property is a wasteland, abandoned houses, houses in dispute, houses to be demolished (installation up to the border of the property).
Residential 2	Users with one or two rooms, only one point of water.
Residential 3	Users with inexpensive houses, functional, one or two floors, also houses in construction.
Residential 4	Users with houses of one, two, or more floors, they have all the outbuildings.
Commercial	Micro-markets, offices for professionals, banks, theatres, movies and commercial premises.
Special Commercial	Hotels, private clinics, service stations, restaurants, ice-cream shops, private schools, supermarkets, tannery with industrial discharge (**according to Factor K *)**, social clubs.
Industrial	Handicrafts workshops, mechanic workshops, factories, tanneries, bakeries.
Public	State buildings, parks, gardens, squares, community centres, benefit centres and churches.
Preference	Hospitals, elderly homes, state homes, cemeteries, churches and convents, benefit centres.

Source: SEMAPA's Commercial Management. * Factor K = Pollution or Contamination Coefficient by discharge into the Sewer System that Industries have. The rate is estimated through: Volume times Factor K times Fixed Coefficient.

There are two types of users enjoying SEMAPA's services: metered and non metered. For tariff purposes users are classified in two big groups. residential and special. In the residential group there are four categories R1 to R4 according to the size of the plot, number of water points, state and quality of construction, etc. The

special group includes commercial activities, industry, government, etc. It is interesting to note that that the existing groups and sub-groups did not changed during the concession period. Currently, tariffs are still calculated using the same categories. See Table 12.

Users that don't have meters pay a basic tariff differentiated by category according to the average consumption (the billing is established on the basis of the average metered consumption of the remaining users on the same category). Users with meters pay fix fee per month for the first 12 m3, which is considered minimum consumption. The fix fee charged differs by category. In addition to that, users pay a variable charge for the additional consumption. Such rates correspond exclusively to drinking water. The billing for sewerage is 40 per cent of the total billed for water in the residential categories and 65 per cent of the water bill for special consumers.

Currently, the minimum (fixed) rate charged is (15 Bs) for a consumption of less than 12 cubic m. per month. The amount is applied whether a meter is installed or not. This means that in some places, no more than 15 Bs a month are paid (around 1.96 American dollars) for water, whereas in the poor southern neighborhoods of Cochabamba, people that don't have a drinkable water connection from the public network or a private or cooperative system, pay 3.53 USD a month for no more than 5 cubic m. of water. See table 13. That is to say that these people pay more than double for less than half the water people connected to the network get.

Table 13: Southeastern Commune: inequity in the provision of drinking water in Cochabamba, 2003

districts	Southeastern Alternative Sources				Relation among volume and price with SEMAPA Minimum Rate=MR and tariffs			
	Private Net		Water trucks		Private Net		Water trucks	
	In m3	USD/Month	In m3	USD/Month	M3 /12m3 %	USD/MR Times	M3/12m3 %	USD/MR Times
7	6	3.92	2	5.23	50	2	17	3
8	5	2.75	3	7.19	42	1	25	4
14	1	3.92	3	5.88	8	2	25	3
District	5	3.53	3	6.41	42	2	25	3
Minimum SEMAPA	12	1.96						

Source: Processed by us based on data coming from the Survey about Life Quality (Drinking Water and Housing), CESU-PRINWASS – IFFI, 2003, Cochabamba - Bolivia.

The most dramatic situation is found among those that have no access to any type of water connection, so they must buy water from the water trucks and they pay 6.41 USD a month for only 3 cubic m., less than a fourth of the minimum consumption so they pay 3 times more and get 10 cubic m. less.

In minimum consumption there is an inverse relation between categories, but the system "rewards" rather than penalizes excessive consumption, because the greater the consumption the less the charge and the charging system protects the high levels of consumption of high income groups, who consume most of the available water. See table 14

Table 14. Basic tariff structure by residential category, 2003
(In American dollars)

CATEGORY	0-12 (minimum)	13-25	26-50	51-75	76-100	101-150	151-9999
Residential 1	1.1	0.1	0.1	0.1	0.2	0.2	0.2
Residential 2	2.2	0.1	0.1	0.2	0.2	0.3	0.3
Residential 3	4.2	0.1	0.2	0.3	0.3	0.3	0.4
Residential 4	7.0	0.2	0.2	0.3	0.3	0.4	0.4

Source: Processed by us using data provided by SEMAPA'S Commercial Management, 2003.
1 American dollars =7.6492 Bs.

Given the situation of poverty in the poorest groups in the city, we can't say that the differentiated rates are a progressive subsidy since water services cover only half of the residential neighborhoods, those of upper and middle classes, and they end where the poor neighborhoods begin. This situation is worsened by the fact that the municipal cadastre hasn't been updated and many houses that have been upgraded and that should belong to category R4, being now luxury homes, are still in category R1. This prevents the existence of a solidarity rate going from the more affluent groups to those poor ones. What happens, on the contrary, is that there is a subsidy from the part of the poor sections towards the richer sections that, being lucky enough to live in the legal part of the city, enjoy the clean water that comes form SEMAPA.

In spite of the existence of a billing criteria table, tariffs applied include some adjustments that could contributing to lack of transparency in the billing process. We present an example of an estimation form in Table 15 with the objective of explaining how billing is done, based on a consumption of 33m^3 in an R2 category home. This might help the reader understand the difficult SEMAPA rating system. Note that factor 0.133347 corresponds to the accumulated 33 m^3, not to 21, which is supposed to be the additional consumption. Actual tariffs paid include an additional 40 per cent for sewer service, which brings up the cost to 7.5 USD per month for 33m^3. For a little more than a cubic meter per day per family (e.g. 33m^3) the price is near to that that poor sectors pay to water trucks for only 3 m^3 a month (District 8).

Table 15. Estimation of consumption cost for 33 m^3 at Residential 2 Category, 2003

Description	Consumption m^3	USD	Numbers not rounded	Rounded numbers
Basic	12	2.245987	2.2	
Excess	21	0.133347	2.8	
Total without rounding			5.0	
Total Water	33			5.1
Sewer 40%			2.0	2.1
Form cost			0.3	0.3
Total Bill				7.5

Source: Processed by us using data provided by SEMAPA'S Commercial Management, 2003.

As is stated in SEMAPA'S information, rates are fixed for the drinking water service. The cost of sewer services amount to a 40 per cent of the cost of water in residential categories. That cost increases to 65 per cent in special categories. During the administration of "Aguas del Tunari", the amount charged for sewer services was of 50 per cent of the amount charged for water.

Table 16 shows tariffs prevailing in 2003 for users not having meters. In this case, the bill is estimated on the basis of the average consumption of the other users of the same category.

Table 16. Estimation of amount to be paid in the non-metered system according to consumption and by service and category type, 2003 (In American Dollar)

Category	Non -metered system, charges for:				Total
	M3	Water	Sewer	Form	amount
Residential 1	12	1.18	0.52	0.26	1.96
Residential 2	15	2.61	1.05	0.26	3.92
Residential 3	21	5.62	2.22	0.26	8.11
Residential 4	29	10.33	4.18	0.26	14.77
Commercial	39	18.17	11.90	0.26	30.33
Special Commercial	49	30.59	19.87	0.26	50.72
Industrial	35	15.30	10.07	0.26	25.62
Public	55	10.72	6.93	0.26	17.91
Preference	64	19.48	12.68	0.26	32.42

Source: Processed by us using data provided by SEMAPA'S Commercial Management, 2003.

The rate structure applied in non-residential categories doesn't use the same ranks as for residential. Differences are noticed starting from the second rank, which goes from 13 to 50 m3, so the reader must be careful when estimating costs.

Table 17. Basic Table of Rate Structure Scale by Non- Residential Category, 2003

CATEGORY	0-12	13-50	51-100	101-150	151-250	251-400	401-9999
Commercial	8.4	0.4	0.4	0.4	0.4	0.5	0.5
Special Commercial	9.8	0.6	0.6	0.6	0.6	0.7	0.7
Industrial	7.6	0.3	0.4	0.4	0.4	0.5	0.5
Public	3.7	0.1	0.2	0.2	0.2	0.3	0.3
Preference	7.0	0.2	0.3	0.3	0.3	0.3	0.3

Source: Processed by us using data provided by SEMAPA'S Commercial Management, 2003.

Towards 2003, there were a total of 56.000 connections, out of these, 42.000 had a meter and 14.000 didn't have one. According to official data had estimated they exist around 125 thousand households in Cochabamba, it means that alone 45% of the families has connection of drinking water network.

1.3.2. Rate Adjustment Mechanisms

In the case of SEMAPA, regulations allow rate adjustments every five years only in presence of the following events:

- Changes in the tax regime causing changes in total costs;
- Changes in the legislation regarding water quality or waste water; physical, chemical or biological changes in the water sources or because of a force major;
- Variation in total costs in a significant magnitude. This implies an adjustment in tariffs in the event that the present value calculated to the next revision date

exceeds 7 per cent of the total projected costs that the concessionaire estimated for that period.

Once the circumstances that allow an extraordinary revision are approved, a tariff change will be implemented. Tariffs will then be fixed again until the next periodical revision. Only one tariff change is allowed per year. All tariffs are charged in Bolivians.

Ever since the conflict known as the war for water, (April 2000) rates have not been modified due to the rule that stipulates that changes can only occur at the end of a five-year period (2000 – 2005). However SEMAPA could request tariff revisions using the norms governing tariff indexation (Law Nº 2066 dated on 04/11/2000)[5].

1.3.3. Income through Billing, Users and Volume by Type of Service

We can observe that during the period from 1997 to 2003, the total number of households connected increased by 29 percent. The number of residential connections with meters increased 36.8 per cent, while non-metered increased by 18.1 per cent. This gives an increase in the total number of residential meter users of 29.6 per cent. In the non- residential system, the installation of meters is lagging behind. Non-metered connections increase faster. According to the same table residential connections with meters represent 65 per cent of the total number of users.

Table 18. Evolution of the Number of Water Users by Residential and Non-Residential Category, 2003

Category	1997	1998	1999	2000	2001	2002	2003	97-03
Metered	26772	27698	28500	30041	32540	35231	36624	36.80%
Non Metered	16899	18400	20311	21554	20758	19238	19966	18.15%
Residential Total	**43671**	**46098**	**48811**	**51595**	**53298**	**54469**	**56590**	**29.58%**
Metered	4641	4835	5271	5136	5210	5452	5604	20.75%
Non Metered	432	448	518	589	589	579	657	52.08%
Non Residential Total	**5073**	**5283**	**5789**	**5725**	**5799**	**6031**	**6261**	**23.42%**
TOTALS	48744	51381	54600	57320	59097	60500	62851	28.94%

Source: Processed by us using data provided by SEMAPA'S Commercial Management, 2003.

The data from SEMAPA reveals that in 2001 there were some 56,-supply points. Of these, 92 per cent were residential in nature. Customers are charged according to a four-level scale that goes from R1 to R4. The residential customers use up to 80per cent of all the volume supplied by the company, one of about 11.1 million cubic meters. (see Table 19).

[5] This law has not been applied because there is no formula for the indexation. Nevertheless, the consumer price index (CPI) has risen 5.95 per cent from April 2000 to January 2004, whereas the national currency has lost a 22.96 per cent value against the dollar during the same period.

Table 19. Income by Billing, Number of users and Volume Consumed in cubic metres according to Category, 2003

	Income for Billing			Water		Volume in Cubic metres	
Categories	USD	Bolivians	%	Users	%	M3/2003	%
R1	65534	501285	1.47	3077	6.19	441050	3.99
R2	918861	7028555	20.55	19174	38.57	3438878	31.09
R3	1727101	13210938	38.63	17793	35.79	4118823	37.23
R4	1759012	13455031	39.35	9672	19.45	3063667	27.69
Residential Total	4470508	34195809	67.17	49716	88.03	11062418	77.68
Commercial	1221192	9341140	75.47	3928	78.99	1343459	77.99
Special Com.	251187	1921380	15.52	360	7.24	217518	12.63
Industrial	145817	1115383	9.01	685	13.77	161566	9.38
Non Residential Total	1618196	12377903	24.31	4973	8.81	1722543	12.10
Preference	93943	718589	16.57	379	21.22	232518	15.98
Social	141344	1081170	24.93	514	28.78	495104	34.02
State	331748	2537606	58.51	893	50.00	727622	50.00
Special Total	567035	4337365	8.52	1786	3.16	1455244	10.22
TOTAL	6655739	50911077	100.00	56475	100.00	14240205	100.00
1 USD =	7.6492						

Source: SEMAPA, Financial Statement on Dec. 31st, 2003

Users in residential category (R1, R2, R3, R4) represent approximately 88 per cent of the total number of users. The residential category uses 78 per cent of the total drinkable water volume and represents 67 per cent of the total income generated for billing (Table 19). In 2003, nearly two thirds of the users in domestic or residential category were concentrated in categories R2 and R3. But the highest billing income comes from R4 users because of a higher water consumption volume during 2003.

In sum, SEMAPA doesn't have social rate criteria for sectors of lesser income, but there is a basic rate by category for users without a meter. As we mentioned, this is not a strong indicator since the water network only covers 50 per cent of the territory. For those who have water connections, mechanisms that stop water cuts due to lack of payment should be looked for. In SEMAPA'S case, after two consecutive months of non-payment, water service is cut.

1.3.3. Evolution of the billing/operative costs relation

Between 2001 and 2003, average running expenses were 11.72 per cent higher than total income and they were 18.3 per cent higher than billing income. According to data obtained from 1994 – 2003 periods, the profits were negative in all periods. It can be seen in table 20 that during 1993 – 2003 periods, SEMAPA only had annual losses.

It is important to note, however, that the conduct of these losses decreased year after year in a percentage that varies around 16.9per cent yearly with the exception of 2003 when the annual loss registered amounted 500per cent. In other words, the loss was 5 times bigger than the one registered in 2002. Nevertheless, the income-cost relation for these years is practically the same.

Table 20. Statement of Results, Total Operative Income and Operation Expenses, 1994 – 2003 (In American Dollar)

Statement of Results SEMAPA ($US)	Total Operation Income	Total Operation Expenses	Results of Operation
1994	4288767	-5956194	-1667427
1995	4328971	-6582687	-2253716
1996	5368453	-6905852	-1537399
1997	5984300	-6971991	-987691
1998	6319744	-6349751	-30007
1999	5421464	-4850002	571462
2000 (1)	5005401	-3876149	1129252
2001 (2)	7647022	8597628	-950606
2002 (3)	7434531	8362824	-928293
2003 (4)	7368599	8128273	-759674

Source: SEMAPA, Annual Reports 1994 - 1998, (1) SEMAPA ANNUAL ADMINISTRATION ACTIVITIES REPORT YEAR 2000-2001, (2) CGR (Contraloría General de la República) General Interventor's Office, Republic of Bolivia. Financial Statements on Dec. 31st, 2001, (3) INTERNAL AUDIT UNIT, SEMAPA, YEAR 2002 (4) FINNANCIAL STATEMENTS ON DEC. 31st, 2003 SEMAPA

1.3.4. The Constitution of Capital and its Financing

During the concession of "Aguas del Tunari" (1999-2000), the initial investment commitment was of 214 million dollars (among the programmed investments were the water distribution network expansion, the construction of a new water treatment plant, the installation of water pipes from Misicuni to the valley of Cochabamba and the generation of electricity). During the very conflictive time of services rendered by "Aguas del Tunari" private company, none of the investment engagements were kept. Nowadays, SEMAPA, has to solve many problems with the existing network and the connections. The company has applied for loans at different agencies with the objective of carrying out several investment projects but international financial entities have declared it non-solvable. That is the reason why its major financer is local income.

Table 21. SEMAPA'S Income through billing. Total local and foreign debt, 1997 – 2003

Year	Total USD	Total Debt in USD		Total	% Income source			
	Billing	Local	Foreign	USD	Billing	Local	Foreign	Total
1997	6906536	11082000	16393135	34381671	20%	32%	48%	100%
1998	6608228	11082000	16638352	34328580	19%	32%	48%	100%
1999	6926348	11082000	18240416	36248765	19%	31%	50%	100%
2000	7392667	14529869	797083	22719619	33%	64%	4%	100%
2001	7060546	16589380	902299	24552226	29%	68%	4%	100%
2002	6848625	14360998	799858	22009481	31%	65%	4%	100%
2003	6654410	13056640	997867	20708917	32%	63%	5%	100%

Source: SEMAPA, Financial Statements – Financial Administrative Management, – 2003, Cochabamba, Bolivia.

When observing SEMAPA'S data, and considering what was said before, it isn't casual to find that SEMAPA had a financial boost at the time of its privatization. That situation is explained by a capital injection coming from the Nation's General Treasure and the loan from the World Bank. The Nation's General Treasure granted

SEMAPA the sum of 30 million dollars, as it had never done before, and it is also surprising to see that the World Bank granted 14 million to that company. Afterwards, private capital was withdrawn and SEMAPA had to find funds locally.

As an information complement to what was said above, we have processed the data according to the origin of financing. Foreign loans, including those from the World Bank, have significantly decreased.

Table 22. Origin of SEMAPA'S debt at short and long term, 1997 – 2003 (In dollars)

DEBT IN $US	1997	1998	1999	2000	2001	2002	2003	%
Nation's General Treasure (NGT)	4082000	4082000	4082000	30350833	7149587	7416937	7080702	48%
MISICUNI-Central Bank of Bolivia	7000000	7000000	7000000	7000000	6300000	5132682	4600000	31%
Municipality of Cochabamba					3000000	1664949	1329340	9%
MISICUNI-TITIRI					139793	146431	46598	0%
Local Debt (Short term)	3758334	3698131	3937136	4046694	1405180	1606824	1599216	11%
Total (local debt short & long term)	14840334	14780131	15019136	41397527	17994560	15967822	14655856	94%
French Loan	3647096	4719883	5360253	797083	902299	799858	997867	100%
World Bank	352089	11584732	12546426					0%
Inter-American Development Bank	12393951	333737	333737					0%
Foreign Debt	16393135	16638352	18240416	797083	902299	799858	997867	6%
TOTAL (local and foreign debt)	31233469	31418483	33259552	42194611	18896859	16767680	15653723	100%

Source: SEMAPA Financial Statements (1997-2003)

As can be seen from SEMAPA'S information, in 1997, it had been granted a French loan (35'000.000 FFr), a World Bank loan (14'438.721 U$) a Misicuni-Central Bank of Bolivia loan (7'000.000 U$) and a BID-CORDECO loan (490.382 U$)[6]. Besides the amount assumed by the Nation's General Treasure (NGT), local debt would be limited to Misicuni's loan of 7 million dollars (subscribed as an agreement with NGT in 1995) but the loan became effective in 1997 and it began being paid in 2001. On December 23rd, 1999, applying Supreme Decree 25501, a Subsidiary Contract was subscribed, by which National Fund of Regional Development (FNDR) and Central Bank of Bolivia (BCB) become SEMAPA'S creditors on behalf of the Nation (Ledo Carmen, 2004a). With SEMAPA'S engagement to pay the loans in their totality summing up a nominal value of 30'000,000 U$ in 40 yearly installments of 770.000 U$ that include the present value of the debt plus interests, the interest rate was to be of 10% annually.

After the failed privatization of SEMAPA due to the problems with "Aguas del Tunari" company, SEMAPA partially honored the payment corresponding to year 2000. Obeying Board Resolution Nº 0006/01 dated on March 2nd, 2001, it requested the Ministry of Finance a grace period of 5 years to pay its public debt. During the years 2000 and 2001, applying the Subsidiary Agreement, SEMAPA paid 7 installments of 64,166.67 U$ paying a total of 449,166.68 U$ out of which the State recognized 17,013 as payment of capital and 432,153.69U$ as interest payments.

[6] The loan coming from Central bank of Bolivia (BCB) was a counterpart for the World Bank loan and it was to be used in the following investment projects: Diagnostic and definition of needs at SEMAPA (1,93 per cent), Designing and Implementation of an Institutional Strengthening Programmer (PROFISE)(18.08per cent), and Preparation of the Water Resources Master Plan, including final designs and implementation (79.99 Per cent). The French loan was invested in Studies about subterraneous water sources, macro-measurements and the reduction of crude water losses for the drilling of deep wells (El Paso I, Tiquipaya and El Paso II) and to telemetry and deep well inter-connection, besides the modernization and rehabilitation of the Used Waters Treatment Plant (Alba Rancho and La Maica). The Inter-American Development Bank (BID) loan financed the Angostura Project that contemplated water provision and the collection of used waters in the southern part of the city of Cochabamba over a total area of 1620 hectares (this financing had SEMAPA as a counterpart).

On June 3rd, 2002, an addendum to the subsidiary agreement for loans to International Finance Corporation member of the World Bank Group (AIF 2187-BO), Inter-American Development Bank (BID 601/CO-BO and BID 846/SF-BO), French was subscribed, and signed on December 23rd between the Ministry of Finance and SEMAPA with the object of complementing the Agreement and establishing a debt that amounts to 7,512,356 U$, a sum that results from the following operation:

Total Debt s/g Subsidiary Agreement subscribe don Dec. 99	7,529,869.00	$us
Subtracting payments made during years 2000 and 2001 (Capital 17,013; interests 432,153.69)	17,013.00	$us
Total Debt s/g Addendum subscribed on June 3rd, 2002	7,512,856.00	$us

This amount, according to the payment plan mentioned in the Addendum, should be paid starting on year 2005, and the amounts are of 320,833.31 U$ for year 2005 and 30 instalments of 770,000 U$ starting on year 2006 and ending in 2040.

1.3.5. Financial Mechanisms

The Nation's General Treasure contributed with almost 20 per cent of the financing capital SEMAPA had. This sum increased through the years reaching 60 per cent in 2000. This is one of the reasons negative balances didn't affect the patrimony very much. External debt represented 12 per cent of the capital between 1994 and 2000. As would be expected, the company's negative profitability has prevented profits from being reinvested. So what we have is a kind of subsistence, with no improvements in the assets.

1.3.6. Income generated through services billing

Between 1994 and 2003, income through billing represented nearly 89 per cent of SEMAPA'S total income. Out of these, 80 per cent are income generated by users that belong to the metered system in the years 2000 – 2003. At the only moment SEMAPA had a positive balance was at the time of the privatization (1999-2000) when it received capital injection from the National General Treasury (NGT), and loans from the World Bank (Table 23).

Table 23. SEMAPA'S Types of Income, 1994 – 2003

Year	Services Income	Connection Rights	Other Income	Total Operative Income	Total Operation Expenses	Balance	Services Income	Connection Rights and interests	Other Income	Total Operative Income
1994	3797204	202316	289247	4288767	-5956194	-1667427	89%	5%	7%	100%
1995	3729551	184782	414638	4328971	-6582687	-2253716	86%	4%	10%	100%
1996	4794771	220441	353241	5368453	-6905852	-1537399	89%	4%	7%	100%
1997	5548509	141834	293957	5984300	-6971991	-987691	93%	2%	5%	100%
1998	5590655	135927	593163	6319744	-6349751	-30007	88%	2%	9%	100%
1999	4882887	108079	430497	5421464	-4850002	571462	90%	2%	8%	100%
2000	4511279	70956	423166	5005401	-3876149	1129252	90%	1%	8%	100%
2001	7599004	0	48018	7647022	8597628	-950606	99%	0%	1%	100%
2202	6841928	249	592354	7434531	8362824	-928293	92%	0%	8%	100%
2003	6820989	489	547121	7368599	8128273	-759674	93%	0%	7%	100%

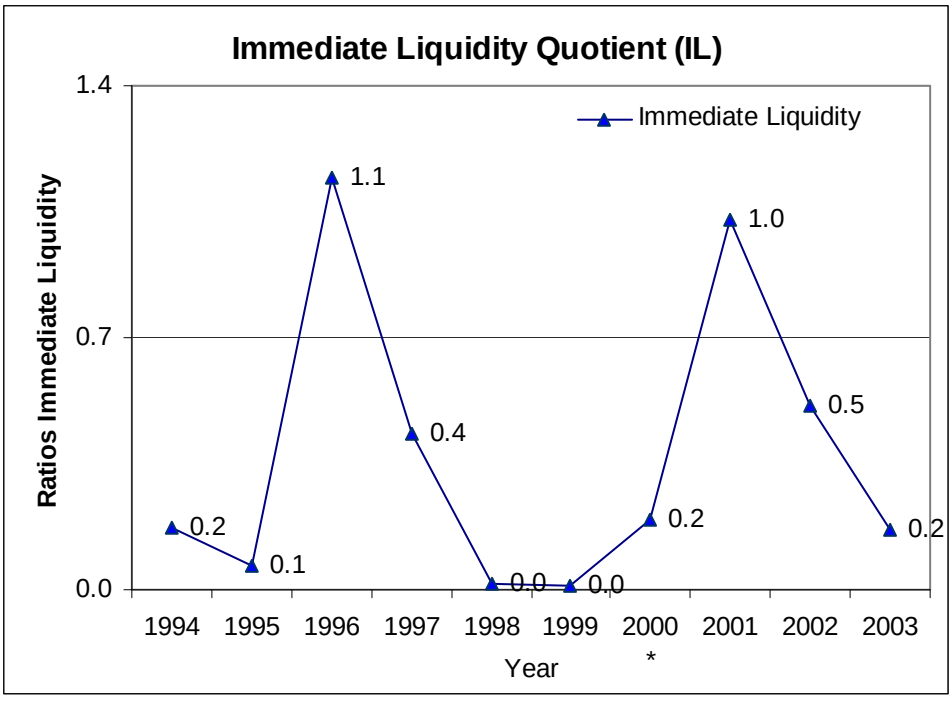
Source: SEMAPA, Financial Statements – Financial Administrative Management, 1997 – 2003, Cochabamba, Bolivia.

Income generated through connection rights during years 1994 - 1997 represents approximately 4 per cent of the income. Since 2001, interests and other property

income are added to this item, but its incidence on the company income is null. We can there infer that SEMAPA just subsists, it isn't taking any actions in order to grow since, as papers show, there are no new connections. This situation explains their negative net balance: operation costs are superior to income.

We will use several indicators for the economic-financial analysis to assess the situation of the company. First, the immediate liquidity quotient (IL), that is the result of dividing available assets by present liabilities. It is alarming to see that in 2003, SEMAPA had an immediate liquidity similar to that found in 1994. The series presented in Figure 1 is irregular, but after 2001 it decreases, which means that SEMAPA has liquidity problems. It only has 0.17 Bs in cash for every boliviano of short-term debt. The figure shows SEMAPA'S attractive situation prior to the privatization. Note than only in 1996 were the available assets superior to present Liabilities (LI = 1.14), that figure later decreased, in 1998, to 0.02 Bs in cash for every boliviano of short-term debt. This same tendency continues through "Aguas del Tunari" administration with a slight recuperation. This means there was no significant variation during the last year. Finally, even though in 2001 there was a significant recuperation, in 2003, SEMAPA'S situation has decreased to the levels seen in 1994.

Figure 1

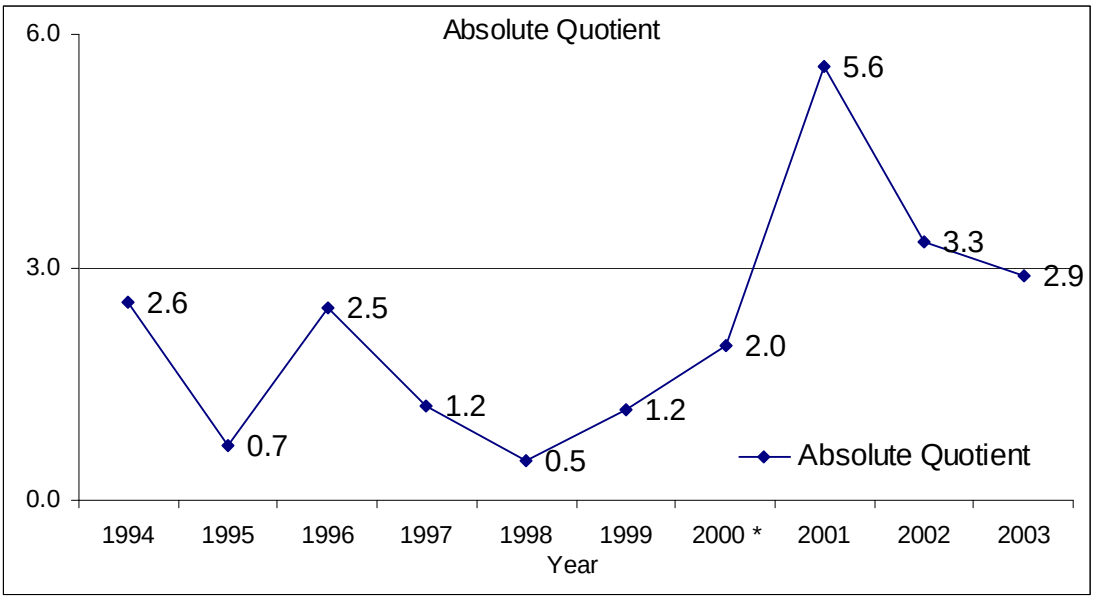


A second indicator is the Solvency Quotient (SQ) that allows the evaluation of Present Assets versus Present Liabilities. In 1994, SEMAPA had 4.93 Bs for every boliviano to face its current obligations including available assets, short-term payables on demand, unrecoverable and consumer goods, among others of lesser importance. During Aguas del Tunari's administration (1999-2000) we can see that there was a lower SQ, of around 1.90 and 2.61 Bs in cash. After 2000, the series increases. The explanation for this fact is the increase of current assets and that current liabilities don't include the "long-term debt", where SEMAPA has its biggest problems.

An indicator that is very close to the one we just saw is the Absolute Quotient; it allows the measuring of the relation between Available Assets and Payables versus Current Liabilities. This is an interesting analysis that shows that SEMAPA has

problems. Note that during 1994. SEMAPA had 2.56 to face every boliviano of short-term debt, under the understanding that payable accounts were to be charged. The worst situation occurred during Aguas del Tunari's administration (1999 - 2000) when, as we can see, there were 1.17 and 1.98 bS to face every boliviano of short-term debt. In the moments immediately after Aguas del Tunari's departure there was a noticeable recuperation, the people that had participated in the war wanted to help "their company" at whatever cost, at least, that was the idea. But unfortunately after 2001, the series decreases although it is better than it was during Aguas del Tunari's administration.

Figure 2



1.3.7. Local and Foreign Debt

It is important to consider the differences among local interest rates and those that exist in international financial circuits (largely in favour of the latter). The company's local debt between years 1997 and 1999 represented, on average, 47 per cent of its total debt and. After the war for water, between years 2000 and 2003, it ascends to 96 per cent of the total debt. This seems to demonstrate that the company has access to loans in better conditions in the internal market. This is not true if we take into account the fact that the Nation's General Treasure (NGT) assumed part of the marginal debt (foreign debt) that SEMAPA had with Inter-American Development Bank (IDB), International Finance Corporation (IFC), French loan, that becomes a national debt (local debt, at first channelled through the Bolivian Central Bank (BCB) and National Fund of Regional Development (FNDR), with an interest rate of 10 per cent at 40 years term and with a reduction of the total debt. Though there are some local institutions such as Misicuni and the Municipality that charge SEMAPA no interests for their loans, they can't grant all the loans it needs.

The "Project Finance" character of the foreign debt (which consists in comparing the interest rate paid for foreign debt with the company's profitability rate) has no sense since SEMAPA is a non-lucrative company. Up to 1998, foreign debt represented 39.19 per cent of the patrimony (28,449,464.17 U$), in 2000 44.78 per cent of the patrimony (39,548,809.67 U$) and form that year on, we can observe a decrease in the foreign debt tendency until it reaches 14.72 per cent of the patrimony in 2003 (14,435,892.68 U$). As we said before, some of the main creditors were Inter-

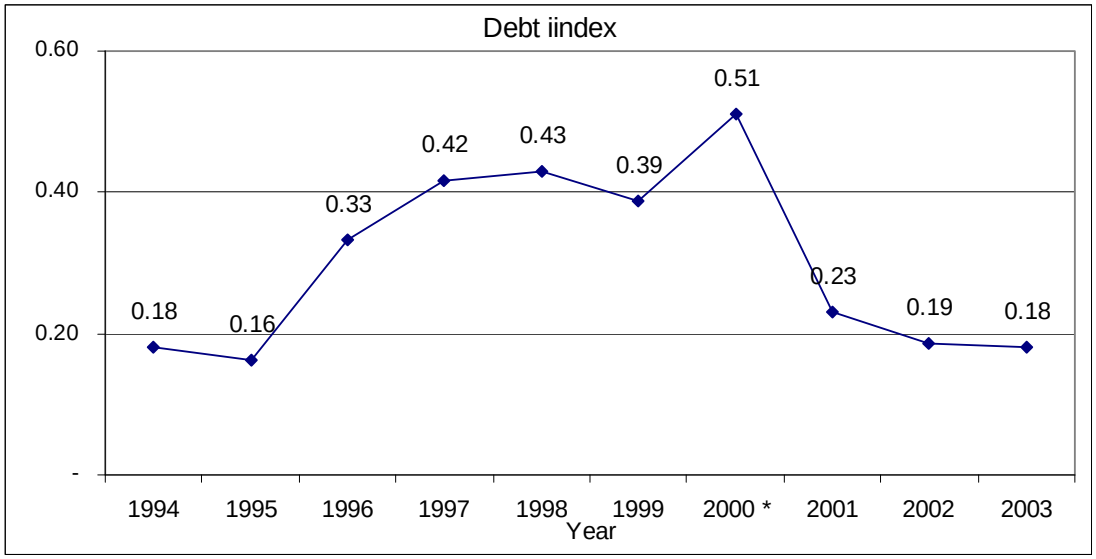
American Development Bank (BID), French Loan and others that, due to the re-programming that took place after the war for water became local debt. Even if foreign debt decreased, we can see that the interest rates of the new loans granted up to 2003 are high, around 12 per cent plus commission charges on non-paid balance.

Other Alternative Sources: SEMAPA receives from the Municipality, 10 per cent of income obtained from the Nation's General Treasure (NGT) under the Popular Participation item.

As far as data show, during the period of concession to "Aguas del Tunari", capital was injected to make water trade attractive. This is shown in the debt index, which reveals the market intention that underlay the contract. In the debt item we not only find short-term debts but also long-term debts and all other debts. This is the reason why Debt Index is result of the relation between Total Liabilities and Patrimony. Liability amounts in 2000 are high in relation to the total liabilities value of 1994 onwards. Until the signing of the concession agreement liabilities had grown almost 5 times.

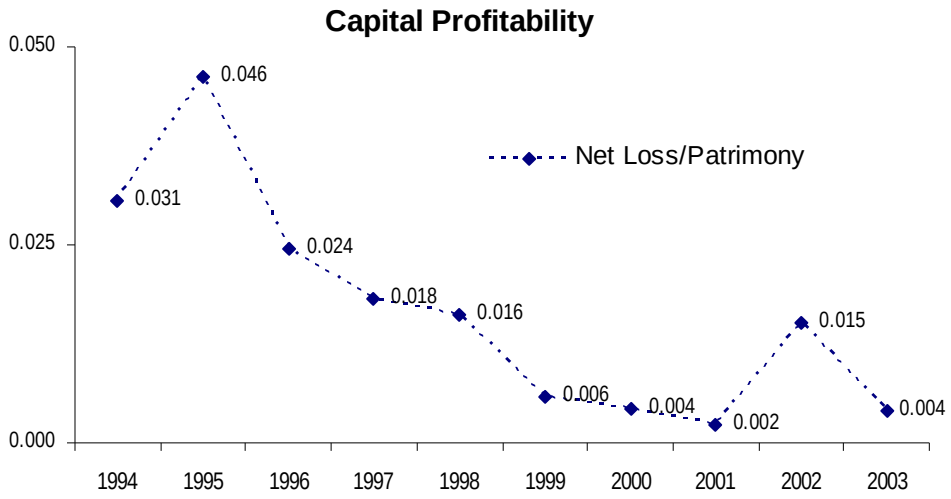
We can see in Figure 3 that debt of SEMAPA increased to 0.5 Bs per 1 Bs invested during the period of Aguas del Tunari administration (1999 to 2000).Finally in 2003, out of every boliviano invested, 0.18 Bs are loans.

Figure 3



Capital Profitability (RK): One indicator have been calculated: in relation to Net Loss versus Patrimony. SEMAPA'S capital profitability shows a tendency that worries. Note that only during 1995 were losses concerning patrimony balanced. Actually, constant and sustained losses during all the period show that the company's patrimony is being dangerously affected in a negative way, year after year and in different proportions. The value represents a global reduction in the patrimony, resultant of the bad activities during the period 1996 to 2003.

Figure 4



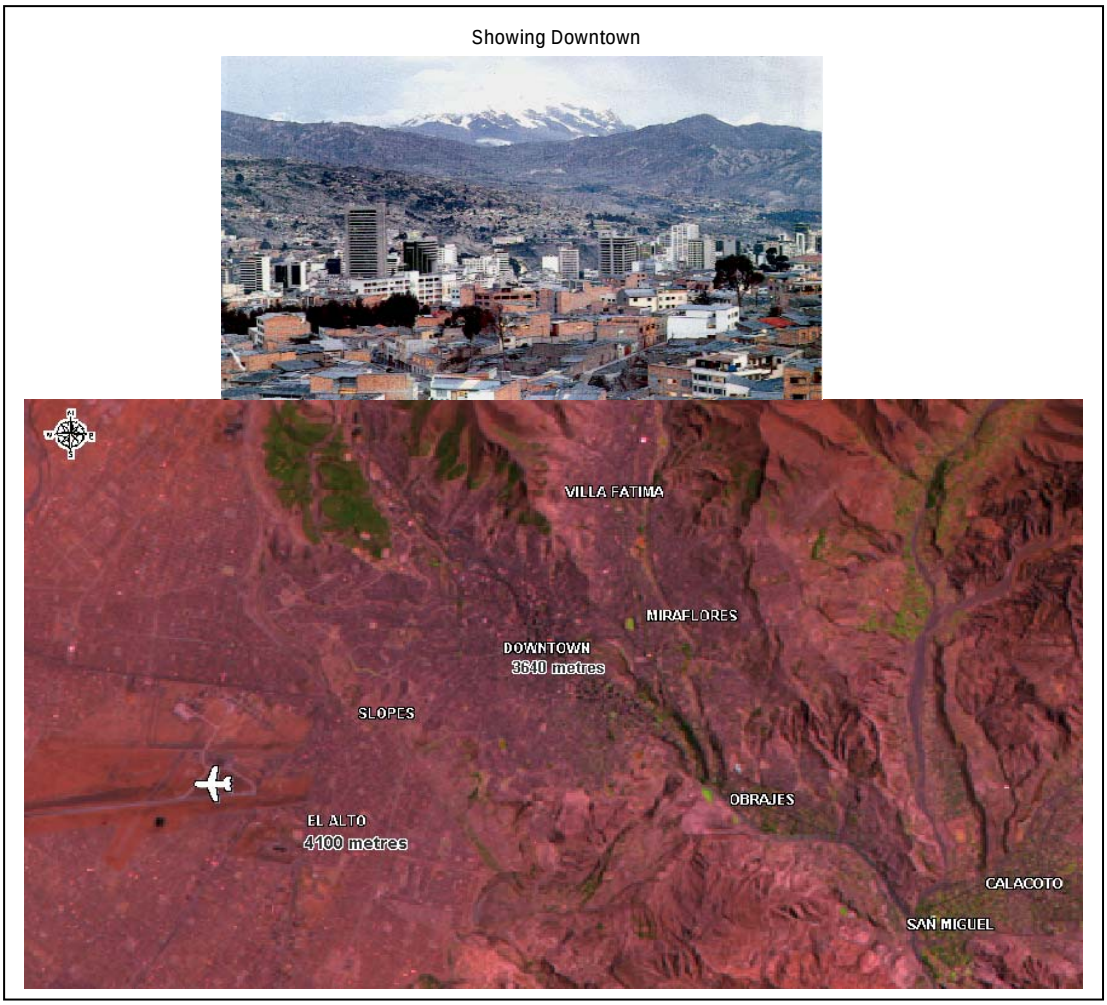
There have been no improvements in the water distribution network, be it by investments and/or extensions, there are no other visible signs of improvement in efficiency during this administration. The provision of a water and sanitation system is a key element in an urban setting that determines the living conditions and health of a population. Unfortunately, it is the people with the least economic power who also suffer from the lack of these services.

PART II: La Paz/El Alto

2.1 The city of La Paz and El Alto

The city of La Paz is found in the Bolivian highlands (*Altiplano*). It has an elevation from 3250 to 4100 metres above sea level, being the highest Capital city in the world. It has been the seat of the Bolivian Government since 1879 and has thus acquired a high level of centrality for the State structures. La Paz is multi-ethnic, a city where there are immigrants from *Aymara* and *Quechua* backgrounds. There are still descendants of the Europeans and in lower numbers of other cultures within the country. Inside the City there are large gaps between poverty and wealth, which express a deep urban social problem.

2.1.1. The Urban Expansion in the city of La Paz



Map 3: The city of La Paz

The basic spatial configuration was designed in 1549 and it obeyed the classical royal rules and also those of the Company of the Indies. The main square (today *Murillo Square*) and streets around this area were populated by the Spanish and Creoles (children of the Spanish born in America), while the native population was located on the other side of the *Choqueyapu River*. Dating from the arrival of the Spanish the physical configuration became highly segregated. The spatial ordering reflected the social hierarchy of the settlers and the social structure. This spatial ordering is currently valid (Szmukler Alicia, 1996). See Map 3.

A process of the diversification of economic activities and international trade began during this period. These allowed the establishment of industrial units of production in the higher part of the *Choqueyapu River.* Industrial workers settled in the north-eastern slope where today we find the neighbourhoods of *Villa Victoria*, *Pura Pura* and *Achachicala*. The construction of the *Guaqui* - *La Paz* and *Arica* - *La Paz* railway routes also included the tracks to *Viacha* where it joined the route to *Antofagasta*

thus permitting it to connect with international markets via the Republics of Peru and Chile. The rail route between *La Paz* and *El Alto* has also become an element, which has defined its urban growth. All these factors helped in the construction of a city which was an economic, administrative and government centre. Giving the city a specific characteristic and thus an unprecedented demographic and economic primacy.

An important characteristic of the housing situation in La Paz is the fact that the rough topography of the city makes a natural limit for the growth of the urban structures. Once all the slopes were filled in the seventies the city began to spread to the highlands above. This was initially considered an expansion of the city, but later, due to the large area it had, it became necessary to give it its own local administration and thus make official the new city of El Alto. Migration is the factor which helps one understand the rapid demographic growth: six out of ten people who live in El Alto were not born there. In the year 2000 the population of this metropolis was over a million and a half inhabitants. Throughout this century it has increased its size by 30 per cent. The number of inhabitants of El Alto is nearly the same as in Cochabamba and it currently hosts the highest concentration of urban poverty in Bolivia.

2.1.2. Internal urban segregation: Residential area

The human development index (HDI) shows that there is a dangerous segregation occurring inside the city. On one hand, the neighbourhoods of the southern part are the ones, which enjoy the highest standard of living and thus have the highest value (0.93) for this indicator in the whole country. On the other, El Alto has an HDI of 0.513, which is below the national average of 0.589. This shows The entire poverty belt, which is found on the “slopes” contains the most physically fragile zones The belt surrounds the whole city, from the western slope to the eastern one, and it reaches its summit in the city of El Alto. This City is found at around 3,950 metres above sea level.

La Paz is a segregated city where the most fragile lands are being used by population of lower income. In 1996 there was a gap of forty times the income for wealthy sectors compared to the population resident on the slopes and in the suburbs.

In these areas a vicious circle has begun since the provision of services has a higher cost, due to the rugged landscape of the steepest hillsides, which people living there cannot afford.

2.1.3 La Paz City Council and their actions

The institution, which is responsible for the definition and execution of urban policies, is the local City Council. Traditionally La Paz City Council had quite a good reputation. It developed one of the best city administrations and good financing capability. Nevertheless, its actions do not always correspond to the logic of technical efficiency, being influenced by politics and rent seeking.

The fast growth of the city and the spontaneous land appropriation brought about a badly organised urban structure. Under these circumstances the need for giving a legal frame to new urbanisation with the elaboration of one of the first regulating instruments in the year 1956. "*The Regulation for Zone Creation and L*and *Division*" was created but did not have the expected impact due to lack of control site maps, which might have helped to put it into practice.

The decade of the sixties witnessed an expansion of the City's government bureaucracy. Signs of corruption appeared in different organisations' dealings with the city council. During the 70s, the urban investment grew and increased the amount destined for the social sectors of high resources stimulating the development of businesses. There were several planning attempts for the longer term, nevertheless, a short-term logic was stronger until a total crisis scenario erupted in the eighties.

During the 80s, urban policies suffered a change, which was explained by the constitution of neighbourhood groups, organised around concrete demands and objectives. On the 10th January 1985, the Organic Law for city councils was passed. This law recognised the city council as a legitimate local government. The direct election of a member of the city council as the City Mayor was introduced. From this moment on, the political interest took over a primary role and unfortunately corruption also increased.

In 1987 the project for strengthening the city government was implemented and was oriented to the modernisation and rationalisation of the municipalities. This project was divided into four programs: a) of administrative reorganisation, which included decentralisation and the creation of operational autonomy, the creation of an information network and the organisation of the city council and the strengthening of the community government; b) of personnel management and training, which included the reduction of personnel and general training programs; c) of strengthening financial management, including a programme to increase the collection of tax, a re-design of financial management, budget formulation and an inventory of municipal property; d) of general purpose and multi-user land control, with the goal of re-evaluating land data. In general terms these trends were kept by the later administrations, with a more democratic approach and with respect for the municipality and the cultural attitude of the population (Morales Rolando, 1995). With the Popular Participation Law of 1994, the municipality was extended into rural areas, where many public responsibilities were transferred and specific mechanisms for citizen participation were created[7].

In theory, all these actions were oriented towards a solution to the chaos and disorder of urban growth. But, the results have not been positive. The plan creating district autonomy was executed between 1994 and 1995 by the city council of La Paz. With autonomy, inefficiencies and lack of operational capabilities became very clear. Also several problems arose: absence of well established rules of the game, non defined areas of action and lack of co-ordination between districts and the city government. The introduction of party politics to the city council reduced the chances of permanence for well-trained professionals and technical personnel. The problems that surfaced were an excessive weight of administrative personnel with relation to qualified personnel, lack of institutional norms, absence of procedures which clearly stated the functions and responsibilities of the districts. Also, badly organised and maintained equipment and structures became evident (Morales Rolando, 1995). These were only some of the elements, which have explained another failure in the attempt to build a framework for city planning.

[7] All of this programs and laws, have been applied in the cities of Cochabamba and La Paz

2.2 Urban infrastructure and residential areas

In 1996 a new district structure was established for the City of La Paz. It was divided into 23 Districts of which 21 were urban and two were rural. Unfortunately, the district division is more of a theory since the levels of equipment and structures are very elementary and there is no financial decentralisation and technical capability is very low.

Starting in 1997 the town planning was in charge of the Institute for City Planning and Research (IIPLAM), which is a decentralised and independent local government body. The functions of the IIPLAM are: to contribute to the formulation of development objectives which might guide city policies; analysis of patterns and trends of growth for cities and regions, preparation of plans and development programmes for urban and regional development, communication and dissemination of these plans and provision of incentives for co-ordinated action between public and private institutions, provision of services for technical aid, information management, educational support, operations research and an improvement of the services within local government.

One of the most important aspects during this period was the succession of different Mayors accepted by large numbers of people of the lower social classes. These aimed their actions at trying to solve specific situations, which were not part of any large urban development plan. Many well-known architects participated in modernisation projects for the City, both in financial issues and also in operational aspects. International co-operation provided large funds, strengthening local government's ability to solve current problems. Among these was chaotic growth, changes in the central zone, the growth of the slope settlements and of the residential zones in the south. These latter required expensive investments in infrastructure and the provision of water, etc.

Added to the technical problems were problems of the corruption of at least three previous mayors. This way, La Paz got into the 21st century without a strategic program, which might help plan the future urban development and establish the basis of a sustainable city.

The result of this sequence of mistakes is a growing, unsatisfied demand for public infrastructure, especially in the northern zone, on the slopes of the hills and in the City of El Alto. On the other hand, in the southern part of the city and surroundings the upper and middle classes of society live comfortably.

2.2.1. Social inequality in the access to the drinking water in La Paz and El Alto: AISA-SAMAPA before of the Concession

Between 1976 and 1992 in the city of *El Alto*, only twelve kilometres from downtown *La Paz*, there has been an unprecedented demographic explosion. In only fifteen years it has multiplied its population five times (from 95 thousand in 1976 to more than 405 thousand inhabitants in 1992). In 2001, La Paz and El Alto metropolitan area had a population of over 1.3 million. The population is almost evenly distributed between the two cities.

Poverty is structural in this city, Already in 1991, the city of El Alto was declared “city in emergency." Although the figures of the National Institute of Statistics (INE) indicate that a reduction of the levels of poverty has taken place, these are still very high. According to the method of Unsatisfied Basic Needs, the population living under conditions of poverty in El Alto is of around 67 per cent. In 2002, 82 per cent of the households have an income inferior to 2 dollars per person a day and almost half of its residents don't even have a dollar per person a day to provide for all their needs, the data came from Survey of Improvement of the Living Conditions (MECOVI, 2002). The official indicators of poverty of MECOVI show that the poverty levels in El Alto are still alarming. Discrepancies on poverty indicators by district are eloquent. Districts of the urban periphery districts have the least advantages.

This city also has a series of unsatisfied demands of public services such as a basic sanitary system.

El Alto’s main characteristic is that it receives around 10 thousand new immigrants per year. Its growth is disordered and with countless deficiencies regarding housing such as bad quality constructions with bad basic services infrastructure and where families generally live in crowded conditions. In 2001, INE’s report registers 165,320 houses out of which 60 per cent are occupied by the owner; 26 per cent are rented and 12 per cent are given in exchange of services or lent by relatives. Regarding the water supply, out of a total of 566,048 inhabitants, 56,518 are supplied by a pipe inside the house; 85,475 by a pipe outside of the house (faucet in the yard); 5538 by pipe outside of the house (public faucet); 5530 by a well, 5694 water by truckers and 6565 by other means. As for the sewage installation, 75838 houses have electric sewage network and around 90 thousand don't have this service.

A simple inspection of the cadastral blueprints shows that the city of El Alto has expanded in all directions. The city has expanded beyond the limits established by the concession of drinking water. That is the reason why when the performance indicators of the concessionaires are examined, as is the case of Aguas del Illimani, the results are positive. Figures hide the drama of those living outside the intervention area. In the case of the city of El Alto, we are talking about the neighbourhoods located in the northern and southern periphery. These also happen to be the areas where the poorest are concentrated. Those responsible for the companies that have been granted concessions say that they can not help these areas since they are “not included in the obligations of the concessionaire and it is a financially unsustainable to service under the current contract conditions” (Aguas del Illimani, 2004).

SAMAPA was created through the Law Decree Nº 7597 on April the 20th, 1966, as Municipal Autonomous Service of Drinking Water and Sewer System. The company was granted autonomy of operations and administration within the area of La Paz and El Alto.

In 1988, the drinking water distribution network covered an area of 12360 ha. The network supplied approximately 86 per cent of the total population in the urban area. The total longitude of the distribution system, including the network, adductors and thrusters, was of 1.547 km. The annual report of SAMAPA for same year pointed out that in the cities of La Paz and El Alto there were around 80 thousand connections, of which 52 thousand were located in the city of La Paz. At that time, it was already clear that 85 per cent of revenue from bills were collected in the city of La Paz. The amounts collected in El Alto hardly reached 15 per cent. In 1991, a study was carried out in order to propose a new rate structure. The study was finished in 1996. This

new model included aspects relative to subsidy criteria and improvements in the billing and collection system, in the installation, in the maintenance of meters and in the construction of efficiency indicators (Tapia Verónica, 2000).

In this context, the Ministry of Capitalization of Bolivia subscribed, through the World Bank, a contract with Halcrow, Melveny & Myers and the Bank Paribas to carry out technical studies in order to propose the transformation of the companies offering sanitary services in the cities of La Paz, El Alto (SAMAPA) and Cochabamba (SEMAPA) in the territory of the Republic of Bolivia.

2.2.2. What did the Contract with "Aguas del Illimani" say?

The Concession Contract for the use of waters and the concession of the public service of drinking water and sewer system in the cities of La Paz and El Alto was subscribed on July 24, 1997 with "Aguas del Illimani S.A." The contract explicitly established that the company would connect 71,752 new users in the city of El Alto by December of 2001. The contract was a central part of the government's strategy to provide all households in the peripheral settlements of La Paz and El Alto with access to high-quality water and sewage connections.

The contract also specified that the concession area included Achachicala, Pampahasi and El Alto. It also established that the period of the concession would be of 30 years. The concession was granted to the company that offered the highest number of new connections. The contract also established that, during the first 5 years, tariffs would be indexed to the North American dollar converted to Bolivianos according to the effective exchange rate every month. The cubic meter charge was 0,2214 dollars in the domestic category (Aguas del Illimani, 2001).

In addition to that the concession contract established the following:

- The operator Aguas del Illimani S.A. (AISA) should keep at least 26 per cent of the shares during 10 years;
- The concessionaire should maintain a initial investment of at least USD 10 millions dollars.
- The tariff régime should remain unchanged until the year 2001. An extraordinary revision of tariffs was possible starting from the third year if exogenous economic conditions change. The programmed tariff revisions would take place every 5 years, together with the adjustment of investment, quality and expansion goals that are specified in the annexes of the contract. The concessionaire agreed to offer a water service of quality, with good and continuous pressure.
- The coverage of an area couldn't be smaller than that of the previous period.
- Until the year 2001, the concessionaire should carry out the registration of generators of industrial residues and it should prepare a feasibility project for used water treatment plant in La Paz.
- Aguas del Illimani S.A. (AISA) should appoint technical and accountant auditors to certify the information. The Superintendence ratifies the appointment or request changes.

- The transfer of goods furniture and inventories from SAMAPA to AISA should be carried out by annual instalments over a period of 10 years.
- The rent that AISA should pay SAMAPA for fixed assets should allow SAMAPA to pay its debt[8].
- At the end of the contract, the contractor should transfer fixed assets against the payment of the total worth of the net fixed assets, or of 85 per cent of the net fixed assets in the event of expiration.

In relation to the minimum coverage, we found that the goals have been reached completely in the case of the city of La Paz and with some lacks in El Alto.

Table 24. Minimum Coverage of Drinking Water and Sewer System per Areas and per Year

Area	2001	2006	2011	2016	2021	2026
Drinking water						
Achachicala	100%	100%	100%	100%	100%	100%
Pampahasi	100%	100%	100%	100%	100%	100%
El Alto	82%	85%	90%	90%	90%	90%
Sewer system						
Achachicala	81%	84%	90%	94%	95%	95%
Pampahasi	83%	85%	90%	94%	95%	95%
El Alto	41%	43%	47%	71%	90%	90%

Source: Uzín Luis Guillermo, 1998

In this context, it is important to note that the estimates of the expansion costs of the distribution network were based on the expansion areas foreseen in the ten years covered by the feasibility study and distributed among the systems serviced by SAMAPA. The unitary cost of expansion was estimated in U$S 2.400 per hectare, however, we should add the remaining costs of the:

Domiciliary Connection

The cost of a basic connection that includes installing a meter is of 72 U$ per connection. The value increases in 50 per cent when the new connection belongs to an area that already has the service since costs of repairs tend to be higher and there are not economies of scale present as in the case of big expansion projects.

Connection Pipes or Master Pipes

In order to determine the master pipe's cost, 30m/ha of pipe with a diameter of over 150mm (included in the previous cost) were considered necessary.

[8] All these aspects are stipulated in the contract of assets régime subscribed between AISA and SAMAPA.

In sum, a basic cost per hectare was adopted based on plotting carried out in the city of El Alto and increased in a certain percentage in order to take into account the highest degree in construction difficulty of the network in the dense areas of La Paz. The costs finally adopted were:

Cost of expansion network (including registration outlets, collectors, collectors and connections to the main collector) 6560 $/hectare

Cost of domiciliary connection: 100$/conexión

2.2.3. The concession of the Municipal Drinking Water and Sewer System Service (SAMAPA)- Aguas del Illimani

Table 25 shows the composition of shareholders of AISA, five years after the concession agreement was signed. The predominance of Suez was evident, it held more than half of the shares (55.5 per cent), a Bolivian counterpart occupied the second place through the Banco Internacional de Comercio (BICSA SA) that barely rose in 2 points regarding its initial situation (22.32 per cent). At the beginning of the activities, 40 per cent of shares was in hands of three Argentinean shareholders (AROUSA, Mercantile Society of the Silver and Meller). In 2002, the place was taken by Inversora en Servicios SA, that was also Argentinean, with 9.1 per cent of shares. The presence that the Argentineans held within the group of shareholders has decreased. The fourth place was held by one of the agencies of the World Bank, the International Finance Corporation with around 8 per cent of the actions, CONNAL SRL, a Bolivian consultant company in the area of construction working in La Paz, held 4.6 per cent of the shares and finally, some workers of the Aguas del Illimani company (those that had more than two years of seniority) held 1 per cent of the shares.

Table 25. Five Years after the Constitution of Aguas del Illimani S.A. (AISA), in 2002

SHAREHOLDERS AISA	Number of Actions (31-12-02)	
	Absolute	%
Suez	323,068	55.46%
BICSA S.A.	130,010	22.32%
Inversora en Servicios SA	53,000	9.10%
CONNAL SRL.	26,652	4.57%
International Finance Corporation	43,689	7.50%
Workers	6,096	1.05%

Source: AISA, 2002, Annual Memory, La Paz, Bolivia

2.3. Economic and financial aspects

This section analyses the economic-financial situation of the company “Aguas del Illimani” (AISA) and the characteristics of access to the services of drinking water for the residents of the city of El Alto.

2.2.4 Rate Structures and Criteria

The analysis of this basic component of the economic-financial dimension necessarily faces the existence of certain restrictions associated to questions of very diverse nature. The first one is of socio-demographic nature that is linked with the size and the characteristics of the served populations (in terms of the management costs involved, and considering the different scales –real and potential– of the markets). The second is of geographical nature and it is related with the distance of the cities or of the concession areas to the areas of generation and appropriation of water resources. A third one is related to the pattern of distribution of access to water that possibly explains a kind of segregation in the residential space and has a high correlation with the degree of expansion/coverage of services. They all they determine dissimilar service, expansion and of maintenance costs between the distribution networks and the treatment plants.

In view of what was just mentioned, next we will carry out a brief analysis regarding certain questions or problems that we consider of particular importance and that will let us establish some comparisons among the main rate criteria of current tariff structures, the predominant mechanisms of tariff adjustment and the evolution of the tariffs for the different types of service users, the company's distinctive performance features and the identification of the presence –or not– of some form of subsidy for the consumers of lesser purchasing power (crossed direct subsidies and/or, social interest rates, etc.).

Contrary to the case of Cochabamba, in the cities of La Paz and El Alto the prices of water were increased in almost 60 per cent for domestic use, 18 per cent for commercial use, and 21 per cent for industrial use before the privatization. Tariffs were indexed to the dollar but, after of the protests of December 2000 the indexation was removed.

Tariff structure is progressive (the more consumption, the higher the unitary cost). Before privatization the household could have enjoyed 10 m^3 of free consumption (minimum consumption) which was eliminated by the concessionaire. All consumption of water was charged, fact that may affect negatively sectors with lower economic power. That is why this change was a blow to the meagre economy of the poor.

Between June and September 1996, SAMAPA prepared a new tariff structure (simpler) in order to improve its financial situation. . It was approved at the National Council of Tariffs (CONATA), in December of 1996 and it was implemented in July 1997?, one month before the beginning of the concession. So, AISA began its administration with a brand new tariff structure. With this, the State was looking for a positive image of privatisation.

It is evident that one of the elements that led to the change of SAMAPA's tariff system was the need to simplify the complicated tariff structure. In the old system, there were more than 150 categories and subcategories, with basic quotas, consumption rates, excess consumption rates and an overcharge of 40 per cent for sewer system services for all the users, even for those without a sewer system connection (Uzín Luis Guillermo, 1998).

As a consequence, up to where the data allows us to observe, there are two categories that determine the tariff criteria: metered and not metered users. Tariffs were established according to the following. In the metered system there are 5 big categories: domestic, commercial, industrial, buildings, multifamily housings and state. This tariff structure of Aguas del Illimani doesn't have subcategories. This is a critical point, since the introduction of sub-categories would allow the introduction of

an equity principle. The only criteria to differentiate users was consumption volume, which could have negative impact especially on poor people since volume is not a direct indicator of economic well-being (it could be a building that uses water for other objectives, not necessarily the domestic ones).

In the metered system, the possibility of minimum consumption doesn't exist. Users are billed for the amount they consume. Water is charged starting at the very first m^3[9]. When meter reading cannot be made, the company charges for an estimated consumption based on the average of the last two metered consumptions, according to the user's category.

Table 26. METERED CONSUMPTION

Category	Description
DOMESTIC	Users whose property is used for housing. It has four consumption ranges: from 1 to 30 cubic meters per month, from 31 to 150 cubic meters per month, 151 to 300 cubic meters per month and higher than 301 cubic meters per month.
COMMERCIAL	Users whose property is used for business. It has two consumption ranges: of 1 to 20 cubic meters month and higher than 21 cubic meters per month. The commercial category also applies to all the official users, public and state - owned.
INDUSTRIAL	Users whose property is used for business. It has a consumption range: from 1 cubic meter on. Additionally, all the entities with legal status registered in the National Camera of Industry belong to this category.
BUILDINGS AND MULTIFAMILY PROPERTY	A domestic connection is equivalent to two apartments in buildings or multifamily properties. A building is all property that houses people and has four or more floors, including the first floor, or that has more than two apartments per floor. In the case of properties with domestic and commercial users and a single connection, the commercial services should become independent in order to have an independent connection and meter.
STATE	State buildings, official users, public and state – owned, parks, gardens, squares, community centres, benefit centres and churches. The State Category is similar than the commercial category.

Source: Contract of Concession of Aguas del Illimani

Thus consumption ranges are classified as high, middle high, middle and low. See table 27. The low category pays 0.2214 dollars per m^3 of consumed water. This rate is to public taps.

Table 27. RATES ACCORDING TO CATEGORY AND RANGES OF WATER CONSUMPTION

ITEM	PRICE	CATEGORIES OF USERS (M^3)		
	IN $US M^3	DOMESTIC	COMMERCIAL	INDUSTRIAL
HIGH	1.1862	301 and more *	21 and more	1 and more
MIDDLE HIGH	0.6642	15 to 300	1to 20	
MIDDLE	0.4428	31 to150		
LOW	0.2214	1 to 30		

Source: Aguas Del Illimani – Dept. of Communication, *According to data of the Superintendence of Waters, that was calculated starting at 300 m^3 at that time

[9] AISA documents establish that **neither fixed charges nor basic charges exist, users pay only for amount of drinking water consumed which is calculated from the first cubic meter**

It is important to highlight that most of the users are concentrated in the domestic category, representing a 92 per cent of the total of users in the City of La Paz and El Alto. In the city of La Paz the domestic category represents 89 per cent of the users, with a net consumption in m^3 equal to 73 per cent of the total consumption of the city. It also represents 46 per cent of the total collected for water service in that city. In the city of El Alto, the domestic category is the one that concentrates the biggest quantity in users with a 96 per cent, representing 86 per cent of the total net consumption in m^3 of this city. It represents 62 per cent of the total revenue collected. The second category in importance in both cities is the commercial one, representing 6 per cent of the total of users and with a consumption in m^3 that it reaches 11 per cent of the total. This category contributes to the collection in 24 per cent of the income of AISA. The domestic category of the city of La Paz collects a monthly average per user of 6.15 $US per m^3, with a consumption average of 19.59 m^3 contrary to what happens in the city of El Alto where the consumption average is of 8.43 m^3 and its billing ascends to 2 $US/$m^3$ a month.

2.2.5. Importance of metering in the determination of user's charges

Metering is fundamental because all charges are measured by m^3 increasing at the margin. For example, 30 m^3 in the domestic category are charged at a given rate. But, the next m^3 has another price. While in the industrial category each m^3 used is charged at a different rate.

Investing to increase the number of meters has not been considered by SAMAPA. The proportion of the population non-metered is significant. See table 28

Table 28. Percentage of Connections with Meter per City (June 1996)

Metering	El Alto	La Paz	Total SAMAPA
% connections with meter	79,8%	89,6%	84,9%

Source: SAMAPA, 1996

According to the contract, AISA had one and half to three years to install meters in the domestic sector of the concession area (annex 10; numeral 1.1.). But until today, a great part of the connections in El Alto lacks meters, this means higher tariffs. The inhabitants of El Alto prefer to have a meter, because with the metered system they pay less than a dollar (between 6 and 7 Bs.) per cubic meter. Without a meter, they pay an average established by the company, which corresponds to almost a dollar and half (between 12 and 15 Bs.) per cubic meter. Also, in the case of non-metered consumption fixed charges exists. Users pay US $3.70 per month in properties whose value exceeds 200 thousand Bs. and US $2.40 per month for properties of less than 200.000 Bs. The value of the billing form is US $0.10 per month.

The increase reached in the revenues with the new tariff system was of 30 per cent, but with a decrease in the billing of a third of the total number of the users, in fact, precisely of those who had a smaller consumption. In El Alto, the price increases for water can be dangerous for both regulatory commissions and governments since consumers often view water service as a "right". The importance of water for life and health gives the water bill additional political visibility. The cost for new families to hook up their homes to water and sewage totals more than $445, an amount that exceeds more than six months of income at the national minimum wage (Shultz Jim, 2004).

The percentage of metered connections has decreased, from 85 per cent at the beginning of the concession, to 83 per cent at the end of the year 2000 (SISAB

2000:21). The limited expansion of the meters has historically conspired against the growth of a social conscience concerning the rational use of water. The low social valuation of water and its use (water is almost considered as if it were an infinite resource) also constitutes a serious challenge for the future. In that context, it is certain that the preservation and the rational use of water resources make investments in the expansion of metering imperative. In our study case, only the city of La Paz has benefited from a very big expansion in the metered system. In El Alto, the process is slower. This fact possibly also explains the different consumption levels for different users when, in principle, the company should pursue actions of fairness and of proportionality.

2.2.6. Crossed Subsidies

On one hand, it is important to remember the fundamental human right character that drinking water has and, on the other hand, we must remember that sector deficits (those regarding the expansion of the networks, the quality of the offered services among others) usually affect the users with lower purchasing power more severely. Is there, a subsidy mechanism that gives low income consumers access to drinking water and environmental sanitation a “reasonable” price?

In the case of El Alto, theoretically, tariff structure for drinking water and sewer system, is based on the direct application of crossed subsidies. In fact, this subsidy implies: first, the application of higher rates in the commercial and industrial categories in order to benefit the residential categories with lower charges. Second, the establishment of a multi-part tariffs system (progressive) in each category of users. This last point has not been implemented by AISA. AISA has only one has a category of users without any internal differentiation.

In a situation of widespread poverty and in segregated spaces as is the case in Bolivian cities, it is expected that an important fraction of households don't have the resources to pay the costs of services (including those of the capital). In such case, be it for public interest (for example, to prevent water transmission illnesses such as cholera) or for humanitarian/equity concerns, all countries usually have certain interest in favouring the access to services in general and to those of water and sanitation in particular. This access, in the case of the low income consumers is based on the fact that the funds to pay the services should be provided by other people than the direct beneficiaries (for example, other users, the State or the service company itself). In this respect, three basic strategies exist: the use of traditional crossed subsidies that can allow access through an internal redistribution among the users of a sector; direct subsidies provided by the State; and the implementation of a solidarity rate.

Ultimately, what everybody is trying to achieve it is to increase the degree of coverage of the water services. As we have already seen in the systems applied by AISA company, the lack of a categorization scares the users who, frightened by tariffs raise, do not understand the intention of the company with the so called “crossed subsidies”. People fear that this is just a new mechanism to help economically powerful sectors of the population. Although the classification of users by categories is internationally accepted (residential, commercial and industrial, state), the definition of subcategories in a multipart-tariff system is arbitrary and complex.

The few 497 industrial clients pay variable charges per cubic meter that are superior to those of the 13,160 commercial clients or the 1,127 State clients. The industrial clients contribute with 12.2 per cent to the concession revenues against the State

contribution of 16.3 per cent (without considering collection problems) and the 27.1 per cent of coming from the commercial sector. The problem that this fact generates has become a strong incentive for the industrials to “bypass” the company by means of the partial or total substitution of the service by self supply with wells. This is not legal, because is a contradiction to the exclusivity right clause in the concession contract. The Superintendence attempts to regularize these distortions in the structures of pre-existent company tariffs by means of the periods of rate revision foreseen by the law.

2.2.7 Non Metered System

In the case of the non metered system, a monthly fixed rate is set according to the value of the property. See table 29. In the case of the public taps a rate of 7.90 $US per month is applied.

Table 29. NON METERED CONSUMPTION

PROPERTY VALUE	TYPE RATES
< than 200,000 Bs.	The rate of 2,38 $US is established per connection a month.
> than 200,000 Bs.	The rate of 3,57 $US is established per connection a month.
Public faucets without meter	The rate of 7,90 $US is established per faucet a month.

Current legislation allows service providers to cut the service to users failing to pay their bills for two consecutive months. However, there is a high risk of non-payment from low income consumers with access to the service of drinking water and sewerage, for whom these services are usually relatively more expensive that for those who belong to the middle and high income social strata. No social tariffs are applied. Tariffs are not subsidized although, according to the directive of AISA, crossed subsidies exist.

Table 30. AVERAGE RATES WITH IVA (DECEMBER 2000 - MAY 2001)

	IAVERAGE RATE DOLLARS/MONTH *				AVERAGE WEIGHTED RATE ($US/MONTH)
DOMESTIC	1 to 30	31 to 150	151 to 300	301 and More	
ACHACHICALA	2,71	14,86	77,70	367,63	7,17
PAMPAHASI	2,41	14,34	78,79	330,97	5,65
El Alto (BANK)	1,90	11,69	82,66	315,13	2,72
El Alto (PLATEAU)	1,45	11,16	83,75	339,14	1,65
COMMERCIAL	1 to 20	21 and More			
ACHACHICALA	4,58	87,91			41,06
PAMPAHASI	4,65	75,76			28,07
El Alto (BANK)	4,72	35,00			11,37
El Alto (PLATEAU)	4,95	44,45			14,45
INDUSTRIAL	1 to 30	31 to 100	101 and More		
ACHACHICALA	9,12	62,17	1029,90		392,54
PAMPAHASI	13,79	59,91	1653,20		505,75
El Alto (BANK)	10,77	56,72	381,80		95,62
El Alto (PLATEAU)	11,35	62,81	485,90		153,23
STATE	1 to 20	21 and More			
ACHACHICALA	3,02	448,00			288,37
PAMPAHASI	2,02	395,00			156,55
El Alto (BANK)	2,05	355,00			111,84
El Alto (PLATEAU)	2,69	239,00			79,73

Source: Study Of Prices And Rates Of Aguas Del Illimani Sa. - Period 2002 -2006 Final Report Prepared By Lecg, LLC. It includes dollars 0,1 per bill for the concept of expense of bill emission

Users from El Alto reduced the consumption per capita from 110 to 87 litres per person/day than 1997 to 2003. This may be due to the lack of a policy to secure a minimum consumption, to the uncertainty of consumers on the amount they have to pay, to the situation of widespread poverty in the city of El Alto, or due to natural economic rationality.

In the topic of fixed costs, one can observe that the concession contract accepts the consideration of this type of cost as **other charges**. This item includes the cost for the concept of form with a price of 0.10 $US in all the invoices independently of the level of tariffs.

2.2.8. Rate Adjustment Mechanisms

According to the regulatory framework, there are two types of tariff revisions: periodic and extraordinary.

Periodic revision takes place every 5 years, starting at the date of the beginning of the concession. This is a mechanism to ensure that revenues generated are sufficient for the concessionaire to carry out its contract responsibilities.

The revision and approval of tariffs is considered based on studies that will be carried out by the concessionaire, and on the terms of reference established by the Superintendence (SISAB). SISAB will approve or reject the study through an administrative resolution, formulating the observations that it considers pertinent. During the process of the tariff periodic revision the following steps are to be followed:

Procedure:

a. Nine months before the date of periodic revision (every 5 years), the Superintendence will give the concessionaire of the terms of reference for the study. The study should be undertaken by a specialized consultant (out of a list) and it should have at least with three signatures of the Regulatory Authority, approved by the Superintendence.
b. The consultant firm will carry out the study taking into account the expansion goals and methodology outlined in the concession contract. The consultant will present its results to the Superintendence three months before the periodic revision is due to start.
c. The Superintendence will have one month to approve or to reject, the results of the study, formulating the modifications that it considers necessary.
d. The Consultant firm will have 15 days to carry out the modifications requested by the Superintendence.
e. In the case that the concessionaire rejects the results of the study or the modifications of the Superintendence, the solution of controversies procedure will have to launched according to the clause 21 of the of concession contract.
f. While the controversy between parts is solved, the prices and rates approved by the Superintendence will be applied starting from the date programmed according to the concession contract.
g. Once the controversy is resolved, if need be, the necessary adjustments will be made to the tariffs.

AISA initiated a process of tariff revision for the period 2002 to 2006. The new tariff structure should, besides introducing fixed charges, present a discount in the variable charges per M^3 consumed. The tariff proposal established a threshold of 10 m^3 of

drinking water per month to be covered by fixed charges. However, there is an important number of consumers, more than 109,838 consumers (according to the study of AISA), that consume volumes of water below 10m^3/month. It is for this reason that that the establishment of a consumption threshold of 5 m^3/month was recommended.

2.3 Evolution of the billing/operative cost relation

There are differences in the source of the revenues of the company Aguas del Illimani. As the reader will notice, during the administration of SAMAPA, that is to say, during the 1995 -1996 period, the billing income represented approximately 94 per cent of the total income.

After the privatisation (Aguas del Illimani administration) during the period 1997-2003, the billing income fell almost 9 percentage points representing around 85 per cent of the total billed. The remaining 15 per cent of revenue came from the water connections, sewerage charges, fines, among others. It is important to highlight that the total costs during that period also decreased annually at an average rate of -0,1per cent.

But it is also important to highlight that in 1997, the billing income was 7'357,000 dollars, in 1998 it reached 18'276,000 dollars. It remained almost constant from 1998 to 2003. The relationship between **revenues for billing/ operative costs** shows that the incomes are approximately 18 times higher that the operative costs. After the concession, during the 1998-2000 periods, one can see that the total incomes obtained by AISA had an irregular behaviour, they reached an inflection point during 1999 then they fell in 2.90 per cent in 2000.

In fact, it seems that the residents of El Alto had to lower their consumption as a saving strategy. The result is that AISA's water sale has experienced a constant fall after 1998. The revenue fall is explained fundamentally by the decrease of household consumption.

Income includes an item of called "other billed concepts" that correspond to water and sewer system rights. This item shows an upward trend in the income structure. The reader will notice that in 1998 this item only represented 13,6per cent, and in 2000 it reached 21.4per cent. This is much more eloquent in August 2004, when out of the total billed in all the different categories, 92 per cent of the billed users belonged to the domestic? Category. We must highlight that, although the number of users is important in the domestic category, it represents only a 48 per cent of the total revenue collected in dollars and 77 per cent of the water consumption in cubic meters.

The fixed costs of AISA's administration during the years 1997 to 2001 show a rate of growth of 20 per cent, higher than the operative costs growth, which are of a 17 per cent for the same period. The increase in fixed costs is explained by the increase in personnel cost and cost of third party services. But, it is important to note that during 1998 fixed costs show a negative growth rate of -0.1per cent. Operative costs also decreased 0.2 per cent. It is also necessary to point out that operative costs represent approximately 29 per cent (on average) of the total cost for the 1997-2001 period and the remaining 71 per cent are made up of fixed costs.

2.4 The constitution of capital and its financing

In 1989, the total debt of SAMAPA reached 74 million $US. From 1990 to 1995, SAMAPA tried to clear its obligations. In December of 1996, the debt outstanding was of 37 million dollars. This situation was ostensibly modified after the concession.

Table 31. SAMAPA–AISA: UTILITIES, PATRIMONY AND CAPITAL PROFITABILITY ACCORDING TO YEAR, 1995–2003.

	SAMAPA		AISA						
Indicator	1995	1996	1997	1998	1999	2000	2001	2002	2003
Utility	7681931	438565	107967	1887982	2851125	853918	-807925	1525468	2645767
Patrimony	98320589	100222471	11011099	12547139	15481919	17408658	16570474	18290422	20552023
Profitability of the capital	8%	0%	1%	15%	18%	5%	-5%	8%	13%

Source: Our Production

As was mentioned, service companies use several financing sources. According to the data we were shown, AISA has a strong tendency towards indebtedness. AISA operates with a "project finance" character, that is to say, to obtain a loan abroad with an interest rate lower than its profitability rate. One can see that, during the 1998 administration, AISA had a profitability of capital of 15 per cent and of 18per cent in 1999.

In 2000, an abrupt fall took place in the capital profitability. The capital diminished considerably in almost 13 per cent. In 2001, the situation reached a negative capital profitability of –5 per cent, which means that the rate of profitability was lower than the foreign interest rate during the same periods. After 2002, the capital profitability recovered and went up to 13per cent in 2003. But this doesn't solve situation of the great indebtedness. As we can see in table 32 the relationship debt–patrimony, the situation should still cause worry.

Table 32. AISA: MAGNITUDE OF THE FOREIGN DEBT, PATRIMONY AND INDEX OF EXTERNAL DEBT, 1999 - 2002

Relationship DEBT PATRIMONY	1999	2000	2001	2002
FOREIGN DEBT	18112448	24403235	24943121	23326551
PATRIMONY	15481919	17408658	16570474	18290422
DEBT/PATRIMONY	1,17	1,40	1,51	1,28

Source: Our Production

This situation of debt deserves a deeper and more detailed explanation. If we analyse a report from the Ministry of External Trade – Vice Ministry of Investment and Privatization, published in 1998 (Cayo Salinas, 1998), we can see that SAMAPA's debt balance in May 1996 was of almost of 38 million dollars. See table 33

As we can see in the diagram of AISA's bank and financial debts, between 1999 and 2002, AISA' debt had a growing tendency, with the added difficulty that most of the bank credits for AISA were granted with a Chirographic Guarantee[10], a Credit Bill and a Guarantee Voucher, with the exception of the loans of the Banco de Crédito which

[10] The chirographic creditors cannot claim more rights than those of their debtor. If that debtor loses some of his patrimony, then these creditors simply have a decreased patrimony to share. They cannot challenge the validity of the judgment unless they prove that such judgment constituted an attempt to defraud the creditors.

have a Deposit Guarantee of the inventories of the society. For details on the loans and the conditions of debt repayment See Ledo (2004a).

Table 33. SAMAPA: External Public Debt
(Expressed in American dollars at December 31, 1996)

FINANCIAL ENTITIES	Nº LOAN	AMOUNT DOLLARS	DEBT BALANCE	AMOUNT TO PAY	INTEREST TO PAY	DATE OF EXPIRATION
OPEC	124P-P	600000	18864	155565	323	January 1999
KFW - TGN I	71065020	13370774	14053783	12704836	0	March 2015
KFW - TGN II	71065020	1968349	1303724	1771514	105630	March 2001
BM	2187-BO	7277572	8846031	5584878	88836	October 2011
IDB-SF-BO 571	SF-BO571	23728240	22306993	17488456	35948	May 2019
TOTAL		46944934	46529395	37705250	230738	

Source: 1992–1996 Memory, SAMAPA, July 1997, La Paz – Bolivia. Salinas Cayo, 1998 op. cit. p. 35

Toward the year 2002, the financial institutions with which AISA worked in almost 90 per cent were 4: Citibank, International Finance Corporation, Inter American Development Bank and Corporación Andina de Fomento. After the concession, the debt contracted by AISA for the years 1999-2000 was of 18 million dollars and, between 2001 and 2002 it acquired a debt of about 23 million dollars. AISA's debt is said to be bigger than SAMAPA's. For the years 1999 and 2000 the origin of the funds is 80 per cent foreign. Foreign indebtedness increases in average up to 95 per cent of the total debt in the 2001 and 2002. It is important to highlight that one of the major foreign financers is the Suez -Lyonnaise des Eaux Company, shareholder of AISA, and the other sources are: International Finance Corporation, Inter American Development Bank and Corporación Andina de Fomento.

In consequence, indebtedness is the source of the company's revenues. This has not changed and after the concession. The level of debt is a worrying symptom regarding the sustainability of the company. In 1996, SAMAPA's public debt amounted to 37 million dollars which corresponded entirely to Foreign Public Debt. In the case of AISA most of the loans are commercial loans and are subject to hard (market) rates, such as the Libor rate.

According to the concession contract, AISA should take charge of the financing of the big works and of the primary network, while the clients should pay for their connection to the secondary network. In these past years, the application of this principle was hindered due to the decrease in the clients' water consumption, which produced a significant reduction in the company's income.

In sum, from what precedes we can infer that, whatever administration type (public, private or mixed) of the drinking water and sanitation services, and whatever the quality (in an integral sense) of the service, the topic of the financing – also in all its dimensions, from simply keeping a certain "situation state", up to intents of enlarging the covering and the universalization degree –emerges as one of the crucial problems to be solved. It is possible to infer from the heterogeneous experiences of Cochabamba and La Paz/El Alto that the revenue collection from bills is not enough to ensure profitability and to finance network expansion. This is true even in countries with a higher relative development. So, borrowing from a third party (whichever that might be, from State subsidies to private bank loans) seems to be a structural component regarding the origin of the funds of a water service provider.

Alternative sources

The concessionaire has additional revenues through the item of "drinking water connection right" (155 dollars) and sewer system connection right (180 $US). The revenues reached 1'107,000 dollars for both connections during the 2001 administration.

Table 34. Additional Rates per Connection

CONNECTION RIGHT COST OF	COST IN $US
DRINKING WATER	155
SEWER SYSTEM	180

Source: Superintendencia de Aguas, 1997, Concession Contract of Aguas del Illimani

Beyond the revenues for billing of the services (and their configuration), another financing source that can reach significance, is that of the public subsidies. They assume the form of direct subsidies or that of public financing of expansion works. In addition to that, public financing can cover the operative deficits or take the form of a cost-free transfer for works that the State was carrying out at the time of signing the concession contract. Finally, the state can make direct contributions in cases of public service in the case of La Paz/El Alto.

2.5. Capital generation

In the previous sections we tried to determine, among other things, the origin of the funds generated by the different water and sewerage service companies studied in this research, as well as the distinctive aspects of their recent economic performance and the main elements explaining it. On that base, this section intends to complement and, as far as possible, to enrich the previous analyses, starting with the analysis of investment carried out by the companies and the problem linked to the different mechanisms privileged by the companies to finance capital generation.

AISA's commitment of initial investment consisted on :

1. To increase coverage of drinking water to reach 100 per cent in the areas of Achachicala and Pampahasi, up to December 31rst, 2001. In order to do the company should connect 1,000 households in Achachicala and 1,800 households in Pampahasi per year.

2. To increase coverage of drinking water to reach 100 per cent by 31 December 2001 in the area of El Alto. Of the total number of connections to be installed in El Alto, at least 50 per cent should correspond to network expansion. In order to reach the target the company had to connect 6,800 households per year.

During the first five year period (1997-2001) investment reached 54'786,991 dollars that were used to expand and to improve the capacity of plants and networks. For details on the executed projects see Ledo (2004a). It is estimated that approximately 80 per cent of the capital (68 million dollars) was obtained from third parties (loans, mostly foreign). The contribution of the company's own resources was only 20 per cent of the total amount invested[11].

[11] This estimation was carried out based on data on investment projects of the first five-year period of AISA's operation. No official data concerning the amounts financed by the company and the amounts financed by others is available.

In the beginning of 2001 AISA declared that it couldn't reach the goal of 71,752 connections because of insufficient demand for additional coverage. Up to June of the 2001, AISA installed a total of 51,349 connections. The coverage obligations that are expressed in number of connections are subject to some conditions of population density (at least 50 people living per block and at least five properties). El Alto water advocates and the government say, the company has left more than 200,000 people with no possibility of access to water at all by failing to expand water infrastructure to the municipality's growing outskirts (Shultz Jim, 2004).

2.6 Pro poor dimension: the trap of the condominium system

Possibly, one of the strategies of AISA in order to reach the execution of the goals regarding the number of committed connections and why it won the bid was to imagine strategies of enlarging the number of connections without it meaning an excessive cost for the company. That is to say, their dilemma is how to make money selling water to very poor people, with very low consumption indexes? Or, how to arrive with their product to poor homes without spending a lot, and in such way that they still generate earnings for the shareholders?

The answer was a "condominium" system that supposedly reduced costs by laying pipes through patios and sidewalks. Contrary to the conventional condominium system where the pipes surround the block and the connection to the houses are individual, in the system, a group of houses is connected to a single point of the main network and they constitute a condominium. The branching has four layout alternatives: branching through the back of the lot; branching through the front of the lots; branching through the sidewalks and mixed branching. To reduce costs and to enlarge the number of the connections, they have decreased the depths of the excavations compared to the usually established ones. Obviously this supposes a reduction of costs. However, it is unclear as to whether this technology represents real savings, since, the lesser the slope in the floor excavations, the slower the circulation speed in the pipes of smaller diameter. Without taking into consideration that the diameter corresponds to the number of users this reduction could have negative effects on system performance.

If these measures do reduce the short-term costs, what the technicians of AISA have possibly not understood is that their future sustainability holds huge doubts due to the changes introduced in the basic engineering principles of this type of system. One can say that this type of system will become another white elephant since changing the technical standards constitutes a hard blow to the civic rights of the poor of having a quality service. Unfortunately, AISA reproduces the benefactor's assistance action that tries to help those that are not profitable with measures of lower quality.

AISA is carrying out incentive campaigns for a higher water consumption level. Since its executives point out that El Alto is no business because the poor consume very little water. AISA has carried out actions that allow those "poor" an access to micro-credits for the construction of bathrooms and showers to increase the volume consumed and the number of connections and, therefore, to reach the goals fixed by the concessionaire. Maybe the element that reduces the costs more is that the neighbours themselves are in charge of maintaining the system. This way, the cost is 30 per cent lower than the cost of a normal installation because AISA has managed to a transfer the construction, maintenance and risk costs to the users (though community "participation").

Empirical evidence has demonstrated that, in a situation of extreme shortage, strategies to save water are implemented, including water recycling. This seems to be what happens with residents of El Alto. In most of the houses there is a single water point (usually in the patio). It is unlikely that if a single connection point exists, the technical conditions would allow installing bathrooms, showers and even laundries. Necessary technical accessories would be too costly. On the other hand, one of the problems that El Alto has is that it doesn't have an appropriate slope. Therefore the haulage of the waste- waters requires a bigger quantity of water. As the consumption is low, there is frequent plugging of the sewer that generates bad odours, in many cases inside of the housings because, as we said, in many places the sewerage pipe runs through the house.

What is sad is that the former superintendent of waters, who should be the one in charge of looking after the quality of the service, as is specified it the concession contract, held the following arguments in favour of the condominium system: "it is very interesting that the private sector is participating in a pilot project of the Program of Water and Sanitation of the World Bank call "Condominium System" to spread the networks of drinking water and sewer system looking for low cost solutions for poor users of marginal urban neighbourhoods"(Uzín Luis Guillermo, 1998).

In front of this precariousness picture, supposedly private involvement would solve that problem. Just as in other world experiences, the period of concession begins with the hope of achieving improvements in the service. Regrettably, the results are not encouraging, with the added difficulty that the works developed 'in favour of the poor ' become, in the facts, actions against the poor. And, in spite of the great effort of families when they contract debts to install their connections, the systems falsely "in favour" of the poor becomes their executioner due to the lack of technical specifications that would give the condominium systems a certain sustainability. Worse still, many of the consequences are complicated by a deterioration of the service causing an imminent risk of contamination by waste waters The problems are caused by the reduction of the diameters of the pipes (a decision that didn't contemplate that in El Alto the families are big) and by the fact that a 4 inches wide tube of can not expel waste waters because the slope is lower than the conventional one in El Alto. A very traditional saying in Bolivia is "cheap is expensive", this is what has happened with this project that, unfortunately has experimented with extremely poor human groups who have surely deposited their hope in a project that won't offer them solutions for the multiple range of dissatisfactions.

Part III. Conclusions

One of the main assumptions of those who have been inspired by privatization models in general, and, for the sector of water and sanitation in particular, fundamentally pushed by the multilateral credit organisms, is that privatization *per se* is a necessary and sufficient condition to extend the services and, to increase the efficiency in the drinking water and sewage systems services. After many years carrying on a very active role in the formulation and the implementation of market-oriented reforms, and as a result of the multiple critics coming from diverse places and people, recently the World Bank itself explicitly recognized that these reforms didn't have the expected effects on the population's well-being.

The tale of the two cities – Cochabamba and La Paz/El Alto – we present in this paper show important privatisation failures in the water industry. Privatization of water, an essential element for the human beings life, can be dangerous, mainly when it is carried out with cold economic profitability criteria forgetting the important social implications that universal access to water entails. The evidence presented in

this paper shows that long term actions are needed to allow a change in the administration of the public services and to sustain reforms, with wide community participation. An important task is to get rid off political interferences, which were a contributing factor to the privatization failure of the case of Cochabamba and may threaten success in the case in La Paz/El Alto. In the case of La Paz, the advantage of having a good quantity of water resources, makes policy design errors seem less dramatic.

Data available is not adequate to monitor progress towards achieving universal coverage. Although the indexes of coverage expansion show improvements, their future sustainability of these achievements, under an strict commercial logic, is fragile. A report from the World Bank concludes that, from a company's perspective, the new connections (for the poor) could well represent losses. Incentives don't exist for companies to carry out the necessary cultural re-engineering to increase the water consumption. The report also comments that the structure of tariffs, in which the unitary cost of water increases when the consumption is high, makes it "not profitable to serve homes with low consumption levels" (Foster Vivien, 2001).

Concessions are currently presented as an example of viable, efficient privatization, and with "pro-poor" effects. However, the problems are many. The users already denounce the bad quality and fragility of the works. In fact, a bad precedent has been set, since the commercial logic destroys the notion of "rights." While the promoters argue that the condominium system at least gives something to the poor, others denounce –among them the Neighbourhood Councils– that to make the privatization work systems of uneven quality are being institutionalized – good systems for the "rich" and bad systems for poor. The problem is mediocre access in a context of subordination and inequality.

In view of that, the two most interesting mechanisms, less expensive and more equitable from a socio-economic perspective –and even financial– to expand the services and to improve their quality seem to be the implementation of crossed subsidies and/or the implementation of a solidarity rate for low income consumers. The structuring and implementation of a crossed subsidies system in favour of low income users could become an important palliative for many of the households that can not pay their invoices and that, as a result of it, face services cuts from the service companies. However, it is certain cross subsidies alone will not be enough to reach a universalization in the access to the drinking water and sanitation. So, this policy of crossed subsidies must necessarily be articulated with the implementation of a solidarity rate.

Three conflict vectors emerge: in the first place, the blind search to commercialize water without a reflection on the social character of water or on the impact on peoples' livelihoods. In second place, there is the weakness of the State facing the power of the multinationals –in the conflict for water in Cochabamba, the State demonstrated absolute inability to negotiate, to regulate and to administer a water concession appropriately and in general, to represent and to defend the population's interests. The weakness of the Bolivian State, and the degree of captivity in front of the power of the companies is a reality and a permanent threat to the well being of the most vulnerable population. Finally, maybe the most troubling aspect revealed during the reforms affecting water provision is the democratic deficit in the privatization processes. The privatization experience in Bolivia and the formulation of the necessary legislation to promote it and to sustain it, unveiled the lack of the necessary transparency for participation and the lack of mechanisms for public scrutiny regarding one of the most sensitive topics as is the administration of water. In order to promote the privatization, the government has had to smuggle legislation,

distort approved laws and sign contracts with strong “confidentiality” clauses of that prevent public inspection. This is why one of the most troubling conclusions of this report is that, although the central objective of privatization – enlarging coverage of water and sewer systems to all citizens – regrettably marginalises from the concession gains big sectors of the population. These facts help to understand the drama in which the residents find themselves when they are excluded from the actions that concession companies, in theory, should develop. The companies are openly breaking their commitments as are the government and local authorities failing to assists those in real need.

Acronyms and abbreviations

AISA	Aguas del Illimani SA.
CADWAS	Capacity Development in Water Services
CEDIB Centro	de Documentación e Información Bolivia
EU	European Union
EUR	Euro
HDI	Human Development Index
INE	National Institute of Statistics
IFFI	Institute of Integral Feminine Formation
NGO	Non Governmental Organization
MECOVI	Survey of Improvement of the Living Conditions, National Institute of Statistics
NGT	National General Treasury
SEMAPA	Servicio Municipal de Agua Potable y Alcantarillado
SAMAPA	Servicio Autónomo Municipal de Agua Potable y Alcantarillado
UNESCO	United Nations Educational, Scientific and Cultural Organization
USD	American dollars

References

Aguas del Illimani, 2004, *Nuevos esquemas de PPP: El caso de Aguas del Illimani S.A. Concesión para los servicios de Agua Potable y Alcantarillado Sanitario en las ciudades de La Paz y El Alto - República de Bolivia,* Paper presented at Taller Realidad y Perspectivas Para el Desarrollo del Sector Agua y Saneamiento en la Subregión Andina, Lima, 22-23 de Marzo de 2004.

Aguas del Illimani, 2002, *Memoria anual*, La Paz – Bolivia,

Aguas del Illimani, 2001, *Memoria anual*, La Paz – Bolivia,

Castells, Manuel, 1977, *La Cuestión Urbana,* Siglo XXI, Barcelona-España.

Aguas del Tunari, 1999. *Contrato de Concesión de aprovechamiento de Aguas y de servicio Publico de Agua potable y alcantarillado Sanitario en la ciudad de Cochabamba*. Cochabamba. Mimeo.

Foster Vivien, 2001. *Economic and Financial Evaluation of El Alto Pilot Project: Condominial Water and Sewage Systems and Related Innovations*, http://wbln0018.worldbank.org/eap/eap.nsf/, accessed on 20 October 2004.

INSTITUTO NACIONAL DE ESTADISTICA –INE, 1992, Resultados Censo Nacional de Población y Vivienda, http://www.ine.gov.bo/, accessed on 20 June 2004.

INSTITUTO NACIONAL DE ESTADISTICA -INE (2001) Resultados Preliminares Censo Nacional de Población y Vivienda Departamento de Cochabamba, http://www.ine.gov.bo/ accessed on 12 July 2004.

Karol Jorge, 2000, **La trama institucional de la ciudadanía urbana: lecciones de la privatización de servicios domiciliarios en Argentina**. Paper presented at International Congress of the Latin American Studies Association: Cities, Citizenship and Quality of Life, The Hyatt Regency Hotel, Miami, March 16-18, 2000

Laurie Nina and Crespo Carlos, 2002, *An Examination of the Changing Contexts for Developing Pro Poor Water Initiatives Via Concessions. The Cases of Cochabamba and La Paz-El Alto*, Newcastle: DFID

Ledo Carmen, 2004a, *Inequity and social exclusion in the access to drinking water in La Paz and Cochabamba-City,* Unpublished manuscript

Ledo Carmen, 2002, **Urbanisation and Poverty in the Cities of the National Economic Corridor in Bolivia. Case Study: Cochabamba**, Delft University Press (DUP), PO Box 98, 2600 MG Delft, The Netherlands. info@library.tudelf.nl. ISBN 90-407-2306-0.

Ledo Carmen, 2001, **Inequity and social exclusion in the access to water in Cochabamba-City**, Paper presented at International Conference: "Water, Poverty And Social Development" The Rôle Of Water In History And Development, International

Water History Association (IWHA) and Comparative Research Programme on Poverty (CROP) 10-12 AUGUST 2001, University of Bergen

Ledo Carmen, 2000, “Urbanización, Estructura Productiva y Empleo en Bolivia”. In: **TINKAZOS,** Revista boliviana 6 de ciencias sociales, EDOBOL, La Paz, Bolivia pages 79-120.

Ledo Carmen, 1999, **La Urbanización y los procesos de redistribución espacial de la población boliviana** Paper presented at Second European Congress of Latin-Americanist, September 4-8, 1998,Halle. CD-ROM, Folder A1, Ledo, p.1-20. Thomas Bremer y Susanne Schütz. Halle: Martin-Luther-Universität Halle-Wittenberg. ISBN 3-86010-539-6 Electronic: http://www.ceisal98.uni-halle.de/eingan.htm

Ledo Carmen, 1993, “La problemática del agua en la ciudad de Cochabamba”**,** Master Plan of Drinking Water of the city Cochabamba, SEURECA/CGL/SEMAPA Cochabamba - Bolivia.

Ledo Carmen, 1986, *Estructura Urbana Interna, Desigualdad Social y Mortalidad Infantil: El caso de Cochabamba*, CELADE, Santiago - Chile.

LECG, LLC , 2001, **Study of Prices And Rates of Aguas Del Illimani SA. - Period 2002 -2006**, AISA, La Paz - Bolivia.

Lojkine Jean, 1981, "Análise Marxista do Estado", en Revista de Estudos Regionais e Urbanos, Año 1, Número 1. Brasil. P. 57

Maldonado Rojas, Gonzalo, 2002. *Sistema de regulación del sector aguas en Bolivia,* Paper presented at VII Congreso Internacional del CLAD sobre la Reforma del Estado y de la Administración Pública, Lisboa, Portugal, 8-11 Oct. 2002, Panel: Dilemas en la Reconstrucción de Institucionalidades Regulatorias, Lisboa, Portugal

Morales Rolando, 1995, *The human development in the mountains*, PNUD-HAM La Paz.

Quijano Anibal and Singer, Paul, 1976; “*Urban and Regional Development in Latin America, Problems and Politics” In* Luis Unikel and Andres Necochea , Ed, Cultural Economic Fund, Mexico.

Salinas Cayo, 1998, *Informe Final, Auditoria Legal del proceso de Concesión del servicio publico de agua potable y alcantarillado en las ciudades de La Paz, El Alto y sus alrededores*, Ministerio de Comercio Exterior e Inversiones, La Paz – Bolivia.

Solares Humberto, 1990, *Las políticas de vivienda del Estado Boliviano*, IIA-UMSS, Cochabamba - Bolivia.

Superintendencia de Aguas, 1997, *Contrato de Concesión Aguas del Illimani*, La Paz, mimeo.

Shultz Jim, 2004, *Another Water Revolt Begins in Bolivia*, Volume 60 - December 18, 2004 The Democracy Center, revised 20th January 2005: http://www.democracyctr.org.

Szmukler Alicia, 1996, *"Políticas Urbanas y democracia",* Tesis de Maestría, Instituto Latinoamericano de Doctrina y Estudios Sociales (ILADES), Santiago de Chile.

Tapia Verónica, 2000*, Monopolio Natural del Servicio de Agua Potable. Caso en las Ciudades de La Paz y El Alto, TESIS DE GRADO, UMSA, La Paz – Bolivia.*

Uzín Luis Guillermo, 1998, *Concesión de Aprovechamiento de Aguas y Concesión de Servicios Publicos de Agua Potable y Alcantarillado en las Ciudades de La Paz , El Alto y sus Alrededores*, Paper presented at Conference PPPUE Conference Paper Series, Volume II, Lima Peru.

United Nations, 2003, *Internacional Year of Drinking Water 2003*, document prepared in Spanish by División de Noticias y Medios de Información del Departamento de Información Pública, revised February, 2004.

World Bank, 1997, Facilitating Private Involvement in Infrastructure: An Action Programme, http://www.worldbank.org, revised January, 2004

World Bank, 1997, The Bank's Position Regarding the Improvement of Water Supply to Cochabamba, Washington: World Bank (www.lostiempos.com) revised June, 2004

World Bank, 1998, Memorandum of the President of the International Development Association and the International Finance Corporation to the Executive Directors on a Country Assistance Strategy of The World Bank Group for the Republic of Bolivia. Available at htpp://www.worldbank.org.

World Bank , 1999, Bolivia: Public Expenditure Review Report No. 19232–BO, Washington, DC.

Yáñez César, 2001, *Institutions and Development* - Magazines Nº 8 and 9, p p.299-324. Institut Internacional de Governabilitat de Catalunya, Còrsega 255, 5º 1ª 08036 Barcelona, Espanya. Available at: http://www.iigov.org/iigov/pnud/bibliote/revista/revista8_9/docs/revis8_09.htm