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**EXAME OF THE PRIVATE SECTOR'S
PARTICIPATION IN THE PROVISION OF WATER
SUPPLY AND SEWAGE SERVICES IN BRAZIL**

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CONTENTS

CONTENTS	1
1. OBJECTIVES AND GENERAL METHODOLOGICAL APPROACH.....	2
1.1 OBJECTIVES	2
1.2 GENERAL METHODOLOGICAL APPROACH.....	3
2. IMPACT ASSESSMENT METHODOLOGY.....	12
2.1 OVERVIEW	12
2.2 PSP OBJECTIVES.....	15
2.3 CAUSAL LINKS BETWEEN PSP AND PROCESS OBJECTIVES.....	19
2.4 OBJECTIVES AND INDICATORS	24
2.4.1 Product indicators (immediate results)	25
2.5 INTERMEDIATE RESULTS INDICATORS.....	28
2.6 IMPACT OR END-RESULT INDICATORS	29
2.7 ANALYTICAL CONSTRAINTS.....	33
3. CUSTOMER SATISFACTION COMPARISON.....	36
3.1 SAMPLING DESIGN.....	50
3.2 INFORMATION PROCESSING	54
4. METHODOLOGICAL APPROACH TO DETERMINING FISCAL IMPACTS.....	60
4.1 OVERVIEW	60
4.2. PSP FISCAL IMPACTS ASSESSMENT METHODOLOGY	62
5. METHODOLOGICAL APPROACH TO ASSESSING THE IMPACT OF VARIOUS FORMS OF PSP AND INSTITUTIONAL ARRANGEMENTS	64
5.1 OUTLINE PROVIDED BY MODERN REGULATION THEORY	64
5.2 RELEVANT ASPECTS TO REGULATORY FRAMEWORK CHARACTERIZATION.....	70
6. REFERENCES.....	83
ATTACHMENT I.....	85
ATTACHMENT II.....	88
ATTACHMENTO III.....	96



1. OBJECTIVES AND GENERAL METHODOLOGICAL APPROACH

1.1 OBJECTIVES

The purpose of this study is to examine the impact of the Private Sector's Participation – PSP in the provision of water supply and sewage services in Brazil, answering three fundamental questions as posed by the Terms of Reference:

Question #1 - What is the impact of the Private Sector's Participation on the performance of firms in the provision of water supply and sewage services?

Question #2 - What is the impact of the Private Sector's Participation on households as regards the access to and quality of services provided?

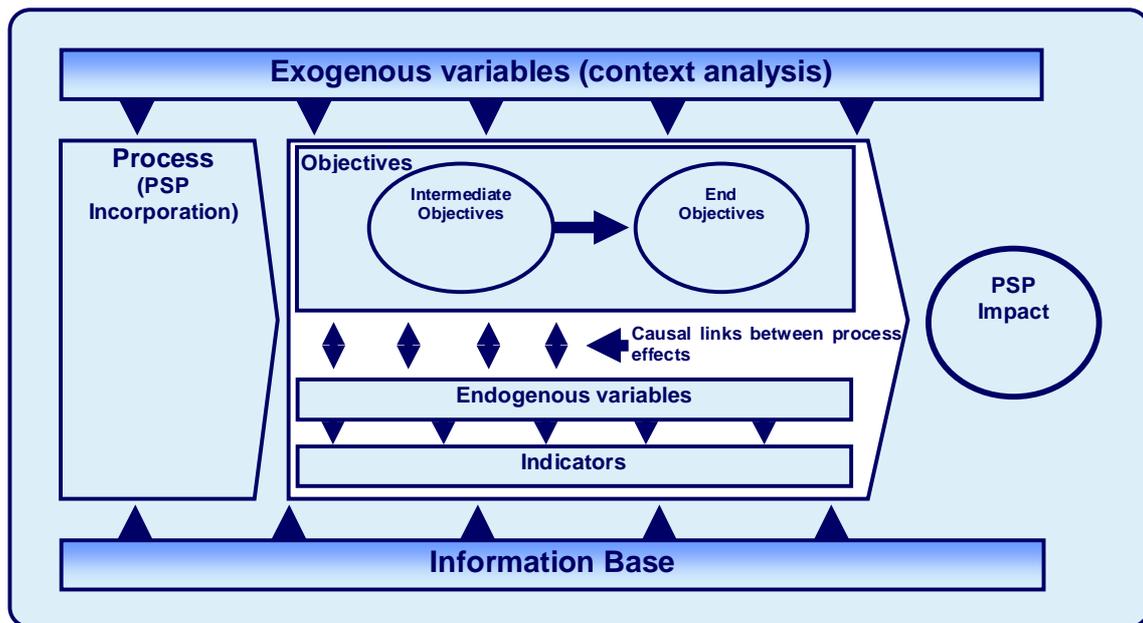
Question #3 - What is the fiscal impact of the Private Sector's Participation?

From the Consultant's perspective, there is a fourth question the Terms of Reference makes reference to, but is not highlighted as one of the study's objectives. This question concerns how the different forms of PSP and their institutional arrangements affect the overall PSP results. Additional questions relate to this topic: What aspects have the most influence on results? What regulatory framework-related topics require improvement in the future, when it comes to designing a PSP? The methodology proposed by the Consortium includes several analyses explicitly intended to answer this group of questions.

1.2 GENERAL METHODOLOGICAL APPROACH

Before discussing the specific methodological approaches suggested to address the various areas of concern, it is worth providing a logical organization of the topics to be investigated. Figure 1 shows a schematic that summarizes these consultants' view, based on a review of the state of the art in impact assessment methodologies.

Figure 1



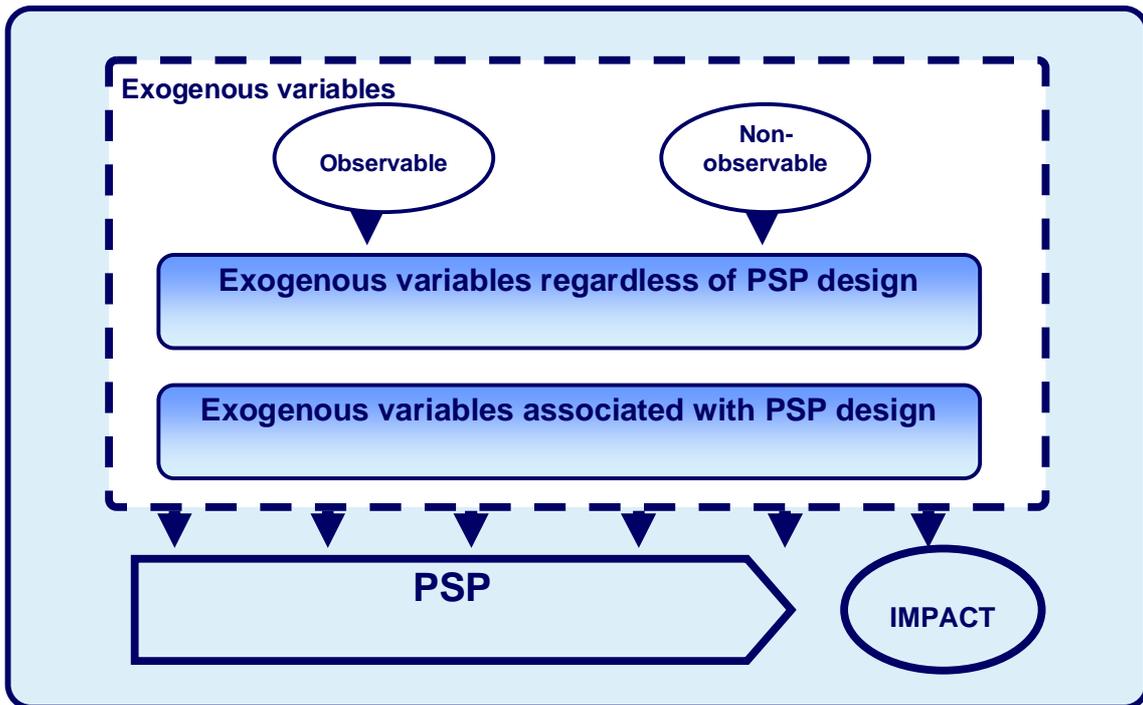


The figure shows a schematic of the typical relationships associated with an impact assessment and their sequence, applied in this case to the context of the project. Firstly, the **Process** whose impact is being assessed is the incorporation of PSP into the provision of water supply and sewage services in Brazil, with objectives or goals than, within the context of this preliminary analysis, can be divided into two major areas: intermediate objectives and end objectives. The latter correspond to the ultimate reason for the attempt to transform the provision of sanitation by means of PSP, that is, to attain a significant increase in the well being of users at a minimal cost; intermediate objectives are all the goals that indirectly assist attaining the end objective, that is, goals for increased service coverage, investment level, efficiency standard, an economic and financial balance capable of assuring long-term permanence of the end objectives, service quality, etc.

Each of these sets of objectives can be associated with a set of variables that PSP is expected to modify (endogenous variables). In turn, in order to determine whether the path of these variables was affected by the PSP and the magnitude of any changes, one must establish indicators capable of a quantitative measurement of the achievement of objectives and the degree of achievement. Identifying and selecting these indicators involves analyzing cause-effect relationships between associated objectives and determining the availability of the information needed to perform measurements.

Finally, the effects of PSP are conditioned by exogenous variables that determine the general context for development. Figure 2, below, attempts to shed light on what this study refers to as exogenous variables.

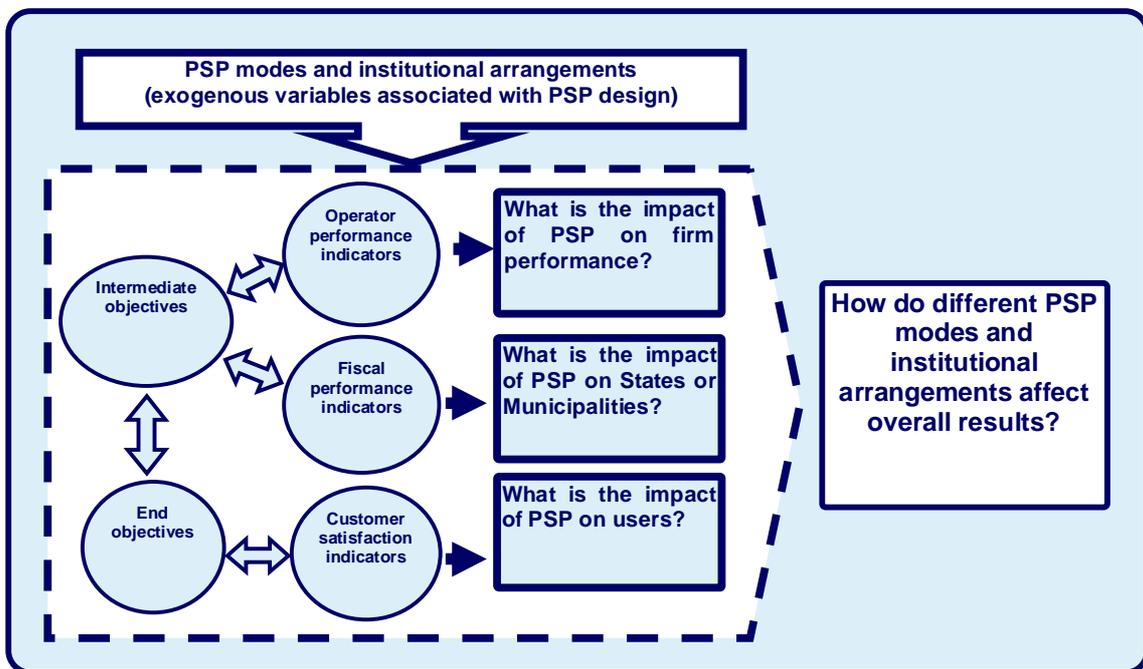
Figure 2



Exogenous variables can be categorized as observable and non-observable. The latter are part of the statistical concept of “error” and cannot, therefore, be quantitatively examined herein. The scope of the study includes, however, analysis of observable exogenous variables, which can be divided into two further cases: those that have been or may be modified by the design of the PSP, either before or during implementation. This includes aspects relative to the various existing PSP modes and institutional arrangements, that is, variables linked to the PSP’s “regulatory framework”. These variables will be studied throughout the project in order to determine their impact on the PSP’s overall performance. The remaining external variables that may have a bearing on results and help characterize the framework, but do not concern regulatory aspects, will also be examined as the study progresses so that they can be incorporated to impact assessments as control variables.

Figure 3, in turn, shows the links between objectives and indicator types, in addition to the questions this study hopes to answer.

FIGURE 3



Intermediate objectives will be examined based upon operators' performance indicators operators' performance indicators, in an attempt to answer Question #1: What is the impact of the Private Sector's Participation on the performance of firms in the provision of water supply and sewage services? In addition, the same intermediate objectives will allow studying indicators associated with the tax performance of Municipalities or States where PSP occurs, in an attempt to answer Question #3: What is the fiscal impact of the Private Sector's Participation?



As for the end objectives, we will study the impact of PSP on variables and customer satisfaction level indicators to answer Question #2: What is the impact of the Private Sector's Participation on households as regards the access to and quality of services provided?

Finally, the preceding models and analyses will answer questions relative to how the regulatory and politico-social framework influences PSP results. In this context, we will attempt to answer the following questions: How do the various PSP modes and institutional arrangements affect overall results? What models have the most influence on results? What regulatory framework-related topics require improvement in the future, when it comes to designing a PSP? What are the differences in terms of regulatory framework between PSP and non-PSP cases? This is Question #4 that the project attempts to answer, as discussed earlier.

Four classes of indicators will be used to examine **operator performance**:

- a) Operating indicators – chiefly intended to measure the quality of the service provided from the operator's perspective, based on four kinds of quality assessment:
- Asset quality – comprehending all aspects relative to bacteriological and physical-chemical quality of the water supplied, as well as of the effluents dumped into receiving areas.
 - Technical service quality – involving technical aspects relative to installed infrastructure, such as network maintenance, emergency service, leak statistics, average complaint service time, distribution



losses control, micro-measurement coverage, and service continuity, among others.

- Customer service quality – concerning every commercial aspect involved in relationships with customers. This item includes commercial invoicing procedures, commercial complaints service, new service requests, invoicing accuracy, waiting time at commercial branches, etc.
 - Environmental conservation – relative to the coverage and operation of sewage treatment plants and final destination.
- b) Financial indicators – intended to measure utilities’ financial performance and efficiency standards in aspects such as net profit throughout the concession period, expenses-to-net revenues, operating margin-to-net revenues, EBITDA-to-net revenues, economic cost of providing water supply and sewage services and identification of productivity gains as compared to the quality of the services provided, electric power efficiency, operating efficiency indicators, level of investment in commercial management information systems, and collections efficiency indicator.
- c) Investment indicators – intended to investigate the physical and monetary progress associated with service indexes stipulated for the concession and verify compliance with such indexes. We will establish indicators to measure total investment levels, including own, governmental and financing funds, both made and upcoming, in annual and *per capita* terms.
- d) Charges and subsidies (macro view) – we will examine the evolution of water and sewage charges from the beginning of the concession to the



present as compared to appropriate price indexes for the industry, in an attempt to determine the behavior of charges against inflation. The depth of the analysis will depend on the amount of historical information available.

The information sources to be used to gather data on the performance of firms will be the available secondary databases, such as SENS, and information from the services providers and institutions involved, to be gathered on the field as the project advances.

It is worth noting that quantitative analyses of the operators' performance will be supplemented with quantitative ones based on key-player survey results and interviews to be had with operator employees, regulators, local governments and other relevant institutions.

Three aspects will be assessed to analyze the **tax performance** associated PSP implementation:

- Change in public debt- and public deficit-related expenditures as a result of PSP;
- Changes in the Municipality's or the State's disbursements or revenues relative to PSP; and
- PSP transaction cost indicators, measured as percentage of the operator's net revenues and to include regulatory costs and other expenses incurred by the Municipality or the State in order to play this role, including such as bidding process expenses – from Invitation to Bid preparation, through the executive design, to the effective characterization of the subject of the bid – and judgment, concession grant and agreement preparation.



The information sources to be used to gather data on the fiscal impact will be those available from the institutions involved in each local case.

From the **customer satisfaction** perspective, the first aspect worth noting is that analysis will involve differentiating the measurement of the impact on poor and non-poor users, and the Consultants' experience with analyses of this kind in Brazil indicates that the population must be divided into these two segments because their satisfaction levels have different characteristics and substantially different results.

The information to be used to measure customer satisfaction will be obtained by means of a survey with poor and non-poor households. The purpose of the survey is to use methodologically strict procedures to gain a view of the relevance (importance) customers assign to each dimension of the product/service received (water supply, sewage collection and commercial service) and determine their forming attributes, as well as their appreciation of the concessionaire's performance on each such attribute.

The foregoing survey will also compile information from users on the charges they pay for the services received and the impact bills have on their income. At the same time, we will obtain a reliable history of the scope and impact of the social charges policy implemented by the concessionaire or other mechanisms to facilitate access to lower-income population layers, such as direct or indirect subsidies and social programs, to name a few. Furthermore, the survey will gather data to determine users' defaulting levels.

In addition, the survey will also investigate topics relative to the coverage of water, collection and treatment services and the final destination of sewage in order to



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assess coverage in specific service areas, including low-income areas and those located in the periphery of the service areas; we expect this to provide data on the magnitude of the no-service customers problems and on the reasons for this situation. Notwithstanding, for the purposes of a quantitative assessment of water and sewage coverage in specific areas, the information gathered by means of the survey will be supplemented with specific information operators may have on the subject, to be compiled as the work progresses.

Finally, as concerns **the impact of PSP modes and institutional arrangements on PSP results**, and according to the outline provided by modern regulation theory, we attempt to distinguish the analysis of structural aspects from those associated with the conduct of the actors involved. We expect to answer questions such as: how do different PSP modes and institutional arrangements affect overall results?; what aspects have the most influence on results?; what topics associated with the regulatory environment require future improvement when it comes to designing a PSP?; what are the differences in terms of regulatory framework between PSP and non-PSP cases?; and what is the impact of these differences on results?

The quantitative analyses to be done of these matters will be limited; as a result, the corresponding qualitative analyses will be very important to provide guidance, validate and any quantitative results. To this end, the key-players survey will be very important, as will information from services providers and institutions at the local, state and federal levels.



2. IMPACT ASSESSMENT METHODOLOGY

2.1 OVERVIEW

In the context of public policies or program analysis, or in the absence of these, but the presence of private sector participation, an impact assessment is defined as a rigorous, objective, independent and systematic procedure intended answer questions such as:

- Did the process have the expected effect on individuals, households and institutions?
- Did it contribute to solving the problem that necessitated the process?
- Did the recipients of the goods and services provided by the process effectively benefit from them?
- Can the effects be truly traced back to the process?
- Were there positive or negative unanticipated effects of the process on the beneficiaries?
- Did the benefits effectively reach specific population groups, particularly low-income ones?
- How did the process affect beneficiaries?
- How might the process be mended to improve its effects?

These and other similar questions are aimed at establishing the effectiveness of the private sector participation process. Together with the analysis of the costs of the resources involved — which are necessarily scarce and have alternative uses — we will determine the “efficiency” dimension of the relevant process. This



method focuses analytical efforts on the quantitative and qualitative “results” of the process in the short, medium and long run.

The analytical boundaries will include, firstly, results showing whether the activities comprehended by the process had the expected effects, that is, whether they reached the intended target public and at what magnitude. This concerns the most immediate effect of the process and includes the quality of the goods and services provided. Secondly, the so-called “intermediate” effects, which include changes in the beneficiaries’ behavior, attitude or status since they became recipients of the goods offered. Finally, the end results (impact) of the private sector participation process are considered as the most important effects the process had on the problem at hand.

This analysis is fundamental, insofar as it is essential to the method do explicitly establish causal links between the process elements and the expected results, that is, to investigate whether the goods and services provided contribute to the attainment of expected benefits.

Another essential aspect to address concerns the need to identify individual internal factors — the consequence of the process and of external factors — that normally affect intermediate or end results, but are not under control of the process.

The results of the private sector participation process, particularly as regards products, are analyzed quantitatively by means of quantitative performance indicators that measure the evolution of production levels of goods and services associated with the process, including quality-related aspects, and qualitative indicators, such as user satisfaction with the products offered.



The process's quantitative results can be analyzed by comparing the pre- and post-implementation status. A comparison can also be drawn with established goals, or with predetermined technical or quality standards.

As concerns intermediate or end results, the goal is to gather information on the beneficiary population to allow measuring behavioral or attitudinal changes, as well as benefits that can be attributed to the overall process.

In this sense, the impact of the process, α , is equal to the result variable (E) for individual i with and without the intervention of the private sector participation process:

$$\alpha_i = E_{1i} - E_{0i}$$

where E_{1i} is the result achieved by individual i with the process and E_{0i} is the result such an individual would have in its absence.

A central issue for the analysis arises from the impossibility of simultaneous observation of the situation of an individual with or without the process, as any projection what would have happened to beneficiaries in its absence must be derived from other sources of information. This analysis involves establishing the "counterfactual condition" of the process, which is indispensable to measuring its impact.

The most popular technique to establish counterfactual conditions is to study the situation of similar individuals who were not party to the process and are used as a "control group". Based on this, a comparison can be drawn between the



average results for participating and non-participating individuals. In order to mitigate the effect of non-measured exogenous variables, a double comparison is done between the two pre- and post-process.

The next section in this chapter describe aspects specifically related to the private sector participation process (PSP) in the provision of water and sewage services in Brazil.

2.2 PSP OBJECTIVES

For the purposes of this study, PSP processes shall be initiatives enabling the private sector to become partly or fully responsible for the provision of water and sewage services in Brazil. These explicitly includes full service concessions, BOT agreements for the production of drinking water or sewage treatment plants, full or partial services management contracts, and the incorporation of minority (but controlling) private stakes in public or State-owned companies. This analysis excludes the outsourcing of certain specific tasks (such as network maintenance, billing and others) that are limited in scope.

An early methodological task is to establish the explicit and implied objectives of implementing a PSP process. Generally speaking, it is understood that a PSP's ultimate goal is to **improve the living standards of service users by meeting the demand for water and sewage at appropriate quantities and an appropriate quality**. Possibly, in some cases, there is a special concern with improving the situation of lower-income households. Generally speaking, there is also a concern with reducing the pollution of sewage receiving areas in order to meet environmental standards and thereby improve the quality of living of the population served. Finally, it is likely that reducing the financial burden on the



Municipal, State or Federal Government may be a relevant concern in and of itself.

The objectives of each PSP will be determined by analyzing the nature and the structure of the contracts incorporating the private sector, as well as the information obtained in interviews with relevant actors, in particular the granting power that sponsored the process in each relevant municipality.

Initially, and in light of the contract types adopted in Brazil, as well as of the experience overseas, the following core and subsidiary objectives can be anticipated for PSP processes:



TABLE 1

Contract Type	Core Objectives	Subsidiary Objectives
Full water service concession	<ul style="list-style-type: none"> • Expand water services coverage, specially to low-income households. • Increase the system's production and distribution capacity. • Improve water service quality, including user service. • Meet investment goals. 	<ul style="list-style-type: none"> • Improve service efficiency. • Provide and attract investment funding. • Reduce the financial burden on the municipality or state. • Establish a long-term sustainable solution.
Full sewage service concession	<ul style="list-style-type: none"> • Expand sewage services coverage. • Increase used water treatment capacity. • Improve sewage service quality, and compliance with environmental standards. • Meet investment goals. 	<ul style="list-style-type: none"> • Improve service efficiency. • Incorporate used water treatment systems technologies and expertise. • Provide and attract investment funding. • Reduce the financial burden on the municipality or state. • Establish a long-term sustainable solution.
Water production BOT	<ul style="list-style-type: none"> • Increase drinking water production capacity. • Meet physical, chemical and bacteriological standards for the water distributed. 	<ul style="list-style-type: none"> • Provide and attract investment funding. • Improve drinking water production efficiency. • Reduce the financial burden on the municipality or state
Sewage treatment BOT	<ul style="list-style-type: none"> • Expand sewage treatment capacity. • Meet sewage disposal standards. 	<ul style="list-style-type: none"> • Provide and attract investment funding. • Improve sewage treatments efficiency. • Incorporate used water treatment systems technologies and expertise. • Reduce the financial burden on the municipality or state.



Contract Type	Core Objectives	Subsidiary Objectives
Full or partial management contract	<ul style="list-style-type: none"> • Improve service management on some or all dimensions. 	<ul style="list-style-type: none"> • Improve service efficiency. • Improve service quality, particularly as regards attention to users. • Improve the services provider's financial situation.
Equity stake in a state-owned company	<ul style="list-style-type: none"> • Improve coverage, capacity and service quality. 	<ul style="list-style-type: none"> • Improve service efficiency. • Provide and attract investment funding. • Reduce the service's fiscal burden.

The foregoing objectives represent the most typical baseline situations in the various PSP modes. Concession contracts normally set explicit service coverage goals to be attained over the years; investment goals over certain periods of time, with more or less detailed specification; quality and user service goals. Those contracts also specify what goals apply to certain predetermined geographies (the concession's operating territory or service area). Coverage goals may be set globally or specified by sub-region or sub-area.

Some Full Concession contracts may lack explicit service coverage expansion goals and refer chiefly to global investment amounts or other indicators. Even so, the study will establish and analyze relevant coverage changes seen during the concession period and measure the impact associated with them. Note that impact is assessed separately from analysis of compliance with the contracts per se, which is a different analytical dimension.



In these cases, it will be important to stipulate the contract's explicit objectives and the possible reasons why specific coverage goals were not incorporated, as is traditional.

BOT contracts, on the other hand, very specifically bind the private actor to the provision of certain minimum levels of *in natura* or treated water per concession year at certain points of the distribution network, or to the treatment of certain minimum volumes of sewage, at predetermined parameters and certain points downriver of sewage collection networks.

Full or partial management contracts are limited in the sense that their core objective concerns improving various service management indicators and that they do not hold private operators responsible for financing investments or expanding or replacing services.

Finally, we come to the case of the incorporation of private agents into the equity of state-owned companies. Specific objectives may vary from one case to another, which will have an effect on the terms of incorporation and the characteristics of the regulatory framework that governs the company in question. In general, there is an attempt to incorporate managerial know-how to improve productivity, the financial and commercial situation, and possibly get access to funds needed to finance investments in expansion or improvement.

2.3 CAUSAL LINKS BETWEEN PSP AND PROCESS OBJECTIVES.

An essential element of the impact assessment methodology is establishing the actual causal link between incorporation of a private manager and the outcome of the process. We point out, next, actions private operators typically adopt upon



taking over the service and that are essential to achieving the objectives. Our analysis will survey these and other actions on their qualitative aspects at least, to determine their impact on results and, specially, on the products.

In cases of full concession and, possibly, equity stake in a state-owned company with control over managerial decisions, it can be stated out right that private operators have taken the following essential steps:

- Taking control over management by appointing experienced key executives and implementing new managerial control systems.
- Realigning the main management processes at all areas of the company, to cut costs and increase revenues, including, mainly: user registry alignment, implementing collection and debt-recovery policies, implementing policies to reduce freeloader users, implementing charge adjustments as allowed in contract or proposed ex-post, installing micro-water meters, resizing personnel requirements by firm type and area, inclusion of outsourcing contracts where convenient, etc.
- Developing dissemination and communication processes and actions aimed at service user and non-user communities.
- (possibly) Implementing emergency investment programs to reduce water production and distribution “bottlenecks”, cut losses, reduce sewage pipeline cracks, and cut costs on all service production processes.
- Implementing commercial programs intended to better serve users and control service quality.
- Managing cash surpluses to fund increasing investment.
- Designing optimized investment plans and determining funding needs by source.



- Financial management intended to raise funds in the short term with the commercial or development banking system investment, and in the long and medium term with multilateral agencies and, occasionally, the stock market.
- Injecting supplementary funds needed to finance investment programs.
- Carrying out broader investment plans to expand and replace services.
- Creating a culture of optimizing the use of the company's resources.

In BOT contracts for drinking water production or sewage treatment, cause-effect links are more straightforward and involve, essentially:

- Optimized water production or sewage treatment works designed by experienced professionals.
- Financial management intended to raise funds in the short term with the commercial or development banking system investment, and in the long and medium term with multilateral agencies and, occasionally, the stock market.
- Investment plan implementation.
- Operating systems according to cost-optimizing criteria and compliance with established norms or standards.

Full or partial management contracts usually replicate the elements noted for concession contracts, except as regards investment-related topics. The relevant issues, here, concern the private manager's effective ability to take over services with clearly defined responsibilities, a clear relationship with the granting power and firm personnel, and the dependence of results on actions for which the granting power is responsible, etc.

Where private actors are incorporated into state-owned companies as stockholders with managerial control, the actions to be implemented will depend

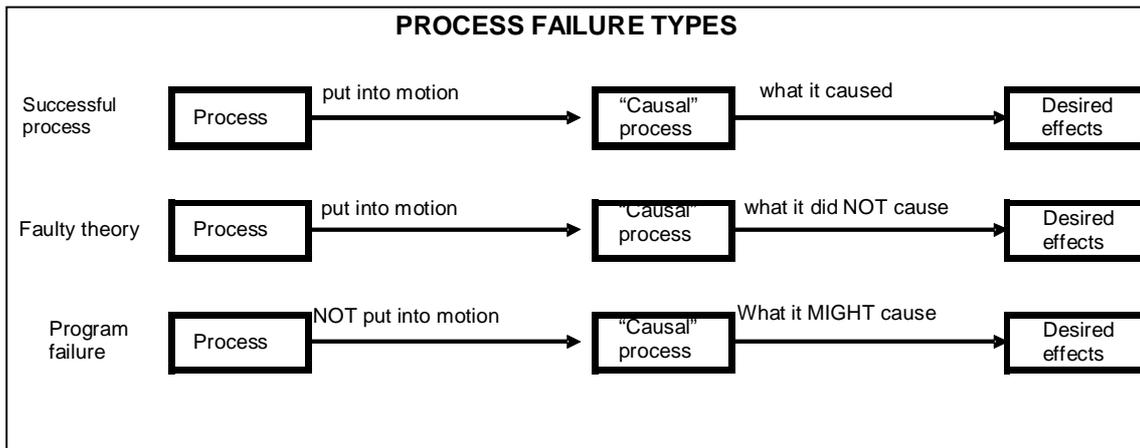


on the contracted terms and conditions, even if these generally include many of those listed for full concessions, with the constraints created by management of a state-owned company with the controls and limitations that the State may have set as a shareholder.

As the study progresses, it will be interesting to gather information on the above aspects to verify causal links present in PSP and enable assigning expected results to specific actions on the part of the private actor. This will also allow detecting in what areas private operators have not acted, distinguishing cases where action was not needed from others where contractual or political circumstances prevented it, thereby impacting the effectiveness of the PSP process.

It is educating to describe the relationship between the process and its results, and the causes of possible failure. The diagram next shows that a private sector participation process is successful where it truly materializes and where the actions relative to the implied causal link method have successfully attained the desired effects.

FIGURE 4



A PSP's "theory" is considered faulty where, despite implementation, the desired effects were not attained because the implied causal links were simply not executed. This situation is illustrated by cases where deficient private incorporation processes (lack of skill, lack of transparency, etc.), contracts with inappropriate incentives, or weak oversight capabilities lead to opportunistic behavior on the part of operators, which focus on monopolizing short-term gains by means of renegotiations, requests for charge hikes, etc., and therefore fail to produce the expected results.

Failures may also occur where the process is not implemented as designed, or implemented only partially. This usually arises from inadequate contract provisions that impose serious constraints on the private operator's freedom of action (e.g., inability to suspend supply to defaulters, inability to shift and reduce existing personnel, etc.), or from political changes detrimental to the process and leading to refusal to authorize agreed charge increases, unpaid bill campaigns, or from deficiencies in the granting power's action where fund injections are needed to complete works underway, etc.



2.4 OBJECTIVES AND INDICATORS

The impact assessment methodology normally makes an explicit distinction between intended objectives and short-, medium-, and long-term results. This categorization of results also reflects the various aspects of the PSP’s effect on process beneficiaries. The Box next shows the general relationships between objectives and results.

TABLE 2

RELATIONSHIP BETWEEN THE OBJECTIVES AND RESULTS OF A PSPS PROCESS

	OBJECTIVES	IMPACT METRICS (END RESULT)
END OF THE PSP PROCESS	Improve quality of living for water and sewage services users	Changes in user well-being: Improved health, comfort, reduced expenses, etc.
	SPECIFIC OBJECTIVES	PRODUCT METRICS IMMEDIATE OR INTERMEDIATE RESULTS
PURPOSES OF THE PSP PROCESS	Provide appropriate quantity and quality services	Network expansion, increased consumption, improved water quality, user service quality, etc.
	Fund and make necessary investments	Make and attract investments, release municipality or state funds
	Improve service efficiency (management contract)	Changes in specific management indicators

It is understood that the ultimate goal (or general objective) of every PSP process is to improve the living standards of water and sewage services users. These results are measured with IMPACT indicators, which attempt to establish the effective change in the well-being of beneficiary households.



Designing a PSP involves incorporating a series of specific purposes or objectives that are directly related to the general objective and usually include: providing or increasing services, attracting the necessary funding and carrying out the required investments, and, in the particular case of management contracts, improve certain management indicators. In this case, results indicators are defined as PRODUCTS (or immediate results), or INTERMEDIATE results, as indicated in the foregoing Box.

The indicators for products, intermediate and end results to be used in this study are specifically discussed next.

2.4.1 Product indicators (immediate results)

Based on the typical objectives of PSP processes as discussed earlier, we can build indicators concerned with expected products to reflect the more immediate and direct effects of the PSP process.



TABLE 3

Contract type	Product indicators
Full water service concession	Number of water connections
	% population served
	% low-income population served
	Consumption: metric-based consumption indicators, such as per capita consumption (cu.mt/household/month) and/or connection-based indicators
	Service continuity (hours of service per day, service interruption indicators)
	Standard pressure levels (compliant % of the served area)
	Physical-chemical quality standards (acceptable samples %)
	User satisfaction (complaints per 1,000 users per year, opinion polls on general and specific issues, such as commercial service, waiting time for service, etc.)
	Investment in expansion (e.g.: new Water Treatment Station or reservoir)
	Investment in replacement (e.g.: network replacement)
Full sewage service concession	Number of sewage connections
	Number of individual systems (where applicable)
	% coverage of sewage connections
	% coverage of sewage connections from low-income households
	% coverage of sewage treatment (% of users with treated sewage or % of sewage collected that is treated)
	Meeting sewage treatment quality standards (% of acceptable samples)
	User satisfaction (complaints per 1,000 users per year, opinion polls on general and specific issues)
	Investment in expansion (\$ per year) (e.g.: discharge ducts)
	Investment in replacement (\$ per year) (e.g.: network replacement)



Contract type	Product indicators
BOT water production contract	Supplied volume of treated water
	Water supply continuity (hours per day, days per year)
	Meeting water quality standards (% of acceptable samples)
BOT sewage treatment contract	Volume of sewage treated
	Treatment process continuity (hours per day, days per year)
	Meeting treated water and sewage standards (% of acceptable samples, treatment efficiency)
Management contract (contract-specific)	Commercial: collection rate; debt; user satisfaction (complaints or opinion polls)
	Technical: water unaccounted for, works oversight costs, systems operation costs, systems maintenance costs (\$/unit/year)
	Management/finance: No. of employees/1,000 connections; No. of skilled employees; managerial, commercial and finance processes cost per user
Equity stake in a state-owned company	Specific depending on the incorporation contract and the regulatory framework.



2.5 INTERMEDIATE RESULTS INDICATORS

The goal, here, is to establish elements showing changes in the beneficiaries' behavior that have a bearing on its ultimate impact.

According to the contracts typology discussed earlier, we can assume that results of this kind are not directly relevant to BOT contracts. As for the other contract types, the following intermediate results are expected:

- Percentage of irregular connections, where a reduction is expected as a fruit of improved commercial policies.
- Change in payment culture as measured by collection rates and defaulting user indexes.

Furthermore, the study will analyze indicators concerned with the operators' efficiency levels and financial situation pre- and post-PSP. Such indicators are not directly related to the products sanitation services generate, by stand as interesting elements for examination based on the project's objectives and on the questions to be answered based on it. Therefore, the following elements will be regarded as indicators:

- Number of employees per 1,000 connections.
- Unit power consumption indexes.
- Water unaccounted for.
- Default levels.
- Operating and maintenance costs indicators.
- Return ratios and other relevant financial indexes or ratios, such as dry liquidity.



The financial aspects of water and sewage services under concession will be analyzed based on documents such as balance sheets and sources and uses statements that the law requires of all privately-owned enterprises.

The sources of funds provide a clear picture of firms' current and long-term liabilities; furthermore, balance-sheet attachments usually provide details on the amounts, currency and terms of each credit operation done in the relevant period. Balance sheets also normally indicate capital injections by shareholders into the concessionaire. We will place requests for such information where not available from balance sheets or annual reports, we will request it.

Similarly, profits and losses statements show the net after-tax profits in each Concession year. These statements contain the detailed information needed to characterize the source of the profits, that is, anything that is associated with changes in yield sources, such as operating cost, depreciation and non-financial expense changes. The information will be collected directly from these statements, which we assume will be available.

2.6 IMPACT OR END-RESULT INDICATORS

Here, the main area of concern lies with the elements that determine the nature and magnitude of monetary and non-monetary benefits that accrue to users. To this end, it is helpful to draw a distinction between the situation of users that were connected to the service at the beginning of the PSP and that of users that were not connected at the time and would presumably remain disconnected in the "counterfactual" case.



For users that were connected to the water service before the entry of a private operator, the following will be considered by user class (poor and non-poor residential, industrial, commercial, etc.):

- Effective water consumption availability based on the mitigation or elimination of possible rotation, interruption, low distribution network or connection pressure, etc.
- Charges paid for water service by user class (consumption range, economic status, etc.), which may, in general, show an increase.
- Quantification of consumer surplus in light of changes in production systems capacity. This metric is derived directly from the cost-benefit analysis of projects of this kind and requires knowing the drinking water demand curve, which is used as a metric to evaluate marginal water consumption. We will attempt to determine the information needed on the price elasticity of demand from existing studies.
- (Possibly) Costs and volumes consumer from complementary sources of supply as alternatives to the public network (such as tanker trucks) due to supply interruption or poor water quality.
- (Possibly) Intra-household investment costs incurred by users to mitigate problems such as supply interruption, low pressure, etc. (use of water reservoirs, pumps, etc.).
- Health indicator relative to water-based diseases, in the event of improved water potability.



For those that were not connected to the water service pre-PSP, the following will be considered by user class (poor and non-poor residential):

- Sources of supply, costs and consumption availability in the unconnected status, including, in separate, the case of bootlegged connections.
- Charges paid and consumption availability, by consumer class, in the connected status.
- Costs – to the user – of connection to the network, including service provider charges and intra-household investments.
- Quantification of costs savings – reduced user expense – and changes in consumer surpluses due to changes in sources of supply. This metric is derived directly from the cost-benefit analysis of projects of this kind and requires knowing the drinking water demand curve, which is used as a metric to evaluate marginal water consumption. We will attempt to determine the information needed on the price elasticity of demand from existing studies.
- Quality of water from alternative supply sources and health indicator relative to water-borne diseases.

For those connected to sewage services, by user class:

- Charges paid for sewage service, which may, in general, show an increase.

For those not connected to sewage services:

- Type and cost of sewage disposal facilities prior to incorporation into the public service.
- Willingness to pay for sewage connection services based, for example, on “contingent valuation” surveys already done in many Brazilian cities.



- Determination of consumer surplus change, comparing willingness to pay for the service with effectively paid charges.
- Health indexes relative to diseases connected with inappropriate sewage disposal systems.

Where sewage treatment works are incorporated:

- The population's perception of and willingness to pay for reduced pollution of receiving water bodies, through contingent valuation surveys already carried out in many Brazilian cities. This population should include non-user beneficiaries, as represented by those living downstream from sewage discharges.
- Indicators of improvement of the sewage receiving body's quality, where relevant.

For public entities that are normally the granting power (Municipalities or States):

- Budgetary impact of the PSP, including incorporation and contract oversight costs, additional tax revenues due to increased service activity, reduced investment as compared to the "counterfactual" situation," and dividends received (where applicable).
- Projected sustainability of the PSP process in light of the perception of political authorities, conflicts during contract performance, attainment of goals set, the population's perception, etc.



2.7 ANALYTICAL CONSTRAINTS

Initially, this analytical methodology has two significant limitations. The first concerns the need for voluminous information on both the current state of the services and the pre-PSP status. Likewise, familiarity is needed with the beneficiaries' water supply and sewage disposal situation before connections were made available, as well as with information on their willingness to pay for certain services. The study's conclusions will be the more reliable, the more this information is available, subject to gathering, and of appropriate quality.

Another important limitation has to do with the absence of control groups with information based on services similar to those in question, but not involved in a PSP process, used to establish a "counterfactual" situation that would lead to a rigorous measurement of the process's impacts.

The limitations and biases this situation implies relate to the possibility that any changes in the indicators are not the consequence of the incorporation of the services into the PSP process, and that unknown exogenous variables may exist that affect results and might indicate that the impact of the process is being over- or underestimated.¹

The following are elements of relevance to this study that may induce biased results, with the respective possible mitigation methods:

¹ Clarke, Kosec and Wallsten's (2004) study in 18 cities with PSPs in Argentina, Bolivia and Brazil, using 28 control cities, shows that service coverage increased where PSP was incorporated, but did so as well in control cities, indicating that the net impact of PSP was not statistically significant.



- **History:** concerning facts had between the pre- and the post-PSP situations that have an effect on results but are unrelated to the process itself. They include factors such as: changes in national, regional or local economic circumstances with a possible impact on production costs; household incomes, and, consequently, demand for services; national or local political changes with an impact on the attitudes of regulators, granting powers and the public towards the private actor; climate changes with a possible effect on service provision (droughts, intense rains). To mitigate these effects, we will attempt to quantify the economic, political and climatic dimensions in the PSP's environment.
- **Maturity:** concerning the possibility that the impacts may be attributed in part simply to the passage of time or steps taken prior to the PSP. To mitigate these effects, we will attempt to gather information on the pre-PSP situation of services, identifying trends and causes.
- **Instrument issues:** corresponds to the fact that the very measurement of impacts may affect the results obtained. In this case, this may influence user satisfaction comparisons, such as determination of the supply status of previously unconnected households, which will depend on the imperfect recollections of the interviewees. Special caution is also needed on analyzing historical data where indicator measurement definitions or procedures have occurred.² Mitigating steps, in this case, include designing user questionnaires carefully in order to enable cross-corroboration of the information gathered and identifying unexplained changes in historic series that require careful review.

² A clear example can be seen from changes in the levels of water unaccounted for, resulting from the incorporation of macro- and micro-meters.



- **Selection:** this item has to do with the notion that Municipalities and States do not randomly incorporate PSP processes, but do so where a PSP is perceived as more likely to be viable and successful. We can assume that many cases exist where other municipalities entertained incorporating a PSP, but decided that it would not be technically, economically or politically viable and, therefore, refrained from developing such a process; one concludes that, in this case, the observed results overestimated the expected effects of application elsewhere. Two extreme and opposite cases that may affect the measurable success of a PSP exist: the first concerns cases where the systems were so degraded at first that, with small management interventions and little investment, significant improvements can be obtained in the short run (2-3 years); the second is the case where systems were in adequate operation and a PSP was incorporated merely to improve certain topical aspects, which is quickly accomplished.³ Identifying and characterizing the initial status of services prior to PSP incorporation is crucial in any attempt to exercise control through the selection factor.
- **Mortality:** concerns the fact that the available sample to determine PSP impact only takes into account services where the process met with reasonable success and therefore remains in operation. Incorporating recently cancelled PSP processes into the analysis would help mitigate this bias.

³ This situation is illustrated by PSP processed in Chile, intended mainly to increase used water treatment coverage. Clarke, Kosec and Wallsten (2004), too, shows that the initial situation of service incorporating PSP was rather better in terms of coverage than that of control services.



3. CUSTOMER SATISFACTION COMPARISON

The main purpose of this section is to determine how PSP processes impacted service quality as perceived by served customers. As such, the scope of this report includes defining what service quality means and the methodological proxy to be used to measure it.

The main challenge the project faces as concerns this section is how to design a measurement device (which may be referred to as *survey*) capable of providing an estimate as accurate as possible of comparative perceived service quality at present (post-PSP) and before (pre-PSP) in each of the municipalities to be included, conveniently grouped according to their similarities based on the cluster analysis done⁴. Further down in this section, we shed light on the various options available to perform such a comparison. We must, then, find the best way to contextualize the changes in the municipality's water concession management, be it by direct (making explicit mention to it in the survey) or indirect (seeking out relevant indications simultaneous with the PSP process, or limiting the comparison to a specific period of time) association.

⁴ For additional detail on the clustering process, see the relevant section.



We therefore expect the survey to be structured as follows:

- **Interviewee Profile Characterization.** This section aims to characterize the interviewee based on a series of variables such as:
 - ↳ Age.
 - ↳ Gender.
 - ↳ Household income.
 - ↳ Schooling.
 - ↳ Socio-economic class.
 - ↳ Household goods.
 - ↳ Etc.

Given that the study's success depends on the interviewees' ability to recognize and remember service quality changes associated with PSP processes in their municipalities, an accurate depiction of the respondent's profile is essential. Our initial estimate is that respondents to valid surveys should be women and housewives (the latter for a period equal to or longer than that since the beginning of the Municipality's PSP process), as they have more direct everyday contact with water in a larger number of different use circumstances:

- ↳ Cooking.
- ↳ Doing dishes.
- ↳ Laundry.
- ↳ House cleaning.
- ↳ Drinking.
- ↳ Etc.



Therefore, their better discernment of service quality is based on an intensive and daily use experience that other household members probably lack.

Another requirement respondents of a valid survey must fill is being currently connected to the network the concessionaire serves:

- If under full concession, the respondent must be connected to both the water and sewage networks.
- Where the concession is for water or sewage only, respondents must be connected at least to the service the concessionaire is providing. In these cases, only the section of the questionnaire that addresses the relevant service will apply.

Connection to the concessionaire's networks prior to the PSP process is not deemed a requirement, as we assume that specific needs (water, sewage network) were being met by different means, lending relevance to satisfaction gap measurement. Anyway, this section must include a question to determine whether the respondents were previously connected to the network or not and, if not, how they met their sanitation needs (water: wells, tanker trucks, bottled water, rivers, etc.; sewage network: direct dumping on the streets, use of septic tank, etc.) and how their quality of life improved in aspects connected with sanitation needs.

Another relevant item concerns specific determination of the impact of the drinking water bill on the interviewee's available income. In this sense, we propose including a question regarding the last water bill paid and obtaining



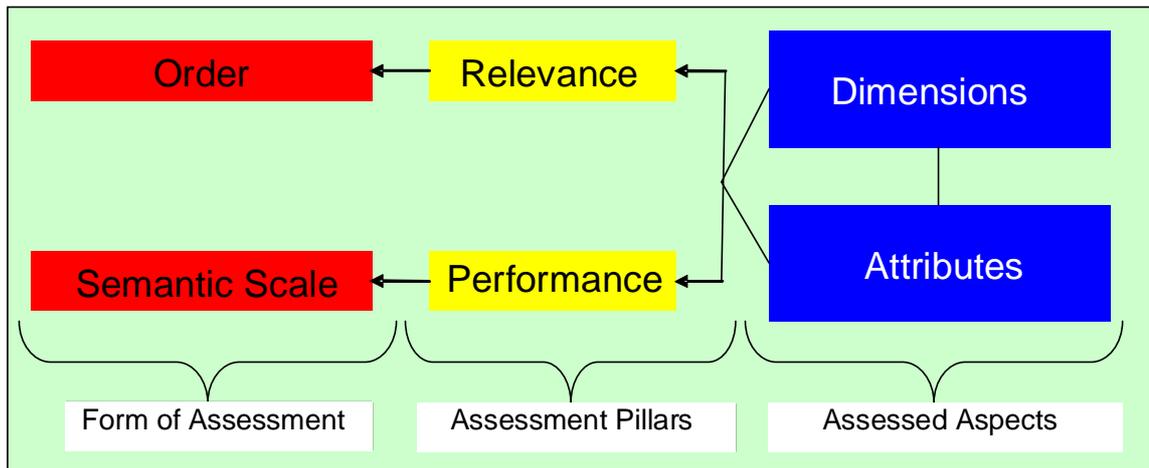
an estimate of household income through the interviewee's socio-economic class profile.

- **On PSP processes.** Before asking specific questions on perceived changes in concessionaire service and, therefore, in PSP processes, a series of initial questions is needed to determine whether a generally biased perception (whether positive or negative) exists on the involvement of private parties in firm ownership. With this, we will attempt to isolate such judgment of value from specific assessments by interviewees of the services rendered by concessionaires, as the perceived difference in service quality is a vector resulting from these two effects (general biases plus actual service quality changes).

It is unclear, so far, whether this section of the survey will be included before or after service quality assessments so as not to compromise the responses of interviewees that acknowledge such differences but are unaware of the fact that a PSP process has been implemented. This is because, as mentioned earlier in this section, we have not yet decided whether, for the purposes of generating the comparison, the PSP will be explicitly mentioned or there will be indirect contextualization with reference to events simultaneous with the PSP process or definition of a certain time window.

- **Assessment.** Based on the previous description, the section will be structured as follows:

FIGURE 4: Schematics of the Selected Measurement Model



As discussed, and in light of the experience of the consulting team with similar studies, we suggest structuring the survey along the following attributes:

↘ **Water Dimension.** Attributes:

- Color.
- Flavor.
- Smell.
- Potable/ treated.
- Supply reliability.
- Pressure.
- Deliverable value.
- Minimum charge.

↘ **Sewage Dimension.** Attributes:

- Treatment plants
- Reflux/ sewage blowback.



- Sewage obstructions.
- Cost.
- Smell.

↳ **Service Dimension.** Attributes:

- Collection.
- Service interruption notice.
- Service channels.
- Politeness.
- Flexible collection.
- Skill.

These dimensions and their attributes have been obtained and validated in the aforementioned study with SABESP in the State of São Paulo, and will be used as a starting point for this project, including, as an additional input, the judgment of the consultants and clients team.

Concerning the attributes and their dimensions, we will survey information relative to the **performance** of firms currently operating in the Municipalities, as well as to the perceived performance of the public concessionaire in operation prior to the PSP process; and to the relative **relevance** clients assign each one. To measure performance levels (satisfaction score), the Consultants will use semantic evaluation scales, whose main strength lies in reduced risk associated with the interpretation of qualitative responses offered by interviewees. In these scales, the classic “good, average, bad” scale gives way to a sentence that associates each such qualifier (good, average or bad) to a concrete fact. We provide, next, the semantics used and polished in previous studies for each of the attributes mentioned earlier:



↳ **Water:**

▪ *Color:*

- ✓ The water is always transparent and clear.
- ✓ The water is sometimes transparent and clear, but sometimes not.
- ✓ The water is often not transparent and clear.
- ✓ The water is never transparent and clear

▪ *Flavor:*

- ✓ The water is always pleasant to drink. It never tastes bad.
- ✓ The water sometimes tastes bad.
- ✓ The water often tastes bad.
- ✓ The water always tastes bad. It is never pleasant to drink.

▪ *Smell:*

- ✓ The water never has a smell.
- ✓ The water sometimes has a smell.
- ✓ The water often smells bad.
- ✓ The water always smells very bad

▪ *Potable/ treated:*

- ✓ The water is completely treated and potable and can be drunk without concern.
- ✓ I think the water is treated and potable, but I'm not sure.



- ✓ I think the water is neither treated nor potable, and is unfit for human consumption.
- ✓ I'm sure the water is neither treated nor potable, and is unfit for human consumption.

- *Regularity/ supply:*
 - ✓ Water is never unavailable.
 - ✓ Water is sometimes unavailable.
 - ✓ Water is normally often unavailable.
 - ✓ Water is always unavailable.

- *Pressure:*
 - ✓ The water pressure from the main is always appropriate.
 - ✓ In most cases, the water pressure from the main is appropriate.
 - ✓ The water pressure from the main is sometimes appropriate.
 - ✓ The water pressure from the main is never appropriate.



- *Deliverable value:*
 - ✓ I pay a fair price for the water because I know it is treated.
 - ✓ I pay a fair price for the water, even if I'm not sure it is treated.
 - ✓ I pay an unfair price for the water because I don't know what I'm paying for.
 - ✓ I pay an unfair price for the water because it is not worth the price charged.

- *Minimum charge:*
 - ✓ I have no problem paying the minimum 10 cu mt charge, even if I sometimes use less.
 - ✓ I am a little uncomfortable paying the minimum 10 cu mt charge, because I sometimes pay for more than I use.
 - ✓ I think paying the minimum consumption charge is unfair because I always pay for more than I use.

↳ **Sewage:**

- *Treatment plants: New attribute to be included; semantics to be defined.*

- *Reflux/ sewage blowback:*
 - ✓ Sewage never flows back from the street or drain.
 - ✓ Sewage sometimes flows back from the street or drain.
 - ✓ Sewage often flows back from the street or drain.



- ✓ Sewage always flows back from the street or drain.

- *Sewage obstructions:*
 - ✓ The sewage pipeline is never plugged.
 - ✓ The sewage pipeline is sometimes plugged.
 - ✓ The sewage pipeline is often plugged.
 - ✓ The sewage pipeline is always plugged.

- *Cost:*
 - ✓ I pay a fair price for sewage because I know it is collected and treated.
 - ✓ I pay a fair price for sewage, even if I don't know whether it is treated and where it goes.
 - ✓ I pay an unfair price for sewage, because I don't know what I'm paying for.
 - ✓ I pay an unfair price for sewage, because what is done is not worth the price.
 - ✓ I do not pay sewage charges.

- *Smell:*
 - ✓ I can never smell sewage from the street or drain.
 - ✓ I sometimes smell sewage from the street or drain.
 - ✓ I often smell sewage from the street or drain.
 - ✓ I always smell sewage from the street or drain.



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↳ **Service:**

- *Collection:*
 - ✓ I have never found a mistake in my water bill.
 - ✓ I have never found a mistake in my water bill, but I know people who have.
 - ✓ I have found mistakes in my water bill.
 - ✓ I always find mistakes in my water bill.

- *Service interruption notice:*
 - ✓ I don't recall service being ever interrupted.
 - ✓ When service is interrupted, I have sufficient forewarning.
 - ✓ When service is interrupted, I have little time to prepare.
 - ✓ When service is interrupted, I get notice at the last minute.
 - ✓ When service is interrupted, I never get notice.

- *Service channels:*
 - ✓ It is very easy to communicate with the Company.
 - ✓ It is easy to communicate with the Company.
 - ✓ Communication with the Company is usually difficult.
 - ✓ Communication with the Company is always difficult.



- *Politeness:*
 - ✓ Employees are always polite and attentive.
 - ✓ Employees are mostly polite and attentive.
 - ✓ Employees are seldom polite and attentive.
 - ✓ Employees are never polite and attentive.

- *Flexible collection:*
 - ✓ The Company always offers flexible ways to pay the bills.
 - ✓ The Company sometimes offers some bill payment flexibility.
 - ✓ The Company never offers flexible ways to pay the bills.

- *Skill:*
 - ✓ Employees are always able to solve problems.
 - ✓ Employees are usually able to solve problems.
 - ✓ Employees are not always able to solve problems.
 - ✓ Employees are never able to solve problems.



Dimensions (water, sewage network and service) are also assessed on less tangible concepts than their constituent attributes, based on the following scale:

- 5. Excellent
- 4. Good
- 3. Average
- 2. Bad
- 1 Terrible

The specific means of comparison between “before” and “after” will be determined based on pre-test results. Three paths are being considered:

- Have interviewees evaluate “before” and “after” using the scores and absolute grades discussed earlier.
- Have interviewees evaluate relative differences between “before” and “after” with sentences such as “now it is much worse than before,” “now is worse than before,” “now it is the same as before,” “now it is better than before,” “now it is much better than before,” etc.
- Use for each attribute a sentence that compares “now” and “before,” through which interviewees can indicate their level of agreement with the sentence. For example, concerning water color, the following statement might be provided: “The water you receive now is clearer than in the 1990s,” asking interviewees to choose one out of “fully agree”, “agree”, “neither agree nor disagree”, “disagree”, “fully disagree”. If this mechanism is used, negative positive (“the water is



now clearer than before”) and negative (“the water is now worse than before”) statements should alternate. This assessment mode corresponds to the “Discrepancy Modes”⁵ commonly used in satisfaction surveys.

To recap, the challenges this section poses to the project are two, basically:

- ↘ Finding the best way to contextualize differences: whether by direct reference to the PSP process, or by indirect contextualization through contemporary indications or the use of representative “before” and “now” periods.

- ↘ Finding the best means to capture differences in perceived service quality.

In order to obtain the relevance of each of these challenges, interviewees are asked to order the attributes and dimensions. They will first order water, sewage and service by relative importance. Having assigned priorities to the dimensions, the next step involves an ordering of the attributes in each such priority. Therefore, for water, they will be asked to order the attributes from 1 to 8 (or, depending on the final survey format, from 1 to 5) based on their importance; for sewage, from 1 to 5 (or 1 to 3), and, for service, from 1 to 6 (or 1 to 4). We will subsequently explain in the section dedicated to information processing how relevance percentages are obtained from this ordering. In addition, if needed, the regressions methodology described in

⁵ Level of agreement with expectations is related to satisfaction level.



the original proposal will be used where required to interpret the relevancies provided by the ordering method.

Finally, this survey section will also include a matrix of water uses and sources, as changes in use-source relationships may help indirectly detect changes in perceived service quality (for example, if prior to the PSP process only bottled water was used for drinking, and now water provided by the concessionaire is used as well, then there would be a perceived improvement in potability).

3.1 SAMPLING DESIGN

Given that this study's core objective is to determine the impact of PSP processes on service quality as perceived by users, the sampling design must take account of the fact that tolerable errors in the process must be relatively minor, so that a significant statistic comparison can be drawn. As a result, we must first consider the populations on which results are intended.

Therefore, samples must provide representative results for the strata made up of the combination of the following information layers:

- Different concession types:
 - ↳ Full Concessions.
 - ↳ Partial Concessions (BOT).
 - ↳ Mixed Concessions (where concessionaire ownership is shared by private enterprise and the State)
 - ↳ Management contracts.



- Clustering in the specific module at the beginning of the project: because a large variety of firms operate in Municipalities under certain types of concession, we will cluster the Municipalities and the firms operating therein to obtain more homogeneous comparison pools.
- Relevant end-customer segments. On this respect, we will analyze the proposed hypothesis concerning perception differences between the low-income population and the remainder⁶.

Therefore, the representative population will depend on the optimum number of groups within each concession type, obtained as a result of the clustering process. Furthermore, the optimum number of clusters does not have to be the same for each concession type. As a result, in concession types with a larger number of firms, there will probably be more cluster than in those with few firms and Municipalities (which, therefore, should have greater expected homogeneity). Notwithstanding. We consider an equal average number of distinct clusters per concession type, and the final number of populations to be represented is calculated as follows:

of distinct concessions (4) * # of socioeconomic segments (2)*

of clusters (n)= 8*n

Where n is the average number of clusters per concession type.

Considering that the main purpose of this section of the project is to compare pre- and post-PSP satisfaction indexes, the sample must assure a sufficiently low error level to enable accurate comparisons. Therefore, we initially estimate working with samples no smaller than 75 cases for each population, as a means of assuring

⁶ The term *high income* will be used in reference to non-low income groups.



relative accuracy of at least 8%, at 95% confidence, assuming standard error for the population on the assessment of the foregoing items lower than 20% of the maximum on the selected measurement scale.⁷

This implies, for example, that in order to know how the customers in a given Municipality rate (1-5) the water provided by the concessionaire, with a sample of 150 cases and sample average of 4.0, we could state that, given the selected sampling design, in 95 out of 100 samples (95% confidence level) taken randomly from the population of customers within a given segment, the average would be somewhere between 3.7 and 4.3 (given the 8% accuracy defined earlier), which is deemed appropriate for a quantitative study such as this.

Considering that the number of represented populations is $8*n$, we will be working with an average two clusters per concession type (although, as noted, this number can be greater or smaller for some concession types); with samples of 75 cases per population, the final number of surveys to be done would be 1,200.

The confidence level accuracy or range is basically dependent on three factors, two of which can be controlled:

- The variability of the studied population, which can clearly not be controlled.
- Sample size: higher confidence levels imply larger samples, given that this is one of the control variables.

⁷ In to the consulting team's experience, a population standard deviation of approximately 20% of the maximum of the measurement scale selected is consistent with estimates based on a satisfaction study done in the sanitation market for SABESP, in the State of São Paulo, with 12,500 interviews.



- Results confidence: is related to interval range. Of course, higher confidence levels imply larger intervals (maintaining, *coeteris paribus*, sample size and population variance).

On the other hand, and as mentioned earlier, the caption of each survey will include questions to determine the interviewee's profile to allow categorization into one of the two relevant groups (high and low income). In this sense, we will use the following characterization questions, which after tabulation with a specific score, will yield the interviewee's socio-economic class:

Table 4: Scoring for Socio-economic Class Categorization

COMFORT ITEMS	NONE	NUMBER OWNED				FILTER 3a What is the schooling level of the head of the household?*	Head
		1	2	3	4+		
a. TV (color)	0	2	3	4	5	Illiterate/ Incomplete Elementary	0
b. Radio (any)	0	1	2	3	4	Complete Elementary / Incomplete Middle.	1
c. Automobile	0	2	4	5	5	Complete Middle	2
d. Live-in maid	0	2	4	4	4	Incomplete High School	2
e. Vacuum cleaner (even handheld)	0	1	1	1	1	Complete High School	3
f. Clothes washer	0	1	1	1	1	Incomplete College	3
g. VCR/DVD	0	2	2	2	2	Complete College	5
h. WC (disregard communal)	0	2	3	4	4	Post-Graduate	5
i. Refrigerator	0	2	2	2	2		
j. Freezer as independent appliance or part of duplex refrigerator	0	1	1	1	1		

* Schooling levels will be aligned with the Ministry of Education's standards



Finally, interviewees are categorized based on their total score:

Table 5: Tabulated Scores

Score	SEG
30-34 points	A1
25-29 points	A2
21-24 points	B1
17-20 points	B2
11-16 points	C
6-10 points	D
0- 5 points	E

Based on this, we will regard as low-income the entire population in socioeconomic groups D and E (consistently with the three minimum-wage criterion). The remainder (groups A1, A2, B1, B2 and C) will represent the high income⁸ segment. Group C might eventually be divided into two sub-groups: C- and C+, incorporating the former (C-) into the low-income population group. This division is still open to discussion as is the threshold between groups.

3.2 INFORMATION PROCESSING

For each of the items assessed in the survey's satisfaction section (that is, for the *overall firm, water, sewage and service*) we will use two families of indexes:

- The so-called Constructed Indexes.
- The so-called Stated Indexes.

⁸ This scoring mechanism, like the proposed cutoffs for low and high income, could be amended based on the project commissioners' criteria.



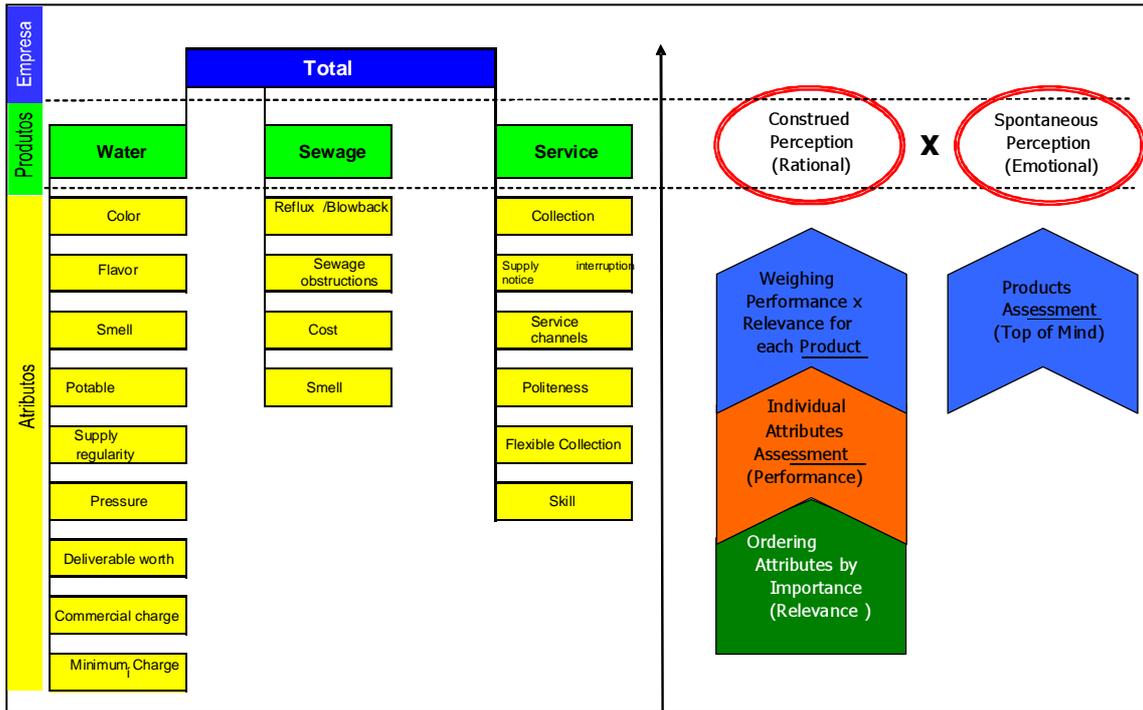
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Stated Indexes will be obtained based on simple tabulation of the responses customers offer to each of the following questions:

- Concerning the overall firm: generally speaking, and considering everything you know or have head mentioned, how do you rate the performance pf the Municipality's water concessionaire: excellent, good, average, bad or terrible?
- Concerning water in general: would you say that the quality of the water provided by the Municipality's water concessionaire is: excellent, good, average, bad or terrible?
- Concerning sewage in general: would you say that the service quality of the sewage network the Municipality's water concessionaire offers is: excellent, good, average, bad or terrible?
- Concerning service in general: le considering everything you know or have head mentioned, how do you rate the service the Municipality's water concessionaire provides: excellent, good, average, bad or terrible?



FIGURE 5: Perceptions Comparison Model





To answer each of these questions, interviewees will have to choose the alternative that best reflects their opinion out of the following:

- 5. Excellent
- 4. Good
- 3. Average
- 2. Bad
- 1. Terrible

The number that precedes each of the terms used to evaluate the service will be tabulated and an average will be computed to obtain the desired indexes.

It is worth noting that in order to assure consistency with the remainder of the data tabulated from the survey, every scale (1-5 in this particular case) will be converted into percentages (that is, 0-100% scales). Mathematically, the computation is as follows:

$$Index_{\%} = \frac{(Index_{original} - 1)}{Max_{scale} - 1} \%$$

This will provide stated (or top of mind) service quality grades (indexes) both for products and services and for the overall firm. The question concerning the overall firm will be asked twice: once before the exhaustive evaluation of attributes and dimensions, and again after.

These stated indexes will be confronted with what the Consulting team calls *Constructed Indexes*, that is, those obtained by weighing the relevance of each product or service dimension by the performance on each.



As can be inferred from the forgoing paragraph, building these indexes will require two elements:

- Dimension relevance.
- Performance on each dimension.

Both will be drawn directly from the survey. Relevance will be calculated by tabulating how each interviewee orders dimensions, using a quadratic scale to build a relevance score for each dimension and attribute. Thus, each dimension and attribute will receive n^2 points each time it is rated n^{th} .

We then add together all of the scores in each ordering, leading to the score allotted each dimension. This ratio — $\frac{Score_{dimension}}{Score_{total}}$ — will be the proxy variable used to ascertain relevance.

Performance on each dimension will be obtained by tabulating (simple average) the score associated with each semantic statement, in the case of attributes, and the score associated with the *excellent*, *good*, *average*, *bad* and *terrible* grades in the case of dimensions and **overall firm** evaluation.

Therefore, the *Constructed Index* for each product will be obtained by:

$$\text{Performance Product}_j = \left(\sum_{\text{Dimension}} \text{Relevance}_i \cdot \text{Performance}_i \right)_j$$



and for the overall firm:

$$Total_{Cluster} = \sum_{Products} Relevance_{Product_k} \cdot Performance_{Product_k}$$

Therefore, the evaluations of water, service, sewage and the overall firm will use both pre- and post-PSP *top of mind* indexes and *constructed* indexes on using this form of comparison or resorting to one of the other two alternatives (having interviewees indicate directly if the post-PSP situation is worse, the same or better; or having them indicate whether they agree with a statement representing a judgment of value regarding the change in an attribute). Anyway, we will analyze the current satisfaction level; what indexes will ultimately be used for comparison purposes (top of mind or constructed); and at what level the comparison will take place (dimensions, overall Municipality, or concession). All will depend on the specific results found, as well as on the nature of the concessions of the Municipalities within each cluster (full concession, management only, etc.).

Finally, statistical tests will be run to compare the averages of selected indexes in order to establish any differences between the pre- and post-PSP situations:

- h_0 (null hypothesis): the average post-PSP index is higher than the average pre-PSP index
- h_1 : the opposite case.

This proof will be examined for every population deemed relevant as mentioned in the specific section dedicated to sampling design.

NOTE: Attachments I, II and III provide, respectively, the questions posed Concessionaires in Initial Interviews, the Data Bank's structure, and the Questionnaire intended to measure User Satisfaction.



4. METHODOLOGICAL APPROACH TO DETERMINING FISCAL IMPACTS

4.1 OVERVIEW

Of particular note, out of the many possible sources of fiscal impacts arising from the private sector's involvement in the provision of sanitation services are those related to service costs, the need for new investments, the regulatory apparatus maintenance cost, and the billing system change. These impacts may be positive or negative depending on various factors, such as: *i)* pre-PSP service status – whether it generated a surplus or deficit; *ii)* mode of service provision – se whether directly by the concession holder or by a state-owned company; *iii)* provider indebtedness level; *iv)* concession type – whether for a price or not, among others.

Theoretically, changing the sanitation service provision model — from direct administration to regulated private enterprise — should not imply relevant fiscal impacts associated with core-activity costing. The charges for the service, whether determined directly by the government or through concession contracts, should be sufficient to cover production costs. In many cases, however, in the pre-privatization period, public charges were under strict control as a means to reduce inflationary effects and, as a result, included significant subsidies at the time of privatization. In these cases, the activity generated a deficit and depended on a constant influx of public resources, both to make investments and to keep up operations and maintenance. When a private company takes over the services and is allowed to implement policies to recover investment, operation and maintenance costs, a positive impact occurs on public accounts, which are released from the pressure of transferring funds to this end.



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Changing the service provider's legal nature implies changes to the activity's tax regime, with impacts on concessionaires, households and governments. The entry of a private operator leads to an increase in tax revenues such as ISS (services tax), ICMS (trade tax), IRPJ (income tax) and others, some of which are not levied on public operators. On the other hand, these tax revenues are passed through to charges to users and, on the other hand, these changes may provide increased municipal, state and federal taxes, with the respective pass-throughs to States and Municipalities. In many countries, the provision of sanitation services is subject to special taxation to alleviate charges and foster service universalization. In Germany, for example, only sewage collection and treatment services are tax exempt, which has historically led to public supply and sewage collection and treatment services to be provided by distinct entities in order to take advantage of the special tax regime.



4.2. PSP FISCAL IMPACTS ASSESSMENT METHODOLOGY

Question 3 to be answered by the proposed study is: What is the fiscal impact of the Private Sector's Participation? This impact will be investigated in connection with States and Municipalities, but also with the Union and consumers themselves. We list, next, PSP-related tax impacts to be investigated under the scope of the proposed study, at no loss to others that may be detected:

- PSP-related changes in expenditures due to public debt and financing;
- PSP-related changes in the Municipality's or the State's expenditures or revenues;
- PSP-related transaction costs arising from the need for pre-concession studies and assessments and from the post-privatization regulatory apparatus;
- Tax changes related to ISS, ICMS, IRPJ and other taxes.

This study will take account of the following elements:

Historic Series pre- and post-PSP:

- a) Charges;
- b) Sanitation Revenues;
- c) Municipal Revenues from the services provided since the PSP;
- d) Sanitation Expenses;
- e) Results (surplus or deficit).



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Historic series grouped by Federative entities, by PSP Type:

- a) Full Concession.
- b) Partial Concession.
- c) Partial Equity Divestment.
- d) Management Contract.

The objectives to be attained based on these analyses are:

- Comparative assessment between the two situations (pre- and post-PSP) of charges and revenues evolution in real terms.
- Comparative assessment between the two situations (pre- and post-PSP) of expenses evolution in real terms, as well as expense composition.
- Assessment of results evolution in real terms (pre- and post-PSP).
- Establishing indicators for sanitation personnel, maintenance, investment, etc., as well as for the public sector's post-PSP expenditures pattern, and comparison with the previous situation.
- Assessing the real evolution and determining public sector budget funds that could be reallocated to other Governmental Functions.
- Projecting post-PSP trends as compared to the previous situation.
- Analyzing fiscal effects by PSP type.

The following information sources will be analyzed:

Available National Treasury (*Secretaria do Tesouro Nacional – STN*) data

- Pre-concession process period – last two years
- until 2005 – latest data available.



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Balance Sheets

- Pre-concession process period – last two years.
- until 2006.

Analysis of Expenditures by Government Function:

- Health and Sanitation Function (until 2001).
- Sanitation Function (since 2002 – Municipalities)

Analysis of Revenues and Expenses Statements:

- on December of the year immediately preceding the Concession process;
- on December of subsequent years – until 2006.

5. METHODOLOGICAL APPROACH TO ASSESSING THE IMPACT OF VARIOUS FORMS OF PSP AND INSTITUTIONAL ARRANGEMENTS

This section discusses aspects of the methodology to be used to assess the of impact various institutional modes and arrangements on PSP results.

5.1 OUTLINE PROVIDED BY MODERN REGULATION THEORY

To frame the discussion of the topic, it is convenient to adopt a simple model that allows conceptualizing the relationships created between the institutional, regulatory, socio-political and concessionaire aspects, as well as the impact they may have on PSP results. To this end, the Consortium understands that modern regulation theory has important elements to contribute, as discussed next.



The need for regulation and its basic purpose: from the enterprising State⁹ to the Regulatory State

Economics teaches that, in competitive markets, the free action of the market forces will cause society to maximize well-being. Under such circumstances, each businessperson will attempt to obtain the maximum possible benefit, and each consumer will attempt to maximize his or her own satisfaction levels, irrespective of the well-being of others. A freely operating market allows “selfish” private motivations to coexist with socially desirable results. The process advances as if under the guidance of an “invisible hand.”

For this virtuous mechanism to occur in a given market, several conditions must be met, such as: low barriers to entry and exit, absence of externalities, complete, easily accessed information to all actors, and more. Where these requirements are not met, it may be convenient to replace the “invisible hand” with a “visible” one (regulation) to intervene in the operation of the market and provide guidance so that higher levels of well-being can be attained.

Some common market failures that necessitate intervention are the presence of externalities (environmental, health, public goods, etc.) and the presence of natural monopolies.

The drinking water and sewage industry is a typical case of natural monopoly: high indivisible and irrevocable investments, a capital-intensive industry, and the presence of large economies of scale in drinking water distribution and sewage

⁹ In this part of the report references to the State are to be understood as a concept relative to the public function in general. Therefore, in the case of Brazil, this concept comprehends the federal, state and municipal levels.



collection. Add to this significant externalities, and the need for the activity to be regulated becomes clear.

In the past, and specially in developing countries, market failures were among the main arguments to justify the State's taking on an entrepreneurial role in the sanitation industry, with an aim to preventing excessive charges and deterioration of service quality and coverage.

Notwithstanding, this model became exhausted over time, due to the difficulty state-owned companies faced to operate efficiently (budgetary constraints, administrative inflexibility, influence of political goals, irrational subsidies, etc.). Likewise, there is often a confusion between performing operating functions and performing regulating and oversight functions that are typically the responsibility of a single public body, which is undesirable.

The enterprising State's problems lead to a growing interest in both incorporating private investors through full or partial management of public sanitation services and introducing radical changes in the industry's operations and management.

These reforms forced the State to organize and play its regulatory and oversight role differently, now fully or partly separate from service providing activities, which could be taken up by private firms or consortia, mixed public-private organizations or decentralized and more independent state-owned companies. This gave rise to the concept of Regulatory or Oversight State.

In this scenario, the challenge before the State is to make monopolistic providers of potable water and sewage services to operate efficiently and be financially viable, providing better services and larger coverage without generating excessive



charges to users.

A good analytical model: the agent-principal problem

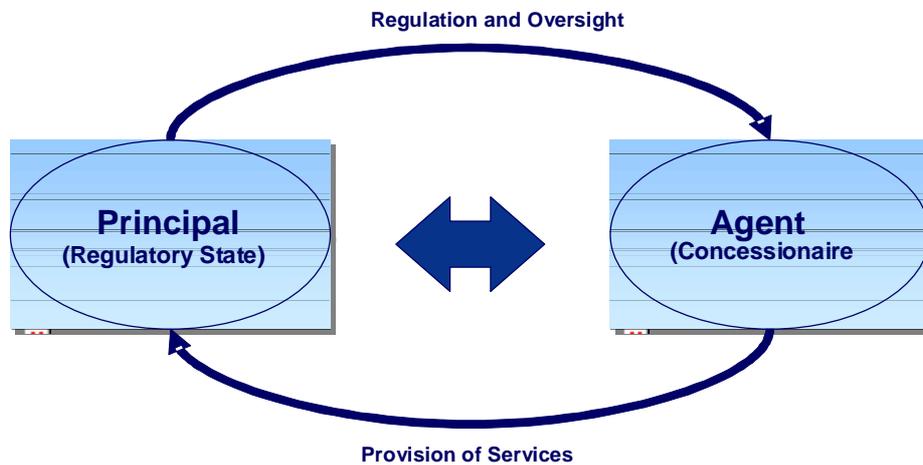
The agency theory adds interesting elements to properly understanding the regulatory function, its main challenges and the design and implementation problems that may arise.

In the new scenario of sanitation services exploitation, the State fully or partly relinquishes provision to the private sector, mixed companies or more independent state-owned entities. The problem under this arrangement is how to make the objectives of the State (Principal) and the Operator (agent) compatible, so that the latter will behave as the former wishes.

The theory indicates that this is an agency problem, where the Principal must set rules and incentives (contract) so that the Agent (Operator) will behave consistently with the Principal's (the State's) objectives. This relationship is illustrated in the next figure:

FIGURE 6

***A GOOD ANALYTICAL MODEL : THE
AGENT-PRINCIPAL PROBLEM***



The theoretical framework shows that, in order to address this agency problem, efforts must focus on designing the contract that governs the relationship between Principal (Regulator) and Agent (Regulated), as well as its enforcement and control mechanisms.

Theory and experience show that, for such a regulatory contract — which may be provided by a set of laws or regulations, or by an ad hoc agreement — to stand a chance of succeeding, the following key aspects must be considered in its design: a) clearly establishing each party's rights and duties; b) not confusing means (regulatory instruments) and objectives (goals); c) separating functions by clearly



stating that control and oversight tasks will be performed by the Regulator (Principal) and that service exploitation tasks will be the responsibility of the Operator (Agent); d) paying heed to the fact that the “Contract” should anticipate potential contingencies and their resolution mechanisms, in order to provide stable “rules of engagement”; e) understanding the “contract’s” oversight rules should be as simple as possible, leading to reasonable oversight and control activities costs for both the Regulator and the Regulated; f) taking into account the fact that the criteria for determining the Operator’s compensation (charges) must provide appropriate, stable and transparent incentives; g) balancing the conflicts between service quality and the investment needed to provide it, as well as between charges and the population’s payment capacity.

The basic focus and objective of a regulatory framework

Modern regulation theory offers elements to understanding the appropriate focus for the analysis of a regulatory framework, its basic objectives and resulting impacts. In this context, the regulatory function may be characterized as a system of incentives and signals intended to induce concessionaires into objectives that are consistent and coincident with the regulator’s objectives and goals.



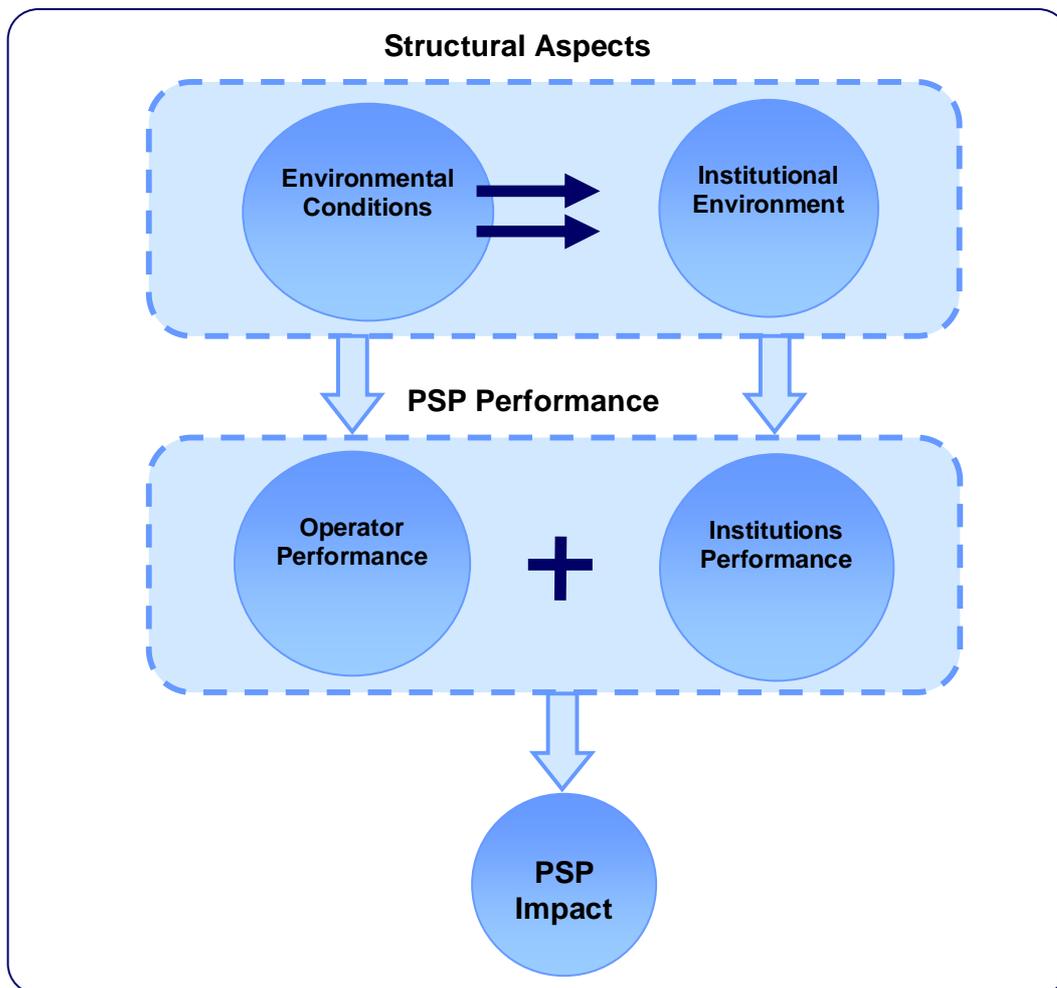
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5.2 RELEVANT ASPECTS TO REGULATORY FRAMEWORK CHARACTERIZATION

In light of the theoretical aspects discussed earlier, we provide, next, aspects to be taken into consideration to characterize and evaluate the regulatory framework that provides the general outline of PSP in Brazil, according to the methodological approach given in Figure 7.

FIGURE 7

Logical Analytical Framework

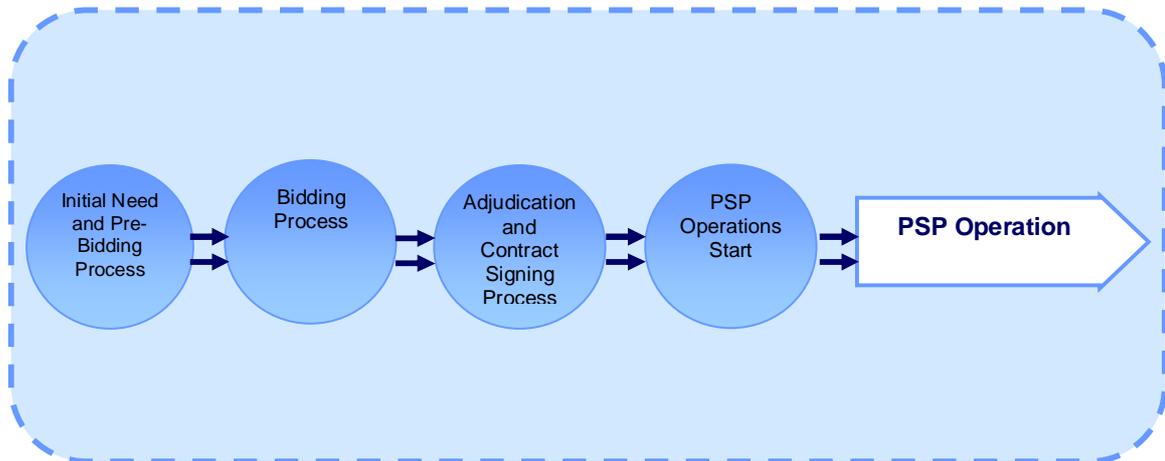


5.2.1 Stages in a PSP

PSP analysis should begin by identifying and contextualizing the various stages that the start and implementation of PSPs have generally displayed in Brazil. Figure 8 illustrates these stages.

FIGURE 8

PSP Gestation, Implementation and Development Process

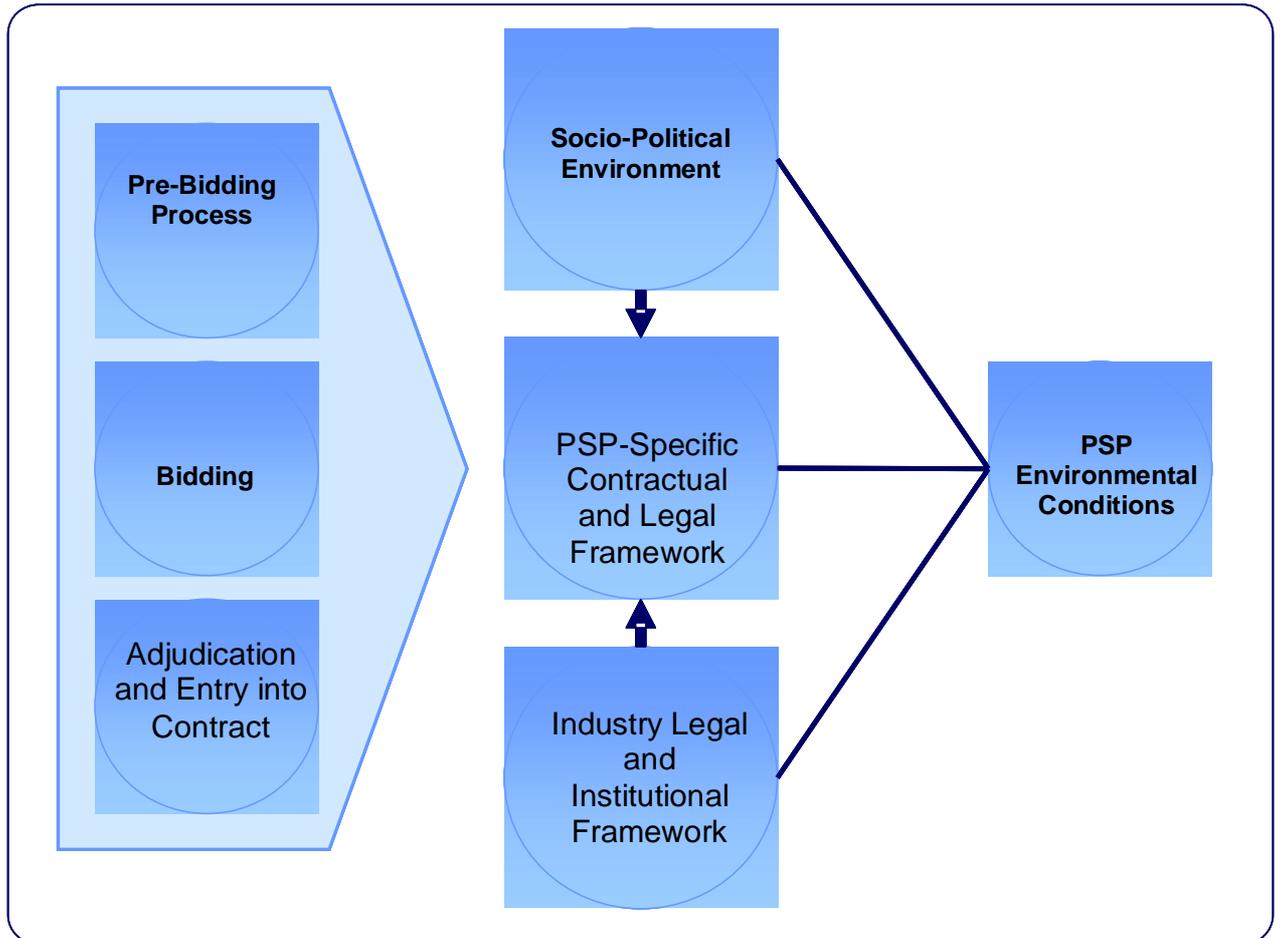


5.2.2 A PSP's Environmental Circumstances

Pre-bid processes, the bidding itself, the adjudication stage and entry into the agreement establish a PSP's specific contractual framework, which, together with socio-political aspects and the industry's legal and institutional framework, make up a PSP's environment as Figure 9 illustrates.

FIGURE 9

PSP Environmental Conditions





To analyze the constitutive circumstances of a PSP, we will investigate the following aspects, based on documentary review and interviews with key players:

- a. Pre-bid process characterization:
 - How did the need for a PSP arise?
 - What entities were involved in creating this need?
 - What entities lead the effort to make the bidding process viable and legal? How did this unfold?
 - How was the process the ultimately led to the design of the bidding framework?

- b. Bidding process characterization:
 - Main Invitation to Bid features.
 - Selection process characteristics, duration, relevant aspects and effects on the process.
 - Competitive intensity.
 - Relevant problems or aspects with a bearing on the bid.
 - Results.

- c. Adjudication and contract signing process characterization:
 - Relevant problems or aspects that hampered the process.
 - Contract changes from the requirements as set forth in the Invitation to Bid.
 - Process duration.



d. Characterization of the PSP's specific contractual and legal framework:

- PSP type.
- Identification of the granting power and concession holder.
- Identification of the contract oversight authority (city government, regulator, state-owned company, etc.).
- Operator corporate species and organization requirements.
- Basic features of the contracted service.
- Contract term.
- Start date.
- Quality, service coverage and investment goals set in contract.
- Supplementary requirements the operator must meet.
- Variables applicable to the contract oversight authority at different levels: service quality, coverage, investment plans, efficiency indicators, financial aspects, etc., showing how contract oversight takes place.
- Oversight entity funding system.
- Operator compensation type (charges, fees, fixed amount, charge by cubic meter, etc.).
- Operator compensation review and adjustment mechanisms.
- Subsidy or social charge applicability mechanisms.
- Required guarantees.
- Granting power or concession holder compensation type (initial payment, % of charges, gratuitous contract, etc.).
- Presence or absence of special controversy resolution mechanisms and, where present, what they may be.
- Final payment for non-amortized assets.
- Contractual fines or sanctions.
- Incentives to service expansion.



- Illustration of the operator efficiency gains incentive scheme.
- Discussion of contract renegotiations.

e. Socio-Political Environment

Identification and characterization of relevant facts that, in light of the legal and institutional framework, have affected the PSP's development and operation since its inception. Each relevant situation identified is to be characterized based on the following information:

- Event summary
- Entities and organizations involved
- Effects on PSP development.

f. Legal and institutional framework

Identification and characterization of relevant facts that, in light of the sanitation industry's legal and institutional framework, have affected the PSP's development and operation since its inception. The following information is to be noted:

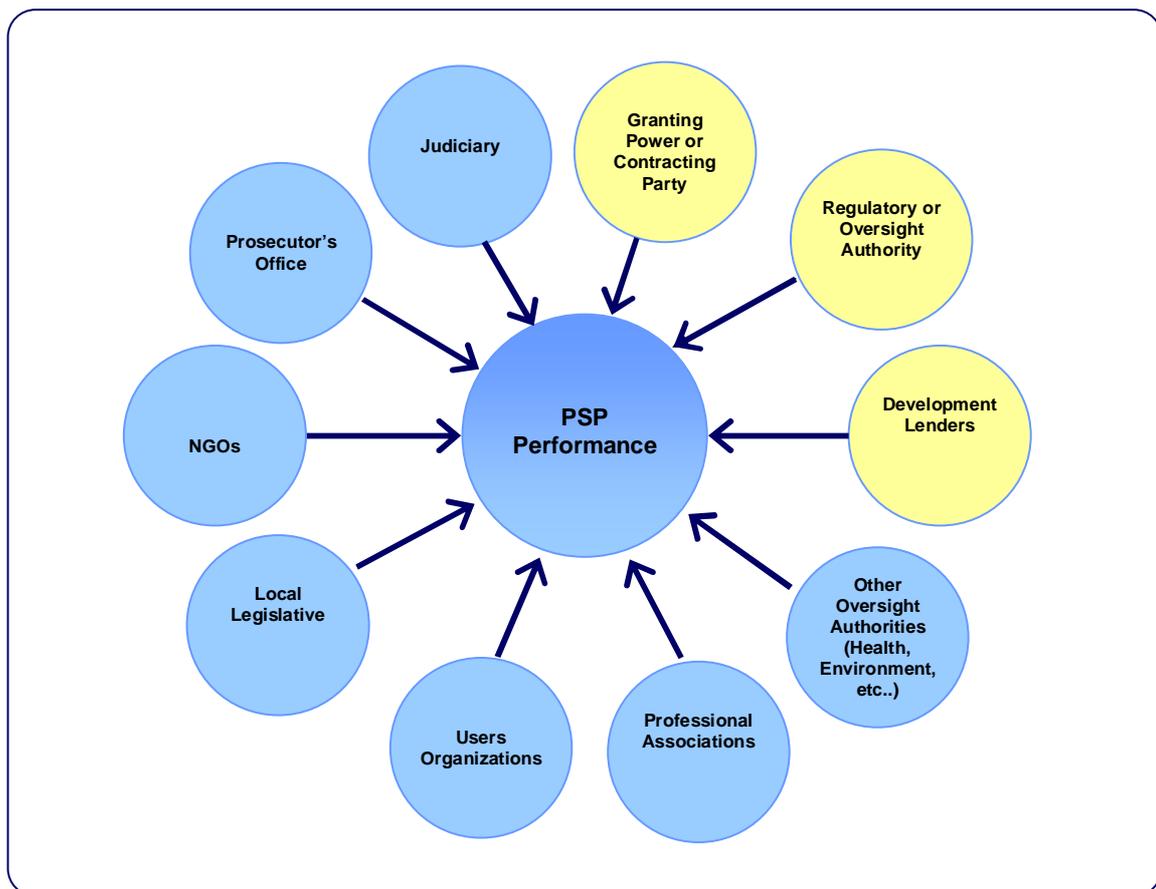
- Environmental standards and oversight authorities' behavior.
- Health Services' Requirements.
- Prosecutor's Office Behavior.
- The behavior of State Governments where the contracting party is a Municipality; of the municipal government where the contracting party is a state-owned company; or of a PSP whose implementation was led by a State government.

5.2.3 Description and performance of the Institutional Environment

Figure 10 provides a generic schematic to characterize the institutional environment of PSPs in Brazil.

FIGURE 10

Institutional Environment with an Effect on PSP Performance





The selected approach to studying the institutional environment identifies two categories of institutions for the purposes of the analysis at hand. On the one hand, institutions whose behavior has routine effect on the PSP's operations and, on the other hand, Institutions that, although normally outside the realm of a PSP's operations, have a significant impact on its development in certain cases or under certain circumstances.

The former group includes the PSP regulatory or oversight authority, the granting power or the Contracting Party, as well as development lenders that have taken or are taking part in funding the PSP's investment .

- a. Regulatory or oversight authority performance: management will be examined based on the following:
 - ↘ Activities to be performed under the contract.
 - ↘ Technical and operating capabilities.
 - ↘ Level of compliance with activities under the contract.
 - ↘ Agility in performing these activities.
 - ↘ Level of independence in its activities.

- b. Granting power or contracting party performance:
 - ↘ Identification of formal responsibilities.
 - ↘ Level of compliance with activities under the contract.
 - ↘ Agility in performing these activities.
 - ↘ Level of independence in its activities.
 - ↘ Identification of activities that, in practice, exceed those under contract.
 - ↘ Stability.



c. Development lenders performance.

The purpose of this module is to understand the impact of the management of development lenders on the PSP's development as regards funding for investment plans made. We will attempt to determine how financing affected the economic management of operators, contractual aspects, the stability of the "rules of engagement", and the reduction of the PSP's risk levels.

Therefore, the second group of Institutions mentioned earlier includes:

- Other oversight authorities (Health authorities, environmental authorities, etc.).
- Prosecutor's Office.
- Local Legislative.
- Judiciary.
- Non-governmental Organizations.
- Uses Organizations.
- Other.

Analysis will be more selective in this case, as it will focus on the examination of topical facts where the presence of such institutions has made itself more clearly felt and, therefore, had an influence on the PSP's operations since its inception.



d. Operator performance under the contract

This module involves an in-depth study of the Operator's performance, in light of the attainment of goals established in Contract. The following aspects will be analyzed:

- Identification of the original goals under the contract.
- Effects of renegotiations subsequent to the original entry into contract.
- Comparison of goals and effective results.
- Reasons for non-compliance.
- Warnings or fines imposed.

5.2.4 Alignment or misalignment of concession objectives and Municipalities' Urban Policy.

The Municipality's Urban Development Policy as an institution is an essential element of the institutional environment to be considered in the definition and implementation of the management model for public sanitation services, including the planning, regulation, oversight and services provision functions.

Prescribed by the Federal Constitution of 1988, article 182, the Urban Development Policy has been regulated by Act No. 10,257/01, with particular emphasis on aspects and guidelines for industrial policy and the Urban Zoning Plan, as regards issues relevant to infrastructure planning and management, the provision of public services and use and occupation of the territory, pursuant to article 30, item VIII, of the 1988 Constitution.



In the absence of a legally institutionalized and organized urban policy, an effective industrial plan or, at least, some manner of systematic, long-term urban management plan addressing general guidelines for sanitation policy are requirements that should provide early guidance to and generally condition the arrangement and institutional format of public sanitation services management, including, in particular, how such services are to be rendered.

Ultimately, even with limited scope as concerns the PSP cases analyzed here, we must consider the presence of a state or regional policy (metropolitan areas or micro-regions) and other legal frameworks at the state-level that address normative, indicative or regulatory guidelines for the sanitation industry that might somehow affect the institutional and regulatory aspects relative to the provision of sanitation services and its impact on the urban policy of the affected municipalities.

In this context, investigation and analysis of the PSP and its provision of water and sewage services under various formats will attempt to obtain information and assess alignment or misalignment between the objectives of the concessions and urban policies and/or state and municipal policies and plans, including the following aspects:

I. Urban policy:

- a. presence, existence and contents of legal and regulatory instruments relative to urban development and/or basic sanitation policies;
- b. presence, currentness and scope of sanitation plans and;/or Zoning Plans;
- c. other urban planning instruments or mechanisms that involve sanitation.



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II. State or regional policy:

- a. presence and scope of a legally constituted sanitation or environmental policy;
- b. laws and other legal instruments concerning regional organization of the state, specially those creating metropolitan regions or micro-regions, and how they interface with municipalities' urban policies and the management of public sanitation services;
- c. presence, currentness and scope of state or regional sanitation plans and how they interface with the respective municipal policies and plans.



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ATTACHMENT I



Initial interviews

We introduce, next, the topics to be addressed in initial interviews with Concessionaires (under way), with the preliminary goal of characterizing the various PSP incorporation processes and their historical development.

1. Description of the bidding process and PSP adjudication

- a. Bidding process history - Main characteristics: date of Invitation to Bid publication, number of bidders, bid variables, authority in charge of the process.
- b. Adjudication process history - Date of bidding process conclusion, any appeals to courts, any political resistance.
- c. What kinds of studies, background information or data were available to interested parties?. What other kinds of survey were developed in pre-PSP study processes? Was it possible to accurately characterize the service's initial status?

2. General Contract Characteristics

- a. Operation start, term, services comprehended by the Concession, operator compensation, etc.
- b. General description of the goals to be attained and variables under the granting power's oversight.
- c. Entities charged with contract oversight.
- d. Warranties.
- e. Penalties
- f. General description of dispute resolution clauses.



3. Charges and Subsidies

- a. Charge adjustment mechanisms under the contract.
- b. What is the influence political aspects have on charge determination?
- c. Is there a subsidy policy design? What characterizes it?
- d. Is the charges system distorted?.

4. Performance under the Contract

- a. Have the goals set been met, or are they being met?
- b. How did the controlling entities behave?
- c. Did any other entities or bodies affect performance under the contract?
- d. What disputes were most frequent? Did the “rules of engagement” change during the term of the contract?
- e. Were any penalties levied? Why?
- f. Were there contract renegotiations (amendments)? When? What were the main areas covered by renegotiation?

5. Technical and economic performance under the contract

Based on information from the SNIS database, the Consortium will provide certain indicators to Concessionaires for preliminary validation purposes:

- a. Financial results.
- b. Evolution of certain efficiency and quality indicators.
- c. Investment levels.
- d. Coverage level.



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ATTACHMENT II



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Data Bank Structure

To facilitate quantitative data-based impact analysis, a relational database is being prepared on the MS Access application, with the following information in its preliminary structure:

- Data on contracts, invitations to bid and other documents regulating each concession, including goals and committed investment.
- Specific information on each Concessionaire.
- Information on each sampled municipality
- Information available from SNIS.
- Information provided by Concessionaires during field work.
- Environmental and health information on each municipality.

The database will further include information gathered from the household survey, when the fields to be covered by the survey have been defined.



The table next provides details on the elements of the preliminary database:

TABLE 1

Table	Table Description	Field	Field Description	
Contracts and Invitations to Bid Data	Concession data obtained chiefly from documentary sources.	Contract Code	Contract identification	
		Municipality	Municipality identification	
		Operator	Operator identification	
		Date of Entry into Contract	Date of entry into contract	
		Granting Power	Granting power identification	
		Oversight	Oversight Authority identification	
		Concession Type	Concession type identification	
		Adjudication Method	Brief description of the main aspects of the adjudication process (bid assessment, bidders, etc.)	
		Water Collection Scope	Information on concession contract scope.	
		Treatment Scope		
		Adduction Scope		
		Reserves Scope		
		Distribution Scope		
		Sewage Collection Scope		
		Sewage Separation Scope		
		Sewage Treatment Scope		
		Operation Start Date		Operation start date
		Contract Term		Concession term in years
		Expiration Date	Estimated expiration date	
		Initial Status	Initial Status: Estimated concession area population	
Initial Status Connections	Initial Status: active water connections in the concession area			
Initial Status Sewage Connections	Initial Status: active sewage connections in the concession area			
Amendment Data	List of Contract Amendments	Amendment Code	Amendment identification	
		Contract Code	Contract identification	
		Date of Entry into Amendment	Date of entry into Amendment	
		Oversight	Oversight - changes relative to this item	
		Water Collection Scope	Information on concession contract scope (based on changes made)	



Table	Table Description	Field	Field Description
		Treatment Scope	
		Adduction Scope	
		Reserves Scope	
		Distribution Scope	
		Sewage Collection Scope	
		Sewage Separation Scope	
		Sewage Treatment Scope	
		Contract Term	
		Expiration Date	New expiration date, if changed
		Contract – coverage goals	Details on coverage goals set in concession documentation.
Description	Requested item description		
Quantity	Quantity in Units		
Unit	Measurement Unit of the goal quantity		
Term	Term for specific goals in months from operation start		
Investment amount	Estimated amount in R\$, where available		
Comments			
Attainment	Goal attainment check, where applicable.		
Contract – Investment goals	Details on investment goals set in documentation	Contract Code	Contract identification
		Description	Requested item description
		Quantity	Quantity in Units
		Unit	Measurement Unit of the goal quantity
		Term	Term for specific goals in months from operation start
		Investment amount	Estimated amount in R\$, where available
		Comments	
		Attainment	Goal attainment check, where applicable.
Contract - Goals other information	Details on other goals set in documentation	Contract Code	Contract identification
		Description	Requested item description
		Quantity	Quantity in Units
		Unit	Measurement Unit of the goal quantity
		Term	Term for specific goals in months from operation start
		Investment amount	Estimated amount in R\$, where available
		Comments	
		Attainment	Goal attainment check, where applicable.



Table	Table Description	Field	Field Description
Operators	General operator information	Operator	Operator identification
		Shareholders	Identification of shareholders and percentage share of equity.
		Population served	Latest data available (Dec-2006)
		Mode	General concession type identification
		Operation start	Start date
		Term	In years
		Promised	Initially promised investment, in R\$
		Effective, 2006	Actual investment in 2006, in R\$
		By 31/Dec/2006	Actual investments made from concession start till 2006, in R\$
		Investments 2007	Estimated investment in 2007, in R\$
		Investments 2008	Estimated investment in 2008, in R\$
		Investments 2009	Estimated investment in 2009, in R\$
		Investments 2010	Estimated investment in 2010, in R\$
		Investments 2011	Estimated investment in 2011, in R\$
		President	Identification of the holders of the main executive positions.
		Commercial Director	
		Technical Operations Director	
		Administrative and Financial Director	
		Address	Contact data for the operator
		Telephone No.	
		Fax No.	
		e-mail	
		Financing	Description of financing obtained, amount and lender
		Person in charge	Questionnaire respondent identification
		Person in charge-title	
		Telephone No.	
Fax No.			
e-mail			
Concession Code	Concession Types Legend	Code	Concession Type Identification
		Concession Type	Concession Type Description
State	State Acronyms Legend	State Acronym	State Acronym
		State	State Name
SNIS – Full Operations	SNIS data on Operators	Operator	Operator Identification
		Code	Datum Identification
		Year	Information year



Table	Table Description	Field	Field Description
		Datum	Numeric datum
Full Operations	Technical data provided by operators	Operator	Operator Identification
		Code	Datum Identification
		Year	Information year
		Datum	Numeric datum
BOT	Technical data provided by operators	Operator	Operator Identification
		Code	Datum Identification
		Year	Information year
		Datum	Numeric datum
Charges Structure	Data on the water service charges structure	Contract Code	Contract identification
		Year	Effective charge year
		Consumption Range	Consumption range or charge group identification
		Unit	Collection unit
		Charge	Charge per unit, water service
		Comment	
Charges Structure	Data on the sewage service charges structure	Contract Code	Contract identification
		Year	Effective charge year
		Consumption Range	Consumption range or charge group identification
		Unit	Collection unit
		Charge	Charge per unit, sewage service
		Comments	
Municipalities	Municipalities legend	Municipality	Municipality Identification
		State	Corresponding State
SNIS – Full Municipalities	SNIS data on Municipalities	Municipality	Municipality Identification
		Code	Datum identification
		Year	
		Datum	Numeric datum
Municipalities- Full	Technical data on Municipalities provided by operators	Municipality	Municipality Identification
		Code	Datum identification
		Year	Effective information year
		Datum	Numeric datum
ENV - Municipalities	Municipal Environmental Variables Data	Municipality	Municipality Identification
		Code	Datum identification
		Year	Effective information year
		Datum	Numeric datum
HEALTH –Municipal data	Municipal Health Data	Municipality	Municipality Identification
		Code	Datum identification
		Year	Effective information year
		Datum	Numeric datum
Codes	Reference for all the Data in the	Municipality	Municipality Identification
		Code	Datum identification



Table	Table Description	Field	Field Description
	listed tables	Year	Effective information year
		Datum	Numeric datum

Figure 1 shows the tables structure and the relationships of the database under development.

The adopted structure and the relationships drawn will enable quick cross-referencing of data as “OLAP” cubes, in addition to permitting specific queries applicable to analyzing the impact of PSP based on quantitative analysis.

In addition, an application associated with the database will be implemented to manage user-interface forms and output reports. To this end, we will exploit the tools MS Access offers and, where needed complement these with VBasic-encoded modules. The goal is to obtain a user-friendly interface that allows adding new information, modifying data, running queries, etc, both as printouts and as MS Excel-importable files.

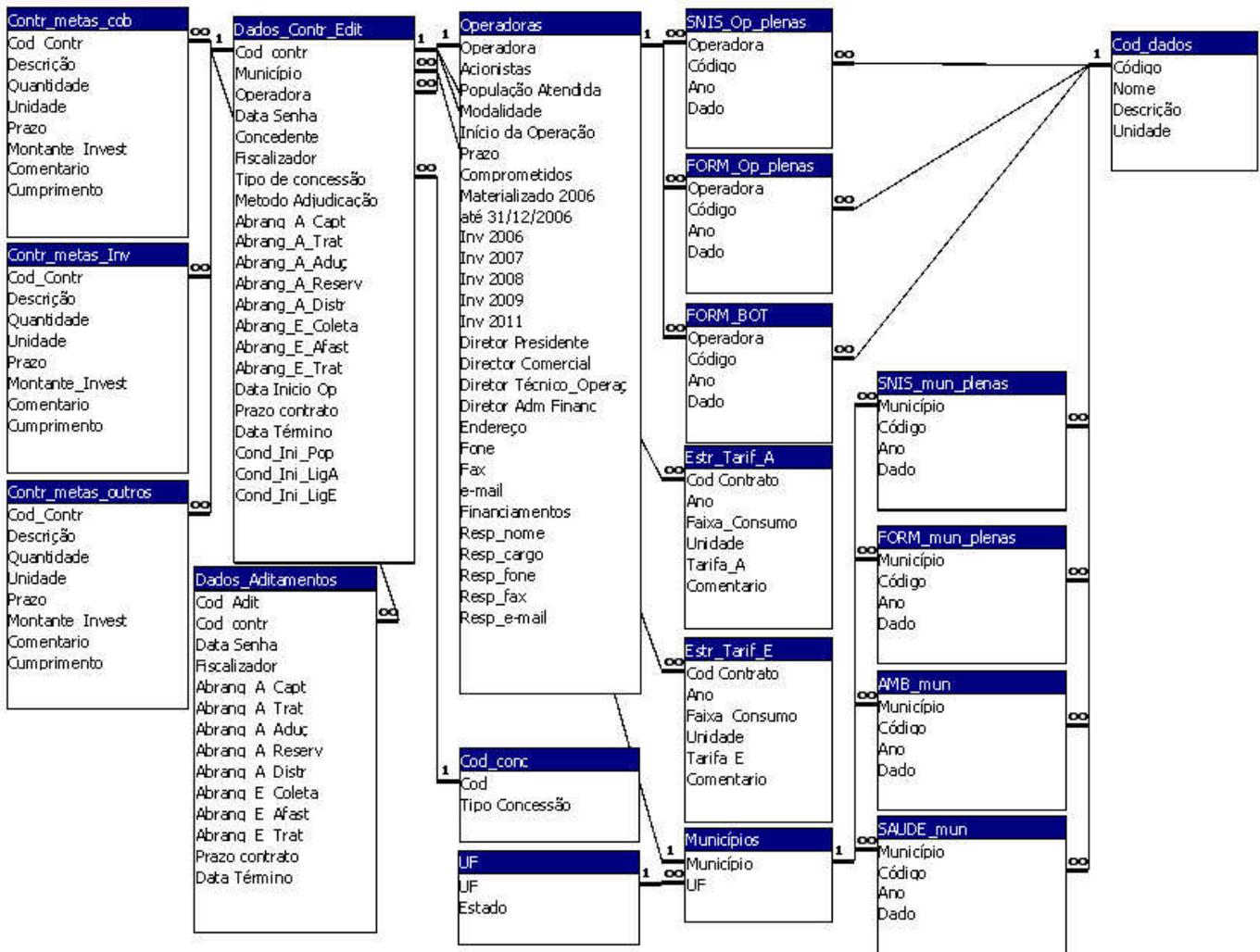
Information is being compiled with standard Excel form spreadsheets to facilitate organizing data and subsequently feeding the relational database.

Finally, it is worth noting that the secondary databases to be used and incorporated into the Data Bank are as follows:

- 1- IBGE 1991 and 2000 Censii
- 2- IBGE – National Sanitation Survey 2000
- 3- IBGE – Municipal Information Bank (2001 - 2003)
- 4- STN - State Budget Implementation (1995 - 2005)
- 5- STN - Municipal Revenues and Expenses (1995 - 2005)
- 6- SNIS – Historical Series 1995-2004
- 7- Municipal Government Balance Sheets



Figure 1
Preliminary Database Structure





FUNDAÇÃO
GETULIO VARGAS

ATTACHMENT III



Semantic Scales Method Questionnaire

INCLUDE INTRODUCTION AND REQUEST TO SPEAK WITH THE HOUSEWIFE.

Initial Section: Screening Questions

P. SCREEN 0: TAKE NOTE OF THE INTERVIEWEE'S GENDER.

1. male	2. female
---------	-----------

If the interviewee is male, ask to speak to the housewife. Faced with insistence in that the "housewife" is male, thank for the attention and terminate the interview.

P. SCREEN 1: Are you the housewife?

1. Yes	2. No
--------	-------

If the answer is YES, proceed with the interview. Otherwise, ask to speak to the housewife again. If that is not possible, thank and terminate the interview.

P. Screen 2: For how long have you been the housewife?

1. Less than 10 years	2. More than 10 years
-----------------------	-----------------------

If less than 10 years, thank and terminate the interview.

P. Screen 3: How long have you lived in this municipality?

1. Less than 10 years	2. More than 10 years
-----------------------	-----------------------

If less than 10 years, thank and terminate the interview.

P. Screen 4: Is your home currently connected to the public network for:

P. Screen 5: Ten years ago, was your home connected to the public network for :

Mark 1 for YES; 2 for NO

		P.F.4	P.F.5
a.	Water		
b.	Sewage		



Confront the interviewee's response with information from the municipality's concessionaire. Proceed with the interview ONLY if the interviewee meets the previous requirements. Otherwise, terminate the interview and thank.

Service Evaluation

P.1: What sanitation company provides treated water from the street to your home? (STIMULATED SINGLE RESPONSE)

1. Company Name	98. Other (TAKE NOTE) _____	99. Don't know/ Don't recall
-----------------	-----------------------------	------------------------------

P.2: Do you remember the name of the water provider 10 years ago? (STIMULATED SINGLE RESPONSE)

1. Company Name	98. Other (TAKE NOTE) _____	99. Don't know/ Don't recall
-----------------	-----------------------------	------------------------------

P.3: Generally speaking, and considering everything you know or have head mentioned, how do you rate the current performance of the municipality's Sanitation Company in its activity: excellent, good, average, bad or terrible? (STIMULATED SINGLE RESPONSE)

P.4: How would you perform the same assessment as before, but considering performance in the 1990s? (STIMULATED SINGLE RESPONSE)

		Excellent	Good	Average	Bad	Terrible
P.4:	Currently	5	4	3	2	1
P.5:	1990s	5	4	3	2	1

P.5: Let us now talk about the importance of piped water, sewage collection and the general services rendered by a water and sewage provider. What of the following aspects is most important to you? Second most important? Third? (STIMULATED SINGLE RESPONSE BY COLUMN)

		P.5		
		1st	2nd	3rd
a.	Piped water supply and treatment	1	1	1
b.	Sewage collection and treatment	2	2	2
c.	Customer service in general	3	3	3



P.6: Generally speaking, would you say that the quality of the piped water you currently get from the Company at home is excellent, good, average, bad or terrible? **(STIMULATED SINGLE RESPONSE)**

P.7: How would you perform the same assessment as before, but considering performance in the 1990s? **(STIMULATED SINGLE RESPONSE)**

		Excellent	Good	Average	Bad	Terrible
P.6:	Currently	5	4	3	2	1
P.7:	1990s	5	4	3	2	1

P.8: I would now like to know the importance you assign to certain aspects relative to piped water. This card lists some of these aspects. Please, read each one of them. Which of these aspects relative to piped water do you deem most important? Second most important? Third? Fourth? **(STIMULATED SINGLE RESPONSE BY COLUMN)**

		P.8			
		1st	2nd	3rd	4th
a.	Transparent/clear water	1	1	1	1
b.	Water is good to drink	2	2	2	2
c.	Water has no smell	3	3	3	3
d.	Water is potable/ treated	4	4	4	4
e.	Water supply is constant	5	5	5	5
f.	Water has appropriate pressure	6	6	6	6
g.	Water is priced fairly	7	7	7	7

P.9: I will now show you some statements describing certain characteristics of water and would like you to tell me which one is closest to the piped water you currently get from the Sanitation Company. **(STIMULATED SINGLE RESPONSE BY ITEM).**

P.10: How would you perform the same assessment as before, but considering water characteristics in the 1990s? **(STIMULATED SINGLE RESPONSE)**

	P.9	P.10
	Today	1990s
a COLOR		
aa The water is always transparent and clear	4	4
ab The water is sometimes transparent and clear, but sometimes not	3	3
ac The water is often not transparent and clear	2	2
ad The water is never transparent and clear	1	1
b FLAVOR		
ba The water is always pleasant to drink. It never tastes bad	4	4
bb The water sometimes tastes bad	3	3
bc The water often tastes bad	2	2
bd The water always tastes bad. It is never pleasant to drink	1	1
c SMELL		
ca The water never has a smell	4	4
cb The water sometimes has a smell	3	3



cc The water often smells bad	2	2
cd The water always smells very bad	1	1
d POTABLE/ TREATED	Today	1990s
da The water is completely treated and potable and can be drunk without concern	4	4
db I think the water is treated and potable, but I'm not sure	3	3
dc I think the water is neither treated nor potable, and is unfit for human consumption	2	2
dd I'm sure water is neither treated nor potable, and is unfit for human consumption.	1	1
e REGULARITY/ SUPPLY	Today	1990s
ea Water is never unavailable	4	4
eb Water is sometimes unavailable	3	3
ec Water is normally often unavailable	2	2
ed Water is always unavailable	1	1
f PRESSURE	Today	1990s
fa The water pressure from the main is always appropriate	4	4
fb In most cases, the water pressure from the main is appropriate	3	3
fc The water pressure from the main is sometimes appropriate	2	2
fd The water pressure from the main is never appropriate	1	1
g DELIVERABLE VALUE	Today	1990s
ga I pay a fair price for the water because I know it is treated	4	4
gb I pay a fair price for the water even if I'm not sure it is treated	3	3
gc I pay an unfair price for the water because I don't know what I'm paying for	2	2
gd I pay an unfair price for the water because it is not worth the price charged	1	1

P.11: Generally speaking, would you say that the quality of the sewage the Company currently provides to your home is good, average, bad or terrible? **(STIMULATED SINGLE RESPONSE)**

P.12: And how would you rate it considering sewage service quality in the 1990s? **(STIMULATED SINGLE RESPONSE)**

		Excellent	Good	Average	Bad	Terrible
P.11:	Currently	5	4	3	2	1
P.12:	1990s	5	4	3	2	1



P.13: About the importance you assign to certain aspects relative to the sewage system you use here at home. This card contains some of these aspects. Please read each one of them. Which of these sewage-related aspects do you consider most important? Second most important? Third? **(STIMULATED SINGLE RESPONSE BY COLUMN)**

		P.13		
		1st	2nd	3rd
a.	Sewage does not flow back	1	1	1
b.	The sewage system never plugs	2	2	2
c.	The sewage service is fairly priced	3	3	3
d.	Absence of sewage smell	4	4	4
e.	Sewage is properly treated and does not cause pollution	5	5	5

P.14: I will now show you some sentences describing certain characteristics of the sewage system serving your home and would like you to point out which sentence is closest to the service you currently get at home. **(STIMULATED SINGLE RESPONSE BY ITEM)**

P.15: And how would respond considering sewage service quality in the 1990s? **(STIMULATED SINGLE RESPONSE)**

	P.14	P.15
	Today	1990s
a REFLUX/ SEWAGE BLOWBACK		
aa Sewage never flows back from the street or drain	4	4
ab Sewage sometimes flows back from the street or drain	3	3
ac Sewage often flows back from the street or drain	2	2
ad Sewage always flows back from the street or drain	1	1
b SEWAGE OBSTRUCTIONS		
ba The sewage pipeline is never plugged	4	4
bb The sewage pipeline is sometimes plugged	3	3
bc The sewage pipeline is often plugged	2	2
bd The sewage pipeline is always plugged	1	1
c COST		
ca I pay a fair price for sewage because I know it is collected and treated	4	4
cb I pay a fair price for sewage, even if I don't know whether it is treated and where it goes	3	3
cc I pay an unfair price for sewage, because I don't know what I'm paying for	2	2
cd I pay an unfair price for sewage, because what is done is not worth the price	1	1
d SMELL		
da I can never smell sewage from the street or drain	4	4
db I can sometimes smell sewage from the street or drain	3	3
dc I can often smell sewage from the street or drain	2	2
dd I can always smell sewage from the street or drain	1	1
e SEWAGE TREATMENT		
ea I am sure 100% of sewage is treated and harmless to health and the environment	4	4
eb I believe sewage is treated to prevent harm to health and the environment, but I am not sure	3	3
ec I am under the impression that sewage is not treated or that treatment is insufficient	2	2
ed I am positive that sewage is not treated, creating toxic waste hazardous to health and the environment	1	1



P.16: Generally speaking, and considering everything you know or have heard mentioned, how do you currently rate the Company's service: excellent, good, average, bad or terrible?: **(STIMULATED SINGLE RESPONSE)**

P.17: And how would respond considering service provided in the 1990s ? **(STIMULATED SINGLE RESPONSE)**

		Excellent	Good	Average	Bad	Terrible
P.16:	Currently	5	4	3	2	1
P.17:	1990s	5	4	3	2	1

P.18: What is the importance you assign to certain aspects of the service a piped water supply and sewage collection provider can offer?. This card contains some of those aspects. Please, read each one of them. Which service-related aspect do you believe is most important? Second most important? Third ? Fourth? **(STIMULATED SINGLE RESPONSE BY COLUMN)**

		P.18			
		1st	2nd	3rd	4th
a.	Provide error-free water bills	1	1	1	1
b.	Provide early warning of water supply interruptions	2	2	2	2
c.	Offer easy access service choices	3	3	3	3
d.	Get polite and attentive service from the company's employees	4	4	4	4
e.	Offer flexible bill collection choices	5	5	5	5
f.	Have employees capable of solving problems	6	6	6	6

P.19: I will now show you some statements describing certain characteristics of the Sanitation Company's service and would like you to indicate which statement is closest to your view of what currently takes place at your home. **(STIMULATED SINGLE RESPONSE BY ITEM)**

P.20: How would you respond considering service characteristics in the 1990s? **(STIMULATED SINGLE RESPONSE)**

	P.19	P.20
	Today	1990s
a COLLECTION		
aa I have never found a mistake in my water bill	4	4
ab I have never found a mistake in my water bill, but I know people who have	3	3
ac I have found mistakes in my water bill	2	2
ad I always find mistakes in my water bill	1	1
b SERVICE INTERRUPTION NOTICE		
bb When service is interrupted, I have sufficient forewarning	4	4
bc When service is interrupted, I have little time to prepare	3	3
bd When service is interrupted, I get notice at the last minute	2	2
be When service is interrupted, I never get notice	1	1
c SERVICE CHANNELS		
ca It is very easy to communicate with the Sanitation Company	4	4



cb It is easy to communicate with the Sanitation Company	3	3
cc Communication with the Sanitation Company is usually difficult	2	2
cd Communication with the Sanitation Company is always difficult	1	1
d POLITENESS	Today	1990s
da Employees are always polite and attentive	4	4
db Employees are mostly polite and attentive	3	3
dc Employees are seldom polite and attentive	2	2
dd Employees are never polite and attentive	1	1
e FLEXIBLE COLLECTION	Today	1990s
ea The Sanitation Company always offers flexible ways to pay the bills	4	4
eb The Sanitation Company sometimes offers some bill payment flexibility	3	3
ec The Sanitation Company seldom offers flexible ways to pay the bills	2	2
ed The Sanitation Company never offers flexible ways to pay the bills	1	1
f SKILL	Today	1990s
fa Employees are always able to solve problems	4	4
fb Employees are usually able to solve problems	3	3
fc Employees are not always able to solve problems	2	2
fd Employees are never able to solve problems	1	1

P.21: Considering all of the questions asked and all that you know or have heard, how do you rate the municipality's sanitation company's current performance: excellent, good, average, bad or terrible? **(STIMULATED SINGLE RESPONSE)**

P.22: How would you rate its performance in the 1990s? **(STIMULATED SINGLE RESPONSE)**

		Excellent	Good	Average	Bad	Terrible
P.21:	Currently	5	4	3	2	1
P.22:	1990s	5	4	3	2	1



P.23: Consider some uses of water: in your home, water is used for: _____(MENTION EACH ITEM)?
(STIMULATED SINGLE RESPONSE BY ROW)

P.24: (FOR EACH USE MENTIONED IN P19=1) What water do you use to ____ (MENTION USE)
(STIMULATED MULTIPLE RESPONSE BY LINE)

		P. 23		P. 24 Today				
		Yes	No	Well	tanker truck	Other	Mineral water/Gallon/Bottled	Piped/Street Water
a.	Drinking	1	2	1	2	3	4	5
b.	Cooking	1	2	1	2	3	4	5
c.	Doing dishes	1	2	1	2	3	4	5
g.	Laundry	1	2	1	2	3	4	5
e.	Bathing	1	2	1	2	3	4	5
f.	Washing sidewalks / common areas / Backyard/ Watering Plants	1	2	1	2	3	4	5
g.	Fill the swimming pool	1	2	1	2	3	4	5

P.25: (FOR EACH USE MENTIONED NI P19=1) What water did you use in the 1990s to: (MENTION USE)
(STIMULATED MULTIPLE RESPONSE BY LINE)

		P. 25 1990s				
		Well	tanker truck	Other	Mineral water/Gallon/Bottled	Piped/Street Water
a.	Drinking	1	2	3	4	5
b.	Cooking	1	2	3	4	5
c.	Doing dishes	1	2	3	4	5
d.	Laundry	1	2	3	4	5
e.	Bathing	1	2	3	4	5
f.	Washing sidewalks / common areas / Backyard/ Watering Plants	1	2	3	4	5
g.	Fill the swimming pool	1	2	3	4	5

About PSP Processes

P.26: Considering a series of service available in your municipality, please rate how you perceive the quality of each one. (STIMULATED MULTIPLE RESPONSE BY LINE)

		P.22				
		excellent	good	average	bad	terrible
a.	Post office	5	4	3	2	1
b.	Movie theatres, theaters and amusement parks	5	4	3	2	1
c.	Private banks in general	5	4	3	2	1
d.	Garbage collection service	5	4	3	2	1



e.	Private education	5	4	3	2	1
f.	Street and park maintenance service	5	4	3	2	1
g.	Supermarket networks	5	4	3	2	1
h.	Banks	5	4	3	2	1

P.27: In recent years, several services that were provided by the Public Sector have been transferred to Private Companies. Rate your agreement with the following statements: **(STIMULATED MULTIPLE RESPONSE BY LINE)**

		P.23				
		Fully agree	Agree	Neither agree nor disagree	Disagree	Fully disagree
a.	Private companies offer more qualitative service.	5	4	3	2	1
b.	Private companies get excessive benefits at the cost of other people.	5	4	3	2	1
c.	State-owned companies are marked by less efficient operations	5	4	3	2	1
d.	Private companies are only concerned with high-income individuals	5	4	3	2	1
e.	State-owned company employees are more skilled.	5	4	3	2	1
f.	State-owned companies work to improve people's quality of living	5	4	3	2	1

P.28: Did you know that in the late 1990s the water service in your municipality was transferred to a private company? **(SPONTANEOUS SINGLE RESPONSE)**

1. Yes	2. No	3. I have heard something about it, but am not sure
--------	-------	---

Final Section: Profiling

P.29: How old are you, please? **(IN THE ABSENCE OF RESPONSE, TAKE NOTE OF APPARENT AGE)**

TAKE NOTE	<input type="text"/>	1. 25-34	2. 35-44	3. 45-59	4. 60 or older
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P.30: Can you tell me if the items next are found in your home (**READ ITEMS BELOW**)? (**IF SO**) How many?

COMFORT ITEMS	6. 7.	NUMBER OWNED				SCREEN 3a What is the head of the household's schooling level? <u>Head</u>
		1	2	3	4+	
k. TV (color)	0	2	3	4	5	Illiterate/ Incomplete Elementary 0
l. Radio (any)	0	1	2	3	4	Complete Elementary / Incomplete 1
m. Automobile	0	2	4	5	5	Complete Middle 2
n. Live-in maid	0	2	4	4	4	Incomplete High School 2
o. Vacuum-cleaner (also handheld)	0	1	1	1	1	Complete High School 3
p. Clothes washer	0	1	1	1	1	Incomplete College 3
q. VCR/ DVD	0	2	2	2	2	Complete College 5
r. WC (disregard communal)	0	2	3	4	4	Post-Graduate 5
s. Refrigerator	0	2	2	2	2	
t. Freezer as independent appliance or part of duplex refrigerator	0	1	1	1	1	

Note: Schooling levels will be aligned with the Ministry of Education's standards.

P.31: Adding together your income and that of the people who live with you, what is your approximate household income?

1. No income	5. R\$ 520.01-R\$ 780.00	9. R\$ 5,201.00-R\$ 13,000.00
2. Up to R\$ 130.00	6. R\$ 780.01-R\$ 1300.00	10. Over R\$ 13,000.00
3. R\$ 130.01-R\$ 260.00	7. R\$ 1,300.01-R\$ 2,600.0	11. Undeclared / refused
4. R\$ 260.01-R\$ 520.00	8. R\$ 2,600.01-R\$ 5,200.00	

P.32: Do you remember how much you paid for your latest water bill?

P.33: ONLY IF REMEMBERS: How much?

P.32	
1. No	
2. Yes	R\$ <input type="text"/>

P. 33



Discrepancies Method Questionnaire

INCLUDE INTRODUCTION AND REQUEST TO SPEAK WITH THE HOUSEWIFE.

Initial Section: Screening Questions

P. SCREEN 0: TAKE NOTE OF THE INTERVIEWEE'S GENDER.

1. male	2. female
---------	-----------

If the interviewee is male, ask to speak to the housewife. Faced with insistence in that the "housewife" is male, thank for the attention and terminate the interview.

P. SCREEN 1: Are you the housewife?

1. Yes	2. No
--------	-------

If the answer is YES, proceed with the interview. Otherwise, ask to speak to the housewife again. If that is not possible, thank and terminate the interview.

P. Screen 2: For how long have you been the housewife?

1. Less than 10 years	2. More than 10 years
-----------------------	-----------------------

If less than 10 years, thank and terminate the interview.

P. Screen 3: How long have you lived in this municipality?

1. Less than 10 years	2. More than 10 years
-----------------------	-----------------------

If less than 10 years, thank and terminate the interview.

P. Screen 4: Is you home currently connected to the public network for:

P. Screen 5: Ten years ago, was your home connected to the public network for :

Mark 1 for YES; 2 for NO

		P.F.4	P.F.5
a.	Water		
b.	Sewage		



Confront the interviewee's response with information from the municipality's concessionaire. Proceed with the interview ONLY if the interviewee meets the previous requirements. Otherwise, terminate the interview and thank.

Service Evaluation

P.1: What sanitation company provides treated water from the street to your home? (STIMULATED SINGLE RESPONSE)

1. Company Name	98. Other (TAKE NOTE) _____	99. Don't know/ Don't recall
-----------------	-----------------------------	------------------------------

P.2: Do you remember the name of the water provider 10 years ago? (STIMULATED SINGLE RESPONSE)

1. Company Name	98. Other (TAKE NOTE) _____	99. Don't know/ Don't recall
-----------------	-----------------------------	------------------------------

P.3: Generally speaking, and considering everything you know or have head mentioned, how do you rate the current performance of the municipality's Sanitation Company in its activity? (STIMULATED SINGLE RESPONSE)

5. excellent	4. good	3. average	2. bad	1. terrible
--------------	---------	------------	--------	-------------

P.4: Do you agree with the statement: "Currently, the municipality's water concessionaire's performance is better than in the 1990s": (STIMULATED SINGLE RESPONSE)

5. Fully agree	4. Agree	3. Neither agree nor disagree	2. Disagree	1. Fully disagree
----------------	----------	-------------------------------	-------------	-------------------

P.5: Let us now talk about the importance of piped water, sewage collection and the general services rendered by a water and sewage provider. What of the following aspects is most important to you? Second most important? Third? (STIMULATED SINGLE RESPONSE BY COLUMN)

		P.5		
		1st	2nd	3rd
a.	Piped water supply and treatment	1	1	1
b.	Sewage collection and treatment	2	2	2
c.	Customer service in general	3	3	3



P.6: Generally speaking, would you say that the quality of the piped water you currently get from the Company at home is: **(STIMULATED SINGLE RESPONSE)**

5. excellent	4. good	3. average	2. bad	1. terrible
--------------	---------	------------	--------	-------------

P.7: Do you agree with the statement: “The water service I get at home now is better than in the 1990s”: **(STIMULATED SINGLE RESPONSE)**

5. Fully agree	4. Agree	3. Neither agree nor disagree	2. Disagree	1. Fully disagree
----------------	----------	-------------------------------	-------------	-------------------

P.8: I would now like to know the importance you assign to certain aspects relative to piped water. This card lists some of these aspects. Please, read each one of them. Which of these aspects relative to piped water do you deem most important? Second most important? Third? Fourth? **(STIMULATED SINGLE RESPONSE BY COLUMN)**

		P.8			
		1st	2nd	3rd	4th
a.	Transparent/clear water	1	1	1	1
b.	Water is good to drink	2	2	2	2
c.	Water has no smell	3	3	3	3
d.	Water is potable/ treated	4	4	4	4
e.	Water supply is constant	5	5	5	5
f.	Water has appropriate pressure	6	6	6	6
g.	Water is priced fairly	7	7	7	7



P.9: I will now show you some statements describing certain characteristics of water and would like you to tell me if you agree with each one: **(STIMULATED SINGLE RESPONSE BY ROW)**

		P.9				
		Fully agree	Agree	Neither agree nor disagree	Disagree	Fully disagree
a.	The water is clearer now than in the 1990s	5	4	3	2	1
b.	The water tastes better now than in the 1990s	5	4	3	2	1
c.	The water now smells worse than in the 1990s	5	4	3	2	1
d.	The water is now better treated and more potable than in the 1990s	5	4	3	2	1
e.	The water supply is now interrupted less often than in the 1990s	5	4	3	2	1
f.	The water now comes out with less pressure than in the 1990s	5	4	3	2	1
g.	I currently pay a more fair price for the water than in the 1990s, because now I'm sure it is treated	5	4	3	2	1

P.10: Generally speaking, would you say that the quality of the sewage service the company currently provides to our home is: **(STIMULATED SINGLE RESPONSE)**

5. excellent	4. good	3. average	2. bad	1. terrible
--------------	---------	------------	--------	-------------

P11: Do you agree with the statement: "*The sewage service I now get at home is better than in the 1990s*": **(STIMULATED SINGLE RESPONSE)**

5. Fully agree	4. Agree	3. Neither agree nor disagree	2. Disagree	1. Fully disagree
----------------	----------	-------------------------------	-------------	-------------------



P.12: What is the importance you assign to certain aspects relative to the sewage system you use here at home. This card contains some of these aspects. Please read each one of them. Which of these sewage-related aspects do you consider most important? Second most important? Third? **(STIMULATED SINGLE RESPONSE BY COLUMN)**

		P.12		
		1st	2nd	3rd
a.	Sewage does not flow back	1	1	1
b.	The sewage system never plugs	2	2	2
c.	The sewage service is fairly priced	3	3	3
d.	Absence of sewage smell	4	4	4
e.	Sewage is properly treated and does not cause pollution	5	5	5

P.13: I will now show you some sentences describing certain characteristics of the sewage system serving your home and would like you to point out which sentence is closest to the service you currently get at home. **(STIMULATED SINGLE RESPONSE BY ITEM)**

		P.13				
		Fully agree	Agree	Neither agree nor disagree	Disagree	Fully disagree
a.	There is now less reflux/blowback than in the 1990s	5	4	3	2	1
b.	Sewage is now plugged more often than in the 1990s	5	4	3	2	1
c.	I currently feel that the price I pay for sewage service is more fair because I am more sure of its treatment than in the 1990s	5	4	3	2	1
d.	I now feel unpleasant smells associated with sewage more often than I did in the 1990s	5	4	3	2	1
e.	Sewage residue is now better treated, with lower impact on public health and the environment	5	4	3	2	1

P.14: Generally speaking, and considering everything you know or have heard mentioned, how do you currently rate the Company's service: **(STIMULATED SINGLE RESPONSE)**

5. excellent	4. good	3. average	2. bad	1. terrible
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P.15: Do you agree with the statement: *"The water supply company's service is better now than what was available in the 1990s"*: **(STIMULATED SINGLE RESPONSE)**

5. Fully agree	4. Agree	3. Neither agree nor disagree	2. Disagree	1. Fully disagree
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P.16: What is the importance you assign to certain aspects of the service a piped water supply and sewage collection provider can offer?. This card contains some of those aspects. Please, read each one of them. Which service-related aspect do you believe is most important? Second most important? Third? **(STIMULATED SINGLE RESPONSE BY COLUMN)**

		P.16			
		1st	2nd	3rd	4th
a.	Provide error-free water bills	1	1	1	1
b.	Provide early warning of water supply interruptions	2	2	2	2
c.	Offer easy access service choices	3	3	3	3
d.	Get polite and attentive service from the company's employees	4	4	4	4
e.	Offer flexible bill collection choices	5	5	5	5
f.	Have employees capable of solving problems	6	6	6	6

P.17: I will now show you some statements describing each one of the service characteristics mentioned earlier and ask you to indicate your level of agreement: **(STIMULATED SINGLE RESPONSE BY ROW)**

		P.18				
		Fully agree	Agree	Neither agree nor disagree	Disagree	Fully disagree
a.	Currently mistakes in the water bills are less frequent than in the 1990s	5	4	3	2	1
b.	Currently, when water supply is going to be interrupted, I get more forewarning than in the 1990s	5	4	3	2	1
c.	Currently, it is easier to communicate with the sanitation company than it was in the 1990s	5	4	3	2	1
d.	The sanitation company's employees were more attentive and polite in the 1990s than they are now.	5	4	3	2	1
e.	Currently, the sanitation company offers more late bill payment flexibility than in the 1990s	5	4	3	2	1
f.	The sanitation company's employees were more capable of solving problems in the 1990s than they are now	5	4	3	2	1

P.18: Considering all of the questions asked and all that you know or have heard, how do you rate the municipality's sanitation company's current performance: excellent, good, average, bad or terrible? **(STIMULATED SINGLE RESPONSE)**



5. excellent	4. good	3. average	2. bad	1. terrible
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P.19: Consider some uses of water: in your home, water is used for: (MENTION EACH ITEM) (STIMULATED SINGLE RESPONSE BY ROW)

P.20: (FOR EACH USE MENTIONED IN P19=1) What water do you use to ____ (MENTION USE) (STIMULATED MULTIPLE RESPONSE BY LINE)

	P. 19		P. 20 Today				
	Yes	No	Well	tanker truck	Other	Mineral water/Gallon/Bottled	Piped/Street Water
a. Drinking	1	2	1	2	3	4	5
b. Cooking	1	2	1	2	3	4	5
c. Doing dishes	1	2	1	2	3	4	5
g. Laundry	1	2	1	2	3	4	5
e. Bathing	1	2	1	2	3	4	5
f. Washing sidewalks / common areas / Backyard/ Watering Plants	1	2	1	2	3	4	5
g. Fill the swimming pool	1	2	1	2	3	4	5

P.21: (FOR EACH USE MENTIONED NI P19=1) What water did you use in the 1990s to: (MENTION USE) (STIMULATED MULTIPLE RESPONSE BY LINE)

	P. 21 1990s				
	Well	tanker truck	Other	Mineral water/Gallon/Bottled	Piped/Street Water
a. Drinking	1	2	3	4	5
b. Cooking	1	2	3	4	5
c. Doing dishes	1	2	3	4	5
d. Laundry	1	2	3	4	5
e. Bathing	1	2	3	4	5
f. Washing sidewalks / common areas / Backyard/ Watering Plants	1	2	3	4	5
g. Fill the swimming pool	1	2	3	4	5



About PSP Processes

P.22: Considering a series of service available in your municipality, please rate how you perceive the quality of each one: (STIMULATED MULTIPLE RESPONSE BY LINE)

		P.22				
		excellent	good	average	bad	terrible
a.	Post office	5	4	3	2	1
b.	Movie theatres, theaters and amusement parks	5	4	3	2	1
c.	Private banks in general	5	4	3	2	1
d.	Garbage collection service	5	4	3	2	1
e.	Private education	5	4	3	2	1
f.	Street and park maintenance service	5	4	3	2	1
g.	Supermarket networks	5	4	3	2	1
h.	Banks	5	4	3	2	1

P.23: In recent years, several services that were provided by the Public Sector have been transferred to Private Companies. Rate your agreement with the following statements: (STIMULATED MULTIPLE RESPONSE BY LINE)

		P.23				
		Fully agree	Agree	Neither agree nor disagree	Disagree	Fully disagree
a.	Private companies offer more qualitative service.	5	4	3	2	1
b.	Private companies get excessive benefits at the cost of other people.	5	4	3	2	1
c.	State-owned companies are marked by less efficient operations	5	4	3	2	1
d.	Private companies are only concerned with high-income individuals	5	4	3	2	1
e.	State-owned company employees are more skilled.	5	4	3	2	1
f.	State-owned companies work to improve people's quality of living	5	4	3	2	1

P.24: Did you know that in the late 1990s the water service in your municipality was transferred to a private company? (SPONTANEOUS SINGLE RESPONSE)

1. Yes	2. No	3. I have heard something about it, but am not sure
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Final Section: Profiling

P.25: How old are you, please? **(IN THE ABSENCE OF RESPONSE, TAKE NOTE OF APPARENT AGE)**

**TAKE
NOTE**

1. 25-34

2. 35-44

3. 45-59

4. 60 or older

P.26: Can you tell me if the items next are found in your home **(READ ITEMS BELOW)? (IF SO)** How many?

COMFORT ITEMS	8. 0	NUMBER OWNED				SCREEN 3a What is the head of the household's schooling level? Head
		1	2	3	4+	
u. TV (color)	0	2	3	4	5	Illiterate/ Incomplete Elementary 0
v. Radio (any)	0	1	2	3	4	Complete Elementary / Incomplete 1
w. Automobile	0	2	4	5	5	Complete Middle 2
x. Live-in maid	0	2	4	4	4	Incomplete High School 2
y. Vacuum-cleaner (also handheld)	0	1	1	1	1	Complete High School 3
z. Clothes washer	0	1	1	1	1	Incomplete College 3
aa. VCR/ DVD	0	2	2	2	2	Complete College 5
bb. WC (disregard communal)	0	2	3	4	4	Post-Graduate 5
cc. Refrigerator	0	2	2	2	2	
dd. Freezer as independent appliance or part of duplex refrigerator	0	1	1	1	1	

Note: Schooling levels will be aligned with the Ministry of Education's standards.

P.27: Adding together your income and that of the people who live with you, what is your approximate household income?

1. No income	5. R\$ 520.01-R\$ 780.00	9. R\$ 5,201.00-R\$ 13,000.00
2. Up to R\$ 130.00	6. R\$ 780.01-R\$ 1300.00	10. Over R\$ 13,000.00
3. R\$ 130.01-R\$ 260.00	7. R\$ 1,300.01-R\$ 2,600.00	11. Undeclared / refused
4. R\$ 260.01-R\$ 520.00	8. R\$ 2,600.01-R\$ 5,200.00	



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P.28: Do you remember how much you paid for your latest water bill?

P.29: ONLY IF REMEMBERS: How much?

P.29	
1.	No
2.	Yes

 R\$

P. 30
