



Municipal Solid Waste Management Defining the Baseline

A Checklist for Assessments of Municipal Solid Waste Systems

Introduction

This document summarises reference materials collected from various sources in order to give a comprehensive overview of information to obtain, data to collect, questions to ask, and issues to focus on, when conducting an assessment of the solid waste management system for a specific city.

A detailed baseline study can be extremely resource intensive. Thus before starting it should be clear **what questions about the MSWM system you are seeking to answer.**

Furthermore planning of the baseline survey needs information and decisions on:

- What sources of information are immediately available, both internally and in related organisations?
- How much detail is required?
- What are we going to use the data for?
- How accurate do the answers need to be?
- Can reliability be checked, if so how?
- What format should be used for data collection and storage?
- Are we seeking quantitative information, qualitative information or both?
- Does qualitative data need to be structured, in terms of opinions, views, or judgements?

The following chapters focus on key-themes which could be covered in the assessment. Although much of the data to be collected is quantitative data, the assessment might include the qualitative data. Although in this document not much focus is given to methodological approaches for data collection there is nevertheless some sparse information on possible methods in the respective chapters.

When the goals of the study are clear, a first step to take is to search for available secondary data which can be obtained from past studies, reports, city census, or databases of responsible authorities.

City's Demographic and Spatial Information

- mapped and tabular information on the city's administrative areas down to the smallest administrative section (in km²)
- total population in the various administrative areas
- location and number of parks, recreation and open spaces
- maps of roads, road types and road length

- maps of income zones (km²), average income (\$/household) per zone, number of households, and average household size, and population per zone
- location and number of commercial establishments and type
- location and number of institutions and type (schools, libraries, religious buildings, hospitals, etc.)
- location and number and type of factories and industries
- mapped current service area (in km²)

This information can often be obtained from map offices, census data, and be improved with primary data from GPS survey as well as household surveys.

Further information on possible demographic background data is given in annex 1, annex 2, annex 3.

Regulations and Legal Framework

Legislation, Acts, and Regulations can provide the necessary information in this thematic sector. The data can be further improved through key-interviews with legal advisors with authorities or specialised legal advisors in environmental law.

Distinction between national level framework including legislation and policies, and local by-laws and regulations is necessary. The implementation of a national policy and strategy for solid waste management requires a legal and regulatory framework. Within this national framework, it may be that cities to have their own local by-laws (annex 5).

- policies of prioritization of action (waste management hierarchy of waste reduction, reuse, recovery, recycling, and finally treatment and disposal).
- Management frameworks (e.g. privatization)
- Financial mechanisms (waste tax or polluter-pay principle).
- Planning regulations (e.g localisation of treatment facilities, Environmental Impact Assessments)
- Technical and constructional standards (size, safety, compulsory operational procedures, etc.)

A possible range of laws at national level that a municipality would typically have to work within are:

- Public Health/Municipal/Waste Collection Legislation
Duty of municipalities to collect, remove and dispose of household waste and other specific types of waste?
Fund raising for waste collection and disposal generally within framework of general legislation covering municipal administration?
Separate user charges may or may not be allowed?
Detailed requirements may be laid down, eg, on storage media, frequency of collection, powers of municipalities and standards for non-compliance?

- Waste Disposal (or more general Environmental Protection) Legislation
Permitting (licensing) scheme for waste transfer, treatment and disposal facilities?
Registration or licensing scheme for 'carriers' of waste?
Responsibilities placed on the waste generator to ensure proper collection, treatment and disposal of their wastes?
Specific requirements for hazardous wastes (eg, a manifest or trip-ticket system to ensure that waste arrives at its designated destination), healthcare wastes or other special wastes?
- Special Laws Related to Recycling
'Producer responsibility' legislation, requiring the 'producers' (defined to include distributors and retailers) of the products giving rise to a waste to take responsibility for that waste, both to pay for the costs of waste collection, treatment and disposal, and to meet specified recycling targets?
- Codes of Practice and Statutory Guidance
Standards for landfill sites, planning procedures, or a code of practice for street sweeping, litter prevention and the cleanliness of public land?
- Physical Planning Laws
Authorisation of any building development (including waste facilities) requiring planning permission or zoning, sometimes from a municipal or regional planning agency?
Environmental impact assessment required for significant developments, including waste treatment and disposal facilities?
- Legal Framework for Privatisation
Regulatory framework governing privatisation? Explicit laws requiring, e.g., the compulsory competitive tendering of many traditional public-sector services to facilitate private-sector involvement in the delivery of municipality services, including waste collection, street sweeping and waste disposal?

Institutional Setup of Waste Management

Assessing the roles of the various stakeholders is an important step in the MSWM survey. A first step is to identify the main Institutional actors (national Gov, Local Gov. etc.), the private sector stakeholders (formal and informal private sector), the civil society movement (CBOs and NGOs) and finally the citizens. Furthermore it might also be necessary to take "external support agencies" (multilateral, bilateral, development banks, etc.) into account as important stakeholders with power and influence.

For each stakeholder the current role and responsibility, the interests and tasks can be determined. This can be obtained for the past, the present and the assumed future development. Methodology of stakeholder analysis and stakeholder mapping is common in development projects and there is much information on the internet on how to conduct such analysis.

National Government

National government authorities are usually responsible for the development and enforcement of an appropriate policy framework as well as overall environmental legislation. Questions arise such as: What policies, legislation, regulations, standards are in place? How and how effective is legislation and policy enforced? How are all objectives supported and how are they monitored? What licensing and permitting framework is in place?

Also the coordination of all the different provincial and municipal governmental bodies is one major issue which should be tackled on national level. Is this in place?

Municipal Management

At the local level the municipality usually has the responsibility of implementing and guaranteeing a functioning solid waste management system. These responsibilities may include:

- Maintaining an adequate level of hygiene
- Assuring public waste containers and their maintenance
- Assuring collection transport, treatment and disposal of waste
- Preventing accumulation of wastes in non designated public or private areas through enforcement of regulations
- Preventing illegal transport and disposal of waste

Assessing municipal roles involves looking at the distribution of responsibilities, know-how capacities, monitoring setup, enforcement of legislation, public education/awareness programmes, financing and cost recovery.

Formal and Informal Private Sector

The formal and informal private sector can be waste producers as well as service provider for waste management. According to their roles they need to be regulated and monitored according to the behaviour that the municipality is interested in achieving. Waste generation, characteristics and their current waste handling measures can be assessed. Are separate regulations for large or special waste generators such as commercial centers, restaurants, cottage industries, construction sites, hospitals etc. in place? Is special care given to sectors generating hazardous waste which will need specific municipal regulations?

If the private sector is service provider, assessments involve determination of workers, equipment, waste amounts managed, cost and benefits (revenues from fees?) Interesting is also the level of municipal control through appropriate contracting methods and monitoring as well as enforcement of regulations and legislation.

In most cities in developing countries, there is also a large informal private-sector involved in unregistered and unregulated activities carried out by individuals, families, groups or micro and small enterprises (MSEs).

CBO and NGO Management

They play an important role as representatives of the population or population groups and can thus transmit messages to and from them. Thus they also play an important role in creating or maintaining awareness and participation. A survey needs to assess this involvement and their impact

As these stakeholders may also be waste management service providers for the municipality or directly for the population, direct assessment of their waste management activities can be measured.

Waste Generation and Classification

There are significant differences between solid wastes generated from different sources. Such sources can be:

Households

Solid waste is the consequence of household activities. In some countries, up to two thirds of this category consists of organic wastes (composition). In poor neighbourhoods traditional cooking can also produce ash, and where sanitation facilities are limited, the waste might also include faecal matter.

Commercial

All solid waste emanating from business establishments such as stores, markets, office buildings, restaurants, shopping centres and entertainment facilities. The wastes typically consist of packaging and container materials, used office supplies and food wastes.

Institutional

Waste originating in police barracks, schools, hospitals, prisons, research organisations and other public buildings. Where the institution involves residents, the waste composition is similar to those from households. For hospital waste it is important for the management system to implement segregation at the hospitals of toxic and infectious waste and conventional household-type waste. After segregation waste which pose a threat to public health need separate collection and disposal arrangements.

Street Sweepings

These always include dust/sand, dirt and litter although in low-income countries they may also contain appreciable

quantities of household refuse, drain cleanings, human and animal faecal matter.

Construction and Demolition

The nature of this material depends upon the resources used in a given region or country for the purposes of construction. In the absence of adequate local ordinances, responsibility for the removal and disposal of these wastes is invariably assumed to lie with the municipality.

Industrial

Although strictly speaking management of such waste lies with the responsibility of the industries, often through lack of control and enforcement the wastes end up in the regular municipal waste stream. The wastes are generated from processing and non-processing industries and utilities. Composition is quite site specific and depends upon the natural resources, raw materials and markets which provide the base for a given city's industrial activity. It may include liquid, sludge, solid or hazardous waste.

Sanitation Residues or 'night-soil'

Although not part of the solid waste stream, depending on the level of sewerage provided, human excreta collected from public toilets, latrines or septic tanks (often called faecal sludge) may be dumped in streets drains and therefore arise in drain clearing and street sweeping wastes.

From the same sources quantities of waste generated varies according to: household size, income level season, cultural activities and festivities. Thus it is important to distinguish these features in a waste generation survey, or then make sure that a good representative average sample is taken for the category of waste source.

If collection of primary empirical data is necessary, it is common practice to undertake analysis in one or more sample areas which are areas significantly smaller than the whole planning area, but which are representative in some way of the larger area. However, even in a small city there are many types of areas with different characteristics, and it is therefore vital that the chosen sampling areas reflect the whole system of study. It

Projected waste generation can be obtained with projected population growth and a factor of "consumption development".

Important waste data may further include:

- waste composition: when considering recycling issues or incineration. In most cases surveys distinguish between: organic matter, paper & cardboard, plastic, glass, metal, other. Further details of composition are distinguished depending on the research question.
- waste density: for determining correlations between waste volume and waste weight
- waste moisture: which relates to density and is critical with incineration

Waste Prevention

Waste prevention programmes (qualitative or quantitative) often initiated by government authorities or NGOs can be assessed through specific interview with key persons in these institutions or by review of literature and reports. Main questions to keep in mind are the impact of the programmes and their long term sustainability.

Typical waste prevention measures are taken up though incentives (user pays by amount generated or deposit programmes) or legislation and enforcement (e.g. abolishing plastic bags). For industries such programmes follow up on "clean production" or "ecodesign" programmes which again are induced through potential financial or image benefits. Assessment can include description of the existence and functionality of such tools and measures.

Storage and segregation at source

Household waste management falls into this category of information. Typical data/information include:

- Household storage containers, materials, life span, costs and sizes. Where in the house are these containers located? Are containers shared between various households?
- How and when is waste disposed into these containers (directly or indirectly by ways of heaps in the backyard?)?
- What are social cultural habits towards waste, hygiene and cleanliness.
- What are roles of the household members in managing wastes? Although most frequently the responsibility of women, children often are the ones that bring the household waste to a larger container or collection point and payment of fees is often the task of men.
- Existing segregation of waste fractions at household level gives indication of recyclable materials value and/or environmental awareness. Who segregates? What materials are segregated, how much quantity?

What are incentives/revenues of such activities? Who is the counterpart (waste dealer) and what relationship exists between household and dealer?

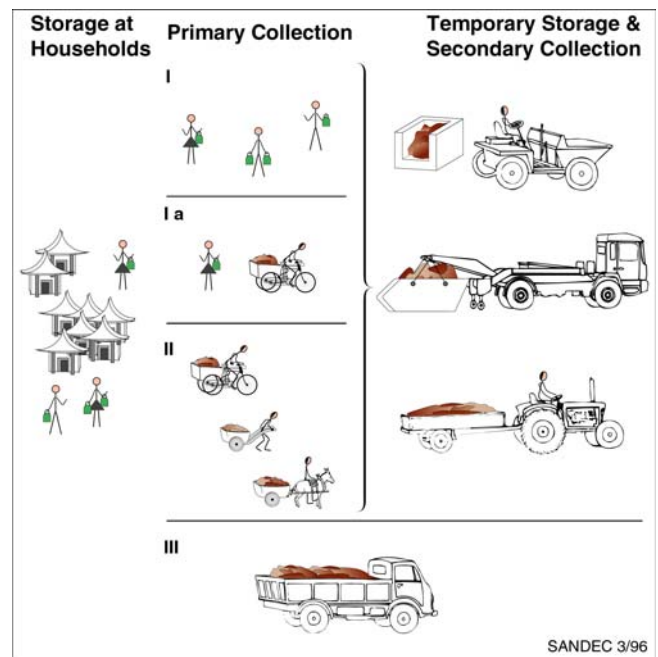
Waste Collection and Transport

Defining Service Levels

It is important to assess baseline service levels to the various service users. This includes

- coverage
- type of service
 - communal collection
 - block collection
 - kerbside collection
 - door-to-door collection
- frequency of collection
- fees

In the case where household members bring their waste to collection points (communal collection), the average distance to the nearest located point is of special interest.



Most often two steps in solid waste collection can be observed (see figure). A "primary collection", involving waste collection from households and its transport to a transfer site (e.g. a large container or built collection point), and then a secondary collection systems which collects at the transfer site and transports the waste to a final disposal site.

The different types of operating systems can be assessed individually which may have evolved to meet local conditions. This includes an assessment of:

- human resources involved

- equipment for the specific type of service
- equipment maintenance
- organizational structure of service provider
- costs and revenues
- distance to point of transfer (if any)
- distance to disposal site
- collection routing
- frequency of collection at the transfer station
- transfer station equipment (type) and hygiene
- personnel management, health and safety
- communication of service provider with service user, service user with municipality, and service provider with municipality

Street Sweeping

Municipal authorities often provide a range of public cleansing services in association with waste collection. For street sweeping and cleansing services both manual and mechanical methods are available, the former being more typical in developing countries.

In many cities, particularly in medium and low-income areas, a high proportion of street wastes is generated from deficiencies in the waste collection system and littering. Due to the poor coverage of the collection system, some waste is discarded or becomes spread in the street. In essence, this situation transfers the responsibility for removing the wastes from the formal collection crew to the sweeping crew, thereby encouraging further manual handling of waste.

Causes that lead to the large quantities of litter include:

- improper or no clean-up activities after public works
- inappropriate species of plants and trees selected for urban landscaping
- erosion of soil from vacant lots and unpaved streets
- inefficient or non-existent storm drainage systems
- accumulation of construction materials and debris on the streets
- spillages of waste set out for collection by waste pickers or animals
- spillage of collected waste during its transfer to collection vehicles
- spillage during vehicle transit where wastes are inadequately covered

Public Cleansing Services may include:

- Street sweeping
- Gully emptying
- Drain cleaning
- Construction and demolition waste removal
- Night soil removal
- Septic tank / cesspit emptying

- Beach and foreshore cleaning
- Mud removal
- Grass cutting
- Waste backlog clearances
- Clean up after natural disasters
- Litter prevention
- Cleaning of public toilets
- Other cleaning tasks

Quantitative indicators of street sweeping activities include:

- human resources involved
- equipment involved
- coverage
- frequency of sweeping, drain cleaning
- amounts of wastes swept
- road/drain lengths swept and cleaned
- costs and revenues
- personnel management, health and safety

Non Organic Materials Recycling

Recycling plays a critical role in reducing waste quantities, returning resources back to use, and minimising the financial and environmental burden of MSWM. Thriving secondary materials markets and recovery schemes are well established in most developing countries. They are usually located in the informal economy and consist of either individuals or groups of waste pickers, or Micro/Small-Enterprises (MSE) and Community-Based Organisations (CBOs).

In many informal recycling systems:

- Newspapers, cardboard and metals are collected from door to door with simple equipment or vehicles such as three wheelers, bicycle carts, which are then sold on to neighbourhood 'junk' shops.
- Materials are recovered by employees of the municipality (waste collectors) from the refuse, both at the collection point, during collection and transport.
- Many families depend on waste picking from dump sites depend for their. They sell to dealers, who often perform some simple sorting and clearing of the recycled materials.
- Itinerant buyers sell to the wholesalers who distribute up the dealer chain to primary industries.

Critical issues to assess on the various levels of the recycling chain can be:

- What materials?
- Recovered by whom and where?
- What amounts?
- What cost and revenues?
- What further processing steps?
- Which middle men and dealers and which industries?
- Social organisation of waste picker communities?

- Social marginalisation and health risks of such individuals?

Organic Materials Recycling

Organic waste recovery, reuse and/or recycling in a city can be assessed with data and information on:

- organic waste generated from different sources. This data can be obtained by waste generation data and waste composition data
- Direct use of organic waste, includes direct use for animal feed, or on soil for agricultural production and possibly its seasonality
- Existing composting activities on household, neighbourhood or city scale and the amounts of wastes processed, processing systems and resulting quality of compost
- Existing users, their location (distance), amounts used/bought, their perceptions and knowledge of compost use and their requirements to compost quality and price

Disposal

Existing final disposal practices for MSWM in most countries consist of dumping of MSW (most of the time without any control) in vacant plots/areas of land. In many cases MSW is dumped in low-lying marshy areas, often as a means of raising land levels for development of housing or commercial/industrial units.

Indicators for assessing waste disposal as well as its associated key environmental, health and safety issues are:

- size and remaining life span of site
- amounts of waste delivered daily
- site management
 - professional site manager with overall responsibility?
 - trained and qualified operational staff ?
 - health and safety of workers?
 - measurement of incoming waste?
 - inspection and clearance?
 - clear direction to the tipping face?
 - good access to the tipping face?
 - supervised placement at the tipping face?
 - working areas of operation in small, well-defined cells?
 - compaction of waste?
 - daily cover?
 - communications at the site?

- proper control and management of waste picking?
 - equipment on site and its utilisation
 - contamination of water resources from leachate (generated from decomposition of MSW)
 - location of dump site (often close to community residential areas, drinking water wells, urban water supply intakes, or in sensitive ecological habitats)
 - levels of odour, dust and visual impact
 - burning of dump sites causing air pollution
 - vermin, insects and scavenging animals
 - scavenging by waste pickers at a dump site
 - delivery of hazardous, toxic or infectious waste
 - planning for siting of future landfills and its participatory approach

Financing

In many cities, solid waste management services are provided by a city waste department that is an integral part of the municipal administration. In others, the services are provided by a wholly owned municipal enterprise operating to some extent at arm's length from the government. In others, although rarely, services are provided by a fully autonomous enterprise (public or private) operating under contract to the government. Each of these arrangements reflects a different level of sophistication in terms of the financing and cost recovery arrangements typically found to be in place.

Where services are provided by a municipal waste department, funds tend to be provided out of the normal municipal budgetary process. Domestic users may make a contribution to the cost of providing the services – possibly through a local property tax or a communal services tax (indirect charge) or a user service fee (direct charge). But the amount of funds raised through such mechanisms does not usually relate directly to the cost of service. The waste department is often in the position of having regularly (usually annually) to present its budget request for the following period. This is then subject to municipal treasury review, and a decision is made on the amount of funds to be allocated. The outcome often reflects as much the budgetary circumstances of the municipal government at the time, and the nature of competing claims on scarce resources, as it does the actual costs involved in providing an efficient service.

It is necessary to establish clearly the existing funding arrangements, both in terms of payments to the service provider and charges to the service users. Sometimes it can be useful to show this diagrammatically (*Money fluxes*). To assess cost of the waste management system, if possible distinction should be made between expenditures for the various waste elements (e.g. sweeping, collection, treatment,

disposal) as well as the different cost types (e.g. capital investment and recurrent costs). Recurrent costs are probably more critical, as it is on this that the financial sustainability of the MSWM system ultimately depends. These costs can be further detailed in cost items such as salaries, fuel, etc., if necessary for the financial assessment.

This can allow determination of costs per tonne of waste for the various components of a proposed solid waste management system.

Critical issue to assess furthermore are tariff structures and level of cost recovery and operational system for revenue collection and its effectiveness.

There is also the issue of affordability and willingness-to-pay for MSWM by the waste generators. Annex 6 provides an example of a questionnaire from a willingness-to-pay survey.

Affordability

Two aspects of affordability need to be addressed. The first is whether the whole solid waste management system is generally affordable to the society in which it is being proposed. This question relates to the appropriate or inappropriate approach and technology chosen for the city. The second question is whether user charges proposed to finance the strategy are affordable (or even appropriate) to all members of society. This question relates to whether user-charges are affordable to poorer members of society. Payment structures can be designed to reflect different levels of affordability (cross subsidies, that the more wealthy users subsidise the poor; or different levels of service for different charges).

Affordability studies depend on the availability of information on household income and expenditure. This is frequently available from national household surveys undertaken periodically by the statistics agency. Statistics specific to large metropolitan areas can usually be obtained but, if not, then national-level information must be used and adjustments made. When using these surveys care must be taken to ensure that the year to which the data relate is known and that adjustments to the present are made appropriately. Advice from the statistics agency should be sought when making such adjustments. Other relevant information is sometimes available from government agencies, such as a department of economic development, from international agencies operating in the country, such as the World Bank, or from NGOs. Average income statistics provide an indication of the overall affordability of a strategy to society, but their use can give a distorted picture in a country with a high level of income variability. Income statistics are particularly useful if they are available for different income groups (population quartiles or quintiles) from which the broad characteristics of income distribution can be inferred. These characteristics can include:

- average per capita disposable income for society as a whole
- average per capita disposable income of the poorest group
- the income differential between the richest and the poorest in society
- the relative shares of the richest and the poorest groups in total disposable income
- changes in the distribution of disposable income between survey periods, providing an indication of whether income distribution is becoming more equitable or more skewed

Willingness-to-pay

Willingness-to-pay surveys assess what hypothetical MSWM service options different customers would be willing to pay for and, as a result, can show how much they value different services. Experience has shown that WTP surveys can provide a range of valuable economic information about the customer base and its preferences for MSWM options.

In particular, WTP studies can help:

- estimate people's willingness to pay for a specific MSWM system, based on the planned improvements
- ascertain consumer satisfaction with the current type and level of MSWM services provided. This information can help devise a number of service enhancing and remedial measures
- identify gaps in public knowledge about a number of MSWM issues that may hinder the implementation of programmes that would ultimately be in the public interest
- collect useful information for the design of future MSWM programmes on current practices priorities over different services and attributes and levels of those services
- minimise the mismatch between what is supplied and what the public wants by increasing the knowledge about the level of MSWM service that the public wants and is willing to pay for

Participation, Environmental Education and Awareness

This section gives information on status in the surveyed city involving:

- "Participatory planning", meaning the involvement of the key stakeholders in the planning process
- "Public Consultation", a forum for the public to voice opinions
- "Public Awareness and Education Programme" involving programmes designed to raise public aware-

ness and understanding of the relevant issues with a set of targeted campaigns.

Public Awareness Campaigns are campaigns designed to raise public awareness and knowledge, targeting specific groups and issues of importance to sustainable waste management. These may include:

- participation in the proper use of collection systems (e.g. container or timing of collection).
- participation in keeping their streets and waterways clean (no littering and dumping)
- participation in reducing overall quantities of waste (e.g. waste avoidance or segregation at source and recycling)
- determining willingness to pay to enhance payment of service charges
- participation in landfill site selection
- awareness of the potential health, safety and environmental impacts associated with poor waste management or the benefits of recycling and resource conservation.

Assessing awareness campaigns involves looking at:

- Who is/was doing it?
- Who is/was being addressed?
- Which methods and tools are/were applied?
- When is/was it done?

Some of the indicators are:

- number of PA&E activities undertaken in the municipality
- rate of attendance at information events
- number of inquiries from the public
- number of complaints from the public
- general appearance of city (ie, cleaner, less litter)
- amount of coverage of SWM issues in local press, radio, local TV
- awareness of key issues; and
- willingness to cooperate, participate and pay for services

Annex 1**Questionnaire on Solid Waste Management**Purpose of the Questionnaire

This questionnaire aims at collecting key information on the current state-of-the-art of the solid waste management of cities. The questionnaire is based on a similar questionnaire by UNCRD for Asian cities.

Notes for Respondents

- (1) The term 'solid waste' used in this questionnaire refers primarily to municipal refuse.
(2) Please give monetary values (#) in local currency.

This Questionnaire Form was completed by:

Name : _____
 Designation : _____
 Address : _____
 Tel. : _____
 Fax : _____
 E-mail : _____

The State of the Art of Solid Waste Management in:

City _____

Country _____

1. SOCIO-ECONOMIC PROFILE OF THE CITY

1.1 Demographic Aspects

	1970	1980	1990	1998
Population				
Households				
City area (km ²)				

1.2 GRDP and Income Distribution

1.2.1 GRDP (Gross Regional Domestic Product the Metropolis) (#): _____

1.2.2 Income distribution (#): _____

(Please provide below information showing the distribution of households by income class)

1.3 Land Use (As of _____)

	Area(Km ²)	Per cent((%))
Residential		
Commercial		
Industrial		

Institutional		
Agricultural		
Park/Open space		
Others		
Total		

* Please attach, if available, a map showing existing land use pattern of the city (Annex I).

2. INSTITUTIONAL AND ORGANIZATIONAL FRAMEWORK FOR SOLID WASTE MANAGEMENT

2.1 Relevant Laws and/or Ordinances (Please give below the titles of major laws and ordinances)

(1) _____

(2) _____

* If there are more than the above, please use an additional sheet.

* Please attach, if available, a copy each of the most relevant laws/ordinances (Annex II).

2.2 Agency/Department/Office Responsible for Solid Waste Management:

- At the national government/state government level:
- At the city level:

*Please attach an organization chart for each of the agencies concerned at the national/state government level (Annex III) as well as at the city level (Annex IV).

2.3 Personnel for Solid Waste Management at the City Level

* Please use the categories of personnel adopted by your organization.

Category	No. of Employees	Monthly Salary

3. SOLID WASTE GENERATION

3.1 Solid Waste Generated in the City

- Estimated amount of solid waste generated: _____ ton/year
- Estimated amount of solid waste generated per capita per day (kg/capita/day): _____

3.2 Composition of Solid Waste

Three major composition

Composition	W (%)
Moisture	
Combustible	
Ash content	
Total	100 (%)

* Excluding such wastes as demolition debris, industrial wastes or the like discarded at collection points.

Physical composition

Composition	W (%) (Wet)
Paper	
Glass	
Metal	

Plastics/Rubber	
Textile	
Wood	
Food waste	
Ash/Soil	
Others	
Total	100.0 (%)

* Please furnish, if available, information on physical composition by season (wet and dry).

- Refuse density (Apparent specific gravity): _____ kg/m³
- Lower calorific value: _____ kcal/kg
 $LCV = 40*(Paper+Textile+Wood+Food\ waste) + 90*Plastics - 46*Moisture$

4. COLLECTION, TRANSFER, TREATMENT, AND FINAL DISPOSAL

4.1 Collection

- Division/office responsible for refuse collection: _____
- Number of workers engaged in refuse collection: _____
- Estimated amount of solid waste collected: _____ ton/year
- Estimated population in the service area: _____, in _____ no. of households
- Refuse collection service area (Please attach, if available, a map showing the refuse collection service area: Annex V):

Collection method (Please give (%) of solid waste by collection method)

Method	(%)
Door-to-door collection	
Communal collection <ul style="list-style-type: none"> • Enclosure • Container • Dust-shoot • Curbside collection 	
Block collection	
Other	
Total	100

* Curbside collection: Residents place their bins on a footway in advance of the collection time and remove them after they have been emptied.

* Block collection: At a bell signal residents bring their wastes containers to a vehicle.

- Frequency of collection: _____ times/week
- Refuse collection fees
- Refuse collection fees (#): _____
 - In case a flat rate is applied, please indicate the rate per unit (i.e., volume, weight, or household).
 - In case differential rates are applied, please attach a copy of the fee schedule (Annex VI).
- Fee collection method (Please give a brief description as to how the fees are collected): _____
- Fee collection rate (Please indicate to what extent the fees are collected): _____

4.2 Refuse Carrier to Transfer Station

Transfer Station	(%)
Handcart	
Animal cart	
Motor vehicle	
Others	

4.3 Transportation to Disposal Sites

- Division/office responsible for transportation: _____
- Number of vehicles and workers: (As of _____)

Type	Direct mgt.	Contract	Total
Dump truck(ton)	units	units	units
Dump truck(ton)			
Open truck(ton)			
Open truck(ton)			
Compactor			
Tractor			
Others()			
Total			
Operation rate of vehicles above	(%)	(%)	(%)
Number of workers			

- Efficiency of transportation
 Transport rate: _____ ton/person/day
 Average number of trips: _____ trips/day
 Population/vehicle rate: _____ persons/vehicle

4.4 Number of Transfer Stations by Type

	No. of stations	Total area (m ²)
Open-space type:		
Space with wall type:		
Container type:		
Others():		
Number of workers:		

4.5 Intermediate Treatment (As of _____)

Type	Plant name (Location)	Capacity (ton/day)	Operation rate ((%))	Workers
Composting				
Recovery of valuable matters				
Incineration				
Others()				

4.6 Final Disposal (As of _____)

Type	Plant name (Location)	Total area (ha)	Capacity (ton/day)	Operation rate ((%))	Workers
Open dumping					
Sanitary landfill					

4.7 Process of Solid Waste Management(Example)

- * Please prepare, a flow chart showing both the activities and their linkages involved in solid waste management and the amount of waste handled/processed at the respective stages (Annex VII)

4.8 Location of Solid Waste Management Facilities

- * Please attach a map showing location of all facilities listed above, i.e., transfer stations, vehicle depots, composting plants, incineration plants, resource recycling plants, dumping sites, etc. (Annex VIII)

5 FINANCIAL ASPECTS (As of _____; 1US\$=_____)

5.1 Total budget for the last three years of the organization to which the solid waste sector belongs (#):

Year			
Budget			

5.2 Budget for solid waste management for the last three years (#)

Year			
Budget			

5.3 Breakdown of the latest budget for solid waste management (#):

Budget	#	(%)
Personal expenses		
Capital investment: Total		
Vehicles:		
Transfer stations:		
Intermediate treatment facilities:		
Final disposal sites:		
Maintenance and operation expenses:		
Vehicles:		
Transfer stations:		
Intermediate facilities:		
Final disposal sites:		
Public enlightenment and awareness building expenses:		
Others		
Total		

5.4 Sources of funds for solid waste management (#)

Budget	#	(%)
Local tax revenue		
Fees		
Grants from central/state government		
Loans		
Others		
Total		

Thank you very much for your kind cooperation and assistance

Annexes:

- Annex I: Existing Land Use Map
- Annex II: Laws and Ordinances Concerning Solid Waste Management
- Annex III: Organization Chart (National/State Level)
- Annex IV: Organization Chart (City Level)
- Annex V: Map Showing Refuse Collection Service Area
- Annex VI: Refuse Collection Fee Schedule
- Annex VII: A Flow Chart of Solid Waste Management Processes
- Annex VIII: Map Showing Location of Solid Waste Management Facilities

Annex 2

SAMPLE QUESTIONNAIRE ON EXISTING SOLID WASTE MANAGEMENT SERVICES, PUBLIC AND PRIVATE

(From Part III, Annex A6; prepared by Sandra Cointreau-Levine)

Note: Though primarily designed for interviews with solid waste managers in cities, this questionnaire can also be used to interview neighborhood associations or individual establishments which have engaged a private firm to provide solid waste services, as well as private firms involved in service provision.

This questionnaire might be given to a manager and collected at a later date, or it might be completed in the presence of a consultant. In the latter case it is useful for the consultant to note whether requests for detailed data are answered with the use of documents, or whether they are answered from memory, without referral to documentation. If documents are not used, this may indicate that the management information system is not well developed, and that some of the answers may be subjective and not very reliable.

If several respondents supply information independently for this survey, it is recommended that one form be used for each respondent.

Details of Respondent(s):

Name of City (or area being considered):

Name(s) and position(s) of Respondent(s):

.....

Date:

General:

1.a Population of the City

1.b Area of City:square kilometers

2. What percentage of total population lives in areas intended for the following categories of land use within your City?

- ⇒ Dense, old, medina or walled city (%)
- ⇒ Low-income spontaneous residential (%)
- ⇒ Laid-out (planned) residential (%)
- ⇒ Central city commercial (%)
- ⇒ Low density commercial or residential (%)
- ⇒ Industrial (%)
- ⇒ Other (Please describe) (%);

3. Describe in your own words the most important problems and needs your City is facing in relation to solid waste management.

.....
.....

Solid Waste System:

4.a What percentage of the total quantity of solid waste generated in the whole City is collected at least once a week? (%)

4.b Of the total collected, roughly estimate the percentage, which is collected by each of the following methods: (Note that both the pick-up point and the transportation method are specified.)

- Door-to-door Total percentage by various means (%)
- ⇒ Door-to-door by pushcart (%)
- ⇒ Door-to-door by animal with baskets (%)
- ⇒ Door-to-door by animal with cart (%)
- ⇒ Door-to-door by small *pickup* truck (%)
- ⇒ Door-to-door by farm tractor and trailer (%)
- ⇒ Door-to-door by open truck (%)
- ⇒ Door-to-door by compaction truck (%)
- ⇒ Door-to-door by other means (Please describe) (%)

- Communal collection points Total percentage by various means (%)
- ⇒ Communal collection point cleared by animal cart, farm tractor, or collection truck (%)
 - ⇒ Communal collection point using containers which are emptied mechanically (%)
 - ⇒ Communal, using skip containers lifted and taken away by a truck (%)
 - ⇒ Communal, using arm-roll containers taken away by a truck (%)

Other systems

- ⇒ *Block system* by truck (truck stops at intervals and sounds signal) (%)
- ⇒ Other system (Please describe) (%)

5. Roughly estimate the number of the following types of vehicles in your fleet which are available for service at least 70(%) of the time and are less than 7 years old.

	<u>Number of vehicles</u>
Small pickup truck
Farm tractor and trailer
Non-compaction <i>side-loading</i> truck
Open truck with non-tipping body
Open tipping truck
Compactor truck
Skip container and lift truck
Roll-on container and arm roll truck
Others (Please describe)

6. What is the average capacity (in cubic meters) of the following trucks, which have been noted above as achieving 70(%) availability and being less than 7 years old?

	<u>Average capacity (in cubic meters)</u>
Small pickup truck
Farm tractor and trailer
Non-compaction <i>side-loading</i> truck
Open truck with non-tipping body
Open tipping truck
Compactor truck
Skip container and lift truck
Roll-on container and arm-roll truck
Others (Please describe)

Solid Waste Facilities:

7. "Disposal sites" may be open dumps, *controlled landfills* (with periodic soil cover), sanitary landfills (with daily soil cover, leachate management and gas ventilation systems), or composting plants. Describe the method of disposal for the solid wastes collected in your City and estimate how many disposal sites exist. What is the average distance (in kilometers one way) from the City center to a disposal site? How long is the trip (in minutes one-way) from the City center to a disposal site, at the time of day when the collection service is provided?

Disposal method	Distance from City center (km)	Travel time from center (minutes.)
1
2
3
4

8. *Collection points* receive only small quantities of solid waste (i.e., loads less than 1 cubic meter) from pushcarts or animals with baskets. From collection points, the wastes are loaded into collection vehicles that take the waste to either a *transfer station* or a final disposal site. Indicate the number of collection points in the City, according to the method used to remove the waste from them:

- ⇒ Cleared by bullock carts.
- ⇒ Cleared by open trucks.
- ⇒ Cleared by compactor trucks.
- ⇒ Cleared by skip containers and lift trucks.
- ⇒ Cleared by roll-on containers and arm-roll trucks.
- ⇒ Other (Please describe)

9. *Transfer stations* predominantly receive medium-sized quantities of solid waste (i.e., loads greater than one cubic meter and less than ten cubic meters) from animal carts and collection vehicles. At these transfer stations the waste is loaded into large transfer vehicles, usually with a capacity of more than 15 cubic meters, which take the waste to a final disposal site. Indicate the number of such transfer stations in the City according to the method by which the waste is loaded into the large transfer vehicles:

- ⇒ Open ground with clearing by wheeled loaders
- ⇒ Ramp and elevated unloading platform with clearing by wheeled loaders
- ⇒ Ramp and elevated unloading platform served by roll-on containers and arm-roll trucks
- ⇒ Other (Please describe)

Human resources engaged in solid waste management:

10. How many people work in the solid waste service? Note which, if any, of these categories are represented by unions.

	Number of staff	Union representation? (Y/N)
Administrative and professional staff		
Operations supervisors		
Collection vehicle drivers		
Operators of other plant		
Collection workers (loading and transporting waste)		
Sweepers		
Workshop staff (portion for solid waste vehicles only)		
Sanitary inspectors or health inspectors		

11. Of the people working in the solid waste service, what percentage are:

- ⇒ Permanent government employees (i.e., on salary with social security benefits) (%)
- ⇒ Daily or casual employees (i.e., paid daily, no job security) (%)
- ⇒ Contract employees (i.e., job security only for short contract period) (%)

12. Considering only the permanent government employees working in the solid waste service, roughly estimate what percentage will become eligible for retirement within the next 5 years.
Estimated percentage (%)

Financial:

13.a What is the amount of the total City recurrent budget for all services? (\$ or other)

13.b What is the amount of the City's solid waste management budget that is for sweeping, small drain cleaning, solid waste collection, solid waste disposal and maintenance of the solid waste equipment? (\$ or local currency)

14.a What percentage of the City's total recurrent budget is covered by property-based conservancy tax? (%)

14.b What percentage comes from Central Government transfers? (%)

15. Do you have a City byelaw requiring households and establishments to pay a solid waste user charge? Yes No

16.a Within your City, is there a tariff structure for solid waste user fees which are payable by residents? Yes No

16.b If so, is it based on waste quantity , consumer income level , or property size ?

17. Is the tariff structure for residents served by private sector systems different from the tariff structure for residents served by municipal systems? Yes No

18.a What percentage of the City's total recurrent budget is covered by direct user charges for solid waste services?
(%)

18.b How are the charges collected?

- Separately, by door-to-door municipal bill collectors
- Separately, by private, commissioned bill collectors
- Directly, by the private firms providing the services
- With water charges
- With electricity charges
- By neighborhood leaders
- By NGOs
- By direct bank deposit
- Other (Please describe)

19. If you have a solid waste user charge, what is the method for increasing the tariffs periodically, (for example, annually)?
.....
.....

Private Provision of Services:

20. Please indicate (✓) which of the following types of private sector provision of service exist in the City.
- ⇒ Pre-collection of residential solid waste - by *private subscription*
 - ⇒ Collection of construction and demolition debris - by private subscription
 - ⇒ Collection of industrial wastes from large factories - by private subscription
 - ⇒ Collection of commercial wastes from large hotels, offices, markets or stores - by private subscription
 - ⇒ Collection of healthcare wastes from hospitals or clinics - by private subscription
 - ⇒ Collection of general municipal wastes from entire neighborhoods (transporting waste from collection point to disposal site) - by contract
 - ⇒ Collection of general municipal wastes from entire neighborhoods - by franchise
 - ⇒ Sweeping or cleaning of streets or open areas - by contract for labor pool
 - ⇒ Repair of City solid waste equipment - by contract on an as-needed basis
 - ⇒ Repair of City solid waste equipment - by contract on a long-term basis
 - ⇒ Conversion of waste to compost - by concession
 - ⇒ Operation of a transfer station and long distance hauling system - by contract or concession
 - ⇒ Operation of a disposal site - by contract or concession
 - ⇒ Removal of decomposed waste from a City disposal site for soil conditioner - by concession
 - ⇒ Collection of user charges or waste taxes - by franchise with bill collection agents
 - ⇒ Other , please describe.

21. Has the City had previous experience with private provision of solid waste services in the past? If any such services have been discontinued, please explain.
.....
.....
.....

22. Does your City have a bylaw requiring households and establishments to cooperate with any private sector agents appointed by the City to provide solid waste services. (Such agents may be appointed under contract, franchise, or concession agreements, or they may be licensed to provide a service.). Yes No

Give each type of private sector participation identified in Question 21 above a serial number and answer the following questions for each one. The abbreviation PSP stands for "private sector participation" and a "PSP arrangement" can be a contract, a franchise or concession agreement, or a licensing arrangement.

		Serial number	1	2	3	4	5
23.a	When did you begin planning and initiate steps toward implementation? (Write date)						
23.b	And when did the private firm actually begin to deliver the service? (Write date)						

24. For each of the examples of PSP, please explain the process by which private firms or organizations are awarded the contract, franchise, or agreement. For example, are the awards based on selection of the best firms from a qualified short list? Or, do the awards follow a competitive bidding process? Or, are the awards based on review of unsolicited proposals? (Write answers on a separate sheet or on the reverse.)

25.a

Serial number	1	2	3	4	5
What is the duration in months of the current contracts, franchises or concessions?					

25.b If PSP arrangements are made for only one year or less, please explain why.

.....

.....

26. Are PSP arrangements automatically renewed at the end of the contract, license or franchise period if performance has been satisfactory, or are the firms required to compete anew for a new PSP arrangement? (Show by ✓)

Serial number	1	2	3	4	5
Automatically renewed					
Tender competition each time					

27. Do your PSP arrangements have cost escalation indices, which are tied to the rate of inflation, exchange rates, or a consumer price index?

Serial number	1		2		3		4		5	
Response	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Yes <input type="checkbox"/>	No <input type="checkbox"/>

28.a Considering the PSP arrangements which you have in your city, please indicate the administrative level at which decisions concerning PSP arrangements and selection of service providers are made.

- At the City level?
- At the Provincial or State level?
- At the Central Government level?

28.b Is the level - at which decisions and selections for PSP arrangement are made – decided according to

- the monetary size of the agreement
- the length of the agreement period
- or the involvement of capital investment?

29. Do you arrange for PSP agreements to have a short duration or a small service area in order to keep the monetary size below a specific level? Yes No

30. For each of the examples of PSP, describe the character of the community in which you first implemented this PSP system? Please describe the community in terms of **land use**, (i.e., suburban *laid out* residential areas (SLR), central commercial or residential areas of high priority use (CC or CR), marginal densely populated neighborhoods (MD), new developments in peripheral areas (PN)), and other aspects such as **density, road access, income level, and location**.

Serial No.	Land use	Density	Road access	Income level	Location
1					
2					
3					
4					
5					

31. In communities which are served by private contractors, does the type and level of service vary at all from the service provided by the municipal authorities? Yes No

If "yes", please explain

.....

32.a Has the city done any comparative studies on the differences in performance between the municipality service and the private sector service? Yes No

32.b Has it monitored differences in productivity per worker , productivity per vehicle , quality of service , or cost of service ?

33.a On what basis do you pay the private firms which are under your PSP arrangements?

- According to - the amount of waste estimated for the area,
- the amount of waste delivered to a disposal site,
- the number of loads collected,
- the size of the service area, or
- (other)?

.....

33.b Does the payment from the city to the various private firms vary according to

- the difficulty of providing the service in a given area, Yes No
- the travel time or distance to the transfer or disposal site, Yes No , or
- the amount of waste to be collected? Yes No

34. What inspection, supervision, and/or performance monitoring do you provide in the areas served by private sector systems?

.....
.....

35.a Do you have any penalty or sanction clauses in your PSP arrangements? Yes No

35.b What course of action can you take if a private firm does not perform satisfactorily?

.....
.....

36 When PSP arrangements were being initiated, what kind of external technical or financial assistance did the City receive from central or provincial government, or from bilateral or multi-lateral agencies?

.....
.....

37. Did the city provide any land, buildings, equipment or human resources to support the private firms' activities initially?
land , buildings , equipment , human resources

38.a Did the city provide any support to the private firms to help them to obtain capital financing? Yes No

38.b Did the city provide any guarantees, or did the city arrange a multi-year contract to enable Bank financing? Yes No
 Please specify

39. Did the city provide community education, general public education, and public participation workshops initially to support the transition to a PSP system? Yes No

If "yes", please provide further information.

40. Are there any problems, observations or issues that you would like to share with us with regard to PSP systems and your experience with them (related to control , reliability , cost , political intervention , performance , other)?

.....
.....

41. Are there any lessons that you have learned which you would like to share with us with regard to PSP systems and your experience with them? (Lessons related to performance specifications , bonds , cost , other .)

.....
.....

42. Have you experienced any benefits from involving the private sector in solid waste services? If so, please explain what these benefits have been. (Some possible examples are: freedom to hire and fire employees , flexibility in hours of work , freedom from bureaucratic procedures and delays , greater access to technical skills , access to credit .)

Other

.....

43. Based on your experience, would you recommend that other cities implement PSP systems similar to yours? Yes
No

44. If you have not involved the private sector in solid waste management, please explain your concerns and reluctance to do so.
Is there concern about

- a greater likelihood that contracts would be audited for performance ,
- political interference in performance ,
- control ,
- cost ,
- reliability ,
- labor unions ,
- social issues , or
- other factors

.....
.....

Annex 3

From: Private Sector Participation in Municipal Solid Waste Management Part III; by Sandra Cointreau-Levine

SAMPLE QUESTIONNAIRE ON EXISTING SOLID WASTE MANAGEMENT SERVICES, Public and Private

Note: Though primarily designed for interviews with solid waste managers in cities, this questionnaire can also be used to interview neighbourhood associations or individual establishments which have engaged a private firm to provide solid waste services, as well as private firms involved in service provision. This questionnaire might be given to a manager and collected at a later date, or it might be completed in the presence of a consultant. In the latter case it is useful for the consultant to note whether requests for detailed data are answered with the use of documents, or whether they are answered from memory, without referral to documentation. If documents are not used, this may indicate that the management information system is not well developed, and that some of the answers may be subjective and not very reliable. If several respondents supply information independently for this survey, it is recommended that one form be used for each respondent.

Details of Respondent(s):

Name of City (or area being considered):

Name(s) and position(s) of Respondent(s):

Date:

General:

1.a Population of the City

1.b Area of City (square kilometres)

2. What percentage of total population lives in areas intended for the following categories of land use within your City?

- > Dense, old, medina or walled city (%)
- > Low-income spontaneous residential (%)
- > *Laid-out* (planned) residential (%)
- > Central city commercial (%)
- > Low density commercial or residential (%)
- > Industrial (%)
- > Other (Please describe) (%)

3. Describe in your own words the most important problems and needs your City is facing in relation to solid waste management.

Solid Waste System:

4.a What percentage of the total quantity of solid waste generated in the whole City is collected at least once a week? (%)

4.b Of the total collected, roughly estimate the percentage, which is collected by each of the following methods: (Note that both the pick-up point and the transportation method are specified.)

Door-to-door Total percentage by various means (%)

- > Door-to-door by pushcart (%)
- > Door-to-door by animal with baskets (%)
- > Door-to-door by animal with cart (%)
- > Door-to-door by small *pickup* truck (%)
- > Door-to-door by farm tractor and trailer (%)
- > Door-to-door by open truck (%)
- > Door-to-door by compaction truck (%)
- > Door-to-door by other means (Please describe) (%)

Communal collection points Total percentage by various means (%)

- > *Communal* collection point cleared by animal cart, farm tractor, or collection truck (%)
- > Communal collection point using containers which are emptied mechanically (%)
- > Communal, using *skip containers* lifted and taken away by a truck (%)
- > Communal, using *arm-roll* containers taken away by a truck (%)

Other systems

- > *Block system* by truck (truck stops at intervals and sounds signal) (%)
- > Other system (Please describe) (%) ...

Small pickup truck

Farm tractor and trailer

Non-compaction side-loading truck

Open truck with non-tipping body

Open tipping truck

Compactor truck

Skip container and lift truck

Roll-on container and arm roll truck

Others (Please describe) ..
Average capacity (in cubic meters)

5. Roughly estimate the number of the following types of vehicles in your fleet which are available for service at least 70(%) of the time and are less than 7 years old.

Small pickup truck
Farm tractor and trailer
Non-compaction *side-loading* truck
Open truck with non-tipping body
Open tipping truck
Compactor truck
Skip container and lift truck
Roll-on container and arm roll truck
Others (Please describe) ..
Number of vehicles

6. What is the average capacity (in cubic meters) of the following trucks, which have been noted above as achieving 70(%) availability and being less than 7 years old?

Solid Waste Facilities:

7. Disposal sites may be open dumps, *controlled landfills* (with periodic soil cover), *sanitary landfills* (with daily soil cover, *leachate* management and gas ventilation systems), or composting plants. Describe the method of disposal for the solid wastes collected in your City and estimate how many disposal sites exist. What is the average distance (in kilometers one way) from the City center to a disposal site? How long is the trip (in minutes one-way) from the City center to a disposal site, at the time of day when the collection service is provided?

Disposal method, Distance from City center (km), Travel time from center (minutes)

8. *Collection points* receive only small quantities of solid waste (i.e., loads less than 1 cubic meter) from pushcarts or animals with baskets. From collection points, the wastes are loaded into collection vehicles that take the waste to either a *transfer station* or a final disposal site. Indicate the number of collection points in the City, according to the method used to remove the waste from them:

--> Cleared by bullock carts.
--> Cleared by open trucks.
--> Cleared by compactor trucks.
--> Cleared by skip containers and lift trucks.
--> Cleared by roll-on containers and arm-roll trucks.
--> Other (Please describe)

9. *Transfer stations* predominantly receive medium-sized quantities of solid waste (i.e., loads greater than one cubic meter and less than ten cubic meters) from animal carts and collection vehicles. At these transfer stations the waste is loaded into large transfer vehicles, usually with a capacity of more than 15 cubic meters, which take the waste to a final disposal site. Indicate the number of such transfer stations in the City according to the method by which the waste is loaded into the large transfer vehicles:

--> Open ground with clearing by wheeled loaders
--> Ramp and elevated unloading platform with clearing by wheeled loaders
--> Ramp and elevated unloading platform served by roll-on containers and arm-roll trucks
--> Other (Please describe)

Human resources engaged in solid waste management:

10. How many people work in the solid waste service? Note which, if any, of these categories are represented by unions.

Administrative and professional staff
Operations supervisors
Collection vehicle drivers
Operators of other plant
Collection workers (loading and transporting waste)
Sweepers
Workshop staff (portion for solid waste vehicles only)
Sanitary inspectors or health inspectors
Number of staff Union representation? (Y / N)

11. Of the people working in the solid waste service, what percentage are:

--> Permanent government employees (i.e., on salary with social security benefits) (%)
--> Daily or casual employees (i.e., paid daily, no job security) (%)
--> Contract employees (i.e., job security only for short contract period) (%)

12. Considering only the permanent government employees working in the solid waste service, roughly estimate what percentage will become eligible for retirement within the next 5 years.

Estimated percentage (%)
(\$ or other)
(\$ or local currency)

13.a What is the amount of the total City recurrent budget for all services?

13.b What is the amount of the City's solid waste management budget that is for sweeping, small drain cleaning, solid waste collection, solid waste disposal and maintenance of the solid waste equipment?

14.a What percentage of the City's total recurrent budget is covered by property-based conservancy tax? .(%)

14.b What percentage comes from Central Government transfers? .(%)

15. Do you have a City byelaw requiring households and establishments to pay a solid waste user charge?

16.a Within your City, is there a tariff structure for solid waste user fees which are payable by residents?
Yes -- No

16.b If so, is it based on: waste quantity -- consumer income -- or property size?

17. Is the tariff structure for residents served by private sector systems different from the tariff structure for residents served by municipal systems?

Yes -- No --

Yes -- No --

18.a What percentage of the City's total recurrent budget is covered by direct user charges for solid waste services? .(%)

18.b How are the charges collected?

- > Separately, by door-to-door municipal bill collectors o
- > Separately, by private, commissioned bill collectors o
- > Directly, by the private firms providing the services o
- > With water charges o
- > With electricity charges o
- > By neighborhood leaders o
- > By NGOs o
- > By direct bank deposit o
- > Other (Please describe) o

19. If you have a solid waste user charge, what is the method for increasing the tariffs periodically, (for example, annually)?

Private Provision of Services:

20. Please indicate (†,†) which of the following types of private sector provision of service exist in the City.

- > Pre-collection of residential solid waste - by *private subscription* o
- > Collection of construction and demolition debris - by private subscription o
- > Collection of industrial wastes from large factories - by private subscription o
- > Collection of commercial wastes from large hotels, offices, markets or stores - by private subscription o
- > Collection of *healthcare* wastes from hospitals or clinics - by private subscription o
- > Collection of general municipal wastes from entire neighborhoods (transporting waste from collection point to disposal site) - by contract o
- > Collection of general municipal wastes from entire neighborhoods - by franchise o
- > Sweeping or cleaning of streets or open areas - by contract for labor pool o
- > Repair of City solid waste equipment - by contract on an as-needed basis o
- > Repair of City solid waste equipment - by contract on a long-term basis o
- > Conversion of waste to compost - by concession o
- > Operation of a transfer station and long distance hauling system - by contract or concession o
- > Operation of a disposal site - by contract or concession o
- > Removal of decomposed waste from a City disposal site for soil conditioner - by concession o
- > Collection of user charges or waste taxes - by franchise with bill collection agents o
- > Other -- , please describe ...

21. Has the City had previous experience with private provision of solid waste services in the past?

If any such services have been discontinued, please explain.

22. Does your City have a byelaw requiring households and establishments to cooperate with any private sector agents appointed by the City to provide solid waste services. (Such agents may be appointed under contract, franchise, or concession agreements, or they may be licensed to provide a service.). Yes -- No --

Give each type of private sector participation identified in Question 21 above a serial number and answer the following questions for each one. The abbreviation PSP stands for private sector participation and a iPSP arrangement can be a contract, a franchise or concession agreement, or a licensing arrangement.

23.a When did you begin planning and initiate steps toward implementation? (Write date)

23.b And when did the private firm actually begin to deliver the service? (Write date)

24. For each of the examples of PSP, please explain the process by which private firms or organizations are awarded the contract, franchise, or agreement. For example, are the awards based on selection of the best firms from a qualified short list? Or, do the awards follow a competitive bidding process? Or, are the awards based on review of unsolicited proposals? (Write answers on a separate sheet.)

25.a What is the duration in months of the current contracts, franchises or concessions?

25.b If PSP arrangements are made for only one year or less, please explain why.

26. Are PSP arrangements automatically renewed at the end of the contract, license or franchise period if performance has been satisfactory, or are the firms required to compete anew for a new PSP arrangement? (Show by , †)

Automatically renewed
Tender competition each time

27. Do your PSP arrangements have cost escalation indices, which are tied to the rate of inflation, exchange rates, or a consumer price index?

28.a Considering the PSP arrangements which you have in your city, please indicate the administrative level at which decisions concerning PSP arrangements and selection of service providers are made.

At the City level? o
At the Provincial or State level? o
At the Central Government level? o

28.b Is the level - at which decisions and selections for PSP arrangement are made ñ decided according to
the monetary size of the agreement o
the length of the agreement period o
or the involvement of capital investment? o

29. Do you arrange for PSP agreements to have a short duration or a small service area in order to keep the monetary size below a specific level? Yes -- No --

30. For each of the examples of PSP, describe the character of the community in which you first implemented this PSP system? Please describe the community in terms of land use, (i.e., suburban *laid out* residential areas (SLR), central commercial or residential areas of high priority use (CC or CR), marginal densely populated neighborhoods (MD), new developments in peripheral areas (PN)), and other aspects such as density, road access, income level, and location.

31. In communities which are served by private contractors, does the type and level of service vary at all from the service provided by the municipal authorities? Yes -- No --

If yes, please explain

32.a Has the city done any comparative studies on the differences in performance between the municipality service and the private sector service? Yes -- No --

32.b Has it monitored differences in *productivity* per worker -- , productivity per vehicle -- , quality of service -- , or cost of service -- ?

33.a On what basis do you pay the private firms which are under your PSP arrangements? According to

--> the amount of waste estimated for the area, o
--> the amount of waste delivered to a disposal site, o
--> the number of loads collected, o
--> the size of the service area, o or
--> (other)? ...

33.b Does the payment from the city to the various private firms vary according to

--> the difficulty of providing the service in a given area, Yes -- No --
--> the travel time or distance to the transfer or disposal site, Yes -- No --
--> the amount of waste to be collected? Yes -- No --

34. What inspection, supervision, and/or performance monitoring do you provide in the areas served by private sector systems?

35.a Do you have any penalty or sanction clauses in your PSP arrangements? Yes -- No --

35.b What course of action can you take if a private firm does not perform satisfactorily?

36. When PSP arrangements were being initiated, what kind of external technical or financial assistance did the City receive from central or provincial government, or from bilateral or multi-lateral agencies?

37. Did the city provide any land, buildings, equipment or human resources to support the private firms' activities initially?
land o , buildings o , equipment o , human resources o

38.a Did the city provide any support to the private firms to help them to obtain capital financing? Yes -- No --

38.b Did the city provide any guarantees, or did the city arrange a multi-year contract to enable Bank financing?
Yes -- No -- Please specify

39. Did the city provide community education, general public education, and public participation workshops initially to support the transition to a PSP system? Yes -- No --
If yes, please provide further information

40. Are there any problems, observations or issues that you would like to share with us with regard to PSP systems and your experience with them (related to control -- , reliability -- , cost -- , political intervention -- , performance -- , other -- .)?

41. Are there any lessons that you have learned which you would like to share with us with regard to PSP systems and your experience with them? (Lessons related to performance specifications -- , bonds -- , cost -- , other -- .)

42. Have you experienced any benefits from involving the private sector in solid waste services? If so, please explain what these benefits have been. (Some possible examples are: freedom to hire and fire employees -- , flexibility in hours of work -- , freedom from bureaucratic procedures and delays -- , greater access to technical skills -- , access to credit -- .)
Other --

43. Based on your experience, would you recommend that other cities implement PSP systems similar to yours?
Yes -- No --

44. If you have not involved the private sector in solid waste management, please explain your concerns and reluctance to do so. Is there concern about

- > a greater likelihood that contracts would be audited for performance o ,
- > political interference in performance o ,
- > control o ,
- > cost o ,
- > reliability o ,
- > labor unions o ,
- > social issues o , or
- > other factors o

Annex 4

Overview of Required Background Data and Information

(in: *Strategic Planning Guide for MSWM. ERM, World Bank, 2001*)

Geographic Boundaries of the Plan Area

- Key MSWM geographic data

Socio-economic Background

- Population size and trends
- Demographic statistics (migration rates, density, geographic distribution, etc)
- Income profile
- Urban employment by sector
- Economic development
- Customs and culture

Housing

- Dwelling ownership
- Dwelling unit profile (occupants, size, facilities, access to facilities, etc)
- Low-income dwelling unit profile (growth rate, density, access to facilities, etc)

Health

- Basic statistics
- Principal diseases and rate
- Geographic and social indicators

Natural Environment

- Ecosystem(s) description (include region, not just metropolitan area, also any areas of particular sensitivity)
- Climate (rainfall, temperature, dispersion conditions)
- Water table and resource supply (inputs and outputs)
- Topography
- Environmental hazards (eg, monsoon, landslides, seismic and volcanic activity)
- Environmental issues (eg, traffic, air quality and water quality)

Land Use

- Urban land use by category
- Land ownership and registration
- Land use regulation
- Land use by suitability

Political Profile

- Administrative system
- Key authority designation
- Key planning initiatives (national, regional, local)
- Key city objectives

Source: Adapted from J. Leitmann (1995) . Rapid Urban Environmental Assessment - Lessons from Cities in the Developing World, Volume 2: Tools and Outputs. UMP Technical Paper No. 15, The World Bank, Washington. ISBN 0-8213-2791-7.

Annex 5**Municipal By-Laws**

(in: *Strategic Planning Guide for MSWM. ERM, World Bank, 2001*)

The power of municipalities to pass by-laws dealing with public health, control of markets, development and use of land, public eating places, shops, waste and litter control into law as subordinate local legislation are to be found in many parts of the world. In some jurisdictions these by-laws need to be ratified by the national or provincial government. They usually have the force of the law by virtue of some framework national legislation – say, environmental protection or public health laws empowering municipal authorities to make local regulations.

Where penalties such as fines and/or imprisonment may be imposed, the municipal authorities must usually bring the case in question before the local civil/magistrate courts. Most municipalities will already have in place regulations and by-laws arising from primary public health legislation and dealing with prevention of disease and epidemics, notification of infectious diseases, burial of the dead, cremation facilities, air pollution, control of slaughterhouses, primary health care and like matters

Waste collection, street cleansing and associated by-laws are sometimes integrated with these public health acts. Similarly, waste management and cleansing services will be controlled by other legislation and agencies. These can include health and safety at work, employment law, fire protection, surface and ground water protection, planning and development control and environmental licensing.

By-laws dealing with waste collection and street cleansing matters will usually cover some or all of the following issues:

Duties on the General Public

- . Use of appropriate waste containers (eg, for healthcare waste)
- . No throwing of waste in the street
- . Time and place for deposit of waste
- . No burning of waste in waste containers
- . Disposal of dead animals and noxious materials
- . No throwing of waste into water courses and storm drains
- . Liaison with the municipal authorities
- . Complaints against municipal employees
- . Other public health matters
- . Payment of lawful charges made by the municipality or franchise contractors

Duties on Traders and Shopkeepers

In addition to the general obligations above:

- . Payment of lawful charges levied by the municipality or waste contractors
- . Use of registered licensed private contractors for collection and disposal
- . Hygiene and disinfection of containers and waste stores
- . Cleaning of forecourts and pavements in front of premises
- . No slaughter of animals except at licensed places
- . No illicit deposit of discarded food and other wastes
- . Care of storm drains and sewers
- . Other relevant public health matters

Duties on Institutions, Commerce and Industry

In addition to the general obligations above, more specific obligations on:

- . Payment of lawful charges levied by the municipality or waste contractors
- . Use of registered and/or licensed private contractors for collection and disposal
- . Use of licensed waste disposal facilities
- . Storage and control of hazardous wastes
- . No burning of wastes on the premises
- . Cleanliness of areas in and around the premises
- . Disposal of food processing, slaughterhouse wastes and other noxious materials
- . Prevention of public health nuisances
- . Keeping of waste records

Duties on Private Waste Contractors

In addition to the general obligations above:

- . Operation to be carried out only by licensed contractors
- . Administrative procedures for issue and revocation of licences
- . Grounds for revocation of licences
- . Payment of lawful charges levied by the municipality
- . Use of appropriate vehicles and containers
- . Use of licensed disposal sites
- . Register of customers served
- . Keeping of waste records

- . Prevention of Public Health Nuisance

Duties on Waste Recycling Entrepreneurs and Small Enterprises

In addition to the general obligations above:

- . Recycling and recovery only in approved locations
- . No cutting and burning of PVC cables and other materials
- . Controls on metal smelting, cutting and welding
- . No illicit deposit of effluents or liquid wastes
- . Storage of recycled materials
- . Disposal of discarded materials at licensed facilities
- . Public health measures

Source: *John R. Holmes.*

Annex 6

MODEL SURVEY QUESTIONNAIRE FOR ASSESSING DEMAND AND WILLINGNESS TO PAY

(Developed by Sandra Cointreau-Levine)

Date of interview:
 Name of interviewer
 Area

A. Identification:

“I would like to ask you some questions that would assist the local government in determining how to improve the solid waste collection service to your neighborhood. These questions usually take about minutes. We are interviewing a sample of per cent of the households and establishments in your neighborhood, so your input is considered very valuable to this survey. Let me first ask you a few questions to identify this house (or establishment) and you.”

- A.1 Household (or establishment) identification:
- A.2 Name of Respondent:
- A.3 Position of Respondent:
 Head of household (or establishment)
 Spouse of head of household (or establishment)
 Other , please describe
- A.4 How many people (children and adults) live in your household (or work in your establishment) on a regular basis?

B. Major Concerns:

(For this question, present the list in a different order on a random basis to each respondent)
 “I would like to show you a list of possible problems that might be faced by your household (or establishment):

- a) Difficult access to drinking water
- b) Poor quality of drinking water
- c) Inadequate disposal of residential wastewater
- d) Inadequate disposal of human excreta
- e) Flooding and inadequate drainage of stormwater
- f) Poor access for motor vehicles
- g) Lack of public transport
- h) Unreliable electricity supply
- i) Inadequate solid waste collection service
- j) Presence of litter and illegal piles of solid waste
- k) Nuisance from solid waste transfer points
- l) Nuisance from solid waste disposal sites

- B.1 Of these possible problems, which do you consider the most serious problem for your household (or establishment)?
 Most serious problem (*Write letter – a to l.*)

 Don't know
- B.2. And which do you consider the second most serious problem?
 Second most serious problem(*Write letter – a to l.*)
 Don't know
- B.3 (If item (i) was not listed) In your opinion, how serious is the problem of solid waste collection in this area?
 Very serious a
 Somewhat serious b
 Not serious c
 Don't know d
- B.4 (If item (j) was not listed) In your opinion, how serious is the problem of littering and illegal piles of solid waste in this area?
 Very serious a
 Somewhat serious b
 Not serious c
 Don't know d

B.5 (If item (k) was not listed) In your opinion, how serious is the problem of nuisance from solid waste transfer points in this area?

- Very serious a
- Somewhat serious b
- Not serious c
- Don't know d

B.6 (If item (l) was not listed) In your opinion, how serious is the problem of nuisance from solid waste disposal or dumping in this area?

- Very serious a
- Somewhat serious b
- Not serious c
- Don't know d

C. Existing Situation Regarding Solid Waste:

“I would like to ask you some questions regarding the collection or removal of solid waste from your household (or establishment).”

C.1 Does your household (or establishment) have a durable metal or plastic container for storing solid waste?

- Yes, we have metal or plastic container a
- We have basket or carton container b
- No, we do not have a container c
- Don't know d

C.2 Does your household (or establishment) receive a collection service of any type?

- Yes a (Go to Question C.3)
- No b (Go to Section D)
- Don't know c (Try question C.3)

C.3 How frequently is your container usually taken out to be emptied?

- Several times each day a
- Daily b
- Three times a week c
- Twice a week d
- Once a week e
- Less frequently f
- Don't know g

C.4 Who usually takes the container with its waste contents out to be emptied?

- Head of household (or establishment) a
- Spouse of head of household (or establishment) b
- Another male adult c (Please specify)
- Another female adult d (Please specify)
- Any male adult e
- Any female adult f
- Any child between the ages of 13 and 18 g
- Any child between the ages of 6 and 12 h
- Don't know i

C.5 Where is your container taken to be emptied?

- The container is placed beside the road for emptying into a collection vehicle a
- The container is emptied into a larger container in the same building b
- The container is emptied into a communal container in the neighborhood. c
- The container is emptied onto an open pile of waste in the neighborhood. d
- The container is emptied at the final disposal, and the waste stays there e
- Don't know f

C.6 Approximately how far or how many minutes walking time one-way is it to empty your container? (If possible the respondent should indicate to the questioner where it is, so that the questioner can later check the distance.)

- meters one-way
- minutes walking one-way
- Don't know

C.7 If your container is emptied into a larger container in the same building or into a communal container in the neighborhood, how often is that (larger) container emptied?

- Daily a

- Three times a week b
- Twice a week c
- Once a week d
- Less than once a week e
- Less than once in 2 weeks f
- Less than once in 3 weeks g
- Less than once a month h
- Don't know i

C.8 If your container is emptied onto an open pile of waste in the neighborhood, how often is that pile removed?

- Daily a
- Three times a week b
- Twice a week c
- Once a week d
- Less than once a week e
- Less than once in 2 weeks f
- Less than once in 3 weeks g
- Less than once a month h
- Don't know i

C.9 For how many years has this type of waste collection service been provided to your household (or establishment)?

- Less than one year a
- One to two years b
- Two to five years c
- More than five years d
- Don't know e

C.10 Who collects the waste from the curbside, communal container, or pile?

- Local government a
- Local public authority b
- Neighborhood group c
- Private company d
- Don't know e

C.11 Has the same organization been collecting the waste for the past five years, or has there been a change in who has been collecting your waste?

- The same organization for the last five years a
- There has been a change in the last five years. b
- Don't know c

If there has been a change, please give more details
.....

C.12 What is your opinion of the service that you are receiving for collection of solid waste from your household (or establishment)?

- Very satisfied a *Go to Question C.14*
- Reasonably satisfied b *Go to Question C.14*
- Not satisfied at all c *Go to Question C.13*
- Don't know d

C.13 If you are not satisfied with service, would you state your primary reason?

- The service is not reliable a
- Frequency of service – the interval between collections is too long. b
- The location of the communal container or pick-up point is unsatisfactory c
- Lack of clean appearance, odors, flies or fires at the communal container. d
- The collection workers are rude or impolite. e
- Lack of clean appearance of the neighborhood f
- Other problem g Please explain.....
.....

C.14 Do you know where the collected waste is taken for final disposal when it leaves your neighborhood?

- Yes a *Go to Question C.15*
- Don't know b *Go to Section D*

C.15 Are you concerned about whether the final disposal is environmentally safe and acceptable?

- Yes a
- No b
- Don't know c

D. Description of Proposed Service Options

“Plans are being developed to upgrade the solid waste system in your neighborhood. To understand your preferences, I would like to discuss the options with you. For each of these options, the cost is different. Households and establishments in your neighborhood will be expected to pay a fee for this improved service. The type of service provided will depend on the fee which you and your neighbors can afford and are willing to pay, as well as your preferences.”

- D.1 Would you like to ask any questions about the plans to upgrade the solid waste system?
 Yes a (Record questions and answer them.)
 No b

E. Demand Assessment:

“Different methods of collecting solid waste have different costs and require different levels of involvement from residents such as you. The vehicles used for collection could be either trucks or tractors, depending on the road conditions in your neighborhood. The main methods of solid waste collection are as follows:

- a) Low Cost System. A large communal container - probably of 5 to 8 cubic meters capacity – (interviewer should demonstrate the size) would be placed in your neighborhood at a central location and each household and establishment would be expected to carry its container of refuse to empty it into the container. The container would have an attendant to sweep the area and keep it tidy. A vehicle would pick up the container and take it away to be emptied before it is completely full.
- b) Low Cost System. A vehicle would come to the neighborhood on a scheduled basis and park for a few minutes at each block or road junction to collect solid waste. When the vehicle parks, it would ring a bell, sound its horn or play a musical jingle to summon residents to bring their containers out to be emptied. All waste in the neighborhood would be kept inside until the vehicle comes.
- c) Medium Cost System. As with the first service option, a large communal container would be placed in your neighborhood. However, instead of you and your neighbors being required to carry their waste to the communal container, door-to-door collection would be arranged for an added fee. The door-to-door collection would be done by a worker using a push cart or donkey, depending on which would work better in your neighborhood.
- d) Higher Cost System. A vehicle would come to the neighborhood on a scheduled basis and provide a door-to-door service. At each building, containers of waste, which have been left at the curbside, would be emptied into the vehicle. The emptied containers would be placed neatly at the curb for residents to bring back into their household (or establishment). Residents would be required to adhere to the schedule and bring their waste to the curb in proper containers before the vehicle arrives.”

- E.1 Which of the service options just described do you prefer, giving consideration to the convenience and the cost?
 Collection method (a) a – Now go to Question E.2
 Collection method (b) b – Now go to Question E.7
 Collection method (c) c – Now go to Question E.10
 Collection method (d) d – Now go to Question E.13
 Don't know e

- E.2 If your preferred collection method (a) were introduced, how far would you be willing to walk to the large communal container?
 50 meters a
 100 meters b
 150 meters c
 200 meters d
 More than 200 meters e
 Don't know f

- E.3 If your preferred collection method (a) were introduced, would you be willing to have the communal container within 20 meters of your house (or establishment)?
 Yes a - Now go to Question E.5
 No b – Now go to Question E.4
 Don't know c – Now go to Question E.4

- E.4 If you answer is “no” or you are not sure, would you please describe your concerns about the container location?

- E.5 The cost of collection method (a) is per person per month. For your household (or establishment), which has people, this amounts to per month.
 Would you be willing to pay this fee to cover the cost of the waste collection service?
 Yes a - Now go to Question E.21
 No b - Now go to Question E.6
 Don't know c - Now go to Question E.6

- E.6 What is the maximum fee per month that your household (or establishment) would be prepared to pay for the collection method that you have chosen (method a)?
per month a - *Now go to Question E.17*
 Won't pay any fee b - *Now go to Question E.16*
 Don't know - c - *Now go to Question E.16*
- E.7 If your preferred collection method (b) were introduced, are there certain times of day when you would find it most convenient to meet the vehicle when it comes to your block to collect waste? (More than one answer may be checked.)
 Early morning before 9 a.m. a
 Anytime in the morning b
 Anytime in the afternoon c
 Early evening after 5 p.m. d
 Anytime during daylight e
- E.8 The cost of collection method (b) is per person per month if the collection vehicle comes times per week. For your household (or establishment), which has people, the fee would be per month.
 Would you be willing to pay this fee to cover the cost of the collection service?
 Yes a - *Now go to Question E.21*
 No b - *Now go to Question E.9*
 Don't know c - *Now go to Question E.9*
- E.9 What is the maximum fee per month that your household (or establishment) would be prepared to pay for the collection method that you have chosen (method b)?
per month a - *Now go to Question E.17*
 Won't pay any fee b - *Now go to Question E.16*
 Don't know c - *Now go to Question E.16*
- E.10 If your preferred collection method (c) were introduced, would you be willing to have the communal container within 20 meters of your house (or establishment)?
 Yes a
 No b
 Don't know c
- E.11 The cost of collection method (c) is per person per month for collection times per week. For your household (or establishment), which has people, this amounts to per month.
 Would you be willing to pay this fee to cover the cost of the collection service?
 Yes a - *Now go to Question E.21*
 No b - *Now go to Question E.12*
 Don't know c - *Now go to Question E.12*
- E.12 What is the maximum fee per month that your household (or establishment) would be prepared to pay for the collection method that you have chosen (method c)?
per month a - *Now go to Question E.17*
 Won't pay any fee b - *Now go to Question E.16*
 Don't know c - *Now go to Question E.16*
- E.13 If your preferred collection method (d) were introduced, what type of containers do you think that you and your neighbors should use for putting out your waste at the curbside?
 Metal dustbins a
 Plastic dustbins b
 Plastic or nylon bags c
- E.14 The cost of collection method (d) is per person per month for collection of your waste from the curbside times per week. For your household (or establishment), which has people, this amounts to per month.
 Would you be willing to pay this fee to cover the cost of your preferred collection method?
 Yes a - *Now go to Question E.21*
 No b - *Now go to Question E.15*
 Don't know c - *Now go to Question E.15*
- E.15 What is the maximum fee per month that your household (or establishment) would be prepared to pay for the collection method that you have chosen (method d)?
per month a - *Now go to Question E.17*
 Won't pay any fee b - *Now go to Question E.16*
 Don't know c - *Now go to Question E.16*
- E.16 What is the reason that you are unsure or don't want to pay for a collection service?

- E.17 (For those who stated that they are unsure or don't want to pay for the collection service from government, or are not willing to pay the government enough to cover the full cost of service.)
Would you be willing to pay the full cost of the collection service if a private company was providing the service and collecting the fee directly from you?
Yes a - *Now go to Section F*
No b - *Now go to Question E.18*
Don't know c - *Now go to Section F.*
- E.18 What is your reason for not being willing to pay a fee to cover the full cost of a waste collection service from the government or a private company?
Can't afford to pay for the full cost a - *Now go to Question E.20*
Don't believe that the service will be reliable b - *Now go to Question E.19*
Don't consider the service important enough to pay for c - *Now go to Question E.19*
Believe that general taxes should cover the cost of this service d - *Now go to Question E.19*
Other e - Please explain
Now go to Question E.19
- E.19 If you are not willing to pay for a collection service and government cannot afford to subsidize it for you, would you be willing to dispose of your wastes according one of the "do-it-yourself" systems described below, so that you do not pollute your neighborhood?
Separation of recyclable materials and composting of kitchen wastes in your yard or garden a - *Now go to Section F*
Separation of recyclable materials and burial of kitchen wastes in your yard or garden. b - *Now go to Section F*
No c
Don't know d
- E.20 If you are not able to afford to pay for the full cost of the collection method that you initially selected, would you consider an alternative method that offers a lower level of service or more effort on your part? Which of the following alternatives would be most acceptable to you? (More than one answer can be checked.)
Selection of a method that has a lower cost a - *Now return to Question E.1*
Walking a longer distance to empty or place your container b
Less frequent collection of waste c
Participation as a volunteer in community efforts to help with collection d
Participation as a volunteer in community efforts to regularly clean up uncollected waste e
Other cost-saving suggestions f Please describe.
None of these g - *Now go to Section F*
Don't know h
- E.21 If you have said that you are willing to pay for a collection service, whom would you prefer to provide the service to you?
The local government a
A private company b
There is no difference c
Don't know d
- E.22 If you have said that you are willing to pay for a collection service, to whom would you prefer to pay the fee?
To a government fee collector a
To a fee collector working for a private company b
To a neighborhood leader c
They are all equally suitable d
Don't know e

F. Other Information

"We will soon be ending this interview. Before we do end it, I would like to ask some questions about you and your family (or members of your establishment)."

- F.1 What is your age? Under 24 a , 25 to 34 b , 35 to 44 c , 45 to 54 d , 55 to 64 e , Over 65 f.
- F.2 What is your level of education (number of years of school)? years
- F.3 What is the level of education of the most educated member of your household (or establishment)? years at school
- F.4 (If a household) How many children under 15 years of age are in your household?

F.5 (If a household) How many people in your household contribute to the household income?
..... people

- F.6 (If a household) What is the occupation of the principle income earner in the household?
- Self-employed as laborer a
 - Self-employed as trader b
 - Self-employed as consultant or professional c
 - Employee of a private company d
 - Employee of government (public sector) e
 - Retired f
 - Other g
 - Don't know h

- F.7 (If an establishment) What is the principle commercial activity of this establishment?
- Trading in goods a
 - Trading in produce, meat, poultry or fish b
 - Professional services c
 - Manufacturing, food preparation d
 - Repair, maintenance e
 - Inn or Hotel f
 - Restaurant, café, bar g
 - Bank h
 - Other i Please describe

“Thank you for your contribution to this survey. We hope to use these results to determine how best to provide affordable and desirable service to the people of your community.

- F.8 If there is need to seek your advice further, may we contact you again?”
- Yes a
 - No b
 - Don't know c

