

# Chapter 3

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*Field Survey*

### 3 Field Survey

Field surveys are crucial to analyze the current situation of the municipal SWM in the Study Area. The data obtained in the surveys become basic information to formulate the M/P. This chapter presents objectives, methods, results and findings of the field surveys conducted in the Study Area in January and February 2000. Those are;

- Waste Amount and Composition Survey (WACS),
- Public Opinion Survey (POS),
- Time and Motion Survey (T&M),
- Recycle Market Survey, and
- Medical Waste Survey.

#### 3.1 Waste Amount and Composition Survey

Waste Amount and Composition Survey (WACS) is actually divided into two parts, i.e.,

- Waste Amount Survey, and
- Waste Composition Survey.

##### 3.1.1 Waste Amount Survey

###### a. Objectives

The objectives of Waste Amount Survey is to know current waste generation ratios of households, commercial entities, institutions, markets and street sweeping in the Study Area. Knowledge of the waste generation ratio is essential for the development and design of integrated solid waste management systems.

The data of waste generation ratios obtained in this survey is then applied to elaborate the waste stream that is used to comprehend the current flow of waste and to make future projections in the Study Area.

###### b. Methodology

###### b.1 Wastes Targeted

The survey covers household, commercial, institutional, market and street sweeping wastes. Waste generation sources were selected through consultation with a local contractor in order to reflect the present situation of the Study Area to the survey.

The wastes except market waste were weighed by spring balance at generation sources, and the market waste was weighed by weighbridge.

###### b.2 Waste Generation Sources

Table 3-1 shows the categories, the number of waste generation sources, the survey days and the number of samples in each category. The categories were 8, the waste generation sources were 79, and the total number of samples was 553.

Table 3-1: Number of Sources and Samples

Category		Number of sources	Survey days	Number of samples
Residential	High	20	7	140
	Middle	20	7	140
	Low	20	7	140
Commercial	Restaurant	5	7	35
	Other	5	7	35
Institutional		5	7	35
Market		2	7	14
Street sweeping		2	7	14
Total		79	-	553

**c. Results**

**c.1 Residential Waste**

140 samples for each income level, 420 samples in total, were obtained for the 7 days. Those were statistically analyzed as below. Consequently, generation ratio for each income level was estimated as shown in Table 3-2.

Table 3-2: Estimation of Waste Generation Ratio

Item	High Income	Middle Income	Low Income
Mean value (g/person/day)	600.8	542.0	418.7
95% reliable value (g/person/day)	± 102.8	± 124.4	± 100.2
Maximum value (g/person/day)	703.6	666.4	518.9
Minimum value (g/person/day)	498.0	417.6	318.5

Based on the results above, generation ratios with 95% reliable ranges were estimated as below.

Table 3-3: Waste Generation Ratio of Residential Waste

Category	Waste generation ratio (g/person/day)
High income	600 (500 to 700)
Middle income	540 (420 to 670)
Low income	420 (320 to 520)

**c.2 Commercial, Institutional, Market and Road Sweeping Wastes**

The following table show the waste generation ratios of commercial, institutional, market and road sweeping wastes.

Table 3-4: Waste Generation Ratio of Commercial, Institutional, Market and Road Sweeping Wastes

Category		Waste generation ratio
Commercial	Restaurant	466 g/seat/day
	Other	482 g/employee/day
Institutional		196 g/employee/day
Market		1,674 g/stall/day
Street Sweeping		198 g/m/day

### 3.1.2 Waste Composition Survey

#### a. Objectives

The objective of Waste Composition Survey is to obtain data of physical and chemical properties of wastes generated in the Study Area. The study focused on determining the following:

- bulk density
- physical composition (wet base)
- moisture content
- carbon and nitrogen content

#### b. Methodology

##### b.1 Waste Targeted

Wastes of all 8 categories were subjects of physical composition and moisture content analyses. Carbon and nitrogen contents were analyzed for residential (middle income as the representative of residential waste), restaurant and market wastes that are potential subjects of composting. Table 3-5 shows the waste targeted and the number of samples.

Table 3-5: Number of Samples of Waste Composition Survey

Category		Samples per day	Survey days	Bulk density	Physical composition	Moisture content	Carbon/nitrogen content
Residential	High	1	7	7	7	7	-
	Middle	1	7	7	7	7	7
	Low	1	7	7	7	7	-
Commercial	Restaurant	1	7	7	7	7	7
	Other	1	7	7	7	7	-
Institutional		1	7	7	7	7	-
Market		1	7	7	7	7	7
Street sweeping		1	7	7	7	7	-
Total		-	-	56	56	56	21

## b.2 Sampling

The wastes used in the Waste Amount Survey were used for the Waste Composition Survey. Wastes from each source were gathered and mixed by category and one sample was extracted from each category by using waste reduction method.

## c. Results

### c.1 Bulk Density

Table 3-6 shows bulk density of the wastes.

Table 3-6: Bulk Density of Wastes

Category		Bulk density (g/liter)
Residential	High income	198
	Middle income	202
	Low income	207
Commercial	Restaurant	353
	Other	60
Institutional		85
Market		335
Road sweeping		172

### c.2 Waste Composition (wet base)

Table 3-7 shows composition of residential waste and Table 3-8 shows of restaurant, other commercial, institutional, market and road sweeping wastes.

Table 3-7: Composition of Residential Waste

Composition	Unit: %		
	High income	Middle income	Low income
Combustible	95.5	94.4	93.4
Food waste	59.5	57.6	66.0
Papers	18.5	13.0	13.1
Textiles	1.2	1.1	2.5
Grass, wood, bamboo	2.7	16.8	4.0
Plastics	12.1	5.8	7.8
Rubber, leather	1.5	0.1	0.0
Incombustible	4.5	5.6	6.6
Metals	1.3	1.1	1.2
Bottles, glass	1.3	2.6	3.7
Ceramics and soil	0.2	0.7	0.6
Others	1.7	1.2	1.1
Total	100.0	100.0	100.0

Table 3-8: Composition of Commercial, Institutional, Market and Road Sweeping Wastes

Unit: %

Composition	Commercial		Institutional	Market	Road sweeping
	restaurant	Other			
Combustible	95.1	97.5	89.3	96.8	88.3
Food waste	62.2	6.4	19.0	78.1	2.6
Papers	22.1	63.1	35.0	9.5	6.4
Textiles	0.0	5.2	1.1	0.3	0.4
Grass, wood, bamboo	0.3	11.8	12.3	1.4	75.3
Plastics	10.2	10.6	20.5	7.2	3.6
Rubber, leather	0.3	0.4	1.4	0.3	0.0
Incombustible	4.9	2.5	10.7	3.2	11.7
Metals	0.7	1.3	0.5	0.4	0.1
Bottles, glass	2.4	0.3	4.6	0.8	0.3
Ceramics and soil	0.0	0.0	1.6	0.7	9.8
Others	1.8	0.9	4.0	1.3	1.5
Total	100.0	100.0	100.0	100.0	100.0

### c.3 Moisture Content

Table 3-9 shows moisture content of each category.

Table 3-9: Moisture Content

Category		Moisture content (%)
Residential	High income	51.5
	Middle income	47.0
	Low income	46.6
Commercial	Restaurant	58.8
	Other	12.8
Institutional		19.2
Market		64.9
Road sweeping		16.6

### c.4 Carbon and Nitrogen Content

Table 3-10 shows carbon and nitrogen contents of residential (middle income), restaurant and market waste.

Table 3-10: Carbon and Nitrogen Content

Category	Content (%)		C/N ratio
	Carbon	Nitrogen	
Residential *	42.7	2.8	15.3
Restaurant	45.2	3.5	12.9
Market	44.6	3.3	13.5

Note: \* middle income

## 3.2 Public Opinion Survey

Public Opinion Survey (POS) on municipal SWM in the Study Area was conducted in January and February, 2000.

### 3.2.1 Objectives

The survey aimed to determine:

- present waste discharge conditions and manners,
- opinion of the residents and institutions regarding solid waste management services, and
- their needs and demands to the services.

### 3.2.2 Number of Samples

420 households and 52 institutions (including both private companies and public institutions) were chosen from all over the Study Area as samples.

#### a. Households

##### a.1 Sample Size

The number of samples required to make them represent the current population of 1,948,794 at more than 95% probability is 384. In order to diminish sample errors, 420 households were finally sampled.

##### a.2 Selection of Samples

In order to distribute samples in the Study Area, maps made by DIGESTYC were used. The maps have 888 segments and each segment comprises of about 300 households. It should be noted that such segments do not consider rural areas and only urban areas are covered. Then the samples were randomly chosen from the segments in order to represent present situations and opinions of households in the Study Area. Table 3-11 shows the sample distribution of households.

Table 3-11: Distribution of Samples (Household)

Municipality	Sample	
	Nos.	(%)
San Salvador	139	33.1
Mejicanos	43	10.2
Ciudad Delgado	20	4.8
Cuscatancingo	10	2.4
San Marcos	22	5.2
Nueva San Salvador	42	10.0
Antiguo Cuscatlán	12	2.9
Soyapango	70	16.7
Ilopango	21	5.0
San Martín	11	2.6
Apopa	30	7.1
Total	420	100.0

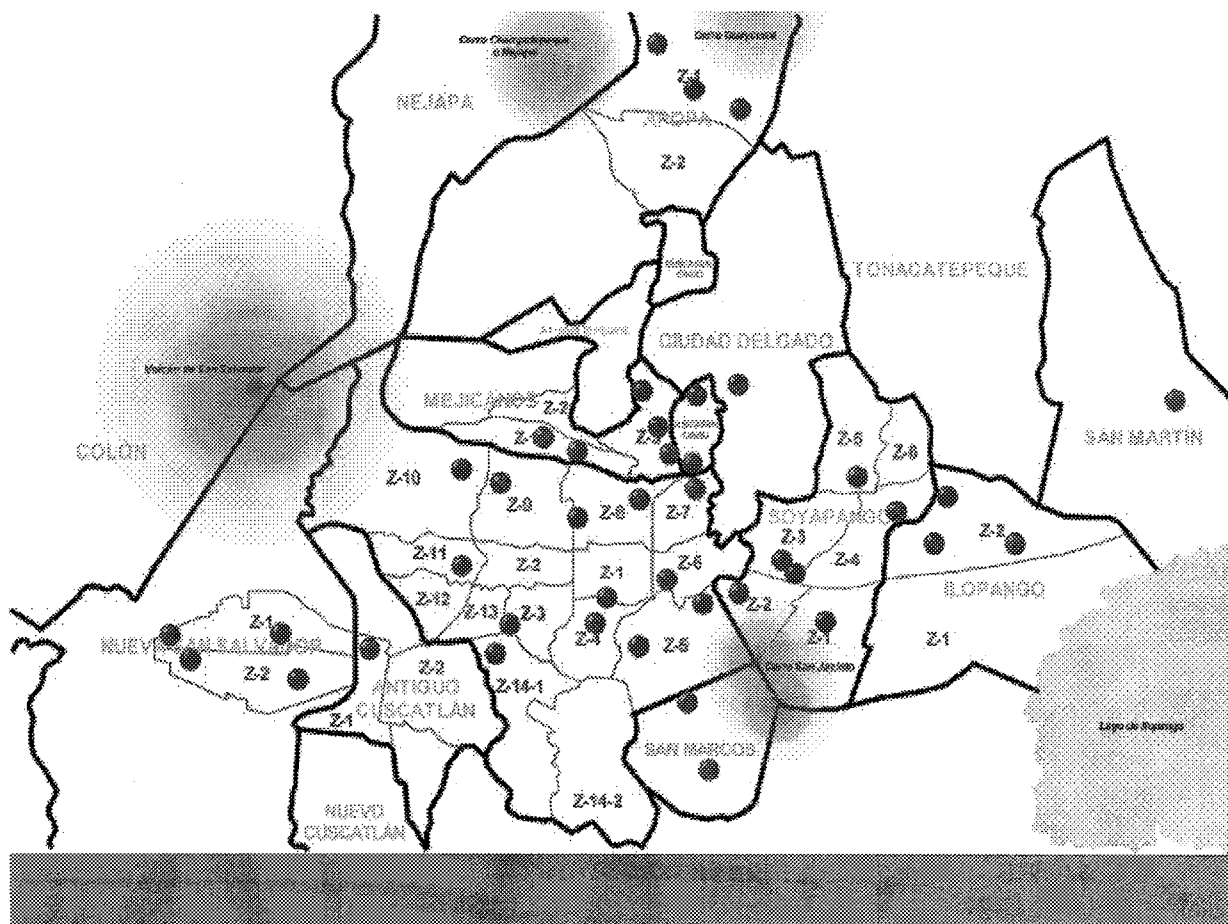


Figure 3-1: Distribution of Samples in the Study Area

**b. Institutions**

52 institutions (including both private companies and public institutions) were sampled by using the DIGESTYC maps in the same way as the households in order that those samples represent the current situations and opinions on SWM of institutions in the Study Area. The sample design also took into account the public sector as well as the private sector.

Table 3-12: Distribution of Samples (Institutions) (1)

Municipality	Sample	
	Nos.	%
San Salvador	34	65.4
Mejicanos	3	5.8
Nueva San Salvador	4	7.7
Antigua Cuscatlán	1	1.9
Soyapango	4	7.7
Ilopango	2	3.8
San Martín	1	1.9
Apopa	3	5.8
Total	52	100.0



Table 3-13: Distribution of Samples (Institutions) (2)

Type of Institutions	Sample	
	Nos.	%
Government office	6	11.6
School	2	3.8
Market	3	5.8
Shop	26	50.0
Restaurant	9	17.3
Manufacture	2	3.8
Other	4	7.7
Total	52	100.0

### 3.2.3 Formulation of Questionnaire

The Study Team prepared the original questionnaire. Through discussion and consultation with the counterparts and a local contractor which conducted this field survey, the draft questionnaire was modified and finalized to meet the actual conditions of the Study Area.

#### a. Households

The questionnaire for households consisted of 9 categories (62 questions):

- 1) General questions; gender, frequency of exposure to the mass media, number of residents, income and expenditure, etc.
- 2) Present situation of public services; access to public services (water supply, sewerage, electricity, etc.), demand for improvement of the services
- 3) Discharge of waste; discharge manner, type of container used, animal scavenging, etc.
- 4) Waste collection services; satisfaction with the service, reasons of dissatisfaction, frequency of the service, etc.
- 5) Recycling and waste reduction; willingness to cooperate with separate collection, necessity of recycling in the Study Area, present situation of recycling, etc.
- 6) Financial matters; amount of collection fee, satisfaction/dissatisfaction with the collection fee, etc.
- 7) Collection fee charging system; tariff (based on electricity/water consumption), billing system (with electricity, water supply, etc.), etc.
- 8) Public cooperation and education; knowledge about waste treatment, willingness to cooperate with a campaign on sanitation/environment improvement, etc.
- 9) Problem about SWM; prioritization of problems about SWM

#### b. Institutions

The questionnaire for private companies and public institutions consisted of 6 categories (39 questions):

- 1) General questions; type of business, number of employees, type of waste generated, etc.,
- 2) Waste storage, discharge, collection and disposal; manner of storage and discharge, frequency of the collection service, direct haulage, etc.
- 3) Recycling and waste reduction; current situation of recycling, type of waste recycled, etc.
- 4) Financial matters; amount of collection fee, satisfaction/dissatisfaction with the collection fee, etc.
- 5) Public cooperation and education; willingness to cooperate with a campaign on sanitation/environment improvement, etc.
- 6) Problem about SWM; prioritization of problems about SWM

### 3.2.4 Results of the Survey

The results are presented in the Data Book.

### 3.2.5 Findings

The findings are presented in Annex C.

## 3.3 Time and Motion Survey

### 3.3.1 Objectives

The survey aimed to obtain the following information of the collection and haulage in order to analyze their efficiency:

- unit time required to perform each task, e.g., preparation of vehicles to operate, collection, haulage to landfill, etc.,
- unit distance of each task, and
- weight of waste collected.

### 3.3.2 The Survey Schedule

#### a. Target Vehicles and Areas

Compactor trucks donated by the Japanese government in 1989<sup>1</sup> and 1996<sup>2</sup> occupy a major number of collection vehicles working in the Study Area. Also, some municipalities utilize dump trucks as collection vehicles. Namely, collection vehicles in the Study Area can be categorized as follows:

- **Large compactor truck** which has a winch for 2m<sup>3</sup> container. 18yd<sup>3</sup> (14m<sup>3</sup>) truck is typical.
- **Small compactor truck** which has no winch for the container. 11yd<sup>3</sup> (8m<sup>3</sup>) and 16yd<sup>3</sup> (12m<sup>3</sup>) are representative trucks.

<sup>1</sup> A 1988 Japanese fiscal year's project

<sup>2</sup> A 1994 Japanese fiscal year's project

- **Dump truck** which is not manufactured specifically for waste collection work, but used in some municipalities due to its convenience of multipurpose use.

On the other hand, currently 10 municipalities haul their waste to the Mariona transfer site and/or Nejapa Landfill. In order to analyze influence of distance to them on the collection and haulage, the Study Area was divided into four parts, i.e., central, west, east and north districts according to the categorization by OPAMSS.

Taking into account the type of collection vehicles and location of the municipalities, 10 collection routes were finally selected (See Table 3-14).

Table 3-14: Targeted Areas and Vehicles for the Time and Motion Survey

District	Municipality	Type of truck		
		Large compactor	Small compactor	Dump truck
Central	San Salvador	x		
	Ayutuxtepeque		x	
West	Nueva S. S	x	x	x
	Antigo Cuscatlan			x
East	Soyapango	x	x	
North	Apopa	x	x	

#### b. Survey Schedule

The site survey was conducted from 7th to 22nd of February 2000. The survey was carried out for 3 days for each route. In total, 30 days of collection and haulage works were recorded.

Table 3-15: Schedule of Time and Motion Survey

District	Municipality	Type of vehicle	Collection route	Equip. No.	Date	Day	No.
Central	San Salvador	Large (18yd <sup>3</sup> )	2.1	63	07-Feb	Mon	1
				58	16-Feb	Wed	2
				26	18-Feb	Fri	3
West	Nueva S.S.	Large (18yd <sup>3</sup> )	Pinares	2	08-Feb	Tue	4
				2	10-Feb	Thu	5
				2	12-Feb	Sat	6
East	Soyapango	Large (18yd <sup>3</sup> )	Montes	19	16-Feb	Wed	7
				19	18-Feb	Fri	8
				19	21-Feb	Mon	9
North	Apopa	Large (18yd <sup>3</sup> )	4	10	07-Feb	Mon	10
				10	16-Feb	Wed	11
				10	17-Feb	Thu	12
Central	Ayutuxtepeque	Small (16yd <sup>3</sup> )	Central	3	09-Feb	Wed	13
				3	10-Feb	Thu	14
				3	11-Feb	Fri	15
West	Nueva S.S.	Small (11yd <sup>3</sup> )	Alpes	19	08-Feb	Tue	16
				19	10-Feb	Thu	17
				19	12-Feb	Sat	18
East	Soyapango	Small (11yd <sup>3</sup> )	Sierra	26	12-Feb	Sat	19
				26	17-Feb	Thu	20
				26	22-Feb	Tue	21
North	Apopa	Small (11yd <sup>3</sup> )	3	13	07-Feb	Mon	22
				13	16-Feb	Wed	23
				13	17-Feb	Thu	24
-	Nueva S.S.	Dump (12m <sup>3</sup> )	Fabricas	16	08-Feb	Tue	25
				14	10-Feb	Thu	26
				14	12-Feb	Sat	27
-	A. Cuscatlan	Dump (16m <sup>3</sup> )	Sultana	8	11-Feb	Fri	28
				8	17-Feb	Thu	29
				8	18-Feb	Fri	30

### 3.3.3 Survey Records and Findings

The survey records and findings are presented in Annex D.

## 3.4 Recycle Market Survey

### 3.4.1 Objectives

The surveys investigated present markets and potential demands for recycled materials, particularly compost and other valuables that would be generated by the technical alternatives to be proposed in the M/P.

The size of the markets and the prices of reusable articles are the main survey items since they could influence the selection of alternatives.

Information on items such as bottles, cans, papers, plastic and compost was investigated by interviewing waste picker, private collectors and recycling companies and by using existing data.

### 3.4.2 Methodology

#### a. Targets of Survey

The survey targets are following sectors.

- Informal sector
  - Waste picker
  - Private collector
  - Middlemen
- Formal sector
  - Recycling companies
  - Compost producer

#### b. Samples

The survey carried out for 22 samples. Table 3-16 shows outline of surveyed samples.

Table 3-16: Outline of Samples

No.	Name	Type of activity	Main product
01	Waste picker	Waste picking	-
02	Waste picker	Waste picking	-
03	Waste picker	Waste picking	-
04	Waste picker	Waste picking	-
05	Waste picker	Waste picking	-
06	Middleman	Brokerage	-
07	PROCOMES	Private Collectors	-
08	Vidrios y Latas	Private Collectors	-
09	Industrias y Destilería "El Muñeco"	Recycling Company	Re-use Bottle
10	Destilería LIZA, S.A. de C.V.	Recycling Company	Re-use Bottle
11	Fabrica de Vidrio (sin nombre)	Recycling Company	Recycled glass
12	HISPALIA, S.A. de C.V.	Recycling Company	Paper
13	Cartotécnica Centroamericana, S.A.	Recycling Company	Paper
14	MOLPASA (Molde de Panamá, S.A.)	Recycling Company	Paper
15	REPACESA	Recycling Company	Paper
16	CORINCA	Recycling Company	Steel
17	ACERO, S.A.	Recycling Company	Steel
18	INDRESA, S.A.	Recycling Company	Steel
19	SIDERURGICA SALVADOREÑA TINETTI, S.A. de C.V.	Recycling Company	Steel
20	La Constancia, S.A.	Recycling Company	Aluminum
21	Fundidora Elmos, S.A de C.V.	Recycling Company	Aluminum
22	SALVAPLASTICS, S.A. de C.V.	Recycling Company	Plastic

### **c. Survey Item**

The survey items are as follows.

- General information of company (number of employee, type of company, established year, annual sales amount, main products or services)
- Major products and shipping item
- Profile of the major client (size of company, sales price and amount, etc.)
- Profile of the major supplier (type of supplier, type of material, original cost, supply amount)
- Processing method
- Opinion (cooperation of recycle activities, trend of production amount, etc.)

### **3.4.3 Results and Findings of Survey**

The results and findings of the survey are presented in Annex E.

## **3.5 Medical Waste Survey**

### **3.5.1 Objectives**

The medical waste survey (MWS) was carried out with following objectives.

- To understand the status quo of the medical waste management in AMSS
- To obtain information for formulating an optimal system for the future medical waste management
- To estimate present and future medical waste stream based on the outcome of this MWS

### **3.5.2 Samples**

Table 3-17 shows numbers of medical institutions and beds in AMSS. 41 medical institutions are selected from them for this inquiry survey on medical waste management (Table 3-18). With regard to medical waste amount, not only the medical institutions but also medical waste collectors are inquired in this survey.

Table 3-17: Hospitals and Number of Beds in AMSS

Classifications		Nos. of hospital	Nos. of beds per type of hospital			Total
			I more than 200 beds	II 50 to 200 beds	III less than 50 beds	
Private	Charity	1	-	60	-	60
	NGOs	1	-	78	-	78
	Private	19	-	347	277	624
	Total	21	-	485	277	762
Public	ISSS	15	908	377	120	1,405
	Ministerio de Defensa	1	302	-	-	302
	Ministerio de Justicia	1	-	50	-	50
	MSPAS	32	2,480	111	345	2,936
	Total	49	3,690	538	465	4,693
Total		70	3,690	1,023	742	5,455

Table 3-18: Outline of Sample Hospitals

N°	Name	Managed by	Beds	Address	Tel.
1	Hospital Rosales	MSPAS	554	Final Calle Arce y 25 Av. Norte	222-5866
2	Hospital Maternidad	MSPAS	308	1 Calle Poniente y 25 Av. Norte	221-0129
3	Hospital Zacamil	MSPAS	230	Centro U. J. S. Cañas, C. Zacamil, Mejicanos	272-2000
4	Hospital Bloom	MSPAS	291	25 Av. Norte y Final. 29 calle Poniente	225-8171
5	Hospital Psiquiátrico	MSPAS	400	Calle La Fuente, Cantón Limón Soyapango	291-0056
6	Hospital Neumológico	MSPAS	292	Carretera Planes de Renderos km. 9 1/2	280-8202
7	Hospital San Rafael	MSPAS	220	Final. 4ta. C. Ote. #9-2 Nueva S.S.	228-1740
8	Hospital San Bartolo	MSPAS	60	Fnal.C. Fco. Menéndez , Z. Franca San Bartolo	295-1675
9	Hospital Militar	M. Def.	274	Res. San Luis, Av. Bernal	274-6066
10	U.de S. San Miguelito	MSPAS	0	20 Av. Nte. y 25 Calle Ote.	274-3283
11	U. de Salud Concepción	MSPAS	0	Barrio Concepción, 5° Calle oriente, S.S	235-8850
12	U.de San Antonio Abad	MSPAS	0	Fnal. C. El Algodón Col. Miralvalle	274-3239
13	Laboratorio de Salud	MSPAS	0	Alameda Roosevelt Contiguo Hospital Rosales	271-1339
14	Medicina Legal	M.Jus.	0	Centro Judicial Isidro Menéndez	235-1923
15	Hospital M. Quirúrgico	ISSS	308	Av. Juan Pablo II y 1a. Calle Poniente	260-9277
16	Hospital Oncológico	ISSS	53	1 Calle Pte. Y 25 Av. Norte	260-9242
17	H. de Especialidades	ISSS	325	1era. C. Pte. Ctgo. Inst. del Cáncer	260-7369
18	Hospital 1 de Mayo	ISSS	218	Calle Arce y 23 Av. Sur	271-1166
19	Hospital Psiquiátrico	ISSS	103	1era. C. Pte. y C. Arce No 1290	271-0809
20	Hospital Neumológico	ISSS	91	Carretera Planes de Renderos km.8 1/2	280-8140
21	C. de Salud Zacamil	ISSS	0	C. Urbano J. S. Cañas, C. Zacamil, Mejicanos	272-5019
22	Hospital Pro Familia	NGOs	78	25 Av. Norte No. 583	226-3999
23	H. Divina Providencia	Charity	80	Col. Miramonte, Cl. Toluca Pje. B	260-0509
24	Hospital de Diagnostico	Private	62	Col. Medica, Diagonal Dr. Luis Vasquez	226-5111
25	Hospital Ginecológico	Private	55	Col. Medica, Diagonal Dr. Luis Vasquez	226-1122
26	Hospital Metropolitano	Private	30	23 Av. Nte. No. 1340, Col. Medica	225-0060

N°	Name	Managed by	Beds	Address	Tel.
27	Hospital Baldwin	Private	50	37 Av. Nte. No 207	260-9900
28	Hospital de la Mujer	Private	50	Entre 81 y 83 Av. Sur, Col. Escalón	263-5111
29	Hospital Central	Private	28	Col. Guadalupe y Bulevar Tutunichapa	225-5822
30	H. Centro Pediátrico	Private	30	Diagonal Luis E. Vasquez No. 222, Col. Medica	225-3688
31	H. C. de Emergencias	Private	16	Diagonal Dr. Luis Edmundo Vasquez	226-0003
32	Hospital Clínica Mater	Private	10	3ra Calle Pte. No 1225	221-9790
33	H. Cl.Ginec. Drs. Farela	Private	10	27 Av. Nte. No 1317 Col. Medica	225-9967
34	Hospital Climosal	Private	15	6 C. Pte. Entre 6a. y 8a. Av. Sur, Santa Tecla	228-2334
35	Cruz Roja	Private	0	17 C. Pte. y Av. Henry Dunant	271-9220
36	Hospital Salvadoreño	Private	21	6a. Décima c. Pte. No. 2419, Col. Flor Blanca	245-4564
37	H. de Ojos y Otorrino	Private	14	Col. Médica Av. Max Bloch y Av. Emilio Alvarez	225-0122
38	Hospital Instituto de Ojos	Private	10	Bulevar Tutunichapa 2da Diagonal No 326	225-3687
39	Cli. F. de Odont. UES	UES	0	Fnal. 25 Av. Nte. Cdad. Universitaria	225-7198
40	H. Internacional de Ojos	Private	2	Col. Medica, diag. Victor M. Posada No.1321	235-2440
41	Hospital Bautista	Private	55	23 av. Nte. No. 128	222-5522
Total number of beds			4,343		

### 3.5.3 Formulation of Questionnaire

Focal points of the survey items were generation, separation, storage, discharge, collection, treatment and disposal of infectious/hazardous waste from medical institutions. The survey items are summarized as follows.

#### a. Basic Questions

- Location
- Type of services
- Number of employees
- Number of beds
- Others

#### b. Actual Conditions of Generation Source Separation, Storage, Discharge, Collection, Treatment, and Disposal of Infectious and Hazardous Medical Wastes

- Generation amount and composition
- Source separation and methods involved
- Storage method and containers used
- Discharge method and containers used
- Treatment methods (e.g., incineration, disinfection)
- Collector and collection method
- Location where the waste is disposed of and disposal method
- Others

#### c. Opinions

*For infectious and hazardous wastes:*



- Knowledge of medical waste management regulations and their enforcement
- Education of employees on the methods of handling of infectious and hazardous medical wastes
- Fees for the collection and treatment of infectious and hazardous medical wastes

*For municipal wastes*

- Awareness of environmental and sanitation problems
- Acknowledgement of the importance of environmental consideration
- Views on introduction of separate collection
- Payment of collection fees (cleansing tariff) and collection fee amount
- Views on collection fee
- Cooperation in recycling activities
- Contracting out to private companies or direct haulage by the institutions
- Current collection methods
- Others

#### **3.5.4 Results and Findings of the Survey**

The results and findings are presented in Annex F.