

L.5 Regulatory Framework for Competitive Services

L.5.1 Introduction

***Report by CEPAL.- April 2000**

The quantity and quality of public services has improved in Latin America. PPS generalized throughout the region during the 80's, and in the 90's there was a significant progress in the regulation of the markets. However, experience showed that competitive conditions cannot be always guaranteed, and that it is necessary to improve the regulatory frameworks and practices. In some countries of Latin America and the Caribbean there is a regulatory deficit, whereas in others new challenges have arisen as a consequence of the maturity of the markets.

In the chapter about the reduction of regulatory deficit in the public services from the CEPAL report, the solutions on this issue in some industrialized countries are shown, as well as the experiences gained in the region, such as the cases of Argentina, Chile, Colombia and Peru.

CEPAL ranks regulatory challenges as the most important at the financial activities, the domestic public services, those social sector where public and private agents coexist, and the activities with environmental externalities. CEPAL considers that the haste with which some privatization were carried out brought as a result an insufficient attention to the designing of the regulatory norms. Now, the governmental actions face, many times, restrictions stemming from rights acquired during the privatization process.

Two important lessons have to be learnt from the privatization of public services, according to CEPAL. The first one is that definition of the normative and regulatory framework, as well as the institutional designing and implementation of the entities in charge must occur prior the privatization process itself. Otherwise, the reforms can become unstable and give room to patrimonial transfers and unjustified income, sometimes very large amount. The second lesson stresses the convenience of establishing a "clear division" among the functions to formulate the sector development, regulation and operation policies of the services.

It suggests that when elaborating new norms it should be taken into account that the behavior of the enterprises of services is governed mainly by the regulation, but it is also determined by a broader legislation, such as the laws of defense and promotion of competition or more specific such as those that regulate the contracts of natural resources such as water.

Regarding the specific regulatory frameworks, the document deems as convenient "to respect the minimum principles that allow the control of activities and related services: appropriate services in quality and amount, reasonable tariffs, supplying of information, access to facilities and key natural resources, and obligatory accounting norms, prosecution norms and conflict resolution norms, which ensure transparency and impartiality".

In some cases, readjustment of the practices, contracts and regulations in force can be required. To do so, adequate information is required, such as the respect to the principle of reasonable profit, in order not to affect the constitutional guarantee of ownership. Several of the systems analyzed guarantee minimum profits, but they do

not set ceilings to the profits. Others do not contemplate the criterion of reasonable profit.

On the other hand, the integration in the establishment of quality control rules of the service and the sanctions for their infringement, same as the information to users, are relevant elements that must be considered more in detail for the regulation.

In Latin America and the Caribbean, efforts were made to substitute cross-subsidy by focal subsidies, but not all the countries have the political, tax and auditing conditions that allow the change from one system to another. Likewise, the modality of incorporating the regulating entity, its setting up and degree of relative autonomy are fundamentals.

The document acknowledges that the unbalance in information seriously affects the quality of regulation. In the region, few countries have compulsory and standardized accounting systems that allow to reduce such unbalance to a certain extent for the efficiency and transparency of the regulatory process, specially that of the tariff area.

The absence of a regulatory instrument to render the solid waste management services in San Salvador metropolitan area is one of the main limitations to improve the performance by the service providers and to care about the inhabitants' health and protect the environment, as well as to maximize the resources devoted for such activities and promote competition.

Recommendation:

Taking into account the unpredictable consequences in the deterioration of health and the environment, the establishment of a regulatory and institutional framework is recommended, for which a draft of Law Proposal on this issue is submitted to the authorities (see Anexo-O).

On the other hand, it is important to have an organization that performs as a regulator, for which the possibility of assigning that duty to the Superintendent's Office of Electricity and Telecommunications (SIGET), by modifying its law of creation, as other countries have made, and utilizing the regulatory experience achieved and decreasing regulation costs.

L.5.2 General Rules of Regulation

General rules of regulation to render a public service of solid waste management and PPS: Implications for a regulatory and institutional law for the solid waste management in El Salvador

L.5.2.1 Introduction

The economic theory of regulation suggests that a general framework must regulate, in a general and specific form, and specify the following:

- a. Rules of competition (rules for the vertical and horizontal integration)
- b. Forms of PPS (previously analyzed: Annex-K)
- c. Service quality standards
- d. Basic rules on the capital cost rate
- e. Form of solving discrepancies (direct arrangement, arbitration)

- f. Rules to submit the information
- g. Rules for price setting, such as rules to estimate capital cost and a general form to regulate prices

A well designed and general regulation has several advantages, among which the following can be mentioned:

- Rent-seeking activities will be partially eliminated, since the competition rules for the sector are broadly outlined in the regulatory framework.
- The customer-provider relationships are defined. This fact reduces the problems of uncertainty and thus cuts costs.
- Incentives are promoted or created so that private capital can participate in the sector.
- Externalities are reduced (environmental damages, abuse towards certain group of customers, etc.)
- Minimum quality standards for rendering the services are fixed.
- Rules to reduce the unbalance of information through the establishment of information submission norms.
- The alternative of an excessive abuse of market power by the operator is reduced.
- Competition and thus efficiency are ensured by setting the rules for segmentation of the markets.

Due to the above mentioned, a "Regulatory and Institutional Framework for Solid Waste Management" is shown herewith, whose technical fundamentals are shown next:

- a. Policies of competition and rules of vertical integration
- b. Policies of competition and rules of horizontal integration
- c. Service quality standards
- d. Principles and rules for information submission
- e. Insurance
- f. Price setting rules
- g. Capital cost rate
- h. Discrepancies and arbitration

L.5.3 Policies of Competition

L.5.3.1 Policies of Competition and Rules of Vertical Integration²

The analysis of vertical integration corresponds to the concept of assessing the benefits versus the costs (risks) of an integration of the markets by allowing the vertical integration of the diverse functional categories or activities.

As previously explained, the diverse activities or categories of solid waste management are as follows:

- a. Collection
- b. Sweeping
- c. Recycling
- d. Final disposal

a. Household Collection, Sweeping and Recycling

Please note that the activities of household collection, sweeping (mainly when conducted manually) and recycling are correlated. That is, the economy of scale is achieved when integrating them together. The world experience shows that recycling with collection, in most of the cases, is grouped in one single category. When sweeping is conducted mechanically, this activity can be isolated as another functional category, since there would be no profit from the economy of scale when aggregating it because they would behave as independent activities.

Recommendation: *For the specific case of San Salvador Metropolitan Area, provided that sweeping will be carried out manually in all the markets, with the exception of certain sectors of the San Salvador municipality where it will be conducted mechanically, and in order to reduce costs and to benefit consumers, the vertical integration of these three activities is recommended. That is, PPS should be called through competitive tenders, and for household collection, street sweeping and recycling as a whole.*

b. Policies of Competition and Vertical Integration: Household Collection-sweeping-recycling and Final Disposal

Technical evidence shows that the collection activities (including sweeping and recycling) are totally independent from the activity of final disposal. By vertically integrating these activities there are no guarantees through the achievement of economy of scale. The aforementioned is quite clear with the evidence of the United States, where more than 80% of the sanitary landfills or functional activities of final disposal are handled by the public sector, whereas around 85% of collection (sweeping and recycling) is in the hands of private parties. The evidence in Latin America is not so different from that of the United States, since most of the countries where PPS exists, the activity is still in the hands of public entities.

In general, it is convenient that the private sector participate in this activity but without getting integrated into the collection sector, because otherwise there is a risk

² It is the control by the same individual or enterprise, or by its affiliates, of the operation of several activities or functional categories of solid waste management within the same geographical market.

of creating a monopoly in the long term and discrimination against other collection service providers with the purpose of integrating bigger markets in a horizontal manner.

It is important to mention that the scarce participation by the private sector in the final disposal activities is due to the following factors:

- It is a capital intensive activity that requires a great extension of land that meets environmental requirements and a costly infrastructure (access roads, electricity, water, telephone, offices, shops), operative infrastructure (control of entrance-weighing, leachate treatment, runoff control and rainwater evacuation, landfill gas management, borrow pits to extract covering material) and mechanical equipment.
- The risk is high, because in general terms a sanitary landfill is designed for a useful life of 20 to 30 years. Therefore, return of capital is related to this term.
- In general terms, the norms to build sanitary landfills require assuring data to avoid the aquifer pollution or any other environment effect and that satisfies post-closure guarantee of generally 5 to 20 years. Therefore it makes this business unattractive for private parties.

However, given a situation of emergency in the final disposal of solid wastes in San Salvador metropolitan area, majority of the municipalities decided to form a mixed enterprise (MIDES - 90% private capital and 10% municipal) to develop a sanitary landfill in the municipality of Nejapa and other services with an estimated investment of US \$61.2 million.

Each participant municipality entered a long-term contract with MIDES and compromised to discharge a determined monthly amount of solid wastes and paying US \$18.00/ton discharged.

Between March and April 1999, two expert missions hired by the Inter-American Development Bank analyzed the contractual liabilities and the basis for the re-negotiation of the referred contract.

It is expected that MIDES investment program is modified and it can determine both the actual investment cost (to be regulated according to the capital cost rate) and the real operation costs per functional activity, with the purpose of regulating the price through a formula of a "price cap with no readjustment". And it is expected to be reviewed every year.

To prevent MIDES project from falling into the "Averch-Johnson" (or over-investment) effect, it is recommended to use regulation parameters for final disposal costs in Latin America. It is important to point out that in no case is this price going to surpass US\$10 per ton, since this value corresponds to the price of a good technology sanitary landfill with the highest costs available in Latin America (Til-Til) in Chile and Buenos Aires.

- a. It is recommended that PPS should be allowed in a manner that competition exists, and to become able to develop a future final disposal capacity in San Salvador. Prices should be regulated according to the service cost with the capital cost rate.
- b. Consequently, the document of Regulatory and Institutional Framework for Solid Waste Management has been formulated, for competition purposes, in

order to limit the vertical integration between this final disposal activity and collection (recycling and sweeping) activity.

Final recommendation: *It is recommended to limit the vertical integration. That is, an enterprise or juridical person that controls a collection area cannot possess a final disposal system. Finally, it is recommended that the rules of competition (specially for the proposal and their opening, the mergers, prices and other factors that limit competition), should be reviewed by the Office of Consumer Protection, since, according to law, this institution must watch for the competition and protection of the consumer against monopoly, the use of discriminatory or plundering prices or the existence of monopoly prices as a result of collusion activities.*

L.5.3.2 Policies of Competition and Rules of Horizontal Integration³ (Merger of Horizontal Markets and/or Participation of enterprises in Various Areas)

In a market of public services such as that of solid wastes in AMSS, the feasibility for horizontal integration possibly in the future must be assessed by using competition economy (antitrust) techniques that suggest the evaluation of market concentration indexes by means of C4 indexes (Concentration of the 4 largest enterprises in the market) and the Herfindahl-Hirschman index (HHI). HHI index corresponds to the sum of squares of market share by enterprises.

For the purposes of evaluating HHI index and its relation with the feasibility of horizontal integration, in general, the competition commissions in many countries follow the guidelines of the Competition Commission of the United States (antitrust) of the Federal Trade Commission and the Department of Justice of the United States.

The market of AMSS has been evaluated and it has been determined that the only market that can be segmented is the one of San Salvador. A further segmentation of the markets cannot be thought of, due to that the municipal governance should be respected, and the only market feasible to become segmented is that of San Salvador municipality; otherwise the economy of scale is lost in smaller municipalities.

It can be concluded that “**no horizontal integration of the markets in the future is feasible**”. In that sense, the regulatory and institutional framework proposed has established that merger is not allowed horizontally. The collection enterprises will only have participation in a single area. No relation among the providers of the collection service will be allowed in the areas or markets proposed.

Final recommendation: *The regulatory and institutional framework clearly states that the person or enterprise that controls a collection area can have no further participation into another collection enterprise or into an enterprise that manages a sanitary landfill in a private manner or through a system where such enterprise sets the prices of said sanitary landfill.*

L.5.4 Service Quality Parameters

The service quality parameters must be verified by an organization unrelated to the provider of the service. If the municipalities will directly conduct the rendering of the service, they cannot be in charge of verifying the quality of such services. Therefore,

³ It is the control by the same individual or enterprise, or by its affiliates, of the operation of a similar functional category or activity of solid waste management.

it is recommended that the verification of the quality of the service be in charge of regulator. For the purposes of the amount of the fines suggested, the **minimum urban salary (MUS)** is used for San Salvador metropolitan area.

L.5.4.1 Service Quality Parameters for Collection and Sweeping

The experience shows that “free-riding” or “opportunists” activities are common by the private party in this kind of activities. It is quite important that the user is duly informed on their right to claim for several typical reasons such as the following:

- Private operators, before a tariff structure of unit prices or volume prices (price per container) tend to not empty the container completely.
- The collection staff tends to ask for contributions and conditions the quality of the service rendered with the contribution received. In most of the efficient collection systems, the practices of requesting for a contribution is utterly prohibited, since it increases the collection costs and turns the quality of the service discriminatory for the users.

Table L-18, Table L-19, Table L-20 and Table L-21 detail the recommended service quality parameters and the fines suggested for non-fulfillment of the obligations by the providers of the service, be it municipal or private ones. These parameters are being suggested after conducting an exhaustive analysis of the service quality parameters applied in the United States, as well as in developing countries with highly efficient solid waste collection systems where PPS in the services is also high (e.g., Chile, Argentina, Brazil, etc.).

Table L-18 presents the common “general” parameters (non-technical) for the collection and sweeping services.

Table L-18: General Quality Parameters for Collection and Sweeping Services

General parameter for collection and sweeping	Type of fine and amount recommended
Lack of identification of the truck (number, plates) or the mechanical sweeper (number, plates, company, etc.)	2 MUS per truck detected
Lack of uniformity in the presentation of vehicles	1MUS per truck every time the infringement is detected
Ask for contributions (gifts)	1 MUS per person caught in the act (proven)
Staff changing their clothes on public thoroughfare	1 MUS per person caught in the act
Not using the uniform	1 MUS per person caught in the act per day
Inappropriate behavior of rudeness towards the public in general by the collection and/or sweeping staff	1 MUS per person

Table L-19 presents the common “**technical**” parameters for the collection and sweeping services.

Table L-19: Technical Quality Parameters for Collection and Sweeping Services

Technical parameters for collection and sweeping	Type of fine and amount recommended
Non-compliance of the days and time of collection of wastes or sweeping	3 MUS per vehicle every time the act is detected
Every act of excessive noise in the mechanical sweeping and/or collection duty	1 MUS per occurrence
Abandonment of collection vehicle or sweeping vehicle on public thoroughfare	2 MUS per vehicle abandoned per day
Deposit or discharge of wastes from collection or sweeping at unauthorized places	2 MUS per discharge
Leave wastes on public thoroughfare (scattered wastes) due to an inappropriate loading by the collection vehicle or mechanical sweeper	1 MUS per case detected
Parking of the collection vehicle or sweeper on public thoroughfare	2 MUS per vehicle every time it is caught in the act

Table L-20 presents the “**technical**” parameters for the collection service.

Table L-20: Technical Quality Parameters for Collection Services Only

Technical parameters for collection	Type of fine and amount recommended
Leaving wastes scattered during the collection task	1 MUS per case detected
Spilling of liquids percolated on public thoroughfare from collection vehicles	2 MUS per truck every time such infringement is detected.
Searching and selection of materials among the wastes transported by the truck staff or by third parties	1 MUS per truck every time such infringement is detected
Deficiencies in the maintenance, replacement and disinfecting of containers	1 MUS per container every time such infringement is detected
Lack of collection of vegetal wastes from persons and/or public areas	1 MUS per case detected

Table L-21 presents “**technical**” specific parameters for the sweeping activity.

Table L-21: Technical Quality Parameters Specific for Sweeping

Technical parameters for sweeping	Type of fine and amount recommended
Change of route by mechanical sweepers without the authorization by municipality	3 MUS per vehicle detected in each case
Lack of collection of wastes from street sweeping.	1 MUS per truck every time the infringement is detected
Lack of execution of street sweeping on the specified days and time	1 MUS per kilometer non covered

It is recommended that the quality parameters proposed above be printed out on the rear of the corresponding invoice, so that the consumers know their right and can demand the quality for the service they are paying, by claiming to the regulator.

Final recommendation: *It is a requirement to inform about the service quality parameters and their corresponding fines in the tender bases, since this is one of the*

variables that define the final price. The service quality parameters are part of the regulatory and institutional framework, however this does not specify the fines, which in general terms are part of the contract for rendering the service that the private party enters with the municipality.

L.5.4.2 Service Quality Parameters for Final Disposal Activities

The quality parameters for the final disposal service (sanitary landfill) are defined by the Technical Rules for Sanitary Landfills that are shown in the Decree #42 in the Official Gazette of June 1st 2000. These technical rules correspond to a legislation independent from the Regulatory and Institutional Framework Law of Solid Waste Management.

L.5.5 Principles and Rules of Information Submission

In order to efficiently regulate from a tariff viewpoint, the following information should be available, be enough, adequate and timely. The regulator needs to know about the costs to evaluate the tariffs in force and estimate fees for the next period. Information to verify the quality of the service is also required.

A detail of the information that is generally recommended to be requested, in order to conduct an efficient reform and regulation under the diverse PPS systems, is shown next.

Table L-22: Information Rules for the Diverse Forms of PPS

PPS types	Detail of information	Submission period
Common information for all forms of PPS in collection (sweeping and recycling) Contract of service Contract of operation Administration Franchise/concession Under any price regulatory system (lump sum, cost-plus or unit price)	Number of customers attended segmented per district and customer category	Once per year
	Ton collected month by month per route and district for the different type of users	Once per year
	Number, type and capacity of trucks used for collection for the zone where services are rendered	Once per month
	Detail of routes of the collection trucks	Once per year or every time the route is modified
	Detail of frequency and collection schedule per district and route	Once per year or every time it is modified
	Number of employees and salaries per functional category (sweeping, collection, final disposal, management and administration), per month	Once per year
Contract of collection operation (not including commercial system)	Number of trucks used per type (compactor, dump) and identified for each month	Every six months
	General accounting information, which must include balance, balance sheet, patrimony change statement, details of depreciation separately, cash flow statement, detail of assets separated per asset and detail of the cash	Every six months under a cost-plus price system. Annual delivery under lump sum price regulation system
	Detail of cost separated per operation cost and capital cost for the following functional categories: collection, sweeping, final disposal, management and administration	Every two months under cost-plus price regulation system. Once per year under lump sum price system
Owner and/or concessionaire (franchise) of a landfill	Number of ton that enter landfill, per type of user and location (barrio and district) per month.	Every six months
	Number of employees, qualification and salaries per month for each employee category (management, operation or others)	Once per year
	Monthly invoicing per customer type (household, commercial, institutional) for each provider of the service, and for private parties that render the collection service to construction and industries	Every six months

PPS types	Detail of information	Submission period
Franchise or concession vertically for collection (including sweeping and recycling).	Number of invoices issued, collected and delayed payment per type of customers (household, commercial, institutional, or other)	Every six months and electronically
	Details of the collection every month per customer and district	Every six months and electronically
This PPS form is not recommended for El Salvador	Accounting information in general. This should include balance, balance sheet, patrimony change statement, details of depreciation separately, cash flow statement, detail of assets separated per asset, details of cash, credit accounts, debtor accounts	Once per year
	Detail of separated costs per operation cost and capital cost for the following functional categories: collection, sweeping final disposal, management and administration, commercial system	Once per year
Franchise or concession vertically integrated (collection, sweeping and final disposal)	This type of PPS in the market of El Salvador is prohibited, since it is an alternative that can lead to adverse effects such as (i) discrimination of prices, (ii) abuse of prices as a result of monopoly power; (iii) depredation, (iv) others.	THIS PPS TYPE IS PROHIBITED IN EL SALVADOR
Markets not regulated under a license	Deliver the detail of volume (weight), origin (generator or customer) collected monthly and its final disposal place	Every six months

Please note that the information detailed above corresponds the information needed to derive and verify the efficient costs of solid waste management. Since the collection of construction and industrial wastes is currently carried out by private parties, it is recommended that prices are not regulated because the price of the service is conducted through an arrangement between the generator and the provider of the service (with a low transaction cost). In such case, these enterprises must present the detailed information above mentioned under the category of “non-regulated markets” licensed, with the sole purpose of keeping control of the final disposal of wastes and their total generation. This information is required for planning and policy-setting purposes.

If regulated enterprises render other services, they should keep the account separate and complete for the area of the regulated business. In order to avoid “free-riding” activities, it is recommended that the enterprise renders other services but with the same business name.

L.5.6 Public Liability Insurance

The provider of the service will deliver and keep to itself a public liability insurance, fully enforceable and effective throughout the duration of the contract and in every term expansion, with the coverage that ensures the required protection for every event that occurs:

Table L-23: Public Liability Insurance

Coverage	Minimum liability limits
Workmen compensation: Liability towards workmen	According to the labor laws in force
General liability: Physical injuries to people Property damage	For every event and its consequences For every event and its consequences
Liability for accidents with vehicles: Physical injuries to people Property damage	For every person and event For every event

L.5.7 Rules for Price Fixing

L.5.7.1 Definition of Wastes, Markets and Regulation

Generally under a PPS process, the definition of “**solid wastes**” (called by some as “**municipal solid wastes**” or “**urban solid wastes**”), is fundamental to avoid conflicts among the proposals, warding of the contract and future operation of these services.

Urban solid wastes (non-hazardous) comprise the following waste flow:

- **Household solid wastes:** this flow comes from one-family houses, condominiums and/or apartments.
- **Commercial-services solid wastes:** this flow comes from commercial activities such as wholesale and retail sale establishments, private and governmental offices.
- **Industrial solid wastes (non-hazardous):** solid wastes from non-hazardous industrial activities or not related to processes, excluding liquid wastes.

Additionally to the aforementioned, solid wastes are formed by the following items:

- **Vegetal wastes:** this flow comes from parks, public places, pruned public trees and others.
- **Street cleansing and sweeping wastes**
- **Medical wastes other than hazardous and/or infectious**

Other wastes that can be part of urban solid wastes but are frequently not regarded as part of solid wastes (considered as special wastes) are the following:

- Non-pollutant sludge (from landslides)
- Construction and/or demolition waste
- Bulky waste (abandoned cars, junk, etc.,)
- Wastes from cleansing activities (dead animals, material from vacant lots, etc).
- Others

However, the above mentioned are not part of urban or municipal solid wastes in certain legislation; therefore, they should be included as part of an integral management plan and an integral legislation as well.

L.5.7.2 Type of Markets and Price Fixing

a. **Collection and Sweeping: bids and competitive prices as a form of PPS**

Next, the classification of collection markets as shown in the Proposal of Law for Regulatory and Institutional Framework (see Annex-O) is detailed:

a.1 **Free Competition Market for Collection with Operating Permissions**

This market corresponds to the current informal waste collection market coming from constructions, industrial wastes and large generators (commercial and service ones).

In El Salvador, these service providers have no license to do so; therefore, the volume they dispose of is unknown in an appropriate manner. In AMSS, the licensing to this market is recommended in order to reduce the amount of illegal dumping sites, environmental damages and prevent diseases related to this activity.

a.2 Household Waste and Small Commerce, Services and Industry Generators' Collection Market

This market includes the collection of wastes from households, small industries, commerce and service establishments. It is recommended to conduct PPS for this market under the regulation system known as “**participation to serve the market**” through a process of “**competitive tender with closed envelope**” or “**auctions**”. It is recommended that such participation is carried out with “**lump sum prices**” to generate efficiency, reduce monitoring (regulation) costs, partial elimination of “**rent-seeking**” and “**free-riding**” activities. In such way, the price is not regulated, regulation cost is low and efficiency is generated.

a.3 Hazardous Waste Collection Market

This market is not regulated by the proposed law.

b. Regulated Prices for Final Disposal Markets (sanitary landfill)

The generation of competition (efficiency) by making use of “proposals of competitive prices in closed envelopes” or “**auctions**” only applies to short-term contracts or investments (e.g., collection of solid wastes). In case of long-term investments, when these are unmovable (large sunk costs exist) and uncertainty for future investments, this form of competition and price fixing is not applicable (Madrid-Aris and Montero, 1998). Therefore, the participation for the market is not a formula applicable in the long term for the construction of a sanitary landfill.

A concession or franchise can be utilized; therefore, the price should be regulated because the contract of such concession must be consistent with the service life of the investment (generally 20 to 30 years for a sanitary landfill). In this case, the regulation of prices is required.

L.5.7.3 Indexing and Type of Adjustments for Production Costs

The following indexing rules are applicable for the collection and final disposal activities equally.

Normally the readjustment of production costs can be of two kinds:

- a. automatic indexing,
- b. “force majeure” indexing.

a. Types of Automatic Indexing and Recommendations for El Salvador

Automatic indexing of tariffs will be used to allow a progressive adjustment that reflects the variations in cost that affect the rendering of the service. In order to protect the service provider from the risks of production costs increase, the following is used in general:

- Polynomial indexing (it should reflect at least an “efficient” cost structure of the service).

- Single indexing (consumer price index, wholesale price index, imported product price index, etc.)

Adjustment of polynomial index: The basis for the utilization of a polynomial index is as follows:

- The future movement that affects the cost caused by the variations in input prices is not easy to forecast, and the uncertainties related to costs has a relation with the company's operative profits;
- Where it might be probable that the costs of the regulated company are slightly related to Consumer Price Index (CPI);
- Where it is expected that the polynomial index is closely linked with the fluctuations in input costs of the regulated company, in such a way it is expected that such index use reduces risks to which the company is exposed. (It should be pointed out that the important thing is the correlation instead of the trend, if the cost increase is expected over the inflation; then, this can reflect in the "X" factor next to CPI).
- In order that the polynomial index becomes practical, the indexes of its components must have the following features:
 - ◆ Exist and be robust – this means that its indexes should have a stability background and should not be subject to significant revisions, be it in the composition or retrospective adjustments of its value;
 - ◆ The polynomial index must have a broad technical foundation (reflect efficient costs) so that the regulated industry itself does not become a significant contributor to the index (otherwise the use of such index will acquire analogue features on the cost transfer). However, they should also properly reflect the cost base of the industries in order to obtain a reasonable correlation.

Since a polynomial index must reflect the cost structure of an efficient enterprise, an average cost structure of fairly efficient enterprises in Latin America is shown next.

Table L-24: Average Cost Structure of Efficient SWM (Collection and Final Disposal) in Latin America

Description of Cost	Total percentage from cost	Description
Wages and salaries	35%	Average increase index of salaries in El Salvador, published by the Ministry of Economy
Fuel	5%	Fuel increase index published by the Ministry of Economy
Lubricant	2%	Fuel increase index published by the Ministry of Economy
Spare parts	10%	It could be the increase in new engines of a standard truck. Spare parts Import Association
Capital cost	30%	This cost does not apply to a production cost readjustment index. It corresponds to an external variable that the private party must cope with as a variable in the costs of the business at the moment of presenting the project. If this cost were included as an interest rate in the polynomial index, then the business risk would be implicitly borne by the user.
Other costs (office stationery, rent, etc.)	13%	Generally, this cost is increased in a manner proportional to CPI
Taxes	5%	Income tax (a tax rate of 25% in El Salvador, and rate of return of the business of 15%)

Source: Estimates by the Study Team.

Since the capital cost corresponds to a variable that is part of business risk, it should be borne by the private party. It is common that private operators try to include an adjustment factor for interest changes in international interest rates. It is proven that the financing of these projects is carried out with a fixed interest rate; therefore, such polynomial indexes only bring about additional income for the private party.

Should a polynomial index be adopted for the case of a vertically integrated system (collection and final disposal), it should be as follows: (see Table L-24)

$$P_t = P_o * \left[0.30 + 0.13 * CPI + 0.35 * \frac{M_2}{M_1} + 0.05 * \frac{C_2}{C_1} + 0.02 * \frac{L_2}{L_1} + 0.10 * \frac{R_2}{R_1} + 0.05 * \frac{ER_2}{ER_1} \right]$$

P_o, P_t = correspond to the unit price cost (or lump sum price, if the case is) prior to the readjustment and the unit cost the moment after the readjustment, respectively.

CPI = consumer price index published by the Central Reserve Bank (*Banco Central de Reserva*) of El Salvador

M = minimum salary of labor

C = fuel cost (diesel)

L = lubricant cost (oil)

R = Spare part costs

ER = Taxes rate

Please note that the previous factors of the polynomial index, which are defined for the variables of the production cost, must be set in time. That is, the weighting applied to the individual indexes used to create the polynomial index must be

constant during periodical adjustments; otherwise, there is a risk of distorting incentives for the company.

Single index adjustment: The analysis of reasons to use the consumer price index (CPI) versus a polynomial index continues. The reasons to utilize a CPI index are as follows:

1. It is known that the CPI is robust in the sense that is already defined;
2. The readjustment is easier to calculate, manage and it is unlikely to arise disputes over its applications;
3. The public easily understands it and it sends a clear sign with respect to what is expected to occur with the service prices.

Both indexes (CPI or polynomial index) might not accurately reflect the increment in the cost structure. The choice for CPI, which is calculated by the Central Bank of El Salvador (BCR), is used as a readjustment index due to its transparency and implementation easiness, and partly due to possible estimate problems with some sub-indexes, which would be necessary to create a polynomial index (index of increase in spare parts of collection trucks, for instance).

In general, capital costs are fixed (debt by means of long-term interest rate), which represent in the order of 30% of the production cost value. With a tariff indexing of 100% of the CPI value, a value higher than the real one would be indexed on the production costs.

Recommendation for El Salvador : *For the collection and final disposal categories, an automatic annual indexing equivalent to the consumer price index (CPI) is recommended, when such index is lower than 2% per year. For CPI values greater than 2% and less than 5%, it is recommended that updating of tariffs is recommended by considering only 2/3 of the CPI value. For CPI values greater than 5%, an indexing of only 60% of the CPI value is recommended.*

b. Period of Automatic Indexing

Due to the current low inflation level of the Salvadoran economy (less than 2% per year and a level of 2% to 4% until year 2004 is forecast), it is unlikely that the real production costs surpass such figure. Therefore, in case of using a polynomial index or a single index (CPI), it is recommended that the contract entered with the private party and the tariffs be adjusted only once per year (at the end of the year), in order to cut costs of administration and the system transaction.

In case of inflationary periods, generally speaking, salaries do not increase at the same pace. In such periods, a speedy inflation benefits the service provider, since a production cost adjustment by CPI generates an additional revenue for them. For such reason, for the specific case of El Salvador, it is recommended that in case annual inflation is beyond 3%, the readjustment should only consider a value equivalent to 2/3 of the CPI value.

Final recommendation: *Use the automatic indexing through CPI, once per year, as per the specifications above.*

c. Revision for Force Majeure and Cost Transfer

The revision for "force majeure" is considered as a scarcely employed mechanism in the solid waste management. This adjustment allows a tariff adjustment under

exceptional and/or significant circumstances, such that totally out of control by the service provider and by the municipality (e.g., in case of an exceptional climatic event, earthquake, flood or any other event) which generates an additional amount of solid wastes not regarded in the initial tariff system or in the initial forecast of the bid.

The “Regulatory and Institutional Framework for Solid Waste Management” has stipulated under which circumstances a revision for “force majeure” could take place, as well as the mechanism/form/principles that will rule for carrying out such revision for “force majeure”. This circumstance is detailed in the following recommendation.

Recommendation: A revision for “force majeure” with cost transfer is recommended only when a climatic incidence of tropical storm or hurricane (Mitch type) takes place, whose probability of occurrence is equal or greater than 50 years. The probability of occurrence or return period of the event will be estimated through a hydrological study using daily average precipitation statistics, which will undergo a statistical analysis by means of a common logarithm or Gumbell function of probabilities.

L.5.8 Rate of Capital Cost

a. Introduction

For the case of PPS by means of a “concession or franchise with regulated price”, the most important parameter to analyze corresponds to that of “rate of capital cost” or “capital cost”.

The rate of capital cost is measured in percentage (%); therefore, the income allowed as capital cost (including the debt service and profits for the service provider) correspond to the capital cost rate (e.g., 14%) multiplied by the regulatory capital. Regulatory capital is the value of the required assets (which are defined according to a formula of an efficient enterprise) for rendering the service, whose depreciation (useful life) must be “clearly defined in the tariff system structure” or in the regulation.

L.5.8.1 Components or Structure of the Capital Cost Rate (Rc)

The regulator must obtain the financial information of the enterprises in order to monitor their features, particularly the structure of their capital.

The structure of capital has two parts— cost of the debt capital (Rd) and cost of own capital (Rcp). The weighted average of both costs is the “**rate of capital cost**” or, as it is sometimes called, “**earning rate**”. The debt-capital ratio explains that the percentage of capital of the company that is financed through debt, versus what is financed by stockholders. Normally this ratio is defined in the regulatory framework, in order to limit the business risk. For instance, if a service provider has a debt-capital ratio of 1, this means that everything is financed by means of credits; therefore, the operation is more risky because the ability to obtain additional credits is limited.

There exist two regulatory formulas: a) the regulator can control the way of financing of the enterprises, b) the regulator provides incentives to develop the optimal capital structure. The optimal capital structure is the one that minimizes the total capital cost.

The rate of capital cost is obtained through the following formula:

$$R_c = R_d * (1 - t) * \left(\frac{D}{A} \right) + R_{cp} * \left(\frac{OC}{A} \right)$$

Where R_c is the capital cost, R_d is the indebtedness or debt cost and R_{cp} is the cost of own capital. The D/A quotient is the ratio of total debt and total asset and OC/A is the ratio of the own capital regarding total assets or total capital. In this formula t corresponds to the taxes related to the debt (in percentage). For instance, the capital cost for a structure of 50% debt and 50% own capital would be as follows:

Table L-25: Example of Capital Cost Estimate

Type of financing	Percentage of debt/capital ratio	Financing cost	Capital cost (Rc)
Debt capital (D/A)	50%	11% ($R_d(1-t)$)	5.5%
Own capital (OC)	50%	14% (R_{cp})	7.0%
Capital cost = Rc			Rc = 12.5%

In order to know the own capital and debt capital of an enterprise there are two options: a) the book value (accountable) and b) the market value. In case the enterprise has no stock transactions in the stock exchange, the market value is unknown. Since most of solid waste management enterprises in Latin America have no transactions at the stock exchange, the debt-own capital ratio must be obtained from the accounting of the enterprise (books).

L.5.8.2 Rate of Own Capital Cost (R_{cp})

The financial theory offers several alternatives to estimate the “rate of own capital cost”, such as the following:

- a. Using a capital asset pricing model –CAPM
- b. Bond Yield Risk Premium Approach -BYRP
- c. By comparison with other rates of return of similar companies that operate under similar risk conditions.
- d. By using advanced finance techniques such as arbitration theory.
- e. By using other financial methods (price-profits, discounted cash flows, dividends increase model)

Of the above mentioned methods, generally the first two methods are the most commonly applied for the regulation of public service enterprises. The other methods (c. and d.) require a lot of information; therefore, its estimation is expensive, it requires highly trained human resources and, in many cases, the required information is not obtained easily or does not exist at all. (For instance, in order to obtain price-profit ratio, it is required that the enterprises transact at some stock exchange, which is unusual for public service enterprises in developing countries; therefore such information is not available). For purposes of the regulation process concerned, the two most common methods, CAPM and BYRP, will be reviewed.

a. Capital Asset Pricing Model-CAPM

Of the above models, the simplest and widely spread ones to regulate profiting enterprises correspond to the capital asset pricing model (CAPM). Each of the elements that comprise a CAPM model are shown next, and the information sources to estimate the “rate of capital cost” is suggested.

- Through the capital asset pricing model⁴. This model assumes that the return required or expected by the market is **the return of a certain investment or risk-free return, plus a premium for the market or business risk**. The premium for the business or market risk is a function of the co-variations between the return of the activity and the average return of the market (beta coefficient or systematic risk) multiplied by the market risk premium.

$$E(r_i) = r_f + \frac{\sigma_{im}^2}{\sigma_m^2}(E(r_m) - r_f) = r_f + \beta_i(E(r_m) - r_f)$$

- ◆ $E(r_i)$ = Expected return of assets invested in the sector or capital rate of return (earning rate).
- ◆ r_f = Return or risk free asset rate.
- ◆ $E(r_m)$ = Rate of return expected from a diversified market portfolio
- ◆ $\frac{\sigma_{im}^2}{\sigma_m^2} = \beta_i$ = Value or factor of systematic risk, known as beta factor.
- ◆ $\sigma_{i,i}^2$ = Co-variation of the return of the activity regarding a diversified market investment portfolio.
- ◆ σ_i^2 = Variation of the average market return (or a diversified portfolio).
- ◆ $(E(r_m) - r_f)$ = Premium for market risk.

For the application of this model, the following is normally assumed:

- **Return or rate of risk-free asset:** the interest rate of a saving account from a first-rank bank, State or Central Reserve Bank bonds or the United States Government bonds of a period of 10, 20 or 30 years, according to the characteristics of the business. The El Salvador Central Reserve Bank bonds in US dollars (issued for sale on June, 2000) have an interest rate that corresponds to the prime rate of Citicorp Bank (New York) plus 1.5%, which corresponds to a total interest rate from 8.0 to 9.5% and an average of 8.75%.
- **Beta factor:** this factor is econometrically estimated by using solid waste management enterprises in other countries (the value for solid wastes ranges between 0.4 and 0.65). A value of 0.6 is a reasonable value for this type of business in El Salvador, under a price-cap regulation (see Table L-26).
- **Premium for market risk = (E(r_m)-r_f).** In general terms, this element is estimated by doing an econometric study, utilizing the stock market values of the

⁴ This model has several assumptions, such as: (i) it is an homogenous model, (ii) it does not consider transaction costs nor tax, (iii) the model considers that the returns are evenly distributed, (iv) it is one-factor model (market portfolio) and it is highly sensitive to beta value.

United States for a long term period or tendency (e.g., 1935-1999), because short-term values may give distorted results. Econometric studies to calculate average values of “premium for market risk” of this period (1935-1999) show figures in a range of 8.5%. Please note that by using this historical approach, it is assumed that the average of past returns is an appropriate instrument to forecast the expected returns. For such reason, a historical long-term is used for the estimation of such risk.

Therefore, by using the previous values (risk-free asset corresponds to the Central Reserve Bank bond with an average rate of 8.75%, beta=0.6 and premium for market risk =8.5%); therefore, the rate of return of own capital would have the following value:

$$\text{Rate of own capital cost (\%)} = 8.75 \% + 0.6 * 8.5 \% = \mathbf{13.85 \%}$$

In the case of adopting an estimation for rate of own capital cost through a CAPM model, it is important to define the way of establishing the above mentioned parameters in the regulation.

In case that sufficient information is not available in El Salvador to estimate the systematic risk of the activities inherent to this market, international estimates such as those presented in this report will be used instead.

How the discretion should be eliminated for the estimation of the beta factor, and other factors of the asset pricing model?

- It should be conducted by an expert or a consulting firm independent from the parties involved. It is important that the process is regulated in order to avoid rent seeking activities.

Next, a table shows beta values, used in several countries for the different types of regulation and for several public service sectors.

Table L-26: Beta Value Average per Country, Sector and Different Types of Price Regulation

Country	Electricity		Gas		Water		Telecommunication	
	Price regulation model	Beta value	Price regulation model	Beta value	Price regulation model	Beta value	Price regulation model	Beta value
Chile					Model enterprise	0.67		
Canada					Rate of return	0.25	Rate of return	0.31
Japan	Rate of return	0.43					Rate of return	0.62
Sweden							Price-cap	0.50
United States	Rate of return	0.30	Rate of return	0.20	Rate of return	0.29	Price-cap (AT&T)	0.72
							Rate of return (others)	0.52

Source: Alexander, I., Mayer C. and Weeds, H.: Regulatory Structure and Risk and Infrastructure Firms. An International Comparison, Policy Research Working Paper, The World Bank, December 1996.

In case of a lack of information on the El Salvador Government bonds value or the Central Reserve Bank bonds value (no issuing) or lack of beta index for solid wastes, the “average rate of capital cost for the electricity sector” of El Salvador can be adopted, which is estimated by the General Superintendence of Electricity and Telecommunications (SIGET) for the communication sector. Please note that when

choosing the rate of return of the electricity sector, it is being assumed that the risk for both businesses is similar, which is not completely true, but this is a reasonable assumption.

b. Bond Yield Risk Premium Approach - BYRA

Another form commonly used to calculate the rate of return on capital is assigning a fixed premium to an instrument known as low risk instrument. For example, a rate of return on capital can be defined to it as follows:

- a. Select a risk-free asset. The interest rate of the Central Reserve Bank bond as above mentioned can be taken into account (now set at 8.75%) as a risk-free asset. Some experts recommend to consider US Government bond as the risk-free rate, whose interest is in the range of 6.45%. However, for the case of solid wastes that being a type of business appropriate for local enterprise, we recommend to use the Central Reserve Bank bond as the risk-free rate, since this instrument represents the risk-free opportunity costs for local entrepreneurs.
- b. Add a premium for the business. It could be equal to 5% or 6%, which corresponds to a risk from a mature market in this type of business (e.g., in water companies in developed countries the value is in the range of 5 to 6%).

Value of the rate of return on own capital = 8.75% + 5% = 13.75%

The aforementioned is almost equivalent to the application of a CAPM model; i.e., in nominal terms a value quite similar for both approaches (CAPM or BYRA) is obtained. Please note that this last formula has the comparative advantage of being an estimate that can be easily understood by the operators, regulators and public in general. Furthermore, it is a formula with a very simple calculation.

Final recommendation: *it is recommended to estimate the "rate of own capital" by using the risk-free assets (stock) formula plus a premium for business risk concept, in view of its simplicity and understanding. It is recommended that the risk-free asset is the Central Reserve Bank bond mentioned before, and the premium for the business risk 7%.*

L.5.8.3 Rate of Debt Capital Cost (Rd)

The debt capital cost can be normally calculated by directly using the accounting information of the enterprise or through a prefixed formula. The advantages of the second method is that it encourages a search of efficient capital by the enterprise that renders the service. Generally, the prefixed formula is similar to the formula of the risk-free asset" plus a premium, but in this case the premium does not correspond to the business risk but to the business debt. It is recommended to set the rate of debt capital cost as follows:

- a. Select a long-term, risk-free asset. The interest rate for the Central Reserve Bank bond mentioned before can be considered (now set in 8.75%) as a risk-free asset. This represents the debt capital cost of a local business in a good manner.
- b. Add a premium corresponding to the debt of a company. As this value is not known for El Salvador, the risk-free rate of water or solid waste companies in the United Kingdom or the United States can be considered for the premium. For instance, for these countries the premium is estimated from 1% to 2.0%. For El

Salvador the recommendation is 2%. Next, an example of the estimated rate of debt capital cost is shown.

$$\text{Value of rate of debt capital cost} = 8.75\% + 2.0\% = \mathbf{10.75\%}$$

L.5.8.4 Debt-total capital ratio (total assets) recommended for El Salvador

In general terms, the solid waste business is regarded as a low-risk business, given its cost structure features (small sunk and fixed costs and reversible investments) and small contingencies that might affect the supply or demand (it is not a business that depends on hydrological resources such as water business, external shocks that might affect the business are minimal, etc.). The aforementioned implies that a high debt-total capital ratio can be acceptable.

Recommendation: *It is recommended that the debt-total capital ratio has an upper limit 80%, given the low risks for this business.*

Final summary

Recommendation: *In case of participation by the private sector whose price has to be regulated, such as PPS under a concession and/or franchise for a sanitary landfill, it is recommended to estimate the capital cost through a risk-free asset model plus a premium. A maximum debt-capital ratio of 80% for this business is also recommended.*

L.5.9 Efficiency Parameters Recommended for PPS with Regulated Prices for the Competitiveness Analysis: Implications for an Effective Regulation

L.5.9.1 Current Parameters of Collection and Efficiency Standards

It is very important to know the current deficiencies of the system to properly regulate and create correct incentives, in order to generate the expected efficiency. Such efficiency creates future social benefits, since the achievement of efficiency would be reflected on the rendering of a better service and on a lower cost.

Please note that the recommended value for the municipalities of AMSS for year _____ is not the maximum efficiency value that can be achieved in this type of service (see Table L-27).

With being aware of the fact that reaching “**the limit of maximum or optimal efficiency production**” takes a long process that requires the improvement of the human asset (administration, engineering and operation), a progressive process between the period of years 2000-2005 was considered.

Table L-27 details the current parameters of the San Salvador municipality, and the parameters regarded as fairly efficient to be used in the **calculation of the efficient model enterprise tariffs, as well as for the verification of competitiveness by the regulator.**

L.5.9.2 Model Enterprise and Regulating Function

In order to ease the regulating function by the regulator, the efficiency parameters for the diverse functional categories of solid waste management have been created. Several techniques have been used and inductive and deductive approaches by using

Latin American and theoretical information have been employed. The tariff structure can be calculated by using the recommended efficiency.

The existence of efficiency parameters for the case of PPS with regulated prices simplifies the regulating action, as well as it reduces the regulation cost. Furthermore, in cases of PPS with proposal or bid, the prices presented can be verified through the use of efficiency parameters to analyze the possible presence of collusion and/or rent-seeking activities.

Table L-27: Current Deficiencies in the System of the San Salvador Municipality, Some Parameters of an Efficient Model Enterprise for the Tariff Calculation and Regulation

Functional Category	Description of Inefficacy	Alternatives to Improve Efficiency	Current Value in San Salvador Municipality	Expected Efficient Result	Adjustment Period																																							
Generation (external structural inefficacy). Outside the control of Service Provider	Over-generation per capita and per economic activity	<ul style="list-style-type: none"> Taxes Incentives Educational policy Recycling 	In kg/day/person per income level <ul style="list-style-type: none"> High Middle low 	In kg/day/person per income level <ul style="list-style-type: none"> High Middle low 																																								
Commercial type (productive inefficacy)	<p>Insufficiency of the customer database.</p> <p>MIDES invoicing database does not match the cleansing invoicing database.</p>	<ul style="list-style-type: none"> Match databases of electricity companies with those from the municipality to identify all the customers. Create customers lists per type and district 	<p>Nº invoices issues per customer type.</p> <p>Consumption beyond 499 kwh/month is regarded ICI</p> <table border="1"> <thead> <tr> <th>kw</th> <th>Cleansing.</th> <th>S/L</th> </tr> </thead> <tbody> <tr><td>N/A</td><td>467</td><td>0</td></tr> <tr><td>49</td><td>4784</td><td>10920</td></tr> <tr><td>99</td><td>13465</td><td>24573</td></tr> <tr><td>149</td><td>11923</td><td>18348</td></tr> <tr><td>199</td><td>9851</td><td>13985</td></tr> <tr><td>249</td><td>6851</td><td>9447</td></tr> <tr><td>299</td><td>4664</td><td>6403</td></tr> <tr><td>399</td><td>5713</td><td>7983</td></tr> <tr><td>499</td><td>2691</td><td>4371</td></tr> <tr><td>subtotal =>500</td><td>60709</td><td>96030</td></tr> <tr><td>total</td><td>7320</td><td>13411</td></tr> <tr><td></td><td>68029</td><td>109439</td></tr> </tbody> </table>	kw	Cleansing.	S/L	N/A	467	0	49	4784	10920	99	13465	24573	149	11923	18348	199	9851	13985	249	6851	9447	299	4664	6403	399	5713	7983	499	2691	4371	subtotal =>500	60709	96030	total	7320	13411		68029	109439	No. Customer/type/District: Household: ICIs:	
kw	Cleansing.	S/L																																										
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subtotal =>500	60709	96030																																										
total	7320	13411																																										
	68029	109439																																										
	<p>Fees are neither fair nor equitable.</p> <p>Household customers subsidize ICIs</p>	<p>ICI customers</p> <ul style="list-style-type: none"> Determine the average volume delivered per each ICI customer. Bill the S/L fee per volume delivered, using a "standard volumetric unit (SVU)". A global estimate can be obtained with the indexes gathered in the field works; bill the cleansing fee just like today. <p>Household customers</p> <ul style="list-style-type: none"> Incorporate all the customers. Bill S/L and cleansing fee as today. 	<p>Total volume ICI/type</p> <ul style="list-style-type: none"> Commercial Institutional Industrial Markets 	<ul style="list-style-type: none"> Billing according to energy consumption times 0.075 Billing according to type of SVU delivered/day. Daily average is used. 																																								

Functional Category	Description of Inefficacy	Alternatives to Improve Efficiency	Current Value In San Salvador Municipality	Expected Efficient Result	Adjustment Period
Technical type (productive inefficacy)	• Routes	Frequencies	it is not uniform	Uniform	
	• Maintenance	Reduce spare parts cost and No. of mechanics	XXX % of the equipment value	e.g., 3 times/week XXX % of the equipment value	
	• Use of technologies				
Inefficacy of basic production factors (of assignment and production)	High capital cost due to low collection by truck	Increase of truck performance	X - X (Ton/vehicle/day)	X - X (Ton/vehicle/day)	
	• Labor	Reduce the ratio per 1,000 persons served	2.3 employees per 1,000 persons served	XX Employees per 1,000 persons served	
Sweeping	Sweeping coverage (km/day/employee)	Improve performance (km/day/employee)	XX (km/day/employee)	XX (km/day/employee)	
	Sweeping load (kg/km)	Garbage bins and education	XXX kg/km	XXX kg/km	
Inefficiency of intermediate input	TYPE OF INPUT				
	• Fuel consumption	Control in supply	XX gallons/day	XX gallons/day	
	• Oil lubricants	Control in supply	XX gallon/month/truck	XX gallon/month/truck	

L.5.10 Arbitration and Decisions

The conflict settlement is fundamental to reduce the burden (costs) of regulation and create an economic efficiency. In general, developing countries have slow and inefficient judicial systems. Studies show that solving the conflicts at first instance through the judicial system is not efficient, since this increases transaction costs and generates inefficiencies that are consequently paid by the users and thus reduce social welfare.

To solve conflicts we have taken the provisions in articles 161 to 169 of the Law on Acquisition and Contracting of Public Administration, which establish the following:

- The contracting parties will try to settle their differences through a direct arrangement; the requesting party will request settlement for the other party in writing with setting the day, time and place, the requested party should reply within 15 days after receiving the request. If a solution is not achieved, the parties can make use of the arbitration procedure.
- Each party will appoint an arbitrator and a third arbitrator will be appointed by the previous two by common consent. In demanding the arbitration, only the unsolved issues can be outlined at the direct arrangement of the arbitration.

The recommendation by institutional economy experts on the most efficient system, and which is validated by the world trend (Smith and Gray, 1999), is the creation of a vertical structure for disputes and appeals settlement. The vertical structure must be simple; i.e., not involving many people or institutions to settle the conflict.

It is recommended that the appealing levels be independent from the regulator and the regulated.

The results of surveys conducted show that most of the service rendering enterprises wish a vertical structure for the conflict settlement, which in the first instance includes the regulator, in the second instance one or several independent people.

Most of the service providers manifest their opposition to settle conflicts through the ordinary judicial system, due to the high cost of transaction generated by the solution of a conflict by means of the judicial systems.

Another important issue on the debate regarding institutions and conflict settlement is that whether the organization itself or two independent organizations must conduct the auditing function (monitoring) and the imposition of fines. For example, Canada and Chile separate the investigation functions and the fines function by two different bodies of specialists.

This approach is consistent with the doctrine of separating the executive power and judicial power of a State with the purpose of protecting against the abuse of the authorities power. Another approach eases the coordination and it corresponds to a single investigation and prosecution agency. Such is the approach by the United States and Germany. What concerns with this structure regarding the power abuse should be dealt with the court appeal procedure.

In summary, regarding the issue about whether a single institution or two, there is no consensus or a worldwide generalized formula. In most of the cases, the approach that

is assumed to work efficiently according to the conditions in the country and at a low implement and operation cost is chosen.

In our regulation proposal for El Salvador, both the regulator as well as the municipalities (in case the service is provided by private parties) will be involved in the auditing of the service quality (the municipality by means of their on-site inspectors – with the collaboration by communal associations, and the regulator by means of a complaint service). Therefore, it should be convenient that a common consensus effort exist to realize an efficient function.

In case the municipality renders the service, the duty of verifying the service quality will be only by the regulator, since a service provider cannot be the judge of its own process.

Regarding the fines, in this last case, it is not recommended that fines be channeled through the municipality, since the municipality will become the judge and the party. It is recommended that the regulator executes them, and for the appealing instance a committee should be formed. It is also recommended that an independent appealing body exist.

L.5.11 Contracts, Effective Regulation and Role by Organizations

a. Introduction

The economy of regulation suggests that specific details of each market (or regulation of the diverse private parties) be established through the contract specifications.

For such reason, there exist some model contracts that, with some work by an expert of regulation economy, can be adapted to every specific situation in El Salvador. Some of the specific aspects of a solid waste regulation are the following:

- Way of settling disputes (institutional structure and amounts)
- Who, how and when are the service quality standards monitored?
- Specific form of the operator's responsibilities such as type of wastes to be collected, volume, where are these wastes disposed of, etc.
- Guarantees of accurate compliance with the contract.
- Insurance, such as insurance of damages to third party, private property, public property, persons, etc.

Please note that the designing of an efficient contract (low-cost transaction contract) that limits rent-seeking and free-riding activities, as well as that creates the incentives to achieve efficiency, is a highly-technical matter that has to be controlled by regulation specialists. Therefore, it is recommended that the regulator or municipality hires an expert for the preparation of a contract model adapted to the reality and diverse markets of El Salvador.

Anyway, a model contract is attached that may be used as a reference when the municipalities decide to invite to tender for PPS.

L.5.11.1 Theory and Empirical Evidence on Contracts

One of the final and crucial elements for the successful conduction of PPS is that related to the contract. The new (modern) regulation theory emphasizes that a

contract must be directly linked with the feasibility to create competition (prevent vertical integration), eliminate the possible search for rent-seeking activities by the private sector, avoid collusion and other ominous elements. A good designing of the contract is fundamental for PPS to generate the efficiency projected and the desired quality of the service is achieved.

The contract is a specific form of regulation. General regulation rules are detailed in the “Regulatory and Institutional Framework for Solid Waste Management” and complemented with specific element such as the following:

- Details of the market (users and volumes)
- Price fixing, revision and forms of payment (fees and forms of payment)
- Right of public usage and easement
- Guarantees for the contract
- Penalties and breach problems solution
- The operator’s duties and responsibilities
- The municipality’s duties and responsibilities.

L.5.11.2 Duration of Contracts for The PPS Forms

The contract duration in this kind of activities is different for the diverse functional categories (collection, final disposal, commercial etc.). Normally, the contract duration is related to the capital account (depreciation) of the system. For example, in collection the contract duration might have to be consistent with depreciation period of the collection equipment.

In the case of a contract of service for a sanitary landfill, in which the private operator is not the owner of the assets (the capital account of the land is not in charge of the operator), the contract can be per year. In case a private party obtains the ownership for a sanitary landfill, the main cost of the capital account is the investment on he land. Like many cases, the sanitary landfills are designed for a service life of at least 20 years, and this obligates the awarding of a contract with this duration.

a. Contracts for Solid Waste Collection and Sweeping

Normally the duration of a contract for SWM is defined by the service life of the equipment. In order to optimize the cost function, the objective is to define the rate of depreciation in a way that the service life of the equipment in accounting is somehow related to the actual service life of such equipment.

For instance, if the rate of depreciation is 20%, this means that the average service life of the equipment is in the range of 5 years. Normally, the duration of the contracts of collection ranges between 4 to 7 years. Table L-28 shows a brief reviewing of the duration of some collection contracts in Latin America.

Table L-28: Regulation, Prices & Adjustments of Some Latin American Cities

City	Duration of contract	Cost readjustment system
Caracas	4 years with optional renewal to 8 years	Annually updated based on 6 cost indexes
Santiago	4 to 7 years	Updated with population increase and each 10% increase in service costs.
Buenos Aires	10 or 5 years with optional renewal for additional 5 years	Updated every 2 months based on a general price index not related to agriculture
Sao Paulo	5 years	Updated based on inflation rate or CPI

The experience in AMSS shows that the useful life of collection equipment is in the average range of 6-7years. If the contract is for five years and there is still a residual value, the private party will prorate this value upon the fees; therefore, the tariff of the competitive proposal will implicitly be adjusted to the depreciation allowed.

Recommendation for El Salvador: *it is recommended that solid waste collection contracts last 7 years.*

b. Contracts for Final Disposal (sanitary landfill)

The contract duration for final disposal will depend on the type of PPS and on that who is bearing the investment risk; which is obviously related to the capital account. Next, the duration of contracts for this functional category is explained.

BOT system: The contract duration for a BOT system depends on the useful life of the project. For example, the designing and construction of sanitary landfill implies that their useful life would be of more than 20 years. If the investment is carried out by the private sector, a contract duration of 20 to 25 years is recommended, according to the useful life of the land.

Service contract for operation of the sanitary landfill: If PPS is allowed for the final disposal system through a service contract, the duration of such contract is directly linked with the investment required or the investment corresponds to the contract part. Generally, a contract for final disposal service may depend on the type of service.

For instance, a contract of machinery service to construct the cells and placement of covering material can last one to two years. If the contract implies the improvement of leachate drainage and treatment system, the duration is defined by the depreciation of the facilities to be built; therefore, it will depend on the type of technology or equipment to be installed.

Recommendation: *It is recommended that the contracts of sanitary landfills operation should be carried out through inviting competitive bids (4 bids at least) that last one or two years. The duration of these contracts beyond two years is not recommended, since long-duration contracts utterly protect the expectations; therefore, a minor productive efficiency is achieved.*