

Guidance Pack

**Private sector participation
in municipal solid waste management**

Part II

Guidance Note

By Sandra Cointreau-Levine

A review of recent international experience of private sector involvement in municipal solid waste management and guidelines for the steps to be taken to ensure successful private sector participation in the coming years

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Chapter 1: INTRODUCTION

1.1 Users and uses of this Guidance Note

The purpose of this document is to assist solid waste managers and key decision-makers in municipalities to decide whether to involve the private sector in solid waste services and, if so, how best to involve them. Information about each of the *private sector participation*¹ options is presented, including some case study experiences.²

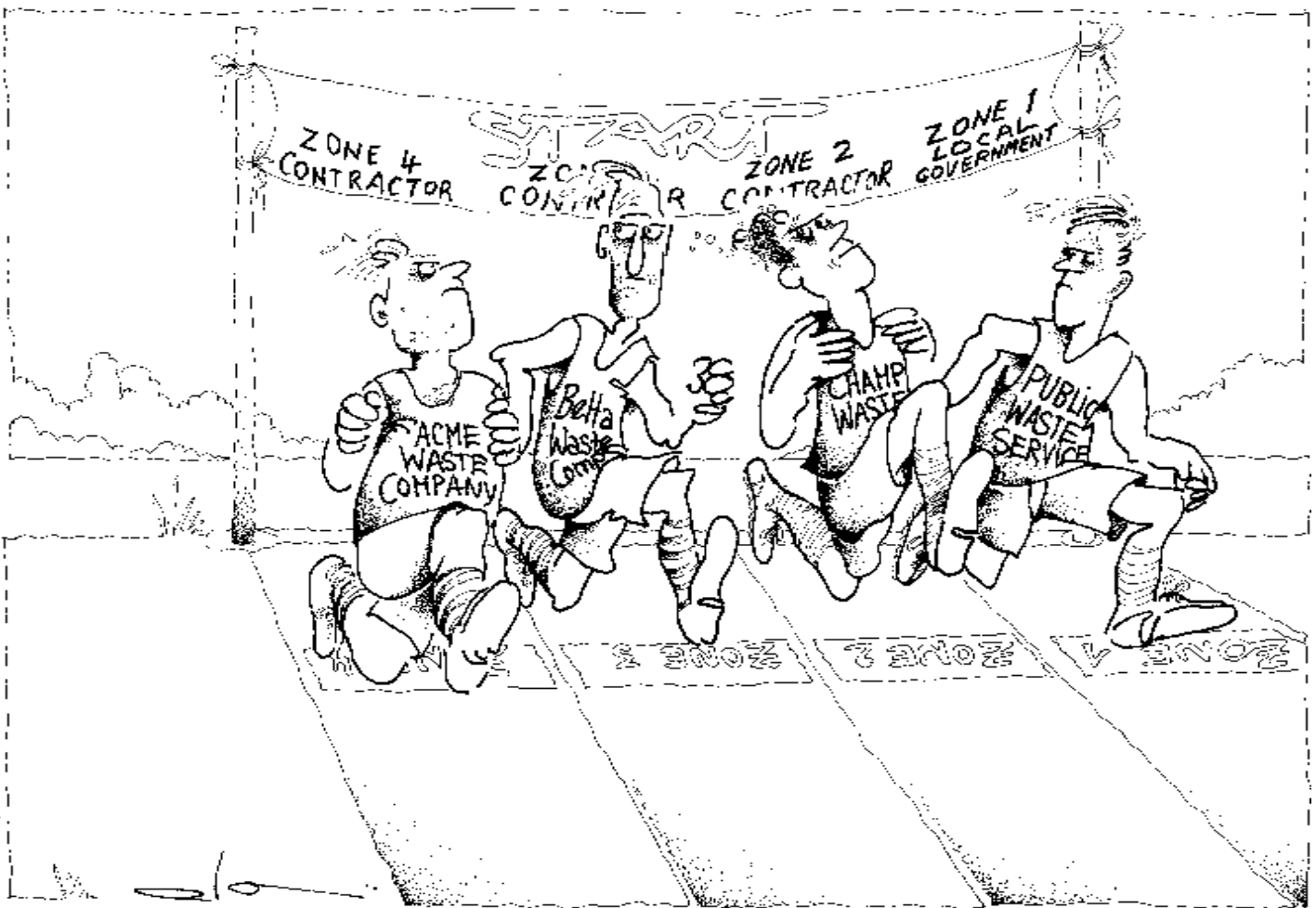
1.2 Recent experience shows the need for guidance

At the end of the 1980s, economic advisors to many developing countries were advocating private sector involvement in urban services. The premise was that *market forces* would automatically make the private sector more efficient than *government*. This premise was generally true in industrialized countries, where market forces were well developed. Unfor-

tunately, the last decade of private sector participation experience has shown that market forces were not well developed in developing countries. Also, *procurement* procedures were commonly not *transparent*, and ethical frameworks for doing business were not well established.

Instead of a decade of efficient private sector participation, numerous government monopolies have been replaced by private sector monopolies.

Without competition and *contestability* (See Box 1.1 and Cartoon 1) there is no way to assure that excessive government costs are not being replaced by excessive private sector costs. Government costs may be high because of high salaries, high social benefits, redundant personnel, and low *productivity*. Private sector costs may be high because of contract *kickbacks*, high commercial borrowing costs, foreign exchange risk, custom duties, corporate taxes, and insurance. (This is discussed further in Section 3.4.)



Cartoon 1

Where there is effective competition, the best performances can be achieved. There are distinct advantages in continuing to use the public sector in one part of the city.

¹ Words are shown in italics to indicate that they are included in the List of Terms and Definitions (Part IV).

² Most of the case study experiences and analysis presented are not from any published sources, but are derived from the Author's personal field experience. Where case study information was not gleaned from direct experience, its source is referenced in the text, and the details of the source can be found in the Bibliography (Annex A11 of Part III).

CONTESTABILITY – THE PUBLIC SECTOR IS ALSO A COMPETITOR

In some developing countries, the private sector may not be sufficiently developed for competition to occur. There may be too few companies with the resources to do the job; some or all of the various companies may have hidden family relationships inhibiting competition; apparently different *firms* may actually be owned by the same people. Government regulation and judicial systems may be inadequate in assuring ethical business practices and minimizing *collusion* and *cartels*. In such countries, competition may need to be enhanced by government providing contestability – i.e., by government giving

service in some areas while the private sector gives service in others. With government contestability, the private sector is aware that government can step in to take over service at any time that there might be abuses or defaults. In countries where professional skills are limited, field experience in providing service in one or more *zones* may be the best way for government to have sufficient experience to *monitor* performance of the private sector in other zones. Cities in the USA, Canada, and the UK with the lowest cost collection service often have government providing contestability to the private sector.

Box 1.1

In most private sector agreements signed during the last decade, technical specifications have been inadequate; *sanctions* for poor performance were minimal; and output monitoring by government was poorly done.

In most private sector agreements signed during the last decade, the following shortcomings have been observed:

- technical specifications have been poorly and scantily defined – such as simply specifying “removal of *refuse*” and “street cleaning”, instead of describing the work in precise and quantified terms;
- it has been difficult to penalize private companies which performed poorly, partly because agreements have not included effective default clauses or sanctions;
- output monitoring by government was insufficient, and
- the durations of *contractual* agreements have been too short to enable the private sector to invest in suitable equipment - most agreements are for periods that are only 10% to 30% of the time needed for the *depreciation* of the investment required. For example, contracts for solid waste collection are often for only one year whereas the depreciation period for collection vehicles is usually four to ten years.

Many governments moved toward *privatization* in the last decade, but few have done so successfully. One of the better examples of good private sector participation occurred in Hong Kong, and this provided an incentive to many Asian countries that wanted to replicate Hong Kong's positive experience.

The first *concession* to design, build, transfer ownership, and operate (DBTO) was for a solid waste *transfer station*; the duration of the contract included the construction stage and the following 15 years. Ownership was transferred upon completion of construction and one year of satisfactory start-up operations. A chemical waste treatment facility followed in 1990, then a second transfer station in 1991, then three *sanitary landfills* followed under design, build and operate (DBO) concessions in 1992, 1993, and 1994, and finally several more transfer stations (Photo 1.1). All these projects involved long term concession agreements, competitive international tenders and foreign/local *joint venture concessionaires*.^{3 4}

This document attempts to provide a few lessons from the last decade of privatization experiences in developing countries. A companion document, entitled “Private Sector Participation in Solid Waste Management in Developing Countries” (Cointreau-Levine, 1994) was published by the World Bank to outline some of the issues to think about before involving the private sector in urban services. That publication gives numerous examples of the pros and cons of various privatization arrangements. It also discusses in detail some contextual issues such as labor *redundancy*. In 1994 there was too little experience to provide guidelines for how to privatize. This document is based on extensive recent experience and so takes the next step, providing “how to” guidance. There is still much to learn, but perhaps this snapshot of what we know today will help to avoid problems tomorrow.

Photo 1.1
The entrance to a private sector transfer station in Hong Kong



³ Based on personal experience of the author, Sandra Cointreau-Levine; and (Stokoe, 1998)

⁴ The International Finance Corporation is authorized to finance DBTO or DBOT concessions, while the International Bank for Reconstruction and Development and the International Development Agency can finance only DBO concessions.

Chapter 2: WHY PRIVATIZE ?

In the five-year period from 1994 to 1998, by involving the private sector, Georgetown (Guyana) was able to increase the number of vehicles involved in daily collection operations from 4 to 18, more than double the frequency of service, and increase city-wide *coverage* from 50% to 85%. Through contracting for *disposal* equipment, Georgetown was able to substantially improve its disposal operations.

The principal reasons for *privatizing* are to bring in private sector investment and improve operational *efficiency*. Some of the advantages and disadvantages of *private sector participation* are discussed below.

2.1 Solid waste management is a public good

Solid waste service is a public responsibility because it is a *public good*, as discussed in Box 2.1. But being responsible for a service does not require the *government* to perform the service with its own human and equipment resources. Government may choose to meet its responsibilities by involving the private sector to provide the service. In such a role, government defines the work to be done, arranges for payment to the private sector, and oversees the work. Furthermore, being responsible for arranging payment does not necessarily require government to pay the private sector. Government may choose to arrange payment by requiring its residents to pay fees directly to the private sector or to commissioned bill collectors.

SOLID WASTE MANAGEMENT IS A PUBLIC GOOD FOR THE FOLLOWING REASONS:

Solid waste collection and disposal services are

- **essential:** the services are essential to public welfare;
- **non-exclusive:** benefits derived from these services accrue to more people than those who directly receive the services;
- **non-rivalled:** benefits derived from these services are shared without the benefits to any individual being diminished.

This is discussed in more detail in (Cointreau-Levine 1994).

Box 2.1

2.2 Existing solid waste services are inadequate yet costly

Solid waste services in most developing countries do not satisfy the full demand in urban areas. In the poorest countries, the service sometimes reaches only 10% to 40% of the urban population. In the better-organized middle-income countries, the services reach from 50% to 85% of the urban population. Most of the waste collected is discharged to *open dumps*, which are often characterized by *open burning*, waste picking for *recyclables*, and animal scavenging for food wastes. Uncollected wastes and the wastes placed in open dumps are probably polluting nearby streams and underground aquifers.

Despite the gross inadequacies in service, the costs are substantial, as illustrated in Box 2.2. The data in this box are based on cost estimates by the Author conducted in over 40 developing countries over the past 20 years. The wide range in costs, as a percentage of the budget, reflects the differences in priority placed on efficiency, level and frequency of service, and the acceptability of open dumping. Also, the percentage of the budget depends on the number of urban services that are decentralized to the local level. The size of a city is not a major factor affecting the percentage of the budget that is allocated to solid waste services.

SOLID WASTE SERVICE COSTS ARE HIGH

Total estimated costs (including safe disposal):

- 0.7% to 2.6% of GNP in *low-income* countries
- 0.2% to 0.5% of GNP in high-income countries

Recurrent actual costs (based on existing systems, usually without safe disposal in low-income countries):

- 20% to 50% of city *revenues* in low-income countries
- 1% to 10% of city revenues in high-income countries

Box 2.2

2.3 Experience shows the benefits of private sector participation

There are many cases of dramatic reductions in costs as a result of the involvement of the private sector. Box 2.3 gives some examples, drawn from (Donahue, 1989), (Stevens, 1980), (Bartone, 1991), (Bartone, 1997) and (McDavid, 1997), among others.

EVIDENCE FROM AROUND THE WORLD

UK and USA Studies

- Private sector service costs have been at least 25% lower due to rationalized operations and greater management flexibility.
- *Managed competition*, with competition between government and private sector operations, is the most cost-effective option.

Canadian Studies

- Private sector service costs have been at least 25% lower in most provinces, and at least 60% lower in Atlantic Province.
- Comparatively high costs for the private sector in Quebec Province were due to older and larger equipment, larger crew sizes, and lower *productivity*.

Latin American Studies

- Private sector service costs have been about 50% lower due to higher labor and vehicle productivity.

Malaysian Study

- Private sector service costs have been at least 20% lower due to greater efficiency.

Box 2.3

2.4 What are the reasons for private sector efficiency ?

Rather than having a blind belief that the private sector must always be more efficient, it is useful to understand the reasons why the private sector can be more efficient than the public sector. The main reasons are summarized below.

- A private sector service provider is *accountable* to its customers, and is obliged to react if the customers are not satisfied.
- *Contestability* – competition between the private and public sectors - is effective in improving cost-effectiveness (Box 1.1).
- If clear *performance measures* are specified in the *contract* or agreement, and the private sector operator is supervised effectively, good standards of operation can be achieved.
- Private sector management have more flexibility -
 - to hire qualified staff
 - to pay staff according to their performance

- to *terminate* the employment of unsatisfactory workers, and
- to adjust working hours according to service demand.

- The private sector is less restricted by bureaucracy
 - in obtaining spare parts for repairs, and
 - so that it can lease equipment when it is needed and subcontract to meet peaks in demand.
- The private sector generally enjoys more freedom from political interference
 - so that it can optimize the size of the work force and the ratio of professional to operational staff, and
 - to concentrate its resources on the service for which they are intended, without staff or equipment being requisitioned for other purposes.

When the reasons for higher private sector efficiency are understood, it is possible to prepare arrangements for involving private companies such that the higher potential for efficiency is achieved in practice. The next Chapter suggests how this can be done.

Chapter 3: KEYS TO SUCCESSFUL PRIVATE SECTOR PARTICIPATION

3.1 Successful private sector participation needs careful structuring

Involving the private sector in the delivery of urban services, if properly structured, does the following:

- it improves service *efficiency*, and
- it increases investment.

However, if the arrangements and conditions are not well structured, *privatization* may not achieve either of these objectives, regardless of the effect of *market forces*.

Take, for example, the objective of improving service efficiency. Improving efficiency generally requires

- the upgrading of knowledge and skills,
- improvements in the equipment,
- rationalization of operations and maintenance,
- *accountability*, and
- *performance monitoring*.

In many developing countries, the private sector has had no experience in the provision of solid waste services and so has no knowledge of how to rationalize service delivery. Unless the *contractual* arrangement specifically encourages the private sector to draw on international experience and, perhaps, involve international specialists, the private sector may only copy *government* service, making the same mistakes. Also, unless the contractual arrangement enables new and efficient equipment to be purchased, the private sector may be burdened with using existing old equipment which is less suited to solid waste services than the equipment previously used by the public sector.

3.2 Remember the objective – low costs

Higher *productivity* alone does not lead to lower costs. Even though a private sector team tends to handle more waste in a daily shift than an equivalent team of local government workers, the private sector must bear many costs that government is not required to pay. As a result, even a highly efficient privatized service could be more costly than government service. For example, local governments in developing countries typically have access to lower cost capital financing, because they have the backing of their national treasury. Where local governments receive grants or transfers from central governments, these should be noted within an accounting of total finance cost. Whilst local governments do not usually pay interest on such grants or transfers, the total finance cost should include the interest rate which central government pays on its treasury notes, as an *opportunity cost* of capital.

Costs of government and private sector collection of solid waste in Quito (Ecuador) were analyzed and compared by the Author in 1998. Interestingly, there was no significant difference between costs on a per tonne basis. While total costs were similar, there were numerous differences in specific components of the costs, including differences in the following:

- Finance costs at current borrowing rates and payback periods (42% over 9 years for government, 46% over 5 years for the private sector),
- Customs duties (23% for the private sector, 0% for government),
- Basic salaries and benefits (personnel costs are 3 times higher per person for government, mostly due to social benefits),
- Administration (higher for government),
- Insurance (5% for the private sector),
- Repairs (slower by government),
- Length of daily work shift (7 hours for government, 9 hours for the private sector),
- Size of collection crew (smaller crews of 4 in government operations, larger crews of 6 for the private sector),
- Profit required for return on investment (10% for the private sector).

One reason for the higher personnel costs in government was that most workers had completed many years of service (44% of the workers had been working for local government for more than 15 years). Also, the labor unions had, over time, negotiated high benefits (250% over basic salaries).

One of the few comparable items was the measurement (by *time and motion* studies) of the productivities of the collection workers - they were similar for both sectors per hour of work. A 10% profit was assumed for the private company. The similarity between the costs of government and the private sector was determined to be largely because the government waste collection workforce had incorporated many improvements into its working practices during the previous four years. Collection routes had been rationalized, worker and vehicle productivity improved, vehicle *downtime* minimized, use of *consumables* controlled, and public cooperation developed. Quito had thus improved the daily productivity of government collection workers from 1.19 to 3.06 tonnes per collector between 1993 and 1997, and its vehicle productivity from 7.69 to 11.91 tonnes per vehicle.

Figure 3.1 shows the costs of the government and private sectors in Quito (Ecuador) It is worth noting that, in this situation, there is a relatively little difference in costs between the private sector and government. Photographs 3.1 and 3.2 show two of the types of vehicle referred to Figure 3.1

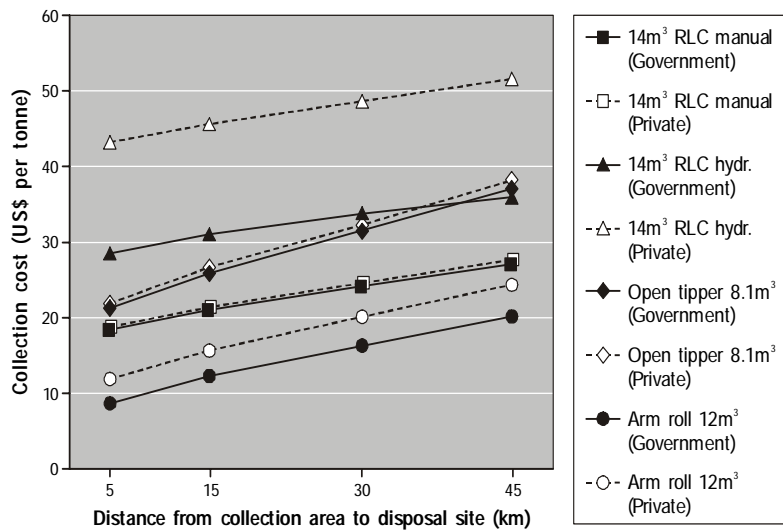


Figure 3.1
Waste collection costs – government and private sectors Quito (Ecuador), 1998

Notes

RLC Rear-loading compactor truck, specially designed for collecting low-density solid wastes, manual loading or hydraulic (**hydr**) lifting of bins

Arm roll See Photograph 3.2



Photograph 3.1
Loading an open truck, collection contract, Quito (Ecuador), 1998



Photograph 3.2
An arm roll truck picking up a container in the Medina district of Fez (Morocco), 1985. (Waste had been brought to the container by a contractor using donkeys because of the access problems in the narrow lanes.)

3.3 Allow for the cost of financing

There are not enough government *revenues* available in developing countries to cover their infrastructure needs. Loans from international agencies and donor countries can do little more than support investments in important demonstration projects of new infrastructure concepts. A key objective of involving the private sector is to open up a new source of capital financing.

Private sector companies in developing countries typically borrow to make investments for new *contracts* and agreements. Data collected by the Author in a number of developing countries show that the private sector typically pays interest rates 10% to 20% higher than government's opportunity cost of capital. Smaller private companies pay even higher interest rates, because of perceived risk and limited collateral (although experience shows that small businesses default less frequently on bank loans than middle-sized businesses).

Private companies should not be penalized for this situation. When cost estimates are being prepared, the extra costs of borrowing (that the private sector must pay) should be included in estimates.

3.4 Other extra costs which the private sector pays

Additional costs which private sector companies bear, regardless of their quality and efficiency of service, include: customs duties, equipment insurance, vehicle and company registration, company income and property taxes, sales taxes, and marketing costs. See Box 3.1. Customs duties in a developing country typically add from 20% to 100% to the cost of any imported equipment and spare parts; in addition there are often hidden costs for obtaining the cooperation of customs officials. Comprehensive insurance, which is required by any commercial bank which finances equipment, adds 3% to 6% of the assessed value of any equipment to its annual cost of ownership. To vehicle and company registration costs must be added, as a hidden cost, the unofficial payments needed to "grease" the government's bureaucratic "wheels", so that paperwork and approvals are completed properly and on schedule. Company income and property taxes may be small, but in some countries the cost of negotiating these taxes downwards needs to be recognized. In most developing



Cartoon 2

If the playing field is not level and one of the competitors has an unfair advantage, the disadvantaged players are likely to withdraw. The final result is that there is no effective competition.

countries, foreign companies must pay taxes in full, which results in unfair competition if local companies can avoid these taxes - the playing field is not level. (Cartoon 2 illustrates the concept of the *level playing field* – if the circumstances strongly favor one of the competitors, other competitors may be discouraged from taking part and withdraw, so that the benefits of competition are lost.) Marketing costs involve entertainment and gifts, as well as the costs for preparation of proposals. Costs for collecting payments involve more than just bill preparation and follow-up calls, because of the high “payment for payment” costs which are demanded in some countries.

These extra costs are not paid by government. Box 3.1 lists some of the extra costs of the private sector. While the private sector must pay hidden costs, government benefits from hidden subsidies – which should also be regarded as costs. These costs might not necessarily be paid directly by the residents who receive the local government service under consideration, but might be covered by taxes collected from residents or businesses elsewhere in the same country. Hidden subsidies usually are not discernible in local govern-

ment budgets. Such subsidies may be included in general administration budgets, rather than under the budget for the solid waste service. Sometimes operational subsidies are buried within capital development budgets, which include transfers from central government. Some hidden subsidies of government service are listed in Box 3.2.

EXTRA COSTS OF PRIVATE SECTOR SERVICE

(These costs are usually paid by the private sector but not by government.)

- Marketing
- Political manipulation
- Cost of borrowing for capital investment and to cover cash flow needs when payments are delayed
- Customs duties and value added taxes
- Corporate and property income taxes
- Equipment insurance and registration
- Company registration
- Cost of corruption
- Cost of transactions

Box 3.1

HIDDEN SUBSIDIES OF GOVERNMENT SERVICE

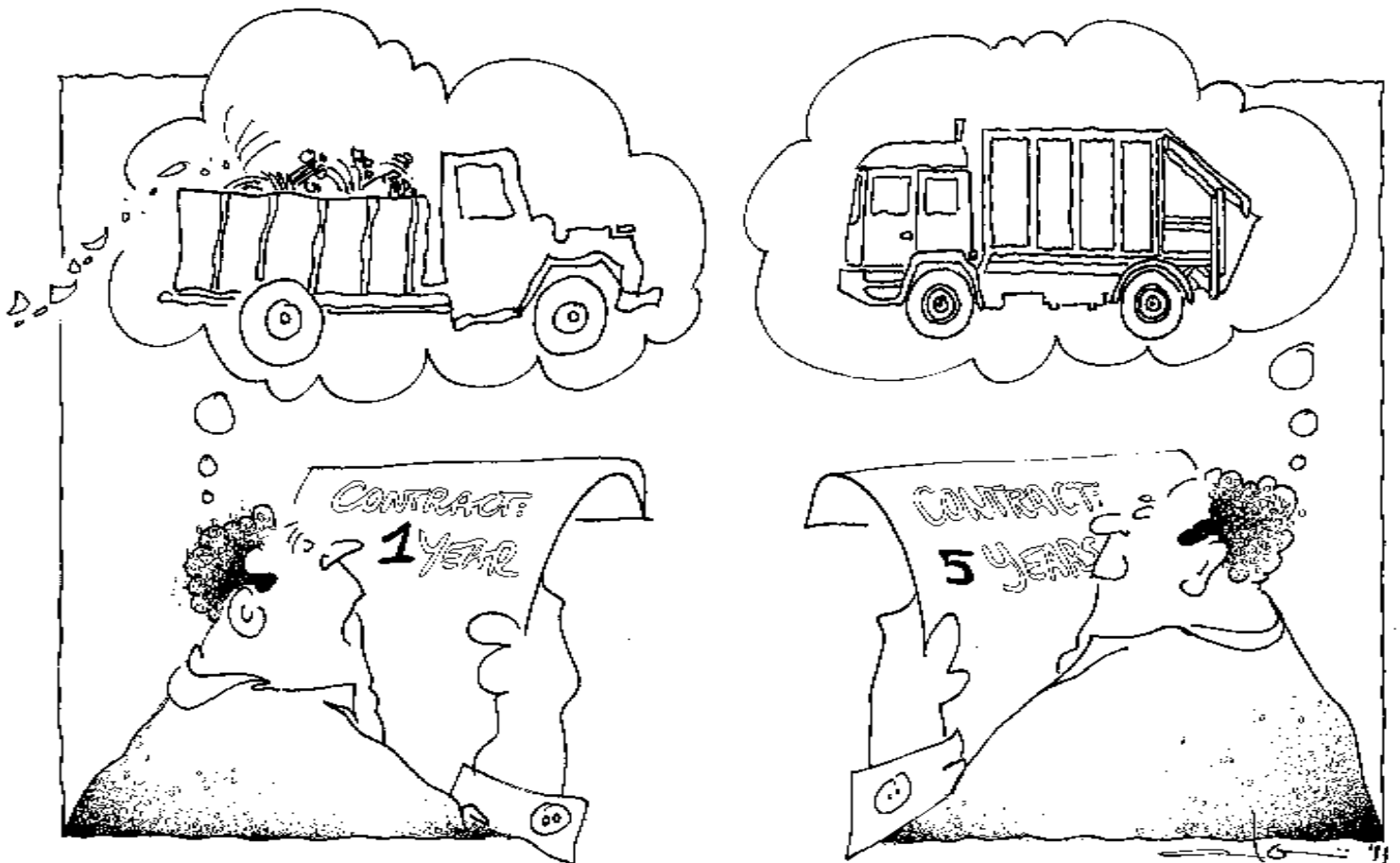
(These costs are not normally considered when the cost of public sector service is being estimated.)

- Depreciation of assets (buildings and equipment)
- Debt service on capital investment for *utilities* and infrastructure services
- Replacement of equipment destroyed by accidents instead of paying for insurance
- Seconded staff from other municipal departments or from central government
- Administration overheads
- Social benefits (vacation, pension, medical)
- Loss of income from corporate taxes and value added taxes (which would be paid if the private sector were providing the service).

Box 3.2

3.5 Duration of agreement - minimize risks to maximize cost savings

To encourage the best use of the private sector's potential for raising investment capital, governments need to take steps to minimize the private sector's investment risk and enable safe and appropriate periods of financing. Nevertheless, most privatization agreements in the solid waste sector are still for periods of 3 to 12 months regardless of the nature of the investment, rather than the 5 to 15 years needed to match the depreciation period of the new investment, as illustrated in Cartoon 3. (Typically 5 years are needed to pay off loans for *refuse* collection equipment, and 15 years for major transfer or *disposal* facilities). When queried about short agreement durations, governments give several reasons. Often, there is a *procurement* ceiling above which local officials



Cartoon 3

If a contract or other form of agreement is for a period of five years or more, the entrepreneur is able to pay back a loan that enables him to buy suitable vehicles. If the duration of the agreement is for one year, he probably cannot afford to buy efficient vehicles and must try to provide the service with vehicles that are old and inefficient.

cannot approve contracts without provincial or central government review and approval. Government's desire to maintain autonomy and control may override its desire to obtain investment. Sometimes this leads to three-month *service contracts* with small companies, regardless of the greater opportunity for efficiency and reliability from five-year investment-based contracts with larger companies.

3.6 Contestability and competition

Developing countries which contract for solid waste collection service often assume that *private sector participation* automatically means lower prices. Government costs are seldom analyzed in advance of privatizing to provide a basis for assessing the private sector's costs. Comparative *monitoring* of costs of various private sector service providers is not undertaken. The private sector is not forced to set low prices unless there is *contestability* (through comparison with the costs of government service) and competition (by comparison of the bid prices in several tenders and by monitoring the costs of the companies providing the service).

3.6.1 Competition is not what it seems

The appearance of competition is greater than the reality in most developing countries. In some, companies register several times, under different names, with changes in the names of directors, while the owners are the same in each case. In others, there is the appearance of competition but some of the companies that are bidding are actually owned by key government officials and are given favorable treatment in contract awards. Even when companies have distinctly separate and private ownership, there is a tendency for them to get together and agree on prices and conditions. In countries that have no social safety nets (i.e., neither medical insurance, unemployment benefits, welfare, nor disability compensation) and no explicit framework of business ethics, relationships need to be protected. To the extent that there is an appearance of competition, it is typically prearranged by mutual agreement and in harmony.

3.6.2 Contestability enhances competition

Since competitive forces are constrained in developing countries, it is advisable for the government to create *contestability*. In other words, government should continue to provide a service in part of the city, deliberately not contracting out the whole city to the private sector. (In small secondary cities, there may be too small a population to allow the formation of a sufficient number of *zones* to stimulate operational competition among private *firms* operat-

ing in different zones.) To create *contestability*, the private sector should service no more than 70% of any city; and government should service the remainder. By having some collection vehicles and labor available, government *contestability* is further enhanced by its ability to step in to take over from the private sector if there are failures, thus encouraging the private sector to perform optimally. In this arrangement, the private sector also creates *contestability*, since government workers realize that private sector participation could be expanded; and so they may be motivated to work harder. *Contestability* creates a competitive tension that leads both the private sector and government to improve efficiency. Some of the USA cities with the lowest costs for solid waste collection services have achieved *contestability* through *managed competition*, wherein government submits bids in the tendering process alongside the private sector.

During tendering for solid waste services, often only the private sector submits bids. In such cases government has no way of knowing the full basis for the bid price offered; nor can government readily determine whether the various bidders have agreed together to set prices (i.e. *collusion*). One way for government to truly understand the requirements and costs of supplying a solid waste service is to actually provide the service, even if only in one limited area. This allows government to monitor the work of the private sector from a position of knowledge rather than theory, since it must prepare its own estimates for tendering.

Box 3.3 describes an interesting approach to competition, in which there is also an element of co-operation.

3.6.3 Managed competition

Managed competition has been introduced by a number of local governments in the United States. It involves direct competition between municipal solid waste departments and private sector service companies for a publicly tendered service contract. To ensure fairness, contractors are selected by a different department of the municipality and the bids are carefully scrutinized by an independent auditor. An important aspect of making the process equitable is to include in the accounts all indirect costs or hidden subsidies (Box 3.2) that are commonly hidden in the costing of public sector operations. Developing a bid obliges public sector staff to consider all related costs, and it motivates them to work hard to find ways to reduce costs and rationalize operations, to assess the competition and to think in the same way as the private sector. The municipality benefits from this new approach whether it wins the bid or not, as Sacramento (California) and many other local authorities have discovered.

Co-opetition

Co-opetition (Brandenburger, 1996) is a new business philosophy that combines the advantages of competition with cooperation. Co-opetition applies the principles of game theory, which originated as a branch of applied mathematics, to business management. Some of the premises of co-opetition, relative to privatization of the solid waste sector, are discussed below.

Government makes the rules Government, residents (the *generators* receiving the service), and the private sector service providers are all partners in providing solid waste management within each city. Government has the key role of creating the “rules of the game”. Government is responsible for developing the rules that protect the interests of residents, and for making the playing field level so that service providers may compete on an equitable basis.

Government creates **direct rules** that require residents to make their wastes available for collection in an acceptable way and pay charges to cover costs. These direct rules also require the private sector to submit bids according to specified procurement procedures and abide by contract law. Government also creates **indirect rules**, such as tax laws, registration requirements, environmental controls, minimum wage standards, arbitration procedures, and antitrust laws. In developing countries, government may further control the “game” by controlling the flow and pricing of various goods, such as electricity, water and fuel. Government may determine whether foreign companies may participate in the “game”, depending on the nature of its rules about foreign exchange, repatriation of funds, work permissions for foreign specialists, and foreign ownership of local assets and corporate holdings.

Residents and contractors try to change the rules Residents try to change the rules to give themselves a stronger position - whether it is for lower prices, a more personalized service, a more frequent service, obligatory *public consultation* on new facilities, or more remote *siting* of facilities (as a result of the *NIMBY* syndrome of public resistance - “not in my back yard”).

Contractors try to change the rules to give themselves the upper hand - whether it is for higher prices, less specific terms of performance, fewer investment requirements, preference for local firms, tax breaks, or a monopolistic position. Contractors may even try to influence the environmental and occupational health and safety rules that government establishes. For example, in the United States, large private waste management companies lobbied hard for stringent *sanitary landfill* regulations during the 1970s. Stricter regulation forced most government *landfills* and small privately owned landfills to be closed – leaving only the sites owned by large companies still operating.

Government typically has more authority to change the “rules of the game” than the private sector. Unfortunately, one of the biggest problems with private sector participation in developing countries is that governments change the rules frequently and substantially. Often, rule changing occurs with each new political administration, to suit personal and political agendas. Most contracts for solid waste collection in developing countries include no penalty clauses, defining the precise shortcomings or lack of services that can result in penalties being imposed. Yet, these contracts often include a *termination* clause, allowing government to terminate the contract without reason within a specified number of days of notice.

Under the new concept of *co-opetition*, the “players” compete **and** cooperate. Co-opetition is a *win-win* game for all the players, rather than win-lose. In developing countries, the number of financially strong and technically competent private companies is usually limited. In other words, there are so few players that the risk of playing by win-lose rules is unacceptable. For financial sustainability, and to develop the private sector capacity, a win-win strategy is essential.

The first step to co-opetition is dialogue. Recent private sector participation efforts in Ghana, Guyana and Guinea involved government officials working side-by-side with the private sector to develop

- reasonable terms of performance in their waste collection contractual agreements,
- contracts or *franchises* which are longer than a year in duration,
- arrangements to guarantee regular and punctual payments, and
- other ways to minimize risk to investors.

In these countries the private sector capacity has developed substantially. Small firms which started with only one old *open tipper* are now operating several relatively new trucks, some of which are specially designed for refuse collection.

In Ghana, privatization workshops included private company representatives and government officials, working together to develop a model contract agreement. The agreement was designed to encourage investment by the private sector, provide profitable work for private companies, and secure good service delivery for a reasonable price. In Quito (Ecuador) the city solid waste agency worked closely to create and train two *microenterprises* for solid waste collection, each comprising residents of the neighborhoods they would serve. Every few months, the city solid waste managers meet with the microenterprises to review the accounts and assist them to improve service efficiency and quality.

Box 3.3

Chapter 4: OPTIONS FOR PRIVATE SECTOR PARTICIPATION

4.1 Most solid waste management activities can be privatized

Most activities undertaken by *government* can be done with some level of *private sector participation*. Governments should focus on *privatizing* those activities that are most inefficiently done by government and consume a significant portion of government budgets. For example, solid waste collection should be a privatization priority, because it is typically inefficiently done if there is no competition to government service. Furthermore, solid waste services are considered relatively easy for the private sector to undertake, considering the level of skills required, the magnitude of the needed investment, and investment risk. Maintenance of vehicles should also be given priority consideration for private sector participation, because of the delays typical of government workshops (often caused by slow *procurement* procedures and cash flow problems in purchasing spare parts). Sweeping is another area for potential private sector participation, because, as a public sector activity, it is often subject to labor restrictions on the hours worked and because of high costs and administrative difficulties relating to overtime working.

Private sector participation in solid waste management may involve any of the activities listed below. Box 4.2 contains descriptions of the various types of *contractual* arrangements mentioned in the list.

- Provision of vehicles or heavy equipment - by lease or rental agreement with equipment owners. Drivers or operators and maintenance may also be included in the arrangement.
- *Pre-collection* of residential solid waste by *private subscription*. (Under this arrangement each household engages any *licensed* collector of its own choosing and pays a fee directly to the licensed collector. A number of different collection enterprises may service the same neighborhood.)
- *Pre-collection* of residential solid waste by *service contract*. (In this case the City selects the company which receives the *contract*, based on qualifications and competitive bidding, and pays the private company.) Alternatively the service may be arranged by means of a *franchise* (i.e., where the City selects the company which receives the franchise, based on qualifications and proposals, and the users pay directly to the private company).
- Collection of construction and demolition debris - by private subscription.
- Collection of industrial wastes from large factories - by private subscription.
- Collection of commercial wastes from hotels, offices, markets or stores - by private subscription
- Collection and final *disposal* of infectious *healthcare* wastes from hospitals and clinics - by private subscription with private establishments, and *concession* or service contract with public establishments.
- Collection of general municipal wastes from entire neighborhoods - by service contract or franchise, or by *management contract* (meaning that the City selects a company to manage government equipment and staff, and pays for that management input).
- Sweeping or cleaning of streets and open areas - by service contract.
- Repair of municipal solid waste equipment - by service contract on an as-needed basis, where each repair job is contracted after solicitation of several quotes from a list of accepted suppliers.
- Repair of municipal solid waste equipment - by service contract on a long-term basis.
- Conversion of waste to compost - by service contract or concession.
- Operation of a *transfer station* and long distance hauling system - by service contract or concession.
- Operation of a disposal site - by service contract or concession.
- Mining (i.e. excavation and screening) of decomposed waste from a disposal site for sale or use as compost soil conditioner - by concession.
- Collection of *user charges* or waste taxes - by franchise with bill collection agents, water authority, or electricity utility.

4.2 Types of private sector arrangements

Private sector participation involves reducing government control, ownership and/or activity within a service, such as solid waste collection and disposal, traditionally provided by government.

4.2.1 Reduced government control

Government **control** is decentralized by *commercialization*. Commercialization can take many forms. Government agencies for solid waste management are restructured into semi- or quasi-private enterprises with some degree of government *oversight*, but with the management freedom to operate at optimum *efficiency* and generate *revenues* exclusively for their own use. In the case of such enterprises, the assets are typically owned by the enterprise and government is a shareholder of the enterprise (but not necessarily the only shareholder). This may not be exactly private sector participation, but seeks to graft many of the strengths of private companies onto a decentralized government organization. Various forms of commercialization include: private corporations, public corporations, semi-private corporations, and public authorities.

Commercialization reduces government control over decision making. If the public organization has been fully commercial-

ized, the only government ownership may be the shares and the only influence may be the Board appointments. Each commercialization option is slightly different in its level of autonomy.

Commercialization involves changing the financial arrangements of the solid waste organization, including creation of *segregated accounts* and separate revenue streams. As part of the commercialization process, the public solid waste organization is typically changed in its organizational structure so that has more autonomy and *accountability*.

4.2.2 Reduced government ownership

Government **ownership** is reduced when government-owned enterprises are divested (or transferred to the private sector), and when public/private *joint ventures* are formed.

See Box 4.1

REDUCING GOVERNMENT OWNERSHIP

Divestiture

Government-owned enterprises and their related assets are partially or wholly sold to the private sector, with the expectation that the basic function of the enterprise would continue.

Public/Private Partnership

Government establishes a joint venture with the private sector to which each party contributes assets and resources, and each party assumes certain risks and responsibilities as defined in contractual agreements. While this term is sometimes used broadly to mean all public/private arrangements, it is a legally defined term in some countries (such as Indonesia), signifying a joint venture.

Box 4.1

REDUCING GOVERNMENT ACTIVITY

Contracting

Government awards a finite-term service contract to a private *firm* to provide solid waste services, and government pays the firm for the services delivered. Alternatively, government awards a management contract to a private firm to provide management oversight of others who are providing solid waste services.

Franchise *

Government grants a private firm an exclusive monopoly to provide a specific type of solid waste service within a specific *zone*. The firm collects its own revenues from *generators* within the zone or from the sale of solid waste by-products removed from the zone.

Concession

As with the concept of logging, mining or water concessions, government allows the private sector to utilize one of its resources, in this case solid waste, for profit-making purposes. Concessions typically involve construction of major long-term facilities to sort, treat, *transfer*, or dispose of solid waste. Government may pay a *tipping fee* or service charge to defray part of the costs of processing the solid waste, but sale of the concession's product (such as compost), or service fees paid by non-government customers typically cover the remaining costs. Government provides a guarantee of *flow control*, so that amounts of wastes received closely match facility design capacity. Most concessions are operated on a "*take or pay*" basis, where tipping fees are paid even if the guaranteed daily quantity of waste is not provided.

Private subscription

Government licenses private firms to compete with each other in providing solid waste management services. No firm has a monopoly within a zone and price regulation is not required. Each firm collects its own revenues from its customers or "subscribers". (Also known as "open competition".)

Box 4.2

4.2.3 Reduced government activity

Private sector participation is also a means of reducing government **activity**. Government activity is reduced when the private sector participates in service delivery through contracts, franchises, concessions, and *open competition* (or private subscription). See Box 4.2.

4.3 Selecting the most suitable option for waste collection

Each of the above options has value. Selection from among these options should include consideration of site-specific conditions. Generally, in middle-income and high-income countries, contracting for household collection services is preferred over franchise and private subscription (or open competition). In contracting, government is the client and the source

of payments, and therefore has control to ensure that the *contractor* meets performance expectations. For contracting of collection services to be possible, government needs to have sufficient revenues to fully cover the total costs of the services, including *depreciation*, interest on borrowing, salaries, *consumables*, insurance and profit. When governments provide collection services with their own staff and equipment, their budgets typically include only salaries and consumables – and depreciation costs are hidden subsidies (Box 3.2). For collection contracting to be possible, government budgets for *recurrent* expenditures may need to be doubled or tripled to enable the private sector to fully cover its costs. When such dramatic budget increases are not possible, government should explore the other options of privatization, namely franchise and open competition (or private subscription).

Franchise is sometimes the preferred method of privatizing solid waste collection in *low-income* countries that have very

* There is some confusion about this English term, "franchise", since the French term for this type of arrangement is similar to the word "concession". However, in English, the term "concession" does not refer to a zonal monopoly, but only to a major new facility.

constrained government revenues. Also, in countries which have had a strong socialist or communist tradition in which all services have been heavily subsidized, and in countries with a particularly well-known tradition of corruption, residents may not be willing to pay taxes or *user fees* to government. (In the first case they may feel that their contribution is not necessary, and in the second they may believe that the money will not be used for the intended purpose.) In such countries, residents may prefer the franchise method for solid waste collection, because they feel that the private sector will be motivated to provide service in return for fees. Conducting willingness-to-pay surveys prior to privatization is one way to obtain insights into residents' preferences. (See Part III, Annex A9.) Theoretically, individuals paying for a service under franchise arrangements have limited individual bargaining power with the franchisee and little influence on the quality of the service, because the franchisee has a zonal monopoly. However, franchisees are financially motivated to satisfy their customers in order to be paid, and experience indicates that franchisees are very responsive to the demands of customers. Government, however still retains overall responsibility. Whilst not responsible for making payments, government still has the responsibility for awarding the franchises only to qualified and responsible firms, and for *monitoring* their performance with respect to agreed specifications.

Private subscription is generally not recommended for household *refuse* collection in *laid-out* (or planned) residential areas, because it does not allow *economies of contiguity* (i.e., the benefit in efficiency when only one collection vehicle travels a continuous collection route to collect waste). However, private subscription is the most common and preferred method of collecting waste from large generators, such as large hotels, embassies, industries, and commercial establishments. Private subscription may also be viable for large residential apartment complexes. Typically, cities require large commercial and industrial sites that generate (say) over 2 cubic meters of waste each day to make their own arrangements through private subscription directly with private *haulers*. It is the government's responsibility to license private haulers and make sure they comply with licensing criteria. Special domestic wastes are also handled through private subscription arrangements, wherein households request special collection of bulky wastes, construction or demolition debris, and yard wastes, (on the infrequent occasions when such a collection is required). Private subscription is also an appropriate way of arranging for the collection of non-domestic special wastes, when establishments request special collection of infectious healthcare wastes, *hazardous* wastes, and spoiled or outdated foods or medicines.

Pre-collection is typically provided through franchise arrangements. In small communities, pre-collection laborers gather the waste from door-to-door and take it to a *communal transfer point* for removal.

Beginning in the late 1970's, in Surabaya and Jakarta (Indonesia), neighborhood pre-collection systems (involving local neighborhood leaders and workers hired from the community) were *pilot tested*. Pre-collection now is common in most Indonesian cities, reaching about 70% of the country's urban population. In these cities, pre-collection involves hand carts or tricycle carts collecting the waste from door to door. In some neighborhoods, pre-collection is done by individuals hired at the neighborhood level and paid a salary by the neighborhood leader. In other neighborhoods, pre-collection is part of a zonal service contract with the city for solid waste collection. In both cases, residents pay through *direct user charges* to cover the cost of pre-collection and part of the cost of (secondary) collection.

In the mid-1980's, neighborhood pre-collection systems (involving *microenterprises* created by neighborhood residents – Box 4.3) began to be developed in Peru. They are now spreading throughout Latin American cities, including cities in El Salvador and Ecuador. Experience in many developing countries over the past twenty years has proven that households are commonly willing to pay for a pre-collection service directly to a franchisee.

MICROENTERPRISES

The term "microenterprise", when used in the context of solid waste management in Latin America, means more than a very small business. It typically refers to the creation of a new organization from among residents in the neighborhood for the specific purpose of cleaning the neighborhood. Microenterprise workers usually have no previous work experience and have not previously collaborated in such a venture. The microenterprise is developed with the help of external technical, and often financial, assistance. The people have no apparent entrepreneurial ability and they need training and guidance in even simple accounting and contract negotiation. Microenterprises are expressly created with government's approval, and not hired through any tendering process. The concept is that people from the neighborhood are more likely to feel accountable to their friends and neighbors, and also that residents in the neighborhood would be more willing to pay if they know the microenterprise people they are paying and feel responsible to help them with their livelihood. This is one of reasons that youth groups and women's groups are particularly successful - there is the *willingness to pay*. In some cases - only after gaining experience - these microenterprises then venture beyond their own neighborhoods to provide cleansing services in other neighborhoods, as has been the case in Quito (Ecuador).

(There is further discussion of micro- and small enterprises in Haan, 1998)

Box 4.3

Since 1990, a significant number of African cities have been implementing pre-collection schemes. The African examples include microenterprises set up by neighborhood youths in Abidjan (Ivory Coast) and Dakar (Senegal); by non-government organizations (NGOs) in Cotonou (Benin), and by private entrepreneurs in Conakry (Guinea).

In 1995, only 10% of Conakry's solid waste was being collected. From some neighborhoods, individuals with carts or tractors were providing a pre-collection service for a fee and taking the wastes to the City's communal containers. The City collection trucks could not be maintained because of inadequate municipal revenues; and so the emptying of these communal containers by the City was irregular and inadequate. Residents were unwilling to pay taxes or user fees to the City for improvements to be made. However, a willingness-to-pay survey showed that residents would be willing to pay for the service directly to the private sector. In 1998, various small enterprises were awarded franchise zones for waste collection, and residents were advised to subscribe with these franchisees for the collection of their waste. For an average monthly fee of about US\$3 /month, households are now paying directly for waste collection, and the city has become significantly cleaner.

Phnom Penh, Cambodia has a citywide franchise collection system managed by one company, known as Than. This company has sub-franchise agreements with several companies, through a fee-sharing arrangement. While the city would have preferred to contract out the collection service, the revenue base was far too small for this option to be considered.

The biggest concern associated with using private subscription and franchise systems for solid waste collection is that some waste generators would not be willing to pay for the service and that they would not properly dispose of their wastes themselves.

In the rural areas of the USA, where economies of contiguity are of less importance than in urban areas, private subscription is the most common method of solid waste collection despite its higher cost. Private subscription is preferred because generators like to choose their own service provider, and solid waste costs are only a small portion of household income, so residents may be prepared to pay a little more for a service they prefer. However, every rural community provides a local collection point, so that residents who are not willing or able to pay for a house-to-house service can take their wastes to the collection point. These collection points have become popular places for village politicians to do their weekend campaigning prior to elections.

In private subscription and franchises, the residents pay for their wastes to be removed from their neighborhood but do not pay attention to where the wastes are taken for disposal or how much the trucks weigh when fully loaded. In many cases residents would still be willing to pay the collection fee even if the wastes were not taken to an official disposal site. To ensure that wastes are not dumped illegally, private subscription necessitates a strong regulatory and enforcement framework. Franchise agreements should include a clause that the agreement can be *terminated* if the franchisee disposes of waste illegally, and the licenses for

private subscription should be revoked if official disposal sites are not used. This problem is avoided when contractors are paid by municipal authorities, since payment can be made upon proof of discharge of wastes at an official disposal site, often based on the weight of the wastes discharged. This creates an incentive for contractors to dispose of their wastes at official sites.

4.4 Private sector participation arrangements for disposal

For disposal services, in the context of a good environmental regulatory framework and enforcement, open competition (private subscription) is preferred to contracting. In open competition, private companies with disposal facilities are able to compete for clients, regardless of how far away these clients might be from the facility. On the other hand, when government contracts for a disposal service, it limits the service to wastes generated within its geographical jurisdiction.

When a private firm or *public/private partnership* builds, owns, and operates a facility, it is called a BOO agreement. When a firm builds, owns (temporarily), operates and transfers ownership to government, it is known as a BOT agreement. Ownership is usually transferred to government at the end of the concession period but, in some cases (e.g. Hong Kong), ownership is transferred to government at the end of successful start-up operations. When a firm designs, builds, owns, and operates (and/or transfers) a facility, it is called a DBOO (or DBOT) agreement. The private sector typically prefers to design the facilities it eventually must build and operate. This is particularly true for *sanitary landfills*, because of the potential long-term liability for any pollution resulting from inadequacies in the design. These agreements are generally referred to as **concession** types of contractual agreements between government and the private sector. The size of the investment and the length of the depreciation period are key differences between a contract, for which the private sector invests in **equipment and supplies**, and a concession, for which the private sector invests in a **facility**. Under a concession, the replacement and repair of the facilities need to be carefully considered, in terms of both the defining of responsibilities and technical aspects.

Privatization of *landfill* operation at existing sites can be achieved by means of a *service contract*. For any new sanitary landfills, full design-to-operation privatization should be considered. The mode of such privatization would be a DBOO or DBOT *concession agreement*. Colombo (Sri Lanka) has been working on the implementation a new sanitary landfill using a concession, and Hong Kong has already implemented two new sanitary landfills in this way. In the Colombo case, the World Bank has made available project financing for a significant part of the capital investment, thus minimizing the risk to private sector investors and making the project more attractive to them.



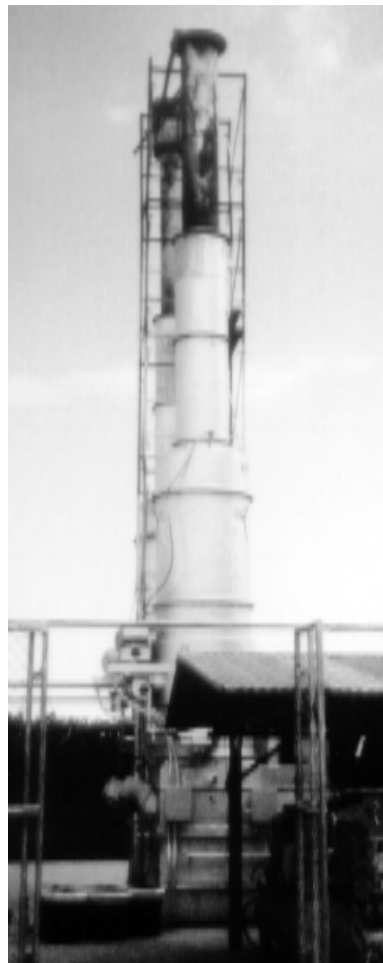
*Photograph 4.1
Landfill operated by a
contractor, Casablanca
(Morocco) 1996*

In Mauritius, under a World Bank project, a sanitary landfill was designed by one contractor, constructed by another contractor and operated by a third. During the transition period between the construction and the operation phases, there were many disputes regarding the adequacy of construction, with the operating contractor refusing to take full responsibility for maintaining the works he had taken over. If, in the long-term, there were adverse environmental consequences (such as groundwater pollution), there undoubtedly would be a legal battle between the design engineer, construction contractor and operations contractor over which one is responsible. The lesson learned was clear – when a new sanitary landfill is to be constructed and operated by the private sector, responsibility for all stages should rest with one company.

To deal with the need for minimizing the investment risk faced by the private sector, the Inter-American Development Bank is now able to provide financing to governments to cover part of the cost of a concession. Invitations to tender can include a statement that financing to the private sector also can be arranged. Both the World Bank and the Inter-American Development Bank can provide guarantees against non-commercial risk.

4.5 Healthcare wastes

Privatization of the collection, treatment, and disposal of high-risk healthcare wastes is recommended. Because hospitals are generally willing and able to pay for such services, the preferred mode of privatization would be a concession agreement to design, build, own, and operate (DBO) the collection and treatment systems for special healthcare wastes. (The concession is basically for the treatment and disposal operations, with the collection included because of the considerable advantages of having one company responsible and accountable for the waste at all stages, from source to disposal.) Also, the same private company could supply the special containers for sharps (such as blades and syringe and drip needles) and infectious wastes (such as bandages and wastes from infectious disease wards).



*Photograph 4.2
Incinerator for healthcare
wastes built and operated
by a private company in
the Philippines*

In Metro Manila (the Philippines), a private sector entrepreneur built a special high temperature incinerator for high-risk healthcare wastes and established a well-controlled collection system. Wastes are sealed in plastic bins at the source and each is given an identification code. The sealed bins are later placed directly in the incinerator, and the wastes burned along with the bin. Within several years, more than half of Metro Manila's 200 medical centers and hospitals have subscribed to the service, even in the absence of an enforced regulatory framework. This is an open competition type of privatization, wherein each hospital privately subscribes to have its wastes taken away and treated. See Photograph 4.2

4.6 Summary

SOME EXAMPLES OF WHO IS DOING WHAT IN PRIVATIZATION

Commercialization of the solid waste management agencies:

Quito, Ecuador
Medan, Indonesia
Bandung, Indonesia
Lagos, Nigeria
Onitsha, Nigeria
Conakry, Guinea
Lima, Peru

Commercialization of the composting agency:

Ho Chi Minh City, Vietnam

Public/private joint ventures for collection:

Riga, Latvia
Semarang, Indonesia

Public/private joint ventures for incineration:

Surabaya, Indonesia
Manila, Philippines

Public/private joint venture for sanitary landfill:

San Salvador, El Salvador

Service contract for pre-collection:

Fez, Morocco

Service contracts for collection:

Sao Paulo, Brazil
Rio de Janeiro, Brazil
Santiago, Chile
Guayaquil, Ecuador
Quito, Ecuador
San Miguel, El Salvador
Banjul, Gambia
Tema, Ghana
Georgetown, Guyana
Jakarta, Indonesia
Abidjan, Ivory Coast
Montego Bay, Jamaica
Kuala Lumpur, Malaysia
Port Louis, Mauritius
Dar es Salaam, Tanzania
All cities, Trinidad and Tobago
Caracas, Venezuela

Service contract for street sweeping:

Surabaya, Indonesia

Service contracts for *transfer*:

Lahore, Pakistan
Damascus, Syria

Service contracts for sanitary landfilling:

Guayaquil, Ecuador
Buenos Aires, Argentina
Bogota, Colombia
Port Louis, Mauritius
Casablanca, Morocco

Contracts for vehicle repair and maintenance:

Padang, Indonesia
Semarang, Indonesia

Contracts for *performance monitoring*:

Buenos Aires, Argentina
Sao Paulo, Brazil
Bogota, Colombia

Franchises for pre-collection:

Abidjan, Ivory Coast
Lima, Peru
Bamako, Mali
Faisalabad, Pakistan
Conakry, Guinea

Franchises for collection:

Accra, Ghana
Bogota, Colombia
Conakry, Guinea

Franchises for collection of *recyclables*:

Cairo, Egypt
Medan, Indonesia

Franchises for mining compost from dumpsite:

Medan, Indonesia
Mumbai, India

Franchise for recycling of construction debris:

Riga, Latvia

Franchises for fee-based *cost recovery*:

Guayaquil, Ecuador
Quito, Ecuador
Surabaya, Indonesia
Padang, Indonesia
Tema, Ghana

Concessions to Build, Own, Operate transfer stations:

Port Louis, Mauritius
Jakarta, Indonesia
Hong Kong

Concessions to Build, Own, Operate sanitary landfills:

Colombo, Sri Lanka
Hong Kong
Lahore, Pakistan

Concessions to Build, Own, Operate compost plants:

Semarang, Indonesia
Porto Novo, Benin

Open competition for waste picking at disposal:

Most cities

Open competition for buying recyclables at source:

Most cities

Private subscription for collection from large sources:

Most cities

Private subscription for pre-collection or collection in marginal areas:

Most cities

Source: Sandra Cointreau-Levine, based on direct field experience

Box 4.4

Chapter 5: CONSIDERATIONS FOR PRIVATE SECTOR PARTICIPATION

5.1 Introduction

It is relatively easy to improve solid waste collection and disposal by involving the private sector. But service improvement is not the most important measure of success. *Private sector participation* is successful only when service improvements are financially sustainable and cost-effective. This chapter discusses some of the considerations for how to optimize private sector participation. Competition, *accountability*, and *transparency* are essential ingredients for successful involvement of the private sector.

To achieve successful private sector participation the following actions are recommended:

- Maintain a balance between the private sector and *government* for optimum *contestability*.
- Negotiate with labor unions or representatives over *restrictive labor practices* and *redundancy*, seeking a phased program of improvements and staff reductions which minimizes adverse social impacts.
- Develop *contractual* periods that enable economic *depreciation* of assets and repayment of loans.
- Develop techniques and facility sizes that are appropriate and economic.
- Define private sector service *zones* that are *equitable* and comparable for optimum competition.
- Achieve *economies of scale* and optimum *spans of management*.
- Rationalize collection and *transfer haul distances* to minimize costs.
- Seek harmony and *co-opetition* with private sector partners for *win-win contractual* and operational relationships.
- Build government capacity to work as an effective partner in contracting and *performance monitoring*, as well as a contestable service provider in competitive zones of service.
- Encourage private sector *joint ventures* that bring in foreign expertise and optimize the use of local knowledge and skills.

5.2 Maintain a balance between the private sector and government

Service arrangements need to be

- for a period that is long enough to allow full depreciation of investments,
- on a scale that is large enough to allow economies of scale, and
- competitive enough to encourage *efficiency*.

Until the private sector within a developing country is well established, it is strongly recommended that government retain at least 30% of the overall collection service area, and continue to provide the solid waste collection service in this

part. Often this stage would last for the first five years of private sector participation. After that, for another 5 years, to maximize contestability and minimize the potential for *collusion*, government probably should continue to provide the service in at least 20% of the overall collection service area.

In Stockholm (Sweden), the local government operates 15% of the collection service and contracts out the remainder to five different private companies. It finds that an advantage of this strategy is that the city can easily compare its costs with the private sector costs, which optimizes contestability. Another advantage it finds is that it can use its own operation to make trials and research new methods, and thus encourage the private sector to improve its methods of operation (Wiqvist, 1998).

In Bogota (Colombia), initially – in 1990 - only one zone of service was awarded to a *contractor*, with government continuing to provide the collection service in about two-thirds of the city. After the next several years, there were eventually three contractors in three zones, with government operating in only about one-third of the city. To minimize the potential for collusion or *cartels*, only international corporations in joint ventures with local *firms* were pre-qualified to bid. The performance of the contractors and the Bogota government collection service were *monitored* and compared by an independent consulting company, to optimize contestability. In 1993, because government could not adequately improve its performance in the zones where it was operating (reportedly due to labor restrictions), the city converted to an entirely *privatized* system, which now has seven zones operated by four *franchisees*. These companies collect *user fees* through a separate company in which all of them are stockholders.

Dakar (Senegal), after experiencing a *public/private joint venture* which was essentially a monopoly, implemented a more competitive privatization arrangement of multiple *service contracts*.

Managed competition has already been discussed in Section 3.6.3. Managed competition has become the most cost-effective service delivery option in the United States. It began in the late 1980s and involves government and the private sector bidding to provide services against each other, and both operating in different but comparable zones in a competitive manner.

Phoenix (Arizona) was one of the first cities to implement managed competition. Initially, the local government team failed to win service zones during the bidding process; but eventually it became a successful bidder and won back many of the city's service zones. Every seven years, in each service zone, Phoenix's solid waste department must compete again with the private sector for the service contract for that zone.

5.3 Labor Redundancy

One of the most pressing concerns of developing countries when privatizing is how to minimize the *termination* of employees. Most countries address this by first freezing the hiring of new staff. Over a period of time the size of the government workforce reduces because older workers retire and some of the younger staff leave to join the private sector. Private sector participation can then be phased in to cover the shortfall in service, filling the gaps caused by the reduction of the government workforce. A number of cities in the United States have adopted a policy of “No layoffs”, since natural *attrition* creates significant flexibility in a transitional move toward involving the private sector. Whilst employment is guaranteed, employees are not assured of keeping the same job in the local government workforce. Jakarta (Indonesia) slowly phased in private sector participation to fill the gaps in the collection service caused by the gradual reduction of the government workforce achieved by this natural attrition, without any employee terminations. Phoenix (Arizona), on the other hand, guaranteed employees that they would not need to change jobs, but did not promise that salaries would be maintained at the same levels.

Private sector participation in Bogota (Colombia) did not result in job terminations for government workers until the fifth year of private sector participation, when all the waste collection work was contracted out to private companies because it had not been possible to obtain improved *productivity* from government workers. Other cities of Colombia organized government workers into cooperatives and transferred government equipment to these cooperatives. The cooperatives were then given multi-year contracts to provide collection services. After several years of experience in operating commercially, the cooperatives were able to compete effectively

In Mauritius, solid waste collection contractors were obliged to hire workers transferred from local government. However, after less than a year, if the workers did not perform to the contractors' satisfaction, they could be dismissed. This type of arrangement circumvents normal *severance pay* requirements of government employment policies and so it is not a fair arrangement. It is especially unfair to older “permanent” employees who have worked for many years in government service with the expectation of employment security and a full pension.

In 1998, Quito (Ecuador) studied how best to phase in private sector participation without adversely affecting labor or creating significant extra costs. The first step was to improve government service efficiency, through improved *routing* and better crew size allocations. Then the city adopted a strategy of natural attrition, including a freeze on hiring, to gradually reduce government personnel in solid waste management. At the same time, it offered voluntary retirement, with an attractive lump sum payment incentive, to all workers over 55 years of age who had completed more than 20 years of service. Private sector contractors were required to offer incentives to encourage government workers to transfer to the private sector and work with them. These incentives were targeted at workers who were not eligible for the voluntary retirement option. The overall goal of the strategy was to reduce government staffing without incurring the extremely high severance pay costs of a government layoff.

5.4 Appropriate duration of agreement and the provision of equipment

Contracts or franchises that involve investment in vehicles should have a minimum length of five years, and investment in fixed facilities requires a minimum agreement duration of ten years. Shorter periods lead to higher prices, because contractors or franchisees are forced to depreciate their investments over periods shorter than the normal economic life of the machines or facilities.

Agreement durations should cover the standard depreciation period and thus enable lower costs. For example, solid waste collection contracts in Bogota (Colombia) were set for a five year period. Shorter periods of obligation are possible for privatization of *pre-collection*, because the investments are for equipment such as handcarts which often last for a shorter time and so can be depreciated over a shorter period. Agreements for transfer and disposal should be for longer periods because of the greater investment involved. For example, *transfer station* concession agreements in Jakarta (Indonesia) were for a ten year period, and both transfer station and *sanitary landfill* concessions in Hong Kong were for 15 years.

If the private sector has limited capacity to invest in solid waste management, low-cost borrowing through subsidized credit lines could be arranged. Another option is for government to purchase the equipment and arrange a lease/purchase agreement in parallel with the service agreement, as has been done for a World Bank financed project for secondary cities in Ghana. (For suggestions regarding contractual arrangements for equipment, see Section A10.2.2b in Annex A10 of Part III and the comments in the NSWMA document in Part V.)

5.5 Flow control and regional agreements

A significant issue for successful implementation of *regional* solid waste facilities is *flow control*. In *transfer*, treatment and disposal contracts this issue needs to be carefully addressed to minimize risk to private investors. Flow control involves the guarantee that a minimum quantity of waste will be delivered to a facility. Private sector participation contracts should specify the minimum, and require a “*take or pay*” commitment from government, wherein government either ensures that the agreed amount of waste is brought to the facility or pays the sum that it would pay for that specified minimum.

For regional facilities, flow control is a particularly troublesome issue to resolve.

For example, flow control problems led to the *closure* of a regional privatized sanitary landfill in Buenos Aires (Argentina) during the 1980s; the closure of a privatized composting plant in Semarang (Indonesia) in the 1990s; and loss of *revenues* at a privatized sanitary landfill in Mauritius in 1998. In the case of regional facilities that are intended to serve many municipalities, it is more difficult to oblige each municipality adhere to the flow control requirements, even though each is a signatory of the *intermunicipal* agreement. New political administrations sometimes walk away from the commitments made by previous administrations, without paying any penalty. Local laws need to be carefully reviewed to find a way to make binding intermunicipal agreements, and there needs to be the political will to enforce the obligations defined in such agreements. In the case of regional disposal facilities, provincial government and/or central government may need to provide flow control guarantees. Perhaps such guarantees could be backed by the option of making adjustments in central government financial transfers to local governments, thus discouraging municipalities from abandoning their commitments.

Concern over flow control is greatest for disposal facilities. Where transfer facilities are available, there is an inherent economic incentive for *haulers* to bring their waste to the transfer stations, because they save money on transport. In contrast, disposal is simply a cost to haulers and waste collection agencies (and this cost can be avoided by *clandestine* dumping). Unless there is a strong environmental regulatory framework penalizing municipalities that do not provide safe disposal, many local governments will resort to inadequate disposal during hard economic times, or when there are other political agendas. Any private entrepreneur planning to provide a solid waste disposal service for a region would need to be sure that the environmental regulatory framework is adequately developed and that this framework and any flow control agreements would be effectively enforced, so that the waste continues to arrive at his site.

5.6 Worker Health and Safety

Data from high-income countries show that laborers in solid waste management face a relatively high risk of disease and injury. In Denmark, solid waste workers are six times more likely to have an occupational infectious disease compared to other workers, and 2.6 times more likely to have allergic *pulmonary* disease. In the USA, solid waste collectors are 10 times more likely to be killed (mostly in vehicular accidents) than other workers. Some of the adverse health impacts include:

- vibration injury for operators of heavy equipment,
- respiratory infection from *bioaerosols* during loading of collection vehicles,
- dust-related asthma and diminished pulmonary function from waste sorting,
- lower back and joint injury from heavy lifting,
- burial and accidents at *landfills* with unstable slopes, and
- vehicle accidents during collection.

The range of adverse health impacts that could threaten solid waste workers is described by Cointreau-Levine (1998).

With private sector participation, special care must be taken to ensure that worker health and safety are not being sacrificed in an attempt to reduce costs. The private sector in developing countries is, in general, not regulated in terms of occupational health and safety. Furthermore, most private sector operations in developing countries rely heavily on workers hired on a daily or short-term basis. Such workers receive little or no training, and have no leverage (such as labor union membership) to support their requests for safe working conditions. Therefore, care is needed to ensure that contractual agreements cover the requirements for worker protection.

5.7 Willingness to Pay

Although solid waste management service is a *public good*, collection of *user charges* enables the service to be financially sustainable. House-to-house surveys can indicate which methods of waste collection are preferred and the sensitivity of *generators* to the level of the charge that they will be asked to pay. Surveys also provide contextual information on the economic levels of households and their ability to pay for service. On the other hand, until people actually receive a service and experience its benefits, they are not able to predict accurately how much they would be willing to pay for it. For this reason, willingness-to-pay surveys need to be conducted both prior to, and after, the start of the waste collection service. Annex A9 in Part III provides a sample willingness-to-pay survey questionnaire, and the questionnaire is also available in electronic format in Part V.

People in developing countries tend to be willing to pay for a service that they receive directly to their house, such as *curbside* service. But experience in developing countries indicates that generators are not willing to pay for a service which comes only generally to the neighborhood, such as the emptying of shared or *communal* containers, unless they pay for that service as a community. For example, in Accra



Photograph 5.1
House-to-house waste collection by contractor, Jakarta (Indonesia).

(Ghana) residents resisted paying a fee at the communal container for each load of waste they discharged into the container. On the other hand, in Sekondi-Takoradi (also in Ghana), residents agreed to pay their neighborhood association so that the association could, in turn, pay for the communal container to be emptied periodically. Similarly, residents of neighborhoods in Conakry (Guinea) paid as a neighborhood group for each emptying of their communal container.

Cities in Indonesia have used this *cost recovery* mechanism for more than a decade. Pre-collection (with pushcarts going from door to door) is managed by the neighborhood leaders. Secondary collection from the neighborhood *transfer depots* is provided by the city administrations. Residents pay their neighborhood leader for both pre-collection and secondary collection, and the leader pays the city for removal of waste from the neighborhood transfer depot.

In some countries, people are more willing to pay for a service provided by the private sector than for a similar service provided by government. This is partly because of a traditional bias that taxes are paid so that government can provide services, and therefore no further fee should be necessary. But, more importantly, there is a greater readiness to pay a fee to a private contractor because of the perception that private sector service is more efficient and reliable than government service. If the financial arrangements for a private sector service are well structured, so that poor service delivery is penalized by a reduction in income, the resulting efficiency and reliability of service are likely to be high.

5.8 Defining equitable collection zones

In many developing countries the private sector solid waste management industry is not well developed and the ethical

framework is often inadequate to minimize collusion and *procurement* irregularities. Therefore, the zones delineated for private and government service need to be as equitable (or similar) as possible for contestability to be assured.

It is not possible for the zones to be identical; each zone will have some unique differences. One mistake that has often been made is to have one set price per tonne of waste collected or per kilometer of road to be swept, despite the site-specific differences between zones. Another mistake is to pay the same lump sum monthly fee for each zone, despite the differences between zones. For privatization to be efficient there should be a competitive tendering process that recognizes that each zone is unique and allows contractors or franchisees to bid for work in each zone according to the conditions that exist in each particular zone.

For reliable collection services, it is recommended that, for private sector involvement, the minimum zone size should require at least three vehicles, so that if one of the vehicles breaks down, the remaining two trucks can finish the day's work by operating during a second shift. However (as discussed in the next section), for economical and effective supervision, the optimum *span of management* for each supervisor or mechanic is normally about five trucks, suggesting that zones should be sized for five vehicles. As a consequence it is recommended that each zone should typically include 50,000 to 100,000 residents. Zones for private sector participation in Caracas (Venezuela) and Bogota (Colombia) were developed to attract international waste management contractors and so were considerably larger. When international contractors are involved the zones should have populations of approximately 400,000 to spread the cost of foreign expertise for supervision of planning and operations.

To make the zones equitable, each zone should have a similar level of difficulty to service and a similar opportunity for generating income - in other words the problems and the prospects should be equitably shared. Conakry (Guinea) and several cities in Ghana have conducted zoning studies prior to privatization of street cleaning and solid waste collection. The terms of reference used for these studies are provided in Annex A7 in Part III.

5.9 Economies of scale and span of management

Each method of collection (such as animal cart, tractor with trailer, or compactor truck) has a particular quantity of waste which it can collect during its daily work period. By *pilot testing* alternative loading techniques and crew sizes, coupled with *time-and-motion* analysis, a realistic estimate of this quantity can be determined. The quantity that can be collected each day depends on

- the number of workers assigned to the equipment,

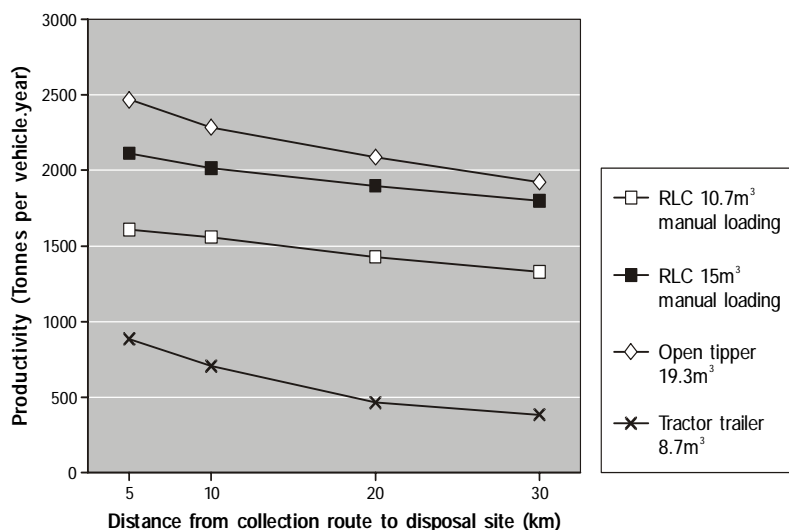


Figure 5.1
The productivity of different vehicles for Port Louis (Mauritius). Productivity depends on many factors including the type and size of the vehicles and the distance to the disposal site.

- the types of containers used for storing the waste (e.g. piles on the ground, plastic bags, baskets, covered bins),
- the location of the containers (e.g. curbside, front gate, backyard),
- the road conditions for access (e.g. paved, unpaved, steep, narrow) and
- the traffic conditions (e.g. slow or congested, or rapid and clear).

Figure 5.1 shows the *productivity* of various equipment options for Port Louis (Mauritius)

For economies of scale in collection, each equipment unit needs to be fully utilized. The cost of collecting one tonne or one cubic meter of waste using different types and sizes of truck should be calculated based on data from pilot tests and time and motion studies. Only vehicles that are suitable in terms of weight, size and maintenance requirements should be considered. In this way the most economical size can be selected.

For efficient operation, the group of equipment units needs to operate at the optimum span of management for supervisors and mechanics. For collection trucks, the optimum span of management for supervisors and mechanics is usually 1 per 5 units. On the other hand, for manual pre-collection equipment (such handcarts, animals carrying pannier baskets or pulling carts), the optimum span of management for supervisors is about 1 per 10 units. For mechanized pre-collection equipment (such as *power tillers* with trailers), it ranges from 1 per 5 units to 1 per 10 units.

In the case of *transfer systems*, the sizes of the collection areas served by each transfer station should be determined in relation to the capacity of the *transfer vehicles*, so that the transfer vehicles are fully utilized. The size of the transfer vehicles and the distance to the disposal facility affect the quantity of waste that each vehicle can reasonably handle, as illustrated in Figure 5.2. Economies of scale for the bulk transport of waste from the transfer station favor large collection areas and few transfer stations, each transfer station handling large quantities of waste. However, the pre-collection stage would suffer if the collection zones became too large because the waste would need to be carried further to reach the transfer station. Therefore it is important to consider all the costs of the whole system. Another consideration, though less important, that may influence the size of the collection zones is the effect of the spacing of the transfer stations on the ease with which a supervisor can travel from one to another to supervise operations.

Economies of scale in disposal of solid waste are based more on the constraints of the facility itself than on the mobile equipment that it uses. There are very significant economies of scale for sanitary landfill. Figure 5.3 illustrates this fact by showing the cost differences for two sanitary landfill

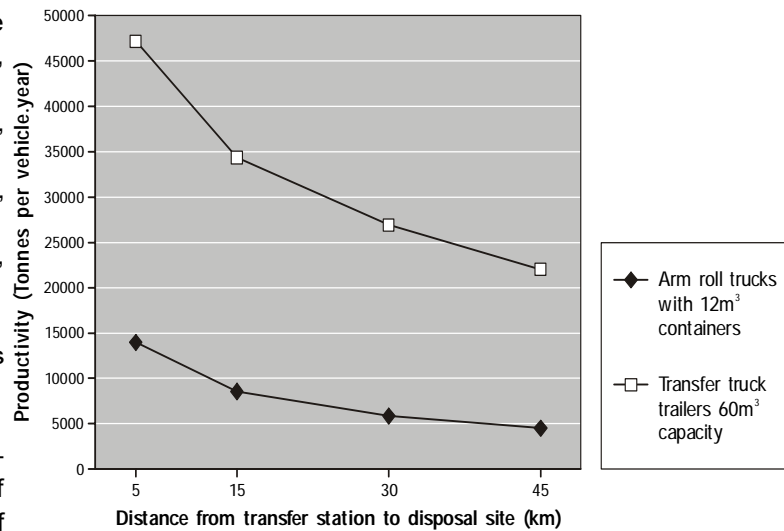


Figure 5.2

The effect of the distance to the disposal site on productivity, for two types of transfer equipment, Quito (Ecuador).



Photograph 5.2

Using a power tiller and a crew of five to collect waste under a franchise agreement in Accra (Ghana) 1997

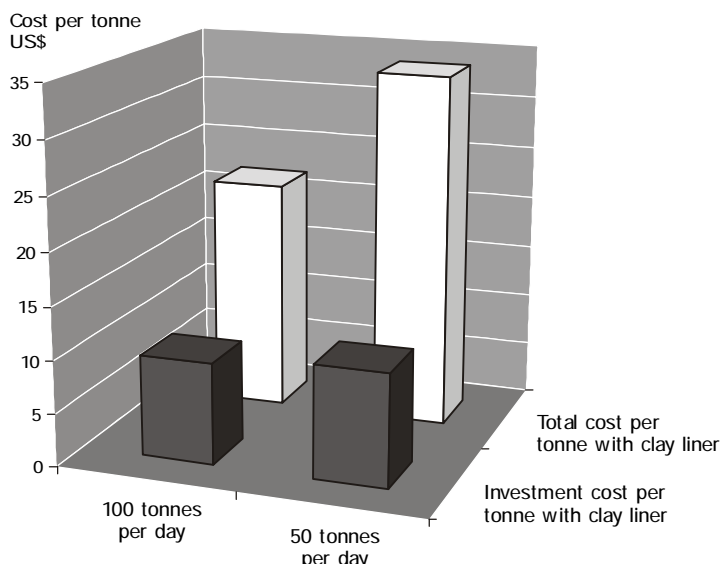


Figure 5.3
Economies of scale for landfill costs in El Salvador

sizes for El Salvador. The international private sector typically looks for a minimum landfill capacity of 300 tonnes per day, both for full utilization of landfill equipment and to have an adequate base of income to support the cost of foreign expertise. Since few secondary cities have this quantity of waste, *bundling* the needs of several small to medium-sized cities into one regional facility needs to be considered if private sector investment (such as through a “design, build, own and operate” *concession agreement*) is desired. Box 5.1 contrasts the need to divide an urban area into collection zones with the need for bundling or grouping for the purposes of *transfer* and disposal.

ECONOMIC IMPACTS ON SOLID WASTE MANAGEMENT RATIONALIZATION

■ For collection – Divide

Divide the city into zones which enable collection economies of scale and optimize competition.

■ For transfer – Bundle

Bundle collection routes by constructing transfer stations and using large transfer vehicles when economic analysis indicates that this is cost-effective.

■ For Disposal – Bundle

Bundle cities and towns into regional groups of municipalities which enable economies of scale in disposal.

Box 5.1

sector and government. A model collection and sweeping agreement, which is usable with either contractors or franchisees, can be found under the file name “SC-Lcoll” in Part V, together with some other sample contracts. The following list of categories of requirements indicates some of the issues that should be covered during the preparation of tender and contractual documents for privatization of any solid waste management service. (In the list below, the “Company” is the private sector entity which provides the service and the “Employer” is the *grantor* – usually local government - that is responsible for the provision of a service.)

Categories of requirements:

- types of services to be provided under the agreement;
- specified outputs from the Company in terms of quantity and quality of services;
- requirements regarding the age of equipment to be used and, perhaps, allowances for recently refurbished equipment;
- requirements on ownership of equipment and/or allowances for leasing of equipment;
- designated holidays or non-service days, if any;
- warranties, insurance, road and other taxes, vehicle registration, and company registration responsibilities of the Company;
- guarantee against political instability to be provided by the Employer;
- financing and bond requirements;
- subcontracting or subleasing provisions;
- foreign currency exchange requirements;
- cost indexing clauses for fuel, labor, and general *consumables*;
- *permit* requirements (such as permits required to operate waste management facilities - see also Section 5.17);
- reference to separate leasing arrangements between the Employer and the Company;
- length of contract;
- method, place, and timing of payments to the Company;
- inspections and audit requirements;
- procedures for handling complaints;
- *sanctions* for poor performance;
- allocation of risks, and remedial measures;
- circumstances in which the agreement may be terminated, definition of default events, and *step-in rights*;
- *Force Majeure* clause;
- indemnity clause; and
- arbitration procedures in the event of unresolved conflict.

Standards and requirements for performance should be carefully specified in private sector participation agreements, with adequate provision made for monitoring and penalizing the company (the magnitude of the penalties being commensurate with the seriousness of any failure in performance). Contractual agreements in many developing countries specify only that a zone should be “cleaned” - a performance measure that cannot be measured. Contractual documents should

5.10 Contractual clauses

Annex A10 in Part III provides a detailed listing (with some discussion) of issues which need to be addressed in the development of contractual agreements between the private

specify outputs in quantitative terms, such as the amount of waste to be collected and the frequency at which the service should be provided.

Allowance should be made for the particular conditions of different zones. This was not done in Jakarta (Indonesia) where contractors were paid on a lump sum basis for cleaning, and payments for each zone not adjusted according to the distance to the disposal site and the difficulty of cleaning the particular zone.

Where major new facilities are being implemented, flow control (Section 5.5) is a key issue to be resolved.

Environmental requirements, such as the use of enclosed truck bodies or the covering of each load with a tarpaulin, and limits for exhaust fumes, need to be included. Health and safety measures for workers - including preventive vaccination and the provision of gloves, respiratory protection, boots, and uniforms - should be specified in the contract. For example, each contractor in Jakarta has uniforms and vehicles of a particular bright color, thus facilitating performance monitoring by residents and city officials.

5.11 Monitoring of performance

Performance monitoring establishes a basis for evaluating the efficiency, *effectiveness*, and cost of service delivery. It defines the “rules of the game” and measures how well the “game” is being “played”. Comparative performance monitoring of all private sector and government players increases competition among service providers, leading to increased efficiency and improved service quality. By quantifying the performance measures to the maximum extent possible, accountability among service providers is increased; in addition, service delivery is linked with consumer satisfaction, and so actions are linked with their consequences. There is effective feedback.

Performance monitoring involves the following activities by government or its hired agents:

- review of quantity and quality of service delivery from all service providers - government and private sector;
- comparison of the results of the monitoring among the different service providers, and
- comparison of the results of the monitoring with results obtained from earlier monitoring exercises.

The aspects of performance that are monitored include:

- service frequency and quantity;
- service efficiency and productivity;
- service reliability;
- service quality; and
- service cost.

For each activity being monitored, a wide variety of performance measures is possible. Annex A2 in Part III provides a

detailed list of possible performance measures for use in monitoring collection and disposal. Some examples of performance measures for solid waste collection are:

- number of households and establishments served per day, length of street swept per day, and length of drain cleaned per day;
- frequency of collection, street sweeping, and drain cleaning;
- tonnes or cubic meters of waste collected daily per solid waste collector, sweeper or drain cleaner;
- tonnes or cubic meters of waste collected daily per vehicle, according to vehicle type and size;
- number of trips (loads) made daily per vehicle, according to vehicle type and size;
- cost per tonne of collection, and cost per kilometer of street sweeping and drain cleaning;
- equipment breakdown frequency and duration, traffic violations, and accident rate per vehicle.

The contractual agreement should clearly define the performance measures by which the performance of the private sector service provider will be assessed – at least initially. In the early stages of private sector participation it is difficult to anticipate how well the selected performance measures will serve all parties. Therefore, a mechanism for annual review and amendment of performance measures is suggested. Actions that would constitute poor performance need to be clearly stated, and sanctions specified for each failure. Examples of poor performance are outlined in Box 5.2. Sanctions are typically penalties for each type of failure, the size of penalty increasing with each repetition of the same shortcoming. After a specified number of failures and related sanctions, the contract typically allows the grantor to cancel the contract, franchise or concession, or the *license* of the company may be revoked.

EXAMPLES OF POOR PERFORMANCE

- Irregular or unreliable service;
- Incorrect or inadequate record-keeping;
- Use of unqualified operational personnel or inadequately maintained equipment;
- Noisy, messy, or polluting working practices;
- Inadequate or inappropriate response to valid complaints;
- Clandestine dumping, spillage, or littering;
- Unsafe work practices or traffic violations;
- Unauthorized collection of special wastes, such as *hazardous wastes*.

Box 5.2

The key control location of the solid waste system is the unloading point or disposal site. Checkpoints in the collection service area and along the main route to transfer and disposal facilities are also useful for monitoring operations. For example, in Lahore (Pakistan) four different points were used for performance monitoring of the private contractor who was transporting waste from a transfer station to the disposal

site. Two separate government agencies manned the different checkpoints, one at three points and another at one point. The inspectors at these checkpoints were responsible for writing the times when each truck passed by en route to the disposal site. For performance monitoring that allows comparison of public and private services, records of the volumes or weights of all loads delivered at the unloading points are essential.

For comparative performance monitoring of public sector versus private sector service, it is advisable to create an independent arrangement. A separate monitoring office within local government may be created for this purpose. This has been done in Phoenix (Arizona), where an Auditor's Office was created to do the measuring. In Florida, a non-government organization, Partners in Productivity, develops performance measures for state government. In Great Britain, a national Audit Commission audits both national and local government performance (Osborne, 1993).

It is also possible to contract for performance monitoring with a private consulting firm. In Bogota, local government continued to provide waste collection services in over 30% of the city area for nearly five years, and the service delivery performances of both government and the private firms were regularly compared by an independent consulting company. This consulting company operated the *weighbridge* at the disposal site as part of its contract requirements. Sao Paulo (Brazil) had a similar arrangement with a private firm, and used a management information system for reporting. Dakar (Senegal) assigned responsibilities for monitoring of the private contractors to four separate entities, to assure accuracy and objectivity in the data.

The costs of disposal operations should be paid from income derived from *tipping fees*, which are charged for each load of waste delivered to a transfer station or disposal site. In order to avoid paying these fees, private sector operators may be tempted to unload their waste clandestinely, at an unauthorized place. To safeguard against clandestine dumping, prohibition of such practices and vigilant enforcement are essential. Initially, tipping fees are set at a low enough rate to encourage full compliance with disposal regulations. Eventually, once the discharge records of all generators and haulers are clearly established (so that the authorities know how much waste can be expected from each source), tipping fees should be increased to cover the full costs of *transfer*, disposal, and *vigilance* against illegal dumping. Such a program has been successfully implemented in Izmir (Turkey).

5.12 Guarantee against political risk

Risk of political intervention is a major issue blocking effective private sector participation in many developing countries. Of particular concern is political intervention in the selection of contractors and interference in actual operations. Certain

neighborhoods may be given priority for public cleansing, because of the political influence of the residents. Private contractors are concerned about whether they will be paid fully and on time, without demands for *kickbacks*. There are numerous examples of private companies having their contracts canceled when these contracts have started to generate a significant profit, so that the work can be awarded to others with better political connections. With each change of political administration, the risk of such problems is renewed, until new relationships are developed.

Because of such perceived non-commercial risks, solid waste companies may prefer to provide collection services under franchise agreements paid directly by customers through *direct user charges*, rather than under contracts with local government, paid from general revenues. For major new facilities (sanitary landfills and transfer stations), private firms may prefer DBOT concessions that have a significant level of government financing, also because of perceived or anticipated political risks.

In the case of such DBOT concessions, ownership can be transferred early during the concession period, after full payment for the capital investment. Hong Kong transferred ownership of its recently implemented sanitary landfills and transfer stations within one year of commissioning. This was done when the contractor had demonstrated that the facilities were operating properly, to reduce the risks to the private sector companies involved. Also, speedy transfer of ownership gave government more autonomy to curtail a contract that was not being well executed, in order to replace the unsatisfactory contractor. However, most developing countries do not have sufficient financial resources to enable them to follow the example of Hong Kong, unless they receive external financing (from organizations such as the World Bank or the regional development banks).

One way to minimize political risk is to form *public/private partnerships* (Section 4.2.2), as has recently been done for a hazardous waste disposal facility in Thailand, a collection system in Latvia, and a solid waste incinerator in Indonesia. However, such partnerships do not allow a reasonable degree of contestability. Governments find it difficult to enforce contractual requirements or impose sanctions within such partnerships.

Another way to minimize political risk is to implement a guarantee against non-commercial risk (such as the guarantee of the World Bank). These guarantees protect against all types of non-commercial risks, including foreign exchange conversion, expropriation, and refusal to abide by the terms of the contract or to respect the decisions of independent arbitrators. Thus far, the World Bank's guarantee has been applied to only a few projects; one example is a large power project in Pakistan. However, it can be adopted and applied at any time for any type of privatization project, whether or not the Bank is involved in providing project financing.

The best way to minimize political risk is to limit the potential for political intervention by improving the transparency and accountability of the procurement process, and making procurements truly competitive. Upgrading of the arbitration system may also help to reduce political intervention, if it allows private firms access to equitable judicial resolution of any conflict arising during a contract. Thirdly, multi-year contracts lessen the potential for political intervention. These steps have recently been successfully taken by the Government of Indonesia, because of its desire to attract private sector financing for its public infrastructure.

5.13 Guidelines for effective procurement

Government has as its objectives

- to minimize its efforts,
- to pay as little as possible for good service, and
- to gain the appreciation of voters.

The private sector has as its objectives

- to minimize its costs,
- to maximize short-term profits, and
- to develop a good relationship with its client.

The procurement process needs to take these objectives into account and attempt to achieve a win-win arrangement for both government and the private sector. Good companies rise to the position of leadership and win contracts when the procurement process is well structured.

To be effective, the procurement process should be

- well advertised, to attract a large number of qualified bidders,
- transparent enough to convince well-established and reputable firms that they can compete fairly with younger firms,
- equitable enough for foreign firms to believe they can compete fairly with local firms, and
- scheduled so as to give all bidders enough time to prepare a good bid.

5.14 Shift in budget allocations needed for private sector participation

When the private sector is engaged to provide a service, all currently hidden subsidies to government solid waste departments need to be included in payments to the private sector for services rendered. These hidden subsidies have been discussed in Section 3.4. They include *debt servicing*, customs duties, insurance, vehicle registration, social benefits, administrative overheads, and *utilities'* charges. Also, capital budget allocations periodically provided in government budgets need, instead, to be considered as *recurrent costs*.

When the collection system is labor-intensive, privatization could lead to a reduction in a municipality's recurrent expen-

ditures. However, when the collection system is capital-intensive, privatization requires a significant increase in municipal recurrent expenditures, because depreciation and debt financing costs need to be paid to the private sector as part of the costs of providing the service. This involves recognition by local and central governments that private sector participation requires budgetary shifts from capital development transfers and other capital allocations to recurrent budgets.

Most recurrent budgets for solid waste management would need to be significantly larger if services are privatized. (Recurrent budgets for public sector operations typically include only salaries of operational personnel who are directly involved, fuel, tires, and spare parts.) For example, in a zone planned to be privatized in Quito (Ecuador) in 1998, a switch from government service to private sector service was estimated to increase total recurrent budgetary requirements by nearly 40 per cent (i.e. by about 55,000 Sucres (\$12) /tonne to 196,000 Sucres (\$44) /tonne).

5.15 Financing

The first thing that the private sector will investigate when considering investment in solid waste service delivery is whether government has the financial means to honor its contractual commitments. Box 5.3 provides a breakdown of solid waste management costs in developing countries and can be used as a framework for proper finance planning. It shows that, compared to collection, sweeping has a lower proportion of capital costs and a higher labor component, and that disposal requires proportionately more capital than collection or sweeping.

	Collection	Sweeping	Disposal
Capital costs	30 – 40 %	20 – 30 %	50 – 55 %
Labor costs	15 – 40 %	50 – 70 %	10 – 20 %
Consumables & maintenance	30 – 45 %	10 – 20 %	30 – 35 %

Box 5.3

Local government may obtain finance to cover capital costs from the following potential sources:

- transfers from central government;
- grants from multilateral and bilateral organizations;
- loans from multilateral and bilateral organizations, development banks, communal funds, and commercial banks;
- renewal funds from user fees or other solid waste tariffs;
- municipal bonds; and
- private sector participation.

Increasingly, more and more developing countries are looking to the private sector for capital investment in the solid waste sector. Hong Kong, whilst not a developing country, set the trend for East Asian developing countries. Hong Kong has implemented an entirely new set of transfer and sanitary landfill facilities in the past six years with private sector financing through concessions. Indonesia and Malaysia have focused heavily on this over the past five years, using private sector investment to address the shortfall in collection services and to implement new transfer facilities. The Philippines obtained private sector financing to close the notorious "Smokey Mountain" *open dump* and provide new housing for the families of more than 5,000 waste pickers that had lived and worked at that dump, in return for the right to develop the site.

5.16 Cost recovery

Apart from having the means to finance capital works, the private sector wants assurances that government will be able to meet its regular payment obligations to cover recurrent costs. Taxes are one means by which local government can raise money to pay for services, and tax revenues are typically paid into **general** local government accounts or sometimes into the central government treasury. The private sector usually prefers a direct cost recovery system based on user charges, and also prefers that all of this income goes to a *segregated account* dedicated to the solid waste sector.

Finance to cover recurrent costs (such as salaries, spare parts, fuel, tires, and utilities) for solid waste management may be obtained from the following sources:

- general local government revenues;
- penalties for littering, clandestine dumping and other solid waste infractions;
- license fees from private haulers of solid waste;
- revenues from the sale of *recyclables* and recovered resources (such as compost);
- direct user charges for collection services; and
- direct user charges for use of transfer or disposal facilities.

Direct user charges lead to greater accountability to the customer since collection of fees may be more difficult if there is dissatisfaction with the service. User charges also provide revenues that can be reliably reserved for the solid waste sector. Furthermore, the private sector is more willing to invest when there is a source of revenue that is not subject to political whim. To encourage government employees to help generate revenue, as well as spend money, there is a global shift away from guaranteed budgets and towards self-supporting service units which must themselves raise the revenue they need (Osborne, 1993). This involves the creation of segregated accounts and direct user charges. Box 5.4 gives examples of direct user charges from many different countries.

EXAMPLES OF DIRECT USER CHARGES FROM ASIA, AFRICA AND LATIN AMERICA

In its national strategy in 1988, Indonesia set a policy that municipalities should implement cost recovery through direct user charges, recommending tariffs averaging 1% of household income. Several Indonesian cities (notably Bandung, Medan, Surabaya, and Jakarta) have been successful in implementing the strategy, and have been recovering from 35% to 70% of total costs.

In 1991, Olongapo City became the first city in the Philippines to implement direct user charges to cover solid waste management costs, and cost recovery of about 35% of total costs is being achieved.

In Phnom Penh (Cambodia), a private company holds an exclusive monopoly to collect all waste. Fees, paid directly by households and establishments, are collected by the private franchisee. The franchisee pays a franchise fee of US\$24,000 per year (increasing by 10% every 5 years) to the City for the privilege of having the exclusive monopoly to provide solid waste management services. The City prescribes the tariff structure and establishes ceilings for each type of household. Neighborhood leaders help to collect user fees, in return for a 10% commission on the fees collected.

In 1996 in Hué (Vietnam), only 7% of recurrent costs for solid waste collection were being covered by direct user charges. Similarly, only 11% of recurrent collection costs were recovered in Nam Dinh (also Vietnam).

Accra (Ghana); Ouagadougou (Burkina Faso); Cotonou, (Benin); and Bamako (Mali) are among the growing number of major cities in Africa to implement citywide cost recovery through direct user charges. The charges in Accra cover about 25 per cent of total system costs and, in most of the city, are collected by special government bill collectors and deposited into segregated accounts dedicated to solid waste management. Some parts of the city are served by a private *concessionaire*, who collects the fees directly from residents served. In 1996 in Bamako (Mali), about 95 per cent of the costs of pre-collection by donkey cart were covered by direct user charges. Nearly 100 per cent of the upper-income residents paid fully and on time, and about 45 per cent of the low-income residents paid.

In Sekondi-Takoradi (Ghana) all businesses within the city pay an "environment tax" as part of the fee for their annual business licenses. The receipts are used to help pay the costs of the city's sanitary landfill.

Municipalities in Ecuador raise their solid waste revenues largely by a 10 to 12 per cent surcharge on the electricity bill paid by each household. Quito (Ecuador) raises all of the money it needs to cover its existing level of recurrent expenditure, and even to finance capital expenditures equivalent to 6 per cent of its total costs. To obtain these revenues, it pays a 4.5 per cent commission to the municipal electrical company for revenue collection. In Guayaquil (Ecuador) all costs required to pay for the private sector to collect, *transfer*, and properly landfill solid wastes are covered through the user charge added to the bills of the municipal electricity company. Because Guayaquil has a significant industrial base for revenue generation, a commission of only 1.5 per cent is charged by the electricity company.

Box 5.4

Municipalities may attempt to set solid waste management tariffs by charging owners or residents according to the area of their properties. Theoretically, this is an ideal method of cost recovery, because it relates charges to property ownership and, thus, with ability to pay. This system works

well in countries where the *cadastral* (land survey) information is up to date and billing of landowners is relatively easy or automated, as is the case in Singapore and South Korea. Charging according to property area is difficult where cadastral information is incomplete.

An alternative method of setting the tariff and collecting the fee, which has been used successfully in Ecuador and elsewhere, is to collect the fee for solid waste management as a surcharge on the electricity bill. A small commission is paid to the electricity utility for this service (Box 5.4).

When the tariff has been set and the demands for payment of the fees sent out, there may be problems in collecting the revenue in an economical and effective way. Problems are exacerbated where the landowners are not locally available or are out of the country, as has been experienced in municipalities of Morocco and El Salvador.

To address problems of fee collection, door-to-door delivery of bills for solid waste user charges is effective. This is being done in Chinameca (El Salvador), where each family pays the same fixed fee each month (10 Colones per family each month) for solid waste management. Similarly, in Tema (Ghana) solid waste fees are collected door-to-door. Tema uses commissioned bill collectors hired by government.

Citizens of Cotonou (Benin) bring their user fee to a local fee collection office. Similarly, as part of a project that has GTZ technical assistance, residents of Cojutepeque (El Salvador) bring their user fees to a local collection office, which might be in a local store or bank. In Onitsha, Nigeria, as part of a project financed by the World Bank, residents were required to bring their fees to a local bank.

Pre-collection of domestic solid waste is proving to be one means of developing financial sustainability, as well as obtaining public cooperation with waste collection systems. In nearly all cases, direct user charges cover the full costs of pre-collection. In some cases, such as in Conakry (Guinea) and Surabaya (Indonesia), the neighborhood revenues are also large enough to provide at least partial payment of (secondary) collection costs related to emptying the communal container or removing waste from the communal collection depot.

Cost recovery is also possible through the sale of recyclables and recovered resources. For example, in Accra (Ghana) a composting operation has been set up with German technical assistance. Solid waste and treated *septage* sludge are co-composted. The cost of producing one cubic meter of the compost was US\$ 9.2. But the market has been willing to pay only US\$ 3.2 for a cubic meter of compost. The compost is now also marketed in plastic bags, at a higher price. At the price of US\$ 1.1 per 50 kilogram bag, full cost recovery is now being achieved. The savings in land disposal cost is about US\$ 1.0 per cubic meter of solid waste converted into compost.

In the end, the secret of success is financial sustainability. Financial sustainability needs the following:

- Well planned and tested solid waste systems - to develop cost effectiveness
- Ethical, legal and regulatory frameworks - to minimize risks to investors
- Competition, accountability and transparency - to maximize the trust of generators.

5.17 Licensing

For collection of special wastes (such as from hospitals and laboratories), or general wastes from large generators (such as large industries and ports), private firms may be allowed to compete freely in getting subscribers to their service. However, a program to license only reputable firms is essential to avoid problems of clandestine disposal. When *open competition* is allowed without a license program, reputable companies are reluctant to compete because there is not a *level playing field*. (Reputable companies that operate according to government regulations would not be able to do the work as cheaply as an unscrupulous company that cuts costs by unacceptable practices.) As part of a licensing program, legislation is necessary to require all waste generators to hire only licensed haulers. Box 5.5 summarizes the reasons why licensing is necessary, and Annex A3 in Part III provides a listing of licensing criteria to consider when privatizing, particularly when *private subscription* methods of private sector participation are being considered.

WHY HAVE A LICENSING SYSTEM ?

- Licensing protects customers from incompetent private organizations, fraud, unfair pricing, and (perhaps) liability.
- Licensing assists the local authority by controlling and enforcing the quality of work from a legal basis.
- Licensing levels the playing field and protects reputable private organizations from unfair competition.
- Licensing protects workers from unfair labor practices.
- Licensing protects the environment from pollution.

Box 5.5

Private haulers collecting hazardous wastes and private facilities handling hazardous wastes should be required to have a special license, in addition to the license they would need to handle general industrial refuse. To qualify for this license, they should be required to complete training in the health and safety aspects of hazardous waste management, as well as receiving instruction on special equipment and handling procedures.

The financial strength of the company is an important criterion for licensing facilities for which long-term ability to protect the environment is essential. For sanitary landfills, the United States has published detailed guidelines on financial requirements that landfill owners and operators must satisfy. These

minimum financial requirements include bond provisions, record keeping, and net worth. ("Financial Assurance Mechanisms for Corporate Owners and Operators" 40 CFR Part 258, final rule published April 10, 1998 in the Federal Register). The purpose of these requirements is to ensure that the operator has the financial resources to react to any pollution risk from the site for a long period after the site is closed.

For hazardous wastes to be managed appropriately and separately from general *municipal solid wastes*, there needs to be a special regulatory framework for hazardous wastes. Such regulation should be enforced by provincial or central government. All hazardous waste management costs should be borne on a "polluter pays" basis, because the generators of such wastes are typically considered well able to pay the costs of transport, treatment and disposal of their hazardous wastes.

Recycling activities need to be licensed. Thailand has more than 1,000 recycling centers with licenses. Surabaya (Indonesia) implemented a program of registering waste pickers and provided assistance in organizing them into a cooperative. The cooperative was given assistance with training and in the sale of their recyclables through the development of networks with buying agents. Any individual in Surabaya is allowed to collect waste from door to door, but only registered pickers (with photo identification cards) are allowed at transfer and disposal facilities. More than half of Surabaya's waste pickers had decided to register by 1996.

Licensing should generate income. At a minimum, the fees should cover government's costs for audit, administration, and monitoring of licensees. The fees are often based on the estimated future gross revenues of the waste management contractors. Annual auditing of all accounts provides a basis for annually updating the license fee.

Licensing often involves amending City bylaws to allow licensed private organizations to provide solid waste collection services. The regulatory framework must prohibit residents and establishments from making use of any private organizations that are not licensed. (Generators may be allowed to manage their own waste.) The most important sanction against licensed firms that do not work according to the regulatory framework is that their licenses can be revoked following a prescribed procedure of warnings and sanctions. Appeal and arbitration procedures need to be defined within the licensing rules. The rules should also specify any procedures for allowing a revoked license to be reissued.

5.18 Capacity building

It might appear that private sector participation reduces the need for *capacity building* in municipalities since work that was previously done by the municipality is now done by the private sector. In fact, the introduction of private sector participation usually requires municipal strengthening, because of

the new tasks which municipal managers are required to perform. Local governments often need technical assistance and training so that they can

- write competent tender documents for privatization of solid waste services,
- prepare estimates of waste quantities and service costs for central government,
- handle complaints, and
- monitor the performance of the private sector operators.

Many countries pay large sums of money to solid waste contractors, and yet are unwilling to allocate even a small amount to providing staff, transportation and communication facilities for performance monitoring. Only seven inspectors were engaged for the whole of Phnom Penh to monitor the performance of the city's private franchisee, which held a monopoly for the solid waste collection service for the entire city. Similarly, in Mauritius, only two inspectors were engaged to monitor all transfer and disposal operations conducted by private contractors throughout the island. If insufficient resources are devoted to the supervision of private sector firms, it is difficult to ensure a good service and to prevent clandestine dumping.

Information and training are often needed on the technical aspects of solid waste management and procurement procedures. Governments need help with technical and economic decisions such as:

- What requirements should be specified regarding the vehicles to be used for collecting waste?
- How large should the collection zones be?
- How frequently should waste be collected?
- Is source segregation of recyclables economic?
- Are transfer stations desirable?
- How many disposal sites should be implemented?
- What type of treatment and disposal is cost-effective?

They also need help in assessing what method of private sector participation will give good results and achieve lower costs. For example,

- Should the landfill be implemented through a turnkey contract or concession, or should Government build the facility and give out a service contract for its operation?
- Should all solid wastes in a given area be collected by a contractor or franchisee, or should residential wastes be handled separately from commercial and industrial wastes from large generators?

Governments seldom prepare good cost estimates before requesting bids for solid waste collection and disposal. They imagine that competition will automatically and always result in the lowest possible bid prices being offered. However, in many developing countries, competition is not well developed, and laws governing cartels, collusion and price setting are seldom enforced. A number of firms may be registered to compete and separately submit bids, but the firms may have the same single owner or the various owners may be part of the same family. In other cases, they may decide

among themselves who will win each zone. Sometimes, government officials or their relatives are directors of the companies that are bidding. All of these unethical practices limit actual competition in many developing countries. Therefore, capacity building may be required to enable local government to prepare its own cost estimates prior to bidding. In the case of collection, these estimates should take into consideration the unique characteristics of each zone such as:

- ease of access,
- the willingness of the residents to cooperate,
- the average distance between stops,
- the method of storing wastes at the source,
- traffic,
- the distance to the transfer facilities or disposal site, and
- road conditions.

Government needs to be able to estimate a target fee (for the work to be tendered) that considers the full range of costs which the private sector pays and provides for an acceptable profit margin. The costs which the private sector must pay include debt service on investment, insurance, registration, fair wages and benefits for workers, uniforms and protective clothing and equipment, and marketing, as discussed in Section 3.4.

The Republic of Trinidad and Tobago was one of the pioneering countries in contracting out collection. There, private companies have been collecting solid waste for over thirty years. Over half of the nation's solid waste is collected by private contractors. Yet, government does not prepare cost estimates for the zones. Each year's bids are simply compared to the previous year's bids to check if they appear reasonable ... and it is assumed that the bidding process automatically leads to the lowest possible bid prices being offered. This suggests that even administrations with long experience in private sector participation could benefit from capacity building.

Subsections (a) and (b) below list issues that generally need to be addressed in capacity building for improved solid waste management and in preparation for the participation of the private sector:

a) At the municipal level:

- Strengthening of municipal capacity to analyze existing costs and project the estimated costs of various privatization activities which could increase investment and improve efficiency in the solid waste sector;
- Creation of new municipal ordinances to achieve the following objectives:
 - ➔ to require residents to cooperate with any private sector agent of the government assigned or licensed to provide service, including economic groups, non-government organizations, *microenterprises*, and private enterprises;
 - ➔ to require residents to pay for the service they receive in accordance with regulations concerning the revision of fees at regular intervals;

- ➔ to require residents to make their waste available to the collecting agency in the appropriate way. (In the case of curbside collection waste should be put out at the right time on the designated day and the an appropriate container – a household dustbin or plastic bag. If a yard collection service is to be provided, generators are required to ensure that their wastes are accessible. For block collection the residents are required to bring their wastes to the waiting vehicle. If communal containers are to be provided, generators should be required to place all wastes inside these containers.);
- ➔ to require residents to cooperate with policies and programs that seek to minimize waste generation at the source, and encourage source segregation of recyclables or special wastes for special collection;
- ➔ where private subscription arrangements have been introduced, to require residents and establishments to use only licensed private haulers for the collection of wastes. (This may apply only to certain types of waste such as recyclables, construction and demolition debris, garden wastes, high risk healthcare wastes, hazardous household wastes, hazardous industrial and commercial wastes, or non-hazardous wastes from large sources);
- Strengthening of capacity to specify technical requirements and performance standards, operations monitoring indices, and sanctions for improved solid waste services;
- Strengthening of capacity to write the legal aspects of contractual and licensing agreements, advertise pending procurement, prequalify private sector companies interested in providing solid waste services, conduct a transparent and accountable evaluation of bidders, and negotiate the terms of agreement;
- Developing favorable arrangements which allow municipalities to engage private sector service providers, with minimal bureaucratic obstacles and delays, and for a multi-year period which matches the depreciation period of the necessary investment;
- Improving the flexibility and efficiency of the municipal workforce so that it can compete with the private sector. This may include the creation of incentives for improved worker and vehicle productivity;
- Development of cost recovery mechanisms which are efficient, low cost, transparent, accountable, and non-leaking, as well as segregated accounts which receive all income from direct user charges and special taxes designed to support the solid waste system, so that revenues are not shifted to other sectors for political reasons;
- Assistance in the creation of inter-municipal agreements for improved collection, transfer, recycling, treatment or disposal in large *metropolitan* areas;
- Development of competence in supervision and performance monitoring, including provisions for communications in the field, transport, record-keeping and data analysis;
- Development of legal mechanisms for speedy and sure enforcement of sanctions for poor performance and illegal conduct.

b) At the central government level:

- Development of policy guidance on private sector participation and cost recovery, to enable municipal leaders to take the political steps to make the necessary changes;
- Development of strong legal deterrents against clandestine dumping of wastes and the use of open dumps, coupled with adequate capacity for vigilance and enforcement; and
- Development of guidance and norms for safe segregation, storage, treatment, and disposal of all categories of wastes.

The private sector also needs capacity building. Dialogue in workshops has been a useful technique in Ghana for building consensus and educating the private sector on the goals of government in privatization. Distribution of information, particularly cost analyses of alternative technologies, has also been useful in enhancing Ghana's private sector capacity. One of the most helpful actions was the creation of a national solid waste management association of private sector haulers in Ghana. Indonesia has also created a national association, but this one is open to both government and private sector solid waste managers. By means of regular meetings and seminars, such associations can promote the exchange of information on existing systems and new concepts, as well as providing a lobbying group to upgrade the solid waste regulatory framework in the country.

5.19 Central government support

Several developing countries have dramatically supported their private sector participation activities by changing national laws and policies, by providing guidance and setting norms.

Colombia modified its constitution so that the private sector could participate directly in performing public services. In 1994, the Colombian Congress issued the "Public Services Law" which established free access to, and competition in, all public services. Before that, public services had been provided by monopoly government enterprises. Also, they enacted the "International Investment Statute" to protect foreign investors from any kind of local discrimination.

Malaysia developed a national program to privatize solid waste services. Local governments were provided with technical assistance, model contracting specifications, and guidance concerning prequalification criteria and procedures, and they were encouraged to enter into multi-year contracts. By the end of 1992, most local governments in Malaysia had contracted out 10 to 80 per cent of their solid waste collection work, and the number of contractors involved in each city varied from one to nine. Nationwide monitoring to compare local government and private sector operations was set up, and it showed that the private sector was more efficient.

Indonesia and Tunisia have nationwide private sector participation programs for urban environmental services, which have been developed with technical and grant assistance from the US Agency for International Development (USAID). These nationwide programs include regulatory and policy changes, coupled with replicable pilot projects to build government privatization capacity and develop the local private sector. In each country, the private sector participation program is directed by an active multi-ministerial steering committee and supported by a consulting team funded by USAID.

5.20 Summary

Each year, as private sector participation is initiated in more and more developing countries, we are moving up the learning curve. The main lesson that has been learned is the importance of pursuing the following three objectives:

competition, accountability and transparency

The list in Box 5.6 provides a summary of some of the key issues to keep in mind when involving the private sector in solid waste services.

KEY TASKS FOR SUCCESSFUL PRIVATE SECTOR PARTICIPATION

- Build local capacity to develop technical specifications and to tender competitively.
- Build local capacity to enable local government to provide contestable services.
- Build local capacity to generate revenues, and operate as a cost center with segregated accounts.
- Create a level playing field by means of a regulatory framework.
- Specify worker safety and environmental requirements.
- Provide mechanisms to assure flow control.
- Define sanctions and enforcement mechanisms that discourage non-performance.
- Prepare for agreements that are long enough to allow full depreciation of investment.
- Prepare separate agreements for different activities to optimize expertise.
- Prepare agreements that are large enough in scope to allow economies of scale.
- Ensure contestability, enable the participation of small to medium sized businesses, and set up decentralized monitoring.
- Include price indexing to allow adequate cash flow and continuous profitability.
- Include public consensus in all key decisions.
- Ensure competitive, transparent procurement, with several competing tenders to obtain efficiency.
- Quantify outputs to enable comparative performance monitoring.
- Enlist public cooperation.
- License and control all private sector involvement.
- Monitor performance to compare service providers.

Box 5.6

Chapter 6: ACTIVITIES FOR PRIVATE SECTOR PARTICIPATION

6.1 Introduction

Involving the private sector does not mean giving all problems to the private sector and walking away from them. *Government* maintains the responsibility to determine what is cost-effective and appropriate for its citizens, and should not involve the private sector unless real benefits are anticipated. The private sector competes most effectively when the parameters of service are determined in advance and clearly specified.

Private sector participation requires strong government and a clear regulatory framework. It also requires that careful study and planning be conducted in advance, so that the best technical systems are selected and specified, and their costs are reliably estimated. Many governments have rushed into *privatization*, not considering the different ways of involving the private sector and not requiring competition in the tendering process. Experience shows that cities pay much higher costs when they proceed in this way.

6.2 Technology Assessment Studies

Prior to private sector participation, studies are needed to determine

- which technology is most cost-effective,
- the optimum sizes and numbers of the required equipment to suit local conditions, distances and waste quantities,
- how many staff to assign, and
- how to obtain public cooperation.

Cost analyses of various types of collection systems, *transfer* facilities, and *disposal* options need to be performed for the existing waste quantities, waste *densities*, transport distances, and road and traffic conditions. Choices between options may not be based entirely on economic considerations. Two similarly priced options (considering *unit costs*, e.g. cost per tonne) may vary significantly in the number of jobs they create, if one is capital-intensive and the other is labor-intensive. Similarly-priced alternatives may have significantly different aesthetic and environmental consequences. The final choice might, therefore, be made for reasons of employment creation, aesthetics or environmental protection, and not simply on the basis of cost.

Information on waste quantity, density, composition, moisture content and *calorific value* from

various types of sources and neighborhoods is usually needed to support the technology assessment studies. Another type of information that is needed comes from *time and motion* studies. Reliable data are needed on vehicle and laborer *productivity* for existing systems, as well as for proposed systems, based on *pilot* trials. Most consultants and master plans give insufficient attention to the collection of these baseline data, and consequently are unable to develop adequate quantitative analyses to compare the various technology options. Figure 6.1 shows an example of comparative analysis of collection options. Figure 6.2 shows results for transfer costs, in which intersections of curves indicate the need to change from one system to another. Figure 6.3 shows the *economies of scale* for sanitary landfilling.

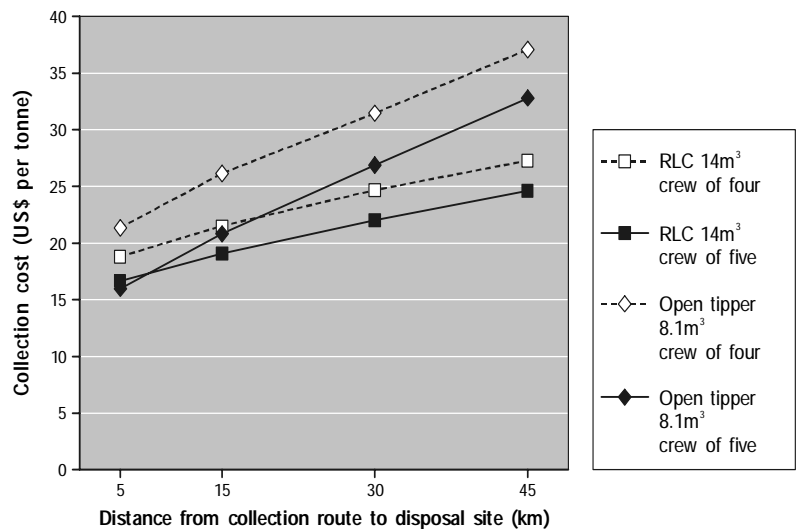


Figure 6.1
Effect of crew size on total collection costs for the public sector in Quito (Ecuador), 1998

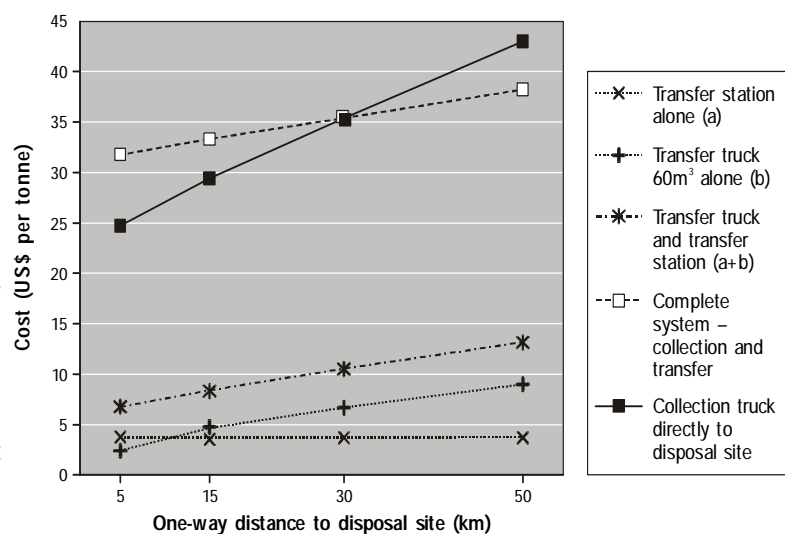


Figure 6.2
Costs for public sector collection and transfer systems, Eastern Zone, El Salvador 1998

Figure 6.3a
Total landfilling costs for sites of different sizes

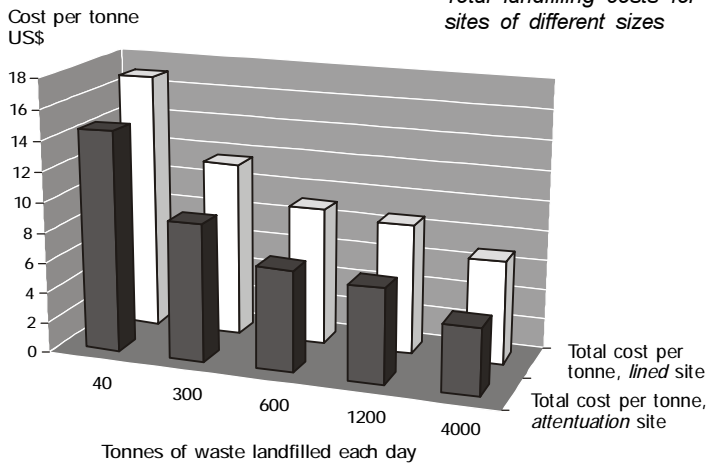


Figure 6.3b
Effect of landfill size on investment and total costs

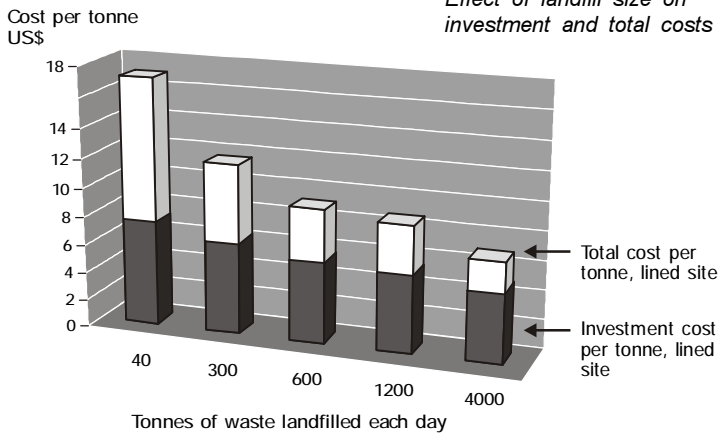


Figure 6.3
Costs of different types and sizes of sanitary landfill for Cavite and Laguna Province (Philippines), 1997. The costs per tonne decrease as the size of the facility increases, indicating economies of scale.



Photograph 6.1
Transfer station built and operated by the private sector, Port Louis (Mauritius), 1998

In *low-income* developing countries, cost reduction measures should focus on the productivity of the vehicle, as well as the productivity of the worker. In low-income countries, equipment costs are often over 50% of the total costs; while labor costs, even after adjustments for social benefits, overtime, and administrative overheads, are typically less than 25% of total costs. (These figures are based on total costs that the private sector must pay, not typical municipal budget figures that do not include the hidden subsidies mentioned in Section 3.4) On the other hand, in high-income countries, the bulk of the cost for is for personnel.

CHOICE OF COLLECTION METHOD AFFECTS COSTS

Private sector productivity in Phnom Penh (Cambodia) was significantly affected by the method of collection, based on time and motion data, as outlined below.

- a) *open tipper* truck (built to transport construction materials), 7 m³ capacity.
Calculated productivities:
 - 4.7 kg/minute.worker,
 - 14.3 minutes/m³ of truck capacity for a crew of 6 workers;
- b) rear-loading rotopacker type of compaction truck, 14 m³ capacity
Calculated productivities:
 - 13.9 kg/minute.worker,
 - 7.2 minutes/m³ of truck capacity for a crew of 4 workers.

(Based on field work conducted by the Author, Sandra Cointreau-Levine, in 1997)

Box 6.1

Crew sizes in developing countries should be large enough to optimize vehicle productivity. A study in Quito (Ecuador) indicated that a five-person crew would be less costly than a four-person crew (Figure 6.1). Ideally, since each city is unique with regard to traffic congestion and speed, road conditions, worker productivity, types of vehicles available, and public cooperation with collection systems, pilot tests should be conducted for various crew sizes and collection methods. Time and motion studies leading to a full cost analysis of each collection option are essential for determining which is the most cost-effective.

Cost analysis in Phnom Penh also showed that there was a significant extra cost where there was a lack of public cooperation. When the collection crew was required to shovel waste up from the ground instead of loading it in plastic bags or from *dustbins*, the cost of collection was about ten per cent higher. When it was necessary to provide a *pre-collection* service using a handcart (because residents would not bring their wastes to a *communal* collection point), the cost was about 100 per cent higher.

To obtain good strategic plans and baseline data that are useful for decision-making, the terms of reference for the preparation of these plans and the collection of the data need to be carefully developed, and good consultants or advisors engaged. Unfortunately, most studies are undermined by poorly written terms of reference. The quality of the profes-

sionals (e.g. engineers, economists) who actually undertake a consultancy assignment is, unfortunately, often lower than the quality promised in the consultancy proposal. To be effective, the planning process must be managed by a government agency that has both expertise and commensurate authority.

6.3 Public consultations

The public is generally united in its view on waste management - "Pick the waste up, but don't put it down". Everyone wants a waste collection service in their neighborhood, but no one wants a disposal site near their house. **NIMBY (Not In My Back Yard)** has become a common slogan. But the waste must be deposited somewhere. There are no cities in the world that are able to recycle 100 per cent of their waste. The cities in the USA and Europe that are recycling the highest proportion of their waste still need to dispose of about half of the quantity that is generated. Waste reduction and resource recovery are still in their infancy. Waste disposal facilities will continue to be necessary for many years to come. The public should be involved in decisions relating to waste disposal operations near their homes, otherwise their opposition may make operation impossible. A thorough program of *public consultation* in the entire planning process, from the establishing of technical options to the development of *site screening criteria*, is essential to lay the foundation for eventual public acceptance of recommended sites and techniques.

To determine public preferences and to increase the public's *willingness to pay*, public consultations are essential. They should be conducted from the beginning of planning, for determination of overall objectives; and then conducted at critical stages of the planning process, to assess public reaction to the various options, including their costs and environmental impacts. More and more, development agencies are conducting public consultations as part of a "demand driven" planning process for any new urban service project. For new facilities, development agencies require public consultations to be a part of the environmental assessment permit process, as well as of the planning of any proposed resettlement of residents.

6.4 Environmental impact assessment

A consideration of the anticipated effects of any project on the surrounding environment is one of the most important inputs into the decision-making process regarding the type and location of any waste management construction project. *Environmental impact assessments* are needed for public consultations. Alternative technologies and sites which are studied in a planning process can be compared more systematically if the environmental consequences of each alternative are described and assessed. The impacts should

be explained in terms that the public can understand – such as any effects on jobs, water supply, *wildlife species* or habitat, the appearance of the countryside, air quality (from stack emissions or dust), noise, etc. Impact assessment is needed to select the best solutions to problems and to design adequate *mitigative measures* that are cost-effective. The assessment process is conducted from the onset of planning, feeding into the development of plans in a cyclic *iterative* manner.

6.5 Design

When privatization involves only services or mobile equipment, the company providing the service should be given some freedom to select and design its methods and equipment in the way that it chooses, provided that they comply with performance specifications. This also applies to the design of large facilities under *concession* agreements. However, if government intends to build and own the facility and use the private company only as an operator, government must take responsibility for the design. For facilities such as sanitary landfills, designs typically require 12 to 18 months to complete.

6.6 Permits

In many countries, waste processing and disposal facilities may not be operated without a *permit*. The permit indicates that the statutory environmental agency is satisfied that the facility is not going to cause unacceptable environmental pollution.

From the onset of planning any new facility, the critical points of the *permitting* process need to be considered. The process leading to the award of a permit includes agreements from



Photograph 6.2

A community meeting to discuss cost recovery for waste collection, Sekondi-Takoradi (Ghana), 1997

the lead agencies at the following stages:

- technology selection,
- pre-selection of the site,
- field investigations confirming the pre-selected site,
- preliminary design and environmental impact assessment, and
- final design and environmental impact statement.

6.7 Steps to private sector participation

Successful implementation of privatization involves taking a number of steps. These steps are listed below. All of these steps are to be taken by Government, and so, in many cases, the capacity of local and national government organizations will need to be substantially improved (Section 5.18) if successful private sector participation is to be achieved.

6.7.1 Identification

- a) Define the problem regarding the adequacy of existing services and constraints to service improvements.
- b) Assess the needs and demand for services, and assess the capacity of the private sector as a service provider in competition with government.
- c) Assess resource constraints affecting both potential service recipients and the private sector, in terms of skills, experience, assets, access to credit, and manpower.
- d) Assess the *affordability* of various service options, considering both capital and operating costs.
- e) Establish priorities for action both within the solid waste sector and in relation to other urban services.
- f) Determine when and how to involve the public in building a consensus towards an acceptable and desired solution.
- g) Develop a private sector participation strategy, determining which services are to be privatized, which method of privatization to use, the size and duration of private sector participation agreements to be developed, and the schedule.

6.7.2 Preparation

- a) Conduct detailed and comprehensive pre-privatization cost analysis of the services to be privatized, including *depreciation, debt service, personnel, administration, social costs, billing, consumables, repair, maintenance, utilities, rental value of facilities, registration, insurance, and tax*, as well as other costs which must still be paid after privatization.
- b) Communicate with personnel who may be affected by the privatization, providing information on anticipated

changes in service quality or quantity, *redundancy* issues and proposed remedial measures, cost and *cost recovery* changes.

- c) Staff and strengthen the office that will procure, administer, *monitor* and control private sector service delivery, and will promote public cooperation with the privatized services. Include management, legal, financial, and technical staff in the capacity building program.
- d) Analyze costs and compare impacts of the technical options, and select the most suitable and cost-effective technology.
- e) Analyze the costs of hauling the waste directly to the disposal site and of using *transfer stations* and large transfer trucks, to determine which is the more economical system.
- f) Determine optimum sizes for collection *zones*, transfer stations, and disposal facilities, considering economies of scale.
- g) Preselect potential sites for the facilities, and determine whether some sites require special privatization arrangements (such as private sector ownership of a parcel of land within larger land holdings that the private sector operator might wish to control⁵).
- h) Rationalize *routing* of collection and transfer vehicles in government zones of service, in anticipation of providing *managed competition* to the private sector in its operations in the other zones of service.
- i) Define collection zones to achieve *equitable* and comparable service conditions. (Section 5.8)
- j) Initiate public participation in assessing the demand for the various options, and the acceptability of the proposed sites, facility concepts and environmental consequences.
- k) Plan resettlement programs (if necessary) and compensation to land users at prospective facility sites.
- l) Undertake environmental analysis of options and sites.
- m) Develop *contractual* conditions for privatization of services.
- n) Develop technical and performance specifications for *procurement* documentation.
- o) Evaluate finance and private sector participation options.
- p) Assess willingness and ability to pay, and relate willingness-to-pay to alternative methods and levels of service. (See Annex A9 in Part III.)
- q) Develop plan of action, schedule of implementation, and critical path.

6.7.3 Appraisal

- a) Create a tariff structure and cost recovery mechanism based on projected costs, willingness to pay and ability to pay. Prepare a phased scheduling of fee increases.
- b) Develop a supportive regulatory framework requiring

⁵ In many situations, land cannot be obtained for waste disposal operations, because major landowners oppose the siting of a waste disposal site on land that they do not control and that is next to their own land. They also may refuse to provide a site within their own land holding. On the other hand, if the operator forms a joint venture with a large landowner (such as a sugar authority or mining company), the siting of the landfill within the land holding would be acceptable to the landowner because it would have control over the operation. Locating the landfill in the middle of a large estate would be more acceptable to the public, since the operation would probably be undetectable from the perimeter of the land holding. If a city buys a site outright and then arranges for it to be developed, it loses these opportunities which only the private sector can arrange.

- public cooperation with the private sector, licensing of private sector participants, and direct user payment for services.
- c) Establish an enforcement system that is quick and responsive, including special wardens and municipal courts, as needed, to effectively secure public cooperation with the solid waste system.
 - d) Create financial arrangements to ensure sustainability, including adequate and equitable central government transfers and shifts in local government budgets from capital to *recurrent* accounts to support *contractors* being paid for *amortization* of assets.
 - e) Develop agreements regarding *flow control* to ensure that the private sector will have adequate business levels which can provide sustainable incomes. (Section 5.5)
 - f) Arrange private sector access to reasonably priced credit lines⁶.
 - g) Take measures to manage private sector risk in order to minimize unnecessary cost padding in bids. These measures may include
 - guarantees against non-commercial risk, (Section 5.12)
 - contractual provisions and arbitration clauses regarding cancellation of the contract or payment problems,
 - cost escalation indices,
 - foreign exchange agreements, and
 - arrangements for repatriation of funds.
 - h) Build local government capacity to undertake inspection, enforcement of the regulatory framework, and *performance monitoring*. This could also include developing terms of reference and a short-list of qualified consulting engineers who might be requested to submit proposals for monitoring *refuse* collection performance.
 - i) Facilitate land acquisition and any resettlement of residents. Negotiate rights of way and traffic management, and make preparations for an environmental permit.
 - j) Develop and implement a *public awareness* campaign regarding the need to change the city's solid waste management system, including changes in service delivery levels, requirements for cooperation from waste *generators*, and cost recovery.
 - k) Establish a *segregated account* for receiving all *license fees*, *user charges*, *tipping fees*, and financial penalties related to solid waste management.
 - l) Establish a qualified and honest procurement evaluation team. If prequalification is deemed necessary, this same evaluation team should also conduct the prequalification exercise. Consider placing an "honest broker" on the team, such as a foreign expert with a strong ethical reputation.
 - m) Prequalification is desired in cases where bid preparation involves major work and expenditure on the part of prospective bidders. (See Annex A4 in Part III.) This is usually the case for site studies and designs, which are needed when tendering for transfer or disposal facility concessions which involve the design, construction and operation of the facility. When prequalification is needed, prequalification criteria for prospective bidders should be developed. Prospective bidders are assessed according to
 - their experience in management, and in the management and maintenance of a vehicle *fleet*,
 - their financial soundness,
 - their experience of managing a labor force,
 - their knowledge of local conditions, and
 - the professional experience and qualifications of key personnel.
 At this stage of the process, technical proposals and bids are not included as criteria.
 - n) Advertise for prequalification in local newspapers and through letters to all embassies, as well as through international competitive tender listings.
 - o) Conduct prequalification in a quantitative and transparent manner according to the prequalification criteria developed. (See Annex A4 in Part III for a sample prequalification advertisement.)
 - p) Develop evaluation criteria for selecting the preferred bid. The criteria should include:
 - bid requirements for insurance,
 - proof of fair labor management and payment of fair wages,
 - insurance documentation,
 - tax returns and proof of tax payments,
 - bid price,
 - equipment offered,
 - *performance bond*, and
 - proposed work plan.
 If *firms* have not already been prequalified, include criteria about the experience and financial soundness of the company, and the professional experience of key personnel, as outlined above for prequalification criteria. (See Annex A5 of Part III for sample evaluation criteria.)
 - q) Advertise tender documents in local newspapers and through letters to all embassies or, if prequalification has been undertaken, distribute tender documents only to prequalified firms.
 - r) Conduct a transparent and accountable evaluation of bids received.
 - s) Select the preferred bid and negotiate with the winning company. A two-envelope system of bidding is preferred. The first stage of selection involves the review of the contents of the first envelope from each bidder. This envelope contains the technical proposals, qualifications, and documents required to meet the tender informational requirements (bonds, insurance, tax returns, etc). As a

⁶ In many countries, recently established companies that wish to become involved in solid waste management have no access to credit. If they are successful in winning a contract or franchise, they are required to pay for loans at high interest rates because they are considered high risk, especially if they have no significant assets or savings. Furthermore the payback period may be shortened, often to only two years, even though the loan is for the purchase of a vehicle with a normal economic life of six years. Arranging access to credit may involve

- the creation of a new line of credit for small disadvantaged businesses engaged in this type of work,
- the support of a "big brother" - such as the Chamber of Commerce, as in Alexandria (Egypt) - to provide some form of guarantee,
- the arranging of a longer term contract from the city that matches the payback period of the loan, or
- agreement by the city to pay a fixed amount monthly directly to the Bank providing the loan.

result of this process, the tenders that qualify on technical grounds are identified. The second envelopes of these qualifying companies are then opened. These envelopes contain the financial details of each bid. Typically the lowest priced bid is selected and this bidder is invited for negotiation, unless the bid is significantly below the government's estimate, in which case the lowest bid can be disqualified and the next lowest selected for negotiation. If two or more of the low bids are nearly equivalent in terms of price, simultaneous, competitive negotiations may be conducted between these bidders and government.

6.7.4 Implementation

- a) Implement necessary civil works for *weighbridge(s)* and/or checkpoints for performance monitoring.
- b) Supervise procurement of equipment and construction of works by the private sector.
- c) Supervise start-up operations of the private sector.
- d) Conduct performance monitoring of private sector operations.
- e) Process completion reports, inspections and payments in a professional and timely manner.