Central American and Caribbean Region

Data Collection Survey on Solid Waste Management Sector in the Central American and Caribbean Region

Final Report

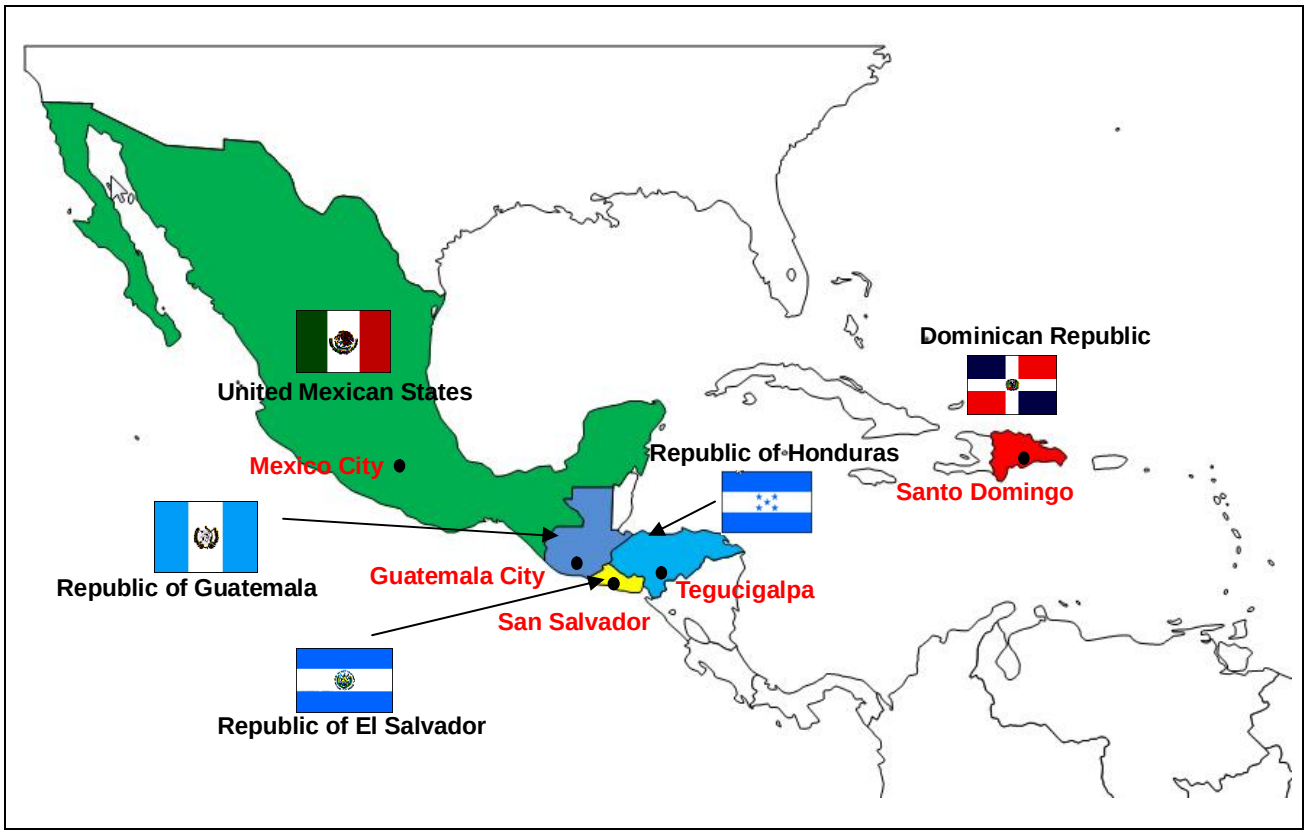
November 2012

Japan International Cooperation Agency

EX Research Institute Ltd.
Rurban Designs, Inc.

GE
JR
12-152

Target Countries of the Field Survey in the Study



	Dominican Republic Area: 48,442 km^2 Population: 10.01 million (2009)		Republic of El Salvador Area: 21,040 km^2 Population: Approximately 6.19 million (2010)
	Republic of Guatemala Area: 108,889 km^2 Population: 14.71 million (2011)		Republic of Honduras Area: 112,492 km^2 Population: Approximately 7.6 million (2010)
	United Mexican States Area: 1,960,000 km^2 Population: 108.63 million (2010)		

Source: Homepage of Ministry of Foreign Affairs, Government of Japan, http://www.mofa.go.jp/mofaj/area/index.html

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1 Background of the Study

In the Central American and Caribbean region, the increase in the amount of wastes caused by the recent rapid economic growth and urbanization has become a serious social issue. Many countries in the region consider waste management as an important policy issue and have been promoting improvement in waste management and waste amount reduction in the recent years. However, issues still remain to be solved such as those regarding lack of infrastructure (e.g. final disposal sites) or those regarding lack of equipments (e.g. waste collection vehicles). Therefore, comprehensive capacity building regarding waste management should be realized through measures such as establishment of proper waste collection and maintenance systems, reduction of wastes, and promotion of recycling.

Based on the requests from the countries in the Central American and Caribbean region, JICA has been actively promoting cooperation in the waste management sector in this region. The Government of Japan is also promoting the concept of 3R (reduce, reuse and recycle) through policy support and technical cooperation under the 3R initiative, which was proposed in the G8 summit in 2004.

JICA has been implementing waste management projects in the region in partnership with the staffs of local governments who are directly involved in the waste management works. This type of cooperation has made considerable achievements and has contributed to improvement in waste management including management of final disposal sites.

On the other hand, it has been identified through the previous cooperation that the capacity of the central ministries such as Ministries of Environment which supervise the local governments is sometimes lacking, such as in cases where there are no national waste management plans.

In order to strategically build on and expand the achievements realized in the past cooperation, capacity building of the central ministries which are responsible for the waste management policies is believed to be indispensable.

It has been identified that the situation of waste management differs greatly among countries and that there are still many remaining issues to be solved. For instance, the relationship between the central government and the local governments or the level of private participation differs greatly among countries. With regard to 3R activities, while implementation may be feasible at a pilot scale, efforts such as cooperation with the private sector or development of products made from recycled materials would be required for the sustainable implementation and development of the activities. Thus, many considerations must be taken into account when cooperation is initiated.

1.1 Objective of the Study

In this context, this Study was conducted with the objective to identify the direction, the purpose, and the principles of cooperation concerning waste management in the Central American and Caribbean region in order to build on and expand the achievements realized in the past cooperation in the waste management sector. In order to achieve this objective, the current situation of the region and the existing common issues were identified, keeping in mind the cooperation with the central ministries who are responsible for the policies.

1.2 History of Waste Management

The first principle in waste management is to prevent damage to the public health. In the first stage of waste management, waste should be safely removed from people’s living space. This is realized through discharge, storage, collection, and transportation of wastes, and the level of achievement can be measured by the waste collection rate. In the second stage of waste

management, waste should be safely treated and disposed. This is realized through intermediate treatment and final disposal, and the level of achievement can be measured by the rate of sanitary landfill (i.e. “sanitary landfill coverage”).

In the third stage, integrated waste management that reduces environmental pressure should be implemented. This is realized through waste prevention from the production, distribution, and consumption stage of products (which may later become wastes) and through promotion of recycling. The level of achievement can be measured by the amount of waste generation per capita.

In each stage, actions such as development of rules (e.g. law, ordinance), establishment of organizations and/or institutions to enforce and manage the rules, and securement of financial resources for management would be required. In order to implement these actions, it is important that there are appropriate waste management policies in place which take into consideration the social and economic conditions of the country.

In addition to collection, transportation, treatment, and disposal of wastes, there is also the collection of recyclables which have market values. In developing countries and newly industrialized countries (at first and second stage of waste management), laws on collection of recyclables are often not enacted and thus recyclables are not properly managed. As a result, recyclables are collected without order by the informal sector (e.g. waste pickers). As economies grow and countries change from being newly industrialized countries to developed countries (at second and third stage of waste management), countries generally enact laws and regulations regarding collection of recyclables and the activity becomes formalized.

In some cases, especially in the developed countries (at third stage of waste management), collection of recyclables is implemented even if the activity is not profitable (i.e. the cost for collection exceeds the sales from recyclables) in order to promote recycling and to reduce the environmental pressure.

1.3 Contents of the Study

The Study conducted the followings in the Central American and Caribbean region.

- Review of achievements realized by previous cooperation activities implemented by JICA
- Identification of current situation with regard to waste management through literature and field survey
- Identification and analysis of current issues in the waste management sector

The results of the Study will be utilized as important information in considering future assistance policies and scopes of the cooperation. The Study consists of literature survey covering all countries in the region and field survey in five countries.

1.3.1 Target Region of the Study

The target of the Study is the Central American and Caribbean region, which consists of following regions (the classification of the countries is as defined by the Japanese Ministry of Foreign Affairs).

- Central American Region: El Salvador, Cuba, Guatemala, Costa Rica, Dominican Republic, Nicaragua, Panama, Honduras, Mexico
- Caribbean Region: Antigua and Barbuda, Guyana, Grenada, Suriname, Jamaica, Saint Vincent and the Grenadines, Saint Christopher and Nevis, Saint Lucia, Trinidad and Tobago, Dominica, Haiti, Bahamas, Barbados, Belize

1.3.2 Target Countries of the Field Survey

Field Survey was conducted in five countries, namely Dominican Republic, Republic of Guatemala, Republic of Honduras, and United Mexican States.

1.3.3 Organizations Surveyed

Central Ministries (ministries such as Ministry of Environment which are responsible for waste management issues), principal local governments, inter-municipal associations that work for waste management, private companies involved in waste management, and other donors were surveyed in the Study.

1.3.4 Identification of the Current Conditions

The current situation was identified regarding cooperation projects such as those implemented by JICA, waste management policies and planning, and assistance by other donors. In doing this, the information at the macro-level such as the human development index, economic indicators, and political institutions were taken into account.

1.3.5 Identification of Issues

The current issues of waste management were identified in view of cost, level of waste management, and institutional/organizational mechanism through the survey.

1.3.6 Considerations of Structured Partnership within the Central American and Caribbean Region

Information which would be useful in determining the content of cooperation with each country was collected. Furthermore, with the view to enhance systematic partnerships within the region such as application of good practices to other countries, information which would be useful in identifying the cooperation strategies was collected and examined. This was done through reviews of different cooperation schemes such as loans, grants, technical cooperation, trainings, south-south cooperation, and volunteer programs.

1.3.7 Investigation of the Potential to Utilize Japanese Technologies

The potential of utilizing waste management technologies where Japan holds competitive advantage such as in semi-aerobic landfill, 3R, and waste incineration was investigated. In doing so, which Japanese technologies hold competitive advantage when applied to assistance to developing countries was considered. With regard to promotion of waste incineration facilities, its validity was considered taking into account the relevant policies in each country.

2 Outline of the Field Survey

The outline of the field survey is shown in the table below (the detailed minutes are contained in Annex 1).

Table 1: Schedule of Field Survey

Dates		Kato	Yamamoto	Ogawa	City Stayed in
Aug 10	Fri	From Japan (Narita) to US (Dallas)	-	From Japan (Narita) to US (Dallas)	Dallas
Aug 11	Sat	From US to Honduras	-	From US to Honduras	-
Aug 12	Sun	Honduras	-	Honduras	Tegucigalpa
Aug 13	Mon	↓	-	↓	Tegucigalpa
Aug 14	Tue	↓	-	↓	Tegucigalpa
Aug 15	Wed	↓	-	↓	Ocotepeque
Aug 16	Thu	↓	-	↓	Ocotepeque
Aug 17	Fri	↓	-	↓	Tegucigalpa
Aug 18	Sat	From Honduras to Guatemala	From Narita to Guatemala	From Honduras to Guatemala	Guatemala City
Aug 19	Sun	Guatemala			Guatemala City
Aug 20	Mon	↓			Guatemala City
Aug 21	Tue	↓			Guatemala City
Aug 22	Wed	↓			Guatemala City
Aug 23	Thu	↓			Guatemala City
Aug 24	Fri	↓			Guatemala City
Aug 25	Sat	From Guatemala to El Salvador			San Salvador
Aug 26	Sun	El Salvador			San Salvador
Aug 27	Mon	↓			San Salvador
Aug 28	Tue	↓			San Salvador
Aug 29	Wed	↓			San Salvador
Aug 30	Thu	↓			San Salvador
Aug 31	Fri	↓			San Salvador
Sep 1	Sat	From El Salvador to Mexico			Mexico City
Sep 2	Sun	Mexico			Mexico City
Sep 3	Mon	↓			Mexico City
Sep 4	Tue	↓			Mexico City
Sep 5	Wed	↓			Mexico City
Sep 6	Thu	↓			Mexico City
Sep 7	Fri	↓			Mexico City
Sep 8	Sat	From Mexico to Dominical Republic			Santo Domingo
Sep 9	Sun	Dominical Republic			Santo Domingo
Sep 10	Mon	↓			Santo Domingo
Sep 11	Tue	↓			Santo Domingo
Sep 12	Wed	↓			Santo Domingo
Sep 13	Thu	↓			Santo Domingo
Sep 14	Fri	↓			Santo Domingo
Sep 15	Sat	From Dominican Republic to US			New York
Sep 16	Sun	From US to Japan (Narita)			-
Sep 17	Mon				-

2.1 Honduras

2.1.1 Outline

The Waste Management Unit has just been established in the Ministry of Natural Resources and Environment (*Secretaria de Recursos Naturales y Ambiente* or SERNA) in February 2012. Currently, there are two staffs responsible for waste management, and both have participated in the 3R training (*Curso Internacional para el desarrollo de elementos para el fortalecimiento de la instrumentación de la gestión integral de residuos con enfoque en 3Rs (Reducir, Reutilizar y Reciclar)*) at the National Environmental Research and Training Center (*Centro Nacional de Investigación y Capacitación Ambiental Mexico*, hereinafter "CENICA"); one in 2011 and the other in 2012. The action plans that they have developed in those trainings have been useful in preparation for waste management laws and regulations. Currently, there are not many staffs in the Waste Management Unit. However, taking into account the fact that the current Minister of Natural Resources and Environment is considering waste management as a priority issue and that the Waste Management Unit was established in February 2012, it is likely that the number of staffs will grow in the near future. The staffs in charge of waste management are aware that they are still lacking in capacity, and they are hoping that JICA can support the capacity building of the waste management administration.

Although JICA has supported development of the master plan for Tegucigalpa City and implementation of pilot projects regarding waste management in the Study on Solid Waste Management of the Urban Area of Tegucigalpa Central District in the Republic of Honduras (*Estudio sobre Manejo de Residuos Sólidos en el Area Urbana de Tegucigalpa, Distrito Central, en la República de Honduras*), a staff of SERNA has commented that "Their achievements have not been sufficiently utilized due to changes in the political situation (i.e. changes in priorities of the policy makers).

The Association of Municipalities in Honduras (*Asocciación de Municipios de Honduros*, hereinafter "AMHON") is an association of municipalities which plays a central role in waste management. However, the members are aware that they lack capacity to implement waste management (e.g. they are not aware of how much sanitary landfill operation would normally cost), and they hope that JICA would support them for the capacity building.

Comayagua City, the former capital city of Honduras, is a city located to the North East of Tegucigalpa, the current capital city. The final disposal site located in this city is a sanitary landfill where there is leachate treatment facilities constructed with the cooperation of Danish International Development Agency (DANIDA).

Figure 1 : Location of Comayagua and Ocotepeque

For the construction of the facilities, DANIDA provided the financial and human resources. With regard to human resources, staffs to supervise the whole project were dispatched from Denmark. With regard to technical aspects, a consultant from El Salvador was hired. This consultant had good knowledge of waste management which had been acquired through participating in JICA's Study on Regional Solid Waste Management for San Salvador Metropolitan Area (*Estudio sobre el Manejo Regional de Residuos Sólidos para El Área Metropolitana de San Salvador en la República de El Salvador*) and participation in the technical project "The project on Integrated Solid Waste Management for Municipalities in El Salvador" implemented by Inter-municipal Association of the Northern Area of La Union (*Asosciación Intermunicipal del Norte de La Unión*, hereinafter "ASINORLU"). The site consists of weighing facilities, administration building, disposal site for municipal solid wastes, disposal site for medical wastes, and leachate treatment facilities. The facilities were very well maintained.

In Ocotepeque Prefecture which is located near the border with Guatemala and El Salvador, "*Mancomunidad del Valle de Sensenti*", an inter-municipal association composed of 7 municipalities (similar to regional associations in Japan), is planning to construct a new final disposal site. Some facilities in this disposal site such as the administration building have already been built, and the construction cost for the final disposal landfill is going to be financed by Spain through SICA (Central American Integration System) and five local municipalities (the municipal councils have already approved of the finance). Thus, the construction of this disposal site is very likely to be realized. This main implementing agency of this project is going to be the NGO *Fundación Microfinanciera Hermandad de Honduras*[1]. After completion of the construction works, a municipal company with specific purpose to final disposal activities will be established and will manage and operate this final disposal site with the revenue from tipping fee.

Establishment of a regional disposal site managed by seven municipalities is a first trial in Honduras. If this trial proves to be successful, then this example could be applied to other similar regions within Honduras or be applied to other similar regions in other countries with the cooperation of the neighboring El Salvador and Guatemala.

However, the implementing organization of this project (a NGO which is coordinating the seven

[1] http://www.hermandadopdf.org/

municipalities and is promoting this project) does not have experience in construction or management of a disposal site. Thus, this organization wishes that JICA provide it technical cooperation as it has provided for ASINORLU in El Salvador.

In Ocotepeque Prefecture, Project Cycle Management (hereinafter "PCM") workshop was organized with staffs of municipalities which are members of *Mancomunidad* in order to analyze the existing problems. The results of the problem analysis in the workshop are shown in Figure 2.

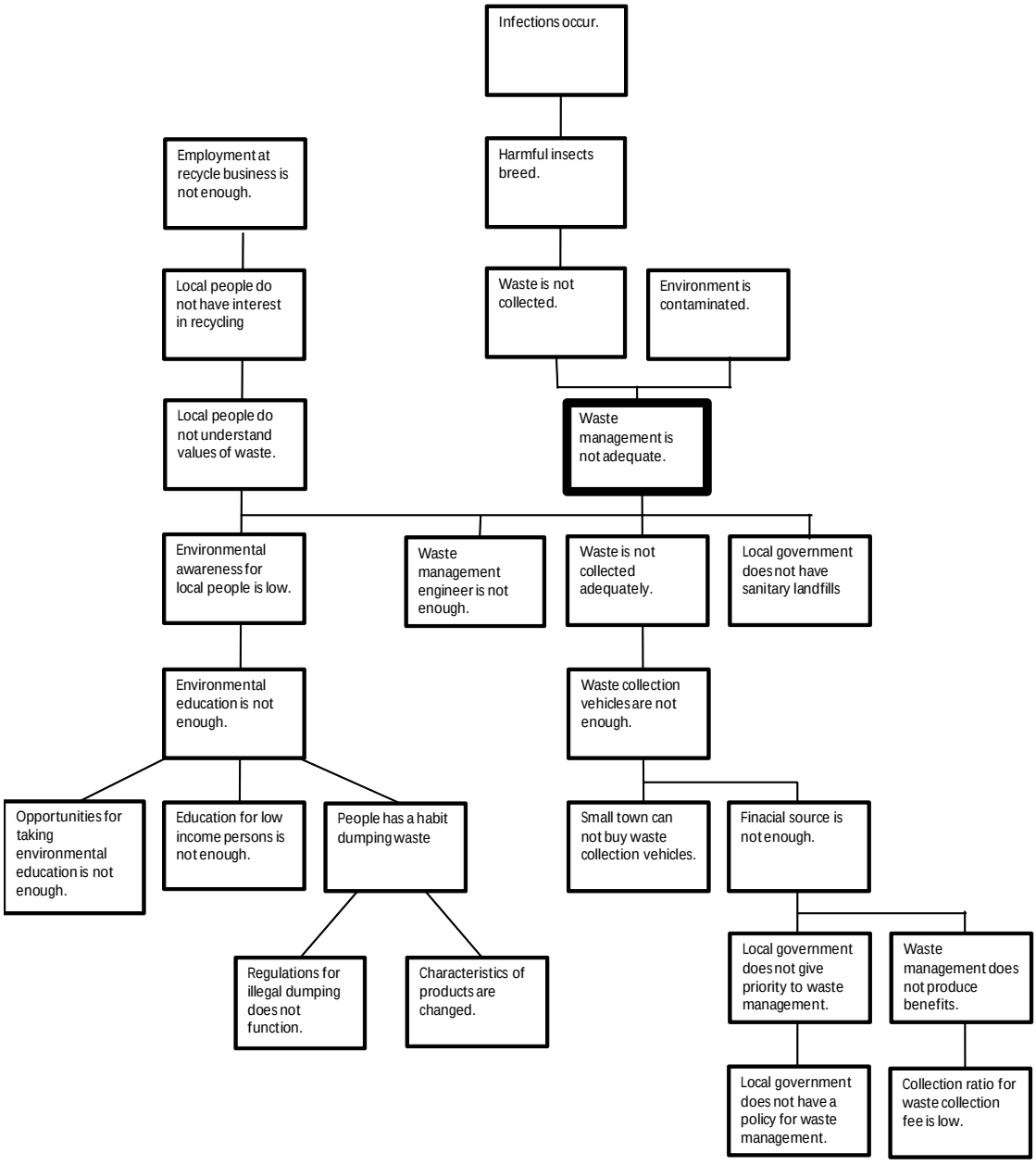


Figure 2: Results of Problem Analysis from the PCM Workshop

In the workshop, many participants pointed out problems related to public environmental education. When the JICA Study Team facilitated the participants to consider the problem of "insufficient waste management", some of the reasons for this problem were identified as "low public awareness on environmental issues", "lack of waste management engineers", "lack of

adequate collection service", and "lack of sanitary landfills", and low public awareness became the center of discussion among the Honduran participants. Meanwhile, little was discussed about the roles or responsibilities of the local governments. It could be due to the fact that the public officials are not aware or reluctant to be aware about their responsibilities. The public officials, especially at the local level, may not consider themselves as "public servants", which could partly be due to the cultural background.

2.1.2 Capacity Assessment

The capacity of the central ministries and agencies and the local governments involved in waste management were assessed based on the JICA capacity assessments (targeted for central ministries and agencies and local governments). The results of the capacity assessments are summarized in the following sections (the capacity assessment sheets are contained in Annex 2).

a. Central Ministries and Agencies

The results of the capacity assessment are summarized in the table below.

Ministry of Natural Resources and Environment (SERNA) of Honduras		
Item	Results of Assessment	Evaluation
Basic Information	Basic information regarding population, land use, natural conditions, economy, and policies are available on websites (the actual information and their sources are both made available)	A
National Laws on SWM	Laws and regulations on waste management is being established.	B
National Policy and Plan	The Draft National Plan 2012-2014 defines proper waste management and 3R	A
Administration in National Level	Although the Ministry of Natural Resources and Environment and the Ministry of Health are both responsible for waste management at the national level, the role of each ministry is not clearly defined. The implementing agency for waste management is the local governments, their knowledge and experience with regard to technical and operational aspects is lacking.	B
National Organization on SWM	A committee consisting of organizations dealing with wastes (relevant ministries, local governments, private companies, etc) was established	A
Privatization Policy	Rules regarding the participation of private companies in the waste management business was established, and some companies conduct collection and transport of wastes. However, all disposal sites are operated by the local governments.	B
Financing	Establishment of a financial system regarding waste management is currently being prepared.	B
Environmental Impact Assessment (EIA) System	There are established laws regarding EIA. EIA must be conducted before constructing waste related facilities.	A
Hazardous Wastes and Chemicals	There are provisions in the General Environmental Law regarding management of solid wastes and hazardous wastes.	B
Pollution caused by waste	Wastes adversely affect the surrounding scenery	B
Education and Training	Although many donors have provided support, many of the efforts are short-term or one-time (not sustained.)	B
Personnel/Organizational Structure	There are only 2 staffs assigned to the Waste Management Unit of SERNA	C
Equipments	Not applicable	-
Explanatory note: A: Good, B:Can be improved, C: Needs to be improved, -: Not applicable		

b. Local Governments

The results of the capacity assessment are summarized in the table below.

Inter-municipal association in a local city in Honduras (Ocotepeque / Mancomunidades Guisayote y Valle de Sensenti)		
Item	Results of Assessment	Evaluation
Basic Information	Basic information from the government and those regarding population, land use, natural conditions, economy, and policies are available on websites (the actual information and their sources are both made available)	A
Management System	Currently, each municipality is managing waste on its own. There are plans for establishing inter-municipal disposal sites by *Mancomunidad.*	B
Collection Rate	Not identified	C
Rules/Regulations	Governed by national laws and regulations	B
Policies	Governed by national laws and regulations	B
Master Plans in City Level	None	C
Finance	Financed by general revenue of each city and support from international organizations	B
Accounting	Financial resources are not enough and should be secured (Accounting/budget system is not clear.)	C
Human Resources	A few number of staffs assigned to waste management for each municipality	B
Intellectual Assets in SWM	None	C
Waste Generation	As there are no weighing facilities, the amount of generated waste is estimated based on the number of collection vehicles.	C
Waste Discharge	No separate discharge	B
Collection and Transport Equipments	Situation is different among different municipalities. In general, there are not enough collection vehicles.	B
Waste Collection	Station collection (collection at collection points)	A
Sweeping, Cleansing	Implemented (although quantitative data is not available)	B
Waste transport	No transfer stations (due to no need)	-
Intemediate treatment	None	-
Recycling	The waste pickers at the disposal site collect the recyclables. The waste pickers are not controlled/	C
Final Disposal Site	There are 4 open dumping sites	C
Medical Wastes	Management rules are not identified	C
Hazardous Wastes	Management rules are not identified	C
Industrial Wastes	Management rules are not identified	C
Social Organizations	There is an active NGO called *Hermandad de Honduras*.	A
Waste Pickers	There are several waste pickers at the dump sites but they are not organized.	C
Waste Recycling Markets	Recyclables such as plastics, glass, and paper are recycled. Middlemen from large cities come to purchase them.	C
Waste and Environmental education	*Mancomunidad* implements environmental education in institutions such as schools	A
Solid Waste Problem(s)	There are no sanitary landfill disposal sites. The collection service is not implemented appropriately. The citizens is not well-consious about environment.	C
Explanatory note: A: Good, B:Can be improved, C: Needs to be improved, -: Not applicable		

2.1.3 Conclusion

The current Minister of Natural Resources and Environment visited the ASINORLU disposal site which was constructed in the Project on Integrated Solid Waste Management for Municipalities in El Salvador which was supported by JICA. As a result, the Minister recognized the importance of waste management and the rules on waste management was approved by the legislative assembly in 2011. The country seems to be active in improving waste management through establishing Waste Management Unit in the Ministry of Natural Resources and Environment and enacting relevant laws.

In addition, with the objective to improve the current situation where only 11.3%[2] of all the waste are disposed at sanitary landfills, there are efforts in Comayagua and other local cities to change current final disposal operations to sanitary landfill. It can be said that the ASINORLU project in El Salvador implemented by JICA and the local consultants who were trained by JICA have greatly contributed to such efforts.

Furthermore, among the local governments that are members of AMHON of Honduras, there are several local governments, namely Puerto Cortes, Comayagu, and Santa Rosa, which are successfully implementing appropriate waste management. Some of the aspects in common among these cities are that the population is relatively large (not Tegucigalpa), the organizations that implement waste management are functioning, and the economy is robust and fees are properly collected. AMHON mentioned that the waste management system shoule be built with due consideration of the capacity of each local government. It also commented that they have made field visits to El Sanvador, but that how to apply their waste management technologies and practices is another important issue to consider in Honduras. Inspired by such efforts, Ocotepeque Prefecture and several municipalities (*Mancomunidad del Valle de Sensenti*) are planning to construct a sanitary landfill site. However, there are concerns that the NGO which is supporting this project may not have sufficient capacity regarding construction or management/operation of landfill sites.

In addition, in the PCM workshop, the issue that citizens have low awareness was the center of discussion. Little was discussed about the roles and responsibilities of the local government, and it was considered that the sense of commitment/responsibility as public servants are still limited especially at local government level.

[2] REGIONAL EVALUATION ON URBAN SOLID WASTE MANAGEMENT IN LATIN AMERICA AND THE CARIBBEAN - 2010 REPORT, IDB, AIDIS, PAHO 2010

2.2 Guatemala

2.2.1 Outline

All institutions visited mentioned that unless the Law for Integral Waste Management (*Ley para la Gestión y Manejo Integral de los Residuos y Desechos*) is approved by the national congress, it is difficult to implement appropriate solid waste management in Guatemala.

Outilne of Ley Para la Gestión y Manejo Integral de los Residuos y Desechos
With the objective to implemented integrated waste management, this law aims to achieve the following goals: - Clarify the responsibility of the waste generators - Decentralize integrated waste management - Implement integrated waste management through sorting, reduction, recycling, and application of appropriate technologies - Reduce illegal dumping of wastes - Raise awareness to change consumption behavior so that waste generation would be prevented - Promote cooperation with national educational system in order to promote appropriate waste management This law stipulates basic issues regarding waste management such as the responsibilities of different actors (i.e. relevant ministries and agencies, local governments, and dischargers), definition of waste, the role of National Commission for the Management of Solid Waste (CONADES) and its components, the obligation of preparing national and municipal plans, and the minimal tipping fee for final disposal.

The capital Guatemala City generates about 1,500 ton/day of municipal wastes and the collection service is provided by concessionaires. Concessionaires also collect services fees and complaint settlements by themselves. The municipality of Guatemala is in charge of final disposal management/operation and street/road sweeping. While the municipal employees count for about 9,000 persons, municipal personnel in charge of the solid waste management counts for only 216 persons, and only 4 of them are management staffs among them (178 persons are assigned to market waste and illegal dumping and the remaining 34 persons are for final disposal site management/operation). The current number of municipal staffs responsible for waste management seems to be seriously insufficient in order for them to be able to appropriately manage 1,500 tonnes of dayly generated solid waste.

According to the interview to Municipal Development Institute (*Instituto de Fomento Municipal*, hereinafter “INFOM”), municipalities put their higher policy priorities on potable water, sewage (sewer system), street lights, parks, public schools, road pavement etc while comparatively limited priority on solid waste management. INFOM stated that this is due to the absence of the sound legislative framework of solid waste management.

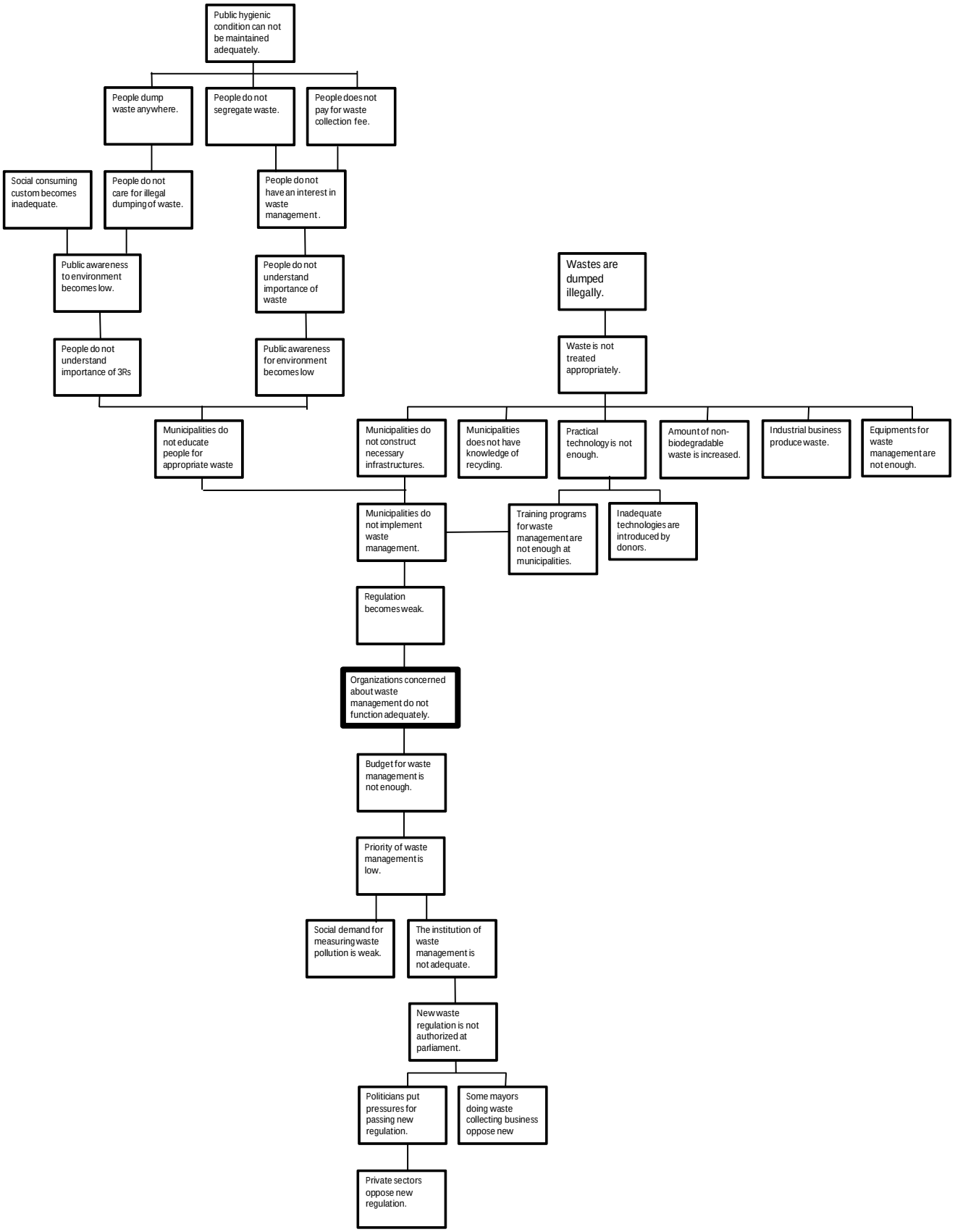


Figure 3: Results of Problem Analysis from the PCM Workshop

A PCM workshop was organized with staffs of central ministries relevant to waste management with the objective to identify the core problem in waste management. The participants analyzed the problem with the facilitation of the JICA Study Team. In the workshop, it was concluded that because the law-enforcement capacity is weak in the present legal system on solid waste management, municipalities are generally not capable of implementing appropriate solid waste management. As a result, illegal dumping is left unresolved to threaten public health in the city.

The four reasons identified for this problem were that the private sector relevant to waste management or the head of the local governments which implement waste collection are "preventing the enactment of Law for Integral Waste Management", and as a result, the "institutions capacity of waste management is limited". Furthermore, "social pressure is weak" regarding waste management which is leading to "low prioritization of waste management". However, it is considered that these four reasons are not the only reasons for the current situation.

From the comments of the participants of the PCM workshop, it was understood that the initial objective of creating National Commission for the Management of Solid Waste (CONADES) was to grant it the national authority to regulate waste management. However, today the CONADES has become merely an advisory body. This could be why the relevant ministries and agencies could not interatively functioned. OPS/OMS has made comments that "legislations are lacking, the responsibilities of different organizations are unclear, and the responsibilities of competent authority are insufficient", which is in line with the perception of the workshop participants.

The current issues should be solved one by one with the national congress approval and enactment of the Law for Integral Waste Management. However, it is also anticipated that the approval and enactment of the law may be delayed than expected, as there are considerable conflicts of interests among many different stakeholders.

2.2.2 Capacity Assessment

a. Central Ministries and Agencies

The results of the capacity assessment conducted based on the capacity assessment sheets contained in Annex 2 are summarized in the table below.

Ministry of Environment and Natural Resources of Guatemala (MARN) and National Commission for the Management of Solid Waste (CONADES)		
Item	Results of Assessment	Evaluation
Basic Information	Basic information regarding population, land use, natural conditions, economy, and policies are available on websites (the actual information and their sources are both made available)	A
National Laws on SWM	A sound legal framework is in the process of establishment.	B
National Policy and Plan	There is a national program (plan), but it is currently only a plan and not yet at the stage of implementation.	B
Administration in National Level	The law clearly stipulates that the central government provides supervision and that the local governments are the implementing agencies with regard to waste management.	A
National Organization on SWM	Although the initial objective of creating CONADES was to grant it the national authority to regulate waste management, it has become merely an advisory body. As a consequence, relevant ministires are not functioning properly.	C
Privatization Policy	Outsourcing to the private sector often occurs in collection and transport of wastes. The collectors are often not organized as companies but are individuals who form groups. Although MARN hopes to promote private concession, it may be challenging for it to properly manage the private concessions.	B

Financing	334 local governments are implementing waste management. However, many of them face difficulties due to financial limitations.	B
Environmental Impact Assessment (EIA) System	There are established laws regarding EIA. EIA must be conducted before constructing waste related facilities.	A
Hazardous Wastes and Chemicals	Provisions regarding hazardous waste management is included in the Law for Integral Waste Management which is being submitted to the national congress. However, as this law was prepared based on the Mexican law, its actual implementation may be difficult.	B
Pollution caused by waste	There are customs to throw away wastes in rivers and thus pollution of water bodies due to wastes becomes a serious problem.	B
Education and Training	Training with regard to waste management is conducted by JICA/CENIC and German International Cooperation (hereinafter "GIZ")/ Integrated Solid Waste Management (Gestión de Integral de Residuos Solidós, hereinafter "GIRESOL"). However, administrative procedures regarding JICA/CENICA should be improved.	B
Personnel/Organizational Structure	Although there are competent personnel in CONADES, the position of CONADES in the current legal framework may be problematic	B
Equipments	Not applicable	-
Explanatory note:	A: Good, B:Can be improved, C: Needs to be improved, -: Not applicable	

b. Local Governments

The results of the capacity assessment conducted based on the capacity assessment sheets contained in Annex 2 are summarized in the table below.

Municipality of Guatemala City (capital of Guatemala)		
Item	Results of Assessment	Evaluation
Basic Information	Basic information regarding population, land use, natural conditions, economy, and policies are available on websites (the actual information and their sources are both made available)	A
Management System	Collection of wastes including setting the collection fee, collecting the fee, and handling the complaints is consigned to the private sector and the municipality is not involved. Thus, the municipality is not aware of the issues with regard to waste collection.	C
Collection Rate	The municipality is not aware of the current situation.due to leaving most of the collection operation to private sector without very limited imvolvement of municipality.	C
Rules/Regulations	Governed by the national laws. In 2002, REGLAMENTO DE MANEJO DE DESECHOS SOLIDOS PARA EL MUNICIPIO DE GUATEMALA was enacted. In 2007, there was a project to review this law, but it has not been revised up until today.	B
Policies	Governed by national policies	B
Master Plans in City Level	Program of Modernization of the Management of Solid Waste in the City of Guatemala was implemented with the support of Inter American Development Bank (hereinafter "IDB") in 2004. No other work has been conducted up until today.	B
Finance	General revenue of the city (for final disposal and street sweeping)	B
Accounting	The collection fee is set by the collecting companies. It is set higher in the higher-income areas and lower in the lower-income areas. The fee is from 5 to 7 USD/month. The city is not involved in the fee collection. The city collects 330 GTQ/vehicle/year for the license.	C
Human Resources	The number of personnel in charge of waste management is 216 which make up only 2.4% of all municipal personnel. There are only 4 administrative staffs.	C
Intellectual Assets in SWM	Program of Modernization of the Management of Solid Waste in the City of Guatemala was implemented with the support of IDB in 2004. No other work has been conducted up until today.	B

Waste Generation	Waste composition has not been surveyed since the survey conducted by JICA in 1991. The amount of wastes is weighed at the final disposal site.	B
Waste Discharge	Mixed discharge	B
Collection and Transport Equipments	Consigned to the private companies	C
Waste Collection	Consigned to the private companies	C
Sweeping, Cleansing	Conducted by the municipality. The streets are kept clean.	A
Waste transport	Not applicable	-
Inter-mediate Treatment	None	-
Recycling	The waste pickers at the final disposal sites and citizens conduct recycling activities.	B
Final Disposal Site	There is one site within the city (Zona 3) and another site outside the city (Villa Nueva). The site in Zona 3 is managed by the municipality and the one in Villa Nueva is managed by AMSA (*Autoridad para el Manejo Sustentable de la Cuenca y del Lago de Amatitlán*). There is the challenge to construct new final disposal sites.	B
Medical Wastes	Current situation is not identified	-
Hazardous Wastes	Current situation is not identified	-
Industrial Wastes	Current situation is not identified	-
Social Organizations	Not identified. If there are problems with the collection service, the citizens complain directly to the private operators. As it is often a family business, the operators are generally close with the local residents.	B
Waste Pickers	There are about 1,200 waste pickers inside the final disposal sites.	B
Waste Recycling Markets	There are many middlemen near the final disposal sites, but the actual situation could not be identified due to security reasons.	-
Waste and Environmental education	Not identified	-
Solid Waste Problem(s)	As it would be difficult to find the land for a new final disposal site, the city would like to use the current site as long as possible.	-
Explanatory note: A: Good, B:Can be improved, C: Needs to be improved, -: Not applicable		

2.2.3 Conclusion

Unless the Law for Integral Waste Management is approved by the national congress, it will be difficult to implement proper waste management. From the results of the PCM workshop, the bottleneck in waste management is believed to be the problem that “organizations concerned with waste management do not function adequately”.

In Guatemala City which is the capital, the amount of waste disposal is approximately 1,500 ton/ day. Collection of the waste fees and handling of the claims are consigned to the private sector. The number of staffs in the municipal government who deal with waste management is too small to implement proper waste management considering the scale of the city. In addition, municipalities place a lower priority on solid waste management, placing their higher priorities on potable water, sewage, street lights, parks, public schools, road pavement etc. The capacity of the staffs in both central government and the Guatemala City is not considered to be high.

2.3 El Salvador

2.3.1 Outline

The sanitary landfill constructed by ASINORLU is being fairly well managed by the self-help efforts by the Salvadoran members 3 years after completion of the JICA technical cooperation project, namely the Project on Integrated Solid Waste Management for Local Governments in El Salvador. ASINORLU's project has strong positive impacts on improving waste management not only in El Salvador but also in other countries in the Central America.

The staffs of Salvadoran Institute for Municipal Development (*Instituto Salvadoreño De Desarrollo Municipal*, hereinafter "ISDEM") headquarters and the eastern office in San Miguel City and the staffs of ASINORLU's landfill site consider that it is one of their most important missions to nationally disseminate the knowledge and know-how obtained through the ASINORLU project.

Therefore, it should be very useful and effective to continue to support the dissemination of the experience of ASINORLU and the Project on Integrated Solid Waste Management for Local Governments in El Salvador (*Proyecto de Manejo Integral de Desechos Sólidos para Municipios en la República de El Salvador*, hereinafter referred to as "PROMADES") experiences to other areas of El Salvador and neighboring countries.

Council of Mayors of the Metropolitan Area of San Salvador (*Consejo de Alcaldes del Área Metropolitana de San Salvador*, hereinafter "COAMSS") commented that although MIDES, the private company which owns the largest final disposal site in the country, is technically advanced, the method of cost sharing is problematic. The monopolistic situation of landfill services by MIDES is leading to high waste disposal costs which become serious financial burden for many municipalities in the country.

Meanwhile, taking the ASINORLU results as an important reference, the Ministry of Environment and Natural Resources actively promotes the realization of construction and operation of sanitary landfills in many other areas in the nation. However, it is likely that it will take more time for their realization due to financial limitation. Thus, it is important to find measures to set the fee for final disposal at an appropriate level.

Although construction and operation pf sanitary landfills require substantial costs, many municipalities do not have the financial capacity to finance them.

In El Salvador, the legal framework on E-wastes is not yet established. Although the issue of managing E-wastes catches attention as one of the trendy issues today, as a fundamental solution, the legal framework for the management of not only E-wastes but for all types of hazardous wastes should be established. Furthermore, action plans regarding management of hazardous wastes should be developed and implemented.

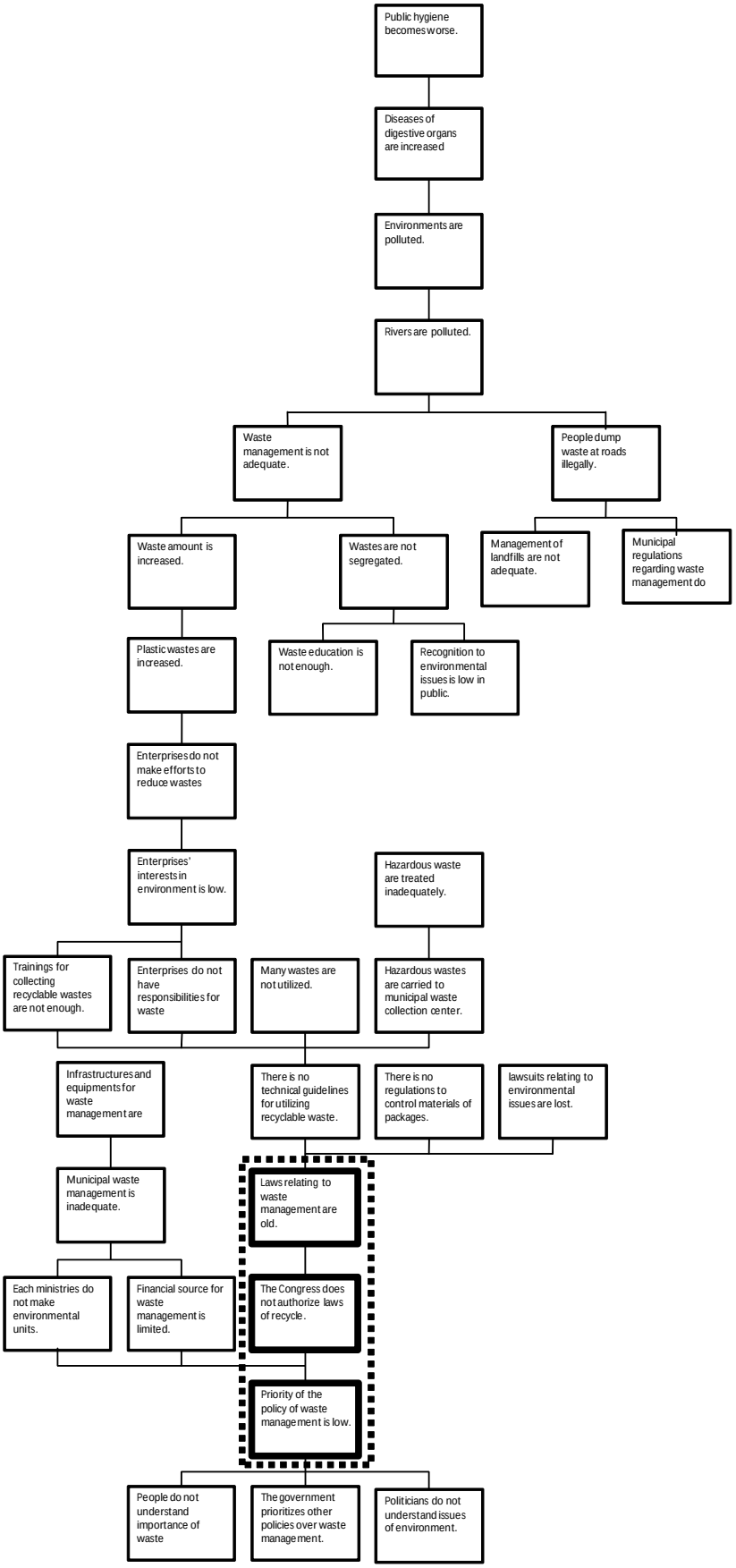


Figure 4: Results of Problem Analysis from the PCM Workshop

A PCM workshop was conducted with the staffs of central ministries and agencies relevant to waste management with the objective to identify the core problem regarding waste management. As a result of discussions and analysis which were facilitated by the JICA Study Team, it was concluded that the core problem was that "waste management is lowly prioritized among policy issues".

The reasons for this problem were identified as "lack of public awareness", "low national priority on waste management", and "lack of understanding among the politicians". However, it is considered that these three reasons are not the only reasons for the current situation.

It was analyzed that, as a result of these problems, issues such as "lack of infrastructure and vehicles for waste management", "lack of legislation to regulate product packaging", and "hazardous wastes are improperly treated", "public health is damaged" are emerging. This problem could be due to the fact that there are not yet evident environmental or health damages caused by the wastes (or even if they exist, they have not yet been recognized by the public) or the fact that there is not enough information on the matter.

2.3.2 Capacity Assessment

a. Central Ministries and Agencies

The results of the capacity assessment conducted based on the capacity assessment sheets contained in Annex 2 are summarized in the table below.

Ministry of Environment and Natural Resources (MARN) of El Salvador		
Item	Results of Assessment	Evaluation
Basic Information	Basic information regarding population, land use, natural conditions, economy, and policies are available on websites (the actual information and their sources are both made available)	A
National Laws on SWM	Although there are laws and regulations regarding waste management enacted, there is no definition of "hazardous wastes". MARN intends to clarify methods to treat and supervise the management of hazardous wastes through amendment of the Environment Act. Furthermore, if this Act is to be amended, how MARN would actually implement hazardous waste management would also become an issue.	B
National Policy and Plan	The national plans, strategies, and policies concerning waste management are all very clear. The issue of waste management has been prioritized after the change in government in 2009. MARN and the Ministry of Health has worked together to reflect the achievements of PROMADES in the National Plan for the years 2010-2015.	A
Administration in National Level	It has been clearly defined in the law that the central government provide supervision and that the local governments are the implementing agencies regarding waste management.	A
National Organization on SWM	There are 10 staffs in MARN who are in charge of waste management. However, the chief of this section has not yet been decided.	B
Privatization Policy	MIDES (a private operator which owns the largest final disposal site in the country) should be properly controlled.	B
Financing	The national strategy which includes waste management is promoting development of infrastructure. The government is considering the finance of such projects with loans from Organization for Economic Co-operation and Development (hereinafter "OECD") Development Assistance Committee (hereinafter "DAC"), IDB, and KfW (Reconstruction Credit Institute or *Kreditanstalt für Wiederaufbau*, hereinafter "KfW").	B
Environmental Impact Assessment (EIA)	There are established laws regarding EIA. EIA must be conducted before constructing waste related facilities.	A

System		
Hazardous Wastes and Chemicals	The management of hazardous waste such as E-waste, tires, lights, metal scraps and batteries is a problem. Hazardous wastes are not defined in the law. Meanwhile, recycling companies are operating and functioning (there is a list of such companies). Methods to treat and supervise the management of hazardous wastes should be clarified through amendment of the Environment Act. Furthermore, if this Act is to be amended, how MARN would actually implement hazardous waste management would also become an issue.	B
Pollution caused by waste	According to the interviews, although there is currently no serious environmental pollution due to wastes, hazardous wastes are not defined and not properly managed.	B
Education and Training	Engineers who can design sanitary landfills should be fostered	B
Personnel/Organizational Structure	The achievements of PROMADES should be utilized as a waste management model in El Salvador; not only from the technical aspect but also from the aspect that the central player was the association of local governments.	A
Equipments	Not applicable	-
Explanatory note: A: Good, B:Can be improved, C: Needs to be improved, -: Not applicable		

b. Local Governments

The results of the capacity assessment conducted based on the capacity assessment sheets contained in Annex 2 are summarized in the table below.

Directorate of Solid Waste Sustainable Management of San Salvador Municipality, El Salvador		
Item	Results of Assessment	Evaluation
Basic Information	Basic information regarding population, land use, natural conditions, economy, and policies are available on websites (the actual information and their sources are both made available)	A
Management System	Directorate of Solid Waste Sustainable Management has become an independent entity in 2008. There is a board which is in charge of its operation, and the chairperson of the board is the mayor. There are also two citizens who take part as board members.	A
Collection Rate	100%	A
Rules/Regulations	Same with MARN	A
Policies	Governed by Statutes for the Sustainable Municipal Solid Waste Management (*Estatutos de la Dirección Municipal para la Gestión Sustentable de Desechos Sólidos*)	A
Master Plans in City Level	There is a master plan for the metropolitan area which was developed with the cooperation of JICA at COAMSS. However, the city does not have its own master plan.	B
Finance	Annual expenditure is 1.4 million USD, consisting of elements such as 9 million for personnel, 1 million for fuel, and 1 million for repairs	A
Accounting	The charge for waste management is collected together with electricity charges. Although residents can choose to pay only the electricity charges, almost all pay also the charge for waste management.	A
Human Resources	There are 1,400 staffs total, consisting of 450 staffs responsible for collection (including drivers), 350 staffs responsible for street sweeping, and 250 staffs responsible for sanitation and street greenery.	A
Intellectual Assets in SWM	Annual report (*Memoria de Labores de Dirección Municipal para la Gestión Sustentable de Desechos Sólidos 2011-2012*) is being published.	A
Waste Generation	The waste composition was surveyed in 2010(*Estudio de Caracterización de Residuos Sólidos / San Salvador, enero 2010*). The amount of wastes generated is being weighed at the final disposal site.	A
Waste Discharge	Wastes are generally discharged without separation. However, there is	A

	a pilot scheme to discharge separately the organic wastes and inorganic wastes. They are separated in the collection vehicles and transported to transfer stations.	
Collection and Transport Equipments	There are 142 vehicles total, consisting of vehicles for waste collection, street cleaning, and vehicles maintenance. The renewal of the vehicles is an issue.	B
Waste Collection	In 1999, the participation of the private sector was approved, and the collection of the wastes is partially consigned to the private sector. The collection of wastes in the slums where streets are narrow is consigned 100% to the private sector. With regard to collection of other domestic wastes and wastes from businesses, collection is partially consigned to the private sector.	A
Sweeping, Cleansing	The municipality implements the street cleaning. The streets are kept clean.	A
Waste transport	6 million USD is paid to MIDES (private operator of the final disposal site) for transporting wastes from transfer stations to final disposal sites.	B
Inter-mediate Treatment	Although there are ideas to utilize organic wastes, there is no compost yard. This applies especially to market wastes, as 80 ton/day is generated.	B
Recycling	In San Marcos City, as recyclables were sorted, a law suit was filed and the local government lost. Currently, the sorting conducted in San Salvador is for educational purposes. If it is going to be expanded, the relationship with MIDES must be considered.	B
Final Disposal Site	For the final disposal, 22 USD/ton is paid to MIDES. When this contract was signed, the local government did not have enough knowledge and thus the content was disadvantageous. When the contract is to be renewed, the content of the contract should be carefully considered.	B
Medical Wastes	After autoclave treatment, wastes are disposed in sanitary landfills at MIDES Nejapa site.	B
Hazardous Wastes	Hazardous wastes are not defined and not properly managed.	C
Industrial Wastes	Current situation not identified	-
Social Organizations	The containers in the streets are provided free of charge by Coca-Cola company as part of their CSR activities. In addition, 10 private companies are supporting separate of wastes through providing pamphlets and separate collection bags in a project called “Colonia Limpia”.	A
Waste Pickers	Waste pickers have successfully been organized into sorters of recyclables.	A
Waste Recycling Markets	Recyclables such as plastics, metals, glass, and paper are purchased by middlemen in the city.	A
Waste and Environmental Education	Current challenges are to expand environmental education and to renew the vehicles. For environmental education, a ship container has been renovated to become an environmental education facility. With the change in government, the issue of waste management is now prioritized. Esepcially, the cleaning of tourist area is fully conducted with 3 shifts of cleansing activities.	B
Solid Waste Problem(s)	Issues with MIDES: By contract, MIDES must transport all collected wastes to the final disposal sites. Thus, reduction of wastes cannot be easily promoted, as this will decrease the amount of wastes handled by MIDES. In San Marcos, a law suit was filed because recyclables were sorted, and the local government lost the case.	-
Explanatory note: A: Good, B:Can be improved, C: Needs to be improved, -: Not applicable		

2.3.3 Conclusion

The ASINORLU project realized the construction of a sanitary landfill with leachate treatment

facilities in a local city in El Salvador with the assistance from JICA, and the facilities are still being properly managed after 3 years of operation. The project is recognized as a good practice regarding realizing sanitary landfill in the Central American and Carribean Region and has great impact in and outside El Salvador. Many visitors from other areas of El Salvador in addition to other countries (e.g. Mexico, Dominican Republic, Venezuela, Central American Commission on Environment and Development (*Comisión Centroamericana de Ambiente y Desarrollo*, hereinafter "CCAD") visited the project site, and the project has provoked the establishment of Waste Management Unit in Honduras.

In El Salvador, engineers have been trained on waste management through the cooperation with JICA. However, in order to realize sanitary landfills nationwide, there are still issues to be solved such as financing of the initial cost and operation and maintenance cost. In addition, the next step is to implement proper management of hazardous wastes. The capacity of the central ministries and agencies and local governments are considered to be high.

2.4 Mexico

2.4.1 Outline

The relationship between Mexico and Guatemala regarding the promotion of south-south cooperation through National Environmental Research and Training Center (*Centro Nacional de Investigación y Capacitación Ambiental Mexico*, hereinafter "CENICA") has not yet drastically improved. Although the members of CENICA have intentions to continually accept trainees from Guatemala, the formalities to realize this take a very long time. Another reason why realizing south-south cooperation through CENCIA is difficult is because it intends to apply Mexican experience to other countries without any modifications. As conditions such as policies, institutions, organizational structure, economic status, population, social conditions including practice regarding waste management, and natural conditions differ among countries, this approach is often not successful.

GIZ is implementing GIRESOL, which is a program with the objective to build capacity of the staffs of local governments regarding waste management. The office of GIZ is located inside the office of the Ministry of Environment and Natural Resources (SEMARNAT), and most of GIZ's budget is allocated for environmental issues. GIZ provides long-term commitment, and the duration of each project is at least three years.

In Mexico City, as the final disposal site within the city has closed, the wastes generated in the city are currently being transported to disposal sites in and outside the Mexico State (Estado de Mexico). There are possibilities that incinerators be introduced for the management of wastes generated in Mexico City. However, whereas the current disposal cost at the

Regarding the difficulties in implementing south-south cooperation through CENICA, CENICA has commented as follows:

Similar to the case of GIRESOL, the south-south cooperation through CENICA is difficult to realize because it tries to apply the Mexican experience to other countries without any local adaptation.

Although action plans are made in the trainings, action plans that are prepared without any field survey have low feasibility.

The selection of trainees is also a problem. Currently, more than half of the trainees are engineers of mid-level or lower. In order to have an impact at the policy level, it is important that government staffs involved in policy making take part in the trainings. In order to reduce the risk that the trained staff would be transferred staffs that are likely stay in an organization even if there were changes in government change (i.e. mid-level officer) should be chosen as trainees.

JICA staffs in each country should provide support regarding the recruitment of the staffs. Furthermore, measures should be taken such as making agreements regarding south-south cooperation among Mexico and relevant organization in other countries.

Please refer to Annex 1: Minutes from Meetings in the Field Survey

final disposal site (i.e. tipping fee) is from 140 to 150 peso/ton (approximately USD 12/ton), the tipping fee after introducing a very low-price incinerator would be approximately USD 50/ton. Thus, if incinerators are to be introduced, how to finance this fee would be an important issue. However, considering the economic level of Mexico, it can be said that this is not something impossible.

The National Program for Prevention and Integral Management of Waste *(Programa Nacional para la Prevención y Gestión Integral de los Residuos* or PNPGIR in Spanish) was formulated with cooperation by JICA. Based on PNPGIR, solid waste management improvement is being promoted nationwide. In these four years, based on PNPGIR framework, investment for solid waste management infrastructure has increased drastically, and the number of sanitary landfill has increased from 88 to 235. Meanwhile, further efforts should be provided for capacity development at the municipal level with regard to operation of landfill. This is because in some municipalities, municipal staffs face difficulties in operating the sanitary landfills after they are constructed.

JICA's cooperation has been effective in achieving improvements in the waste management sector at the national level. However, there are still remaining actions to be taken such as taking concrete actions such as enacting laws and regulations for the management of E-wastes or the end-of life vehicles (hereinafter "ELV") which was realized through the JICA's Project for the Establishment of ELV Management Plan in the Mexican United States which completed this year.

As Mexico is likely to graduate from being an ODA recipient country, JICA focuses its activities on industrial development promotion and south-south cooperation. As industrial development will lead to increase in volume of wastes, it is important that JICA also assist development of industries related to wastes such as through promoting sound recycling or treatment of hazardous wastes.

The Ministry of Environment and Natural Resources (SEMARNAT) is open to the idea of promoting public-private partnership (PPP) regarding the operation of waste related facilities.

2.4.2 Tripartite Cooperation

The south-south cooperation through CENICA includes 3R trainings supported by JICA in addition to cooperation with GIZ under a project called GIRESOL with the goal to build the capacity of the staffs of the local governments.

a. 3R Regional Training at CENICA (South-South Cooperation)

The 3R regional training "Waste Management with 3R Approach (*Gestión Integral de Residuos con Enfoque de 3Rs*)" is being implemented with the objective to train officials of central and local governments so that they would obtain the comprehensive knowledge and techniques required for planning and implementation of appropriate waste management. One period consists of three years, and the first period ended in February 2012. Currently, the training for the second period (2012-2014) is being planned. This regional training accepts 14 trainees from the Central America and the Caribbean countries and 8 trainees from Mexico. For the trainees from Mexico, CENICA burdens the transportation and allowance costs. For the trainees from Central America and the Caribbean countries, JICA burdens the costs for flights and other transportation. Although the participating countries are to be from the Central America and Caribbean countries (southern limit is Panama) in principle, there are exceptions where Mexico supported the participation of a trainee from Ecuador.

The issues and solutions regarding this 3R regional training are summarized in the following table.

Issue	Results of Interview	Proposed Solution
Dissemination of Achievements after the Training	Although action plans are formulated in the trainings, there are questions about their feasibility as they are formulated without detailed field survey.	Steps to verify the feasibility of the action plans should be added. For instance, in order to foster ownership and to reflect the needs of the beneficiary countries, CENICA and other relevant parties could make field visits to the beneficiary countries and identify the current conditions and challenges.
	In the trainings, examples in Mexico are taught. As situations differ among countries, it is difficult to apply them directly to other countries without making any modifications.	Experts that have knowledge about cases other than those in Mexico could participate as training instructors (e.g. experts from Japan or El Salvador)
Selection of the Trainees	Currently, more than half of the trainees are engineers of mid-level or lower. In order to have an impact at the policy level, it is important that government staffs involved in policy making take part in the trainings. However, there are risks that such staffs would be transferred if there are changes in government.	In order to reduce the risk that the trained staff would be transferred staffs that are likely stay in an organization even if there were changes in government change (i.e. mid-level officer) should be chosen as trainees. The staffs to train should be clearly targeted so that the objectives of the training would be met.
Recruitment of the Trainees	Currently, even when CENICA calls out for applications through the international cooperation department of each country, there are very few applications received. There are possibilities that the information about the training is not getting through to the departments responsible for waste management.	JICA staffs in each country would provide support regarding the recruitment of the staffs
Administrative Procedures	In order to participate in the training, candidates must go through administrative procedures with the Mexican Embassy, which could be troublesome.	

Regarding the problem with Guatemala, the situation is as follows.

- The responsible officials from the two countries have held talks two times, but this has not yet solved the problem.
- The Guatemalan parties are not respecting the agreements made between the two countries and are very slow in going through the administrative procedures. In addition, the responsible official often change, which may be due to political background. It is difficult to solve this problems from all aspects.

There was a chance for talks when the Guatemalan parties visited Mexico. However, the Guatemalan parties cancelled the meeting on that day, which again caused a problem. In order to solve this problem, discussions between Guatemala and CENICA should be held.

b. Trainings in El Salvador

As it was found that the ASINORLU project has a big impact on the neighboring countries, there may be possibilities for tripartite cooperation centered on ASINORLU.

One idea is to organize training in El Salvador with the involvement of ASINORLU project staffs, CENICA experts, and Japanese experts.

2.4.3 Conclusion

Mexico is different from the other 4 countries subject to the field survey in this Study, as JICA's cooperation activities are focused only on industrial development promotion and south-south cooperation. As industrial development will lead to increase in volume of wastes, it is important that JICA also assist development of industries related to wastes such as through promoting sound recycling or treatment of hazardous wastes. THE MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES (SEMARNAT) is open to the idea of promoting public-private partnership (PPP) regarding the operation of waste related facilities.

2.5 Dominican Republic

The concept of sustainable environmental protection is defined in the Dominican Republic's National Development Strategy 2010-2030. It also touches on the issue of solid waste management. The Ministry of Environment and Natural Resources (often referred to as "MARENA") considers solid waste management as one of prioritized issues along with river regime management and climate change.

The Ministry of Environment and Natural Resources carried out a nationwide study to understand the present situation of solid waste management. In addition, in some projects for river regime management, final disposal sites were improved with the objective to protect water sources. The Ministry of Environment and Natural Resources considers that the basic principle of waste management is to effectively utilize wastes and to add economic value to the wastes through the promotion of 3R. Although many waste management projects are being implemented regarding issues such as education and training systems, there are not many outstanding achievements due to lack of resources (financial and human), experience, and knowledge. Thus, there are hopes from the Dominican side that Japan provides support to promote proper waste management based on the National Development Strategy.

Among private enterprises, a network of environmentally conscious companies (hereinafter "ECO RED", formerly named RENAEPA[3]) was established about two years ago. This association consisting of approximately 70 companies promotes public-private partnership with regard to promoting environmental conservation and sustainable development. The goal of the association is to promote environmentally-friendly development and participating companies are actively taking part in environmental conservation activities. The idea is that the participating companies declare that their business activities would be carried out in compliance with environmental norms, then they put it into practice, then gain the trust of the public, and then implement environmental conservation activities through public-private partnership. As the first public-private-partnership case, this association prepared and submitted the bill of the national law of solid waste management to the national congress for its consideration.

As for Santiago, the management of the final disposal site was significantly improved with the support of Japanese experts who introduced the Fukuoka method. However, after the replacement of the mayor, the municipality was put in great confusion and as a consequence the proper management of final disposal site has stopped.[4]

In the Santo Domingo special district, a technical cooperation project by JICA, the Project for Appropriate Waste Management in Santo Domingo de Guzman, National District, Dominican

[3] The name of the network changed from RENAEPE (*Red Nacional de Apoyo Empresarial a la Protección Ambiental* or National Network of Business Support for Environmental Protection) to ECO RED in August 2012

[4] In 2005, the problem with at Rafey was occurrence of fires, but this problem was solved by cooperation with JICA. After the new mayor took office in 2010, fire broke out again. This fire could have been set by waste pickers, and the cause of the fire is currently being investigated. In the same period, heavy machineries broke down, and they were replaced by lease. However, the business went into bankruptcy due to insufficient budget.
The details can be found in Annex 1: Minutes of Meeting from Santiago office, Ministry of Environment and Natural Resources, Dominican Republic

Republic, has just terminated this fiscal year. Currently, IDB study with Japanese Trust Fund for Consultancy Services is being carried out for the master plan of Gran Santo Domingo *Mancomunidad* that is composed of 11 municipalities, which proposes to establish 7 transfer stations and a new final disposal site. The Santo Domingo special district is preparing to share the experiences gained through cooperation with JICA to other cities, and it is also providing assistance to CARICOM countries through JICA. The staffs of the municipality have commented that they would like to continue the cooperation with JICA.

The Santo Domingo Este municipality has gained knowledge and experience with regard to environmental management through assistance from JICA such as trainings in Japan and cooperation with volunteers. The staffs of the Santo Domingo Este municipality have commented that although they highly appreciate the JICA trainings in Japan, because it is difficult to dispatch many staffs at one time, it would be effective in establishing a system where staffs can join in trainings within the Dominican Republic such as a professional school specialized in waste management. It was also mentioned that staffs that received the trainings in Japan and returned are being promoted to positions where they can implement the action plans that they have formulated. In addition, meetings are held approximately twice a year in order to share the achievements of the trainings. As the municipality is facing problems in properly maintaining the waste collection vehicles provided by Japan, it is planned that JICA will dispatch a JICA volunteer specializing in vehicle maintenance who will implement activities not only in Santo Domingo Este municipality but also in other cities.

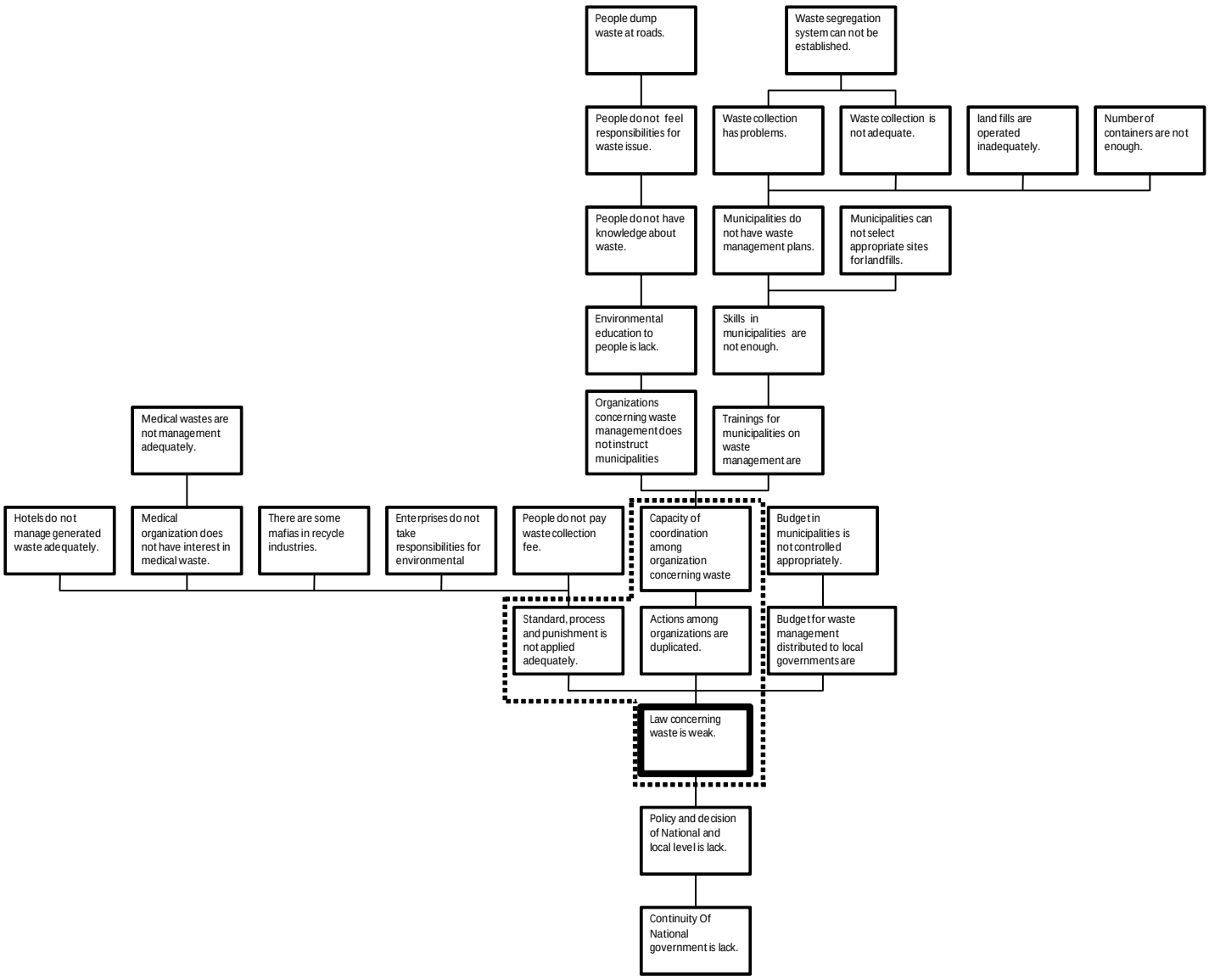


Figure 5: Results of Problem Analysis from the PCM Workshop

A PCM workshop was organized in order to identify the core problem regarding waste management with officials of relevant ministries. With the facilitation of the JICA Study Team, the members concluded that due to lack of laws and regulations regarding waste management, the following issues occur: (i) norms, procedures and sanctions are not applied; (ii) there are overlapping roles among authorities; (iii) sufficient budget is not allocated to municipalities or municipal institutions that are in charge of waste management operations.

Regarding the reasons behind the core problem which was identified as “lack of laws and regulations regarding waste management”, the participants of the workshop identified only two points, namely “lack of continuity of the government and governmental agencies” and “lack of policies and political will among national and local governments”. However, as these may not be the only reasons behind the core problem, the issue should be further analyzed (the common challenges among the countries identified from the results of the PCM workshop are summarized in Chapter 4 Section 4.1.1.b).

2.5.1 Capacity Assessment

a. Central Ministries and Agencies

The results of the capacity assessment conducted based on the capacity assessment sheets contained in Annex 2 are summarized in the table below.

Ministry of Environment and Natural Resources (MARENA) of Dominican Republic		
Item	Results of Assessment	Evaluation
Basic Information	Basic information regarding population, land use, natural conditions, economy, and policies are available on websites (the actual information and their sources are both made available)	A
National Laws on SWM	National-level laws on waste management are currently being drafted.	B
National Policy and Plan	Climate change and waste management are prioritized issues.	A
Administration in National Level	The Ministry of Environment and Natural Resources at the national level and local governments at the local level are responsible for waste management.	A
National Organization on SWM	In principle, the Ministry of Environment and Natural Resources is responsible for waste management at the national level. However, there is also a NGO called FEDOMU which is composed of representatives from local governments from the entire country which deal with waste management. Thus, the roles for each organization should be clarified.	B
Privatization Policy	There is both municipal and private operation.	-
Financing	In principle, local governments finance the operations with waste disposal fees and the general revenue. When large-scale investment is required, loans are provided by the national government as necessary.	B
Environmental Impact Assessment (EIA) System	There are already established laws regarding EIA. EIA must be conducted before constructing waste related facilities.	A
Hazardous Wastes and Chemicals	There is no law regarding hazardous waste management.	C
Pollution caused by waste	There are wastes that are thrown into rivers and streams.	B
Education and Training	There are trainings provided by GIZ/GIRESOL and JICA/CENICA. There are also JICA trainings in Japan.	B
Personnel/Organizational Structure	6 staffs in the Department of Environment Management are responsible for waste management in the Ministry of Environment and Natural Resources.	B
Equipments	Not applicable	-
Explanatory note: A: Good, B:Can be improved, C: Needs to be improved, -: Not applicable		

b. Local Governments

The results of the capacity assessment conducted based on the capacity assessment sheets contained in Annex 2 are summarized in the table below.

Directorate of Urban Cleansing and Equipment (DIGAUE), Santo Domingo National District Municipality (hereinafter "ADN"), Dominican Republic		
Item	Results of Assessment	Evaluation
Basic Information	Basic information regarding population, land use, natural conditions, economy, and policies are available on websites (the actual information and their sources are both made available)	A

Management System	There are many cases where waste collection is partly privatized, and ADN manages the collection activities. There is an organization called Recycling Promotion Center which promotes recycling.	A
Collection Rate	Close to 100%; Although accurate figures are not available for the low-income areas where there are no statistics on the population, it is estimated that the collection rate is close to 100%. There are on-going efforts to improve this rate.	A
Rules/Regulations	The ADN's regulations on waste management were formulated under the JICA study and are currently being enforced. The waste management in ADN is governed by these regulations	A
Policies	In the 2005-2015 strategy of the city, establishment of a sustainable waste management system is stated as one of the goals to be realized. Currently, actions are being taken to realize this goal.	A
Master Plans in City Level	A master plan was formulated under a JICA study. Later, it was reviewed taking into consideration the information obtained through a JICA technical cooperation project. Waste management in the city is being implemented based on this master plan.	A
Finance	Necessary costs are financed by the waste disposal fees and ADN's general revenue. For large-scale investments, loans are provided from the national government.	A
Accounting	Fee collection is consigned to the private sector. 45% of the municipal budget is used for waste management. Approximately 30% of that budget is financed by the waste disposal fees.	A
Human Resources	There are approximately 30 administrative staffs. Total of 44 staffs have been dispatched to either JICA training in Japan or in another country in the region from 2003 to 2011. Among them, one staff has left the organization.	A
Intellectual Assets in SWM	There are reports by the Recycling Promotion Center, database of waste disposal quantity, database on vehicle stations, etc.	A
Waste Generation	Approximately 2,000 ton/day is generated. The amount of generation is measured at the final disposal site and the data are managed in a database	A
Waste Discharge	Wastes are discharged without separation. Efforts are needed to realize sorted discharge.	B
Collection and Transport Equipments	There are 41 vehicles owned by ADN, composed of 30 provided through the Grass Root Grant for Recycle scheme and 11 purchased by ADN. Other vehicles are owned by the private sector.	A
Waste Collection	Wastes are collected at the curbside or collection points.	A
Sweeping, Cleansing	Streets are cleaned both manually and mechanically	A
Waste transport	There is one transfer station.	A
Inter-mediate Treatment	None	-
Recycling	Plastics, aluminum, paper, and bottles are being collected to be recycled. The Recycling Promotion Center cooperates in collecting information on recycling rate.	B
Final Disposal Site	The site is a controlled dumpsite which needs to be improved.	B
Medical Wastes	JICA is supporting awareness-raising activities to promote separate disposal of medical wastes with non-medical (general) wastes.	B
Hazardous Wastes	There are no laws on management of hazardous wastes.	C
Industrial Wastes	Industrial wastes are not managed.	C
Social Organizations	Organizations such as Recycling Network and Environment Network are carrying out activities centered on recycling.	A
Waste Pickers	There are waste pickers both within the city and at the disposal site. In the final disposal site, there are about 400 waste pickers. ADN is currently trying to identify the current situation of the waste pickers.	B
Waste Recycling Markets	There are many middlemen at the disposal site and within the city. The Recycling Promotion Center is currently trying to obtain more	B

	information.	
Waste and Environmental Education	Inside ADN, environmental education is being conducted in schools. There are also many campaigns conducted by the private sector as part of their CSR activities.	A
Solid Waste Problem(s)	There is the issue of realizing a new final disposal site.	B
Explanatory note: A: Good, B:Can be improved, C: Needs to be improved, -: Not applicable		

2.5.2 Conclusion

As a result of many cooperation activities by JICA such as a study, technical cooperation project, trainings in Japan, and regional trainings, the waste management capacity of the capital Santo Domingo has drastically improved. In the technical project previously mentioned[5], the officials of Santo Domingo who were trained in this JICA technical project have drafted text books regarding waste management for staffs of other local governments and are organizing workshops to disseminate this text book with the objective to build waste management capacity. These activities are contributing to the regional diffusion of achievements made through cooperation with JICA.

In other cities such as Santiago, final disposal sites were improved and became Fukuoka-method style through the cooperation with JICA. However, as the mayor changed after the completion of the disposal site, the municipality was put in great confusion and as a consequence the proper management of final disposal site has stopped. There are other assets as a result of cooperation with JICA such as through dispatch of Japan Overseas Cooperation Volunteers (JOCVs) and senior volunteers.

For instance, in Santo Domingo special district, JICA identified the issue of lack of environmental and urban planning in the city (including planning on waste management issues). In order to solve this problem, JICA has dispatched senior volunteers. With regard to trainings, total of 44 officials of Santo Domingo special district in charge of waste management have been dispatched to Japan or other countries from 2003 to 2011.

The private sector is also active in participating in environmental protection activities. Meanwhile, the capacity of the waste management section in the Ministry of Environment and Natural Resources which is responsible for waste management at the national level could be improved as there are still deficiencies such as lack of enacted law on waste management.

In addition to local governments, there is an organization named FEDOMU (Dominican Federation of Municipalities or *Federación Dominicana de Municipio*) which is supported by Spain, Italy, and France. FEDOMU has the capacity to implement activities with the financial resources provided by these donors, to support the planning department of local governments, and to implement projects with its own financial resources. As a result, there is some overlap among FEDOMU, local governments, and inter-municipal association (*Mancomunidad*). The difference between FEDOM and *Mancomunidades* is that FEDOMU is registered as NGO and is an association of local governments and not a national organization. FEDOMU was established as a technical advisory organization for local governments, and staffs in charge of waste management assigned in each regional are formulating waste management plans in a participatory manner. Meanwhile, *Mancomunidad* is a legally approved inter-municipal association which is established for different administrative issues.

2.6 The Activities by Other Donors

The information on activities by international organizations regarding waste management

[5] Project for Appropriate Waste Management in Santo Domingo de Guzman, National District,Dominican Republic

obtained in the field surveys is summarized in the following table.

Table 2: Activities by Different Donors in Each Country

Country	Donor	Activities	Note
Honduras[6]	SICA/ AECID	Finance for the construction of the final disposal site in Ocotepeque (owned by *Mancomunidades Guisayote y Valle de Sensenti*)	Agreement on financial provision was signed in September 2012
	UN-HABITAT	Report on the Current Status of Solid Waste Management in Honduras (*Informe sobre la Situación Actual de la Gestión Integral de Residuos Sólidos en Honduras*)	Completed in January 2012
	UN-HABITAT	Formulation of Intervention Strategy for Solid Waste Management in Honduras (*Estrategia de Intervención para la Gestión de los Residuos Sólidos en Honduras*)	Draft completed in April 2012
	DANIDA	Formulation of National Policy on Solid Waste Management with focus on 3R in Honduras and Implementation Guidelines (*Política Nacional para la Gestión Integral de Residuos Solidos con enfoque en 3R en Honduras y los lineamientos para su implementación*)	Workshop organized in June 2012
	OPS	Solid Waste Sector Analysis in Honduras (*Análisis Sectorial De Residuos Sólidos Honduras*)	Completed in 2010
	OPS, AECID	Inventory of Disposal Sites in 38 Cities of Honduras (*Inventario Georefenciado de Sitios de Disposición Final en 38 Municipios de Honduras*)	Completed in November 2010
	USAID	Manual for Integrated Solid Waste Management (*Manual para la Gestión Integral de Residuos Sólidos*)	-
Guatemala[7]	IDB	No. ATN/MA-12949-GU. National Plan for Solid Waste Management (*Plan Nacional de Manejo de Residuos Sólidos*)	Preparation started from March 2012
Guatemala [8]	AECID	Construction of landfill for the municipality of San Pedro San Marcos (*Construcción del relleno sanitario para el municipio de San Pedro departamento de San Marcos*)	Completed in October 2011
	AECID	Construction of a composting box for the town of San Pedro Sacatepéquez Panajachel in San Marcos Prefecture (*Construcción de una batería de composteras para el municipio de Panajachel*)	Completed in August 2011
	AECID	Construction of a small landfill for the municipality of San José Chacaya (*Construcción de un mini relleno sanitario para el municipio de San José Chacaya*)	Completed in October 2010
	África 70/ European Union	Integrated management of solid waste and sanitation in four municipalities of Guatemala and Nicaragua (*Manejo integral de desechos sólidos urbanos y*	From January 2011 and completed in February 2015

[6] Written by the JICA Study Team based on information obtained in this Study
[7] http://www.iadb.org/en/projects/project-description-title,1303.html?id=GU-T1177
[8] JICA/ INVESTIGATION ON THE CURRENT SOLID WASTE MANAGEMENT IN THE REGION AND SICA MEMBER COUNTRIES / Mercedes Herrera/October 2011

Country	Donor	Activities	Note
		saneamiento ambiental en cuatro municipios de Guatemala y Nicaragua)	
	GIZ, Mexico	GIRESOL network Guatemala	From 2007 and completed in 2011
	África 70/Ministerio de Asuntos Exteriores de Italia	Urban Sanitation Improvement in Santiago Atitlan (*Saneamiento Ambiental Urbano en Santiago Atitlán*)	From March 2009 to February 2010
	IDB	Environmental Recovery Program Basin Lake Amatitlan (*Programa de Recuperación Ambiental de la Cuenca del Lago de Amatitlan*)	From March 2007 to March 2013
El Salvador[9]	USAID, CCAD[10]	Publication of "Construction of New Sanitary Landfills with Composite Liners"	Published in November 2010
	CCAD	Technical guide for closure, monitoring and tracking a disposal site (*Guía de cierre técnico, monitoreo y seguimiento de un sitio de disposición final*)	Published in 2008
	CCAD	Survey on Integrated Waste Management Indicators (*Levantamiento de Indicadores de Gestión Integral de Residuos Solidos*)	Published in 2008
	CCAD	Formulation of a model for integrated solid waste management regulations in small and medium cities (*Formulacion de ordenanza municipal modelo para un sistema integral de gestion de residuos sólidos en ciudades intermedias*)	Published in 2007
	IDB[11]	Creation of Integrated Solid Waste Management by Microenterprise for Wastes Generated in the San Andres Valley of El Salvador (*Creación y Fortalecimiento de Microempresas para el Manejo Integral de Desechos Sólidos Generados en el Valle San Andrés de El Salvador*)	Published in 2008
	GIZ, Mexico	GIRESOL network El Salvador	
	KFW	Loans to finance construction of waste management facilities	Scheduled to be implemented in 2012
Mexico	GIZ[12]	- Reinforces the GIRESOL network - Implements on-going project to improve financial management of a local government (Colima state) - Implements on-going project on E-waste and PET[13] bottles with considerations to gender issues - Implements life cycle assessment project and supports formulation of policy paper on "sustainable production and consumption" - Has supported the formulation of the National	

[9] Written by the JICA Study Team based on information obtained in this Study

[10] CCAD: *Comisión Centroamericana de Ambiente y Desarrollo* (Comission of Environment and Development in Central America) under Central American Integration System (SICA), http://www.sica.int/ccad/

[11] http://www.iadb.org/en/projects/advanced-project-search,1301.html?query=&ProjectNumber=&Country=ES&Status=&Topic=POLL&Sector=&SubSector=&YearFrom=&YearTo=&Fund=&ProjectType=&Cofinancing=&FinancialProd=&FinancingOver=&FinancingUnder=&FinCurrency=&adv=true

[12] Written based on information obtained from interview with GIZ in this Study

[13] PET: Poly Ethylene Terephthalate

Country	Donor	Activities	Note
		Plan on Integrated Solid Waste Management from 2007; From 2009 to 2012, GIZ has supported states and local governments to formulate waste management plans, to develop necessary regulations, and to clarify the roles of different parties. GIZ also supports formulation of policies on management of wastes that occur after disasters. - Puts high priority in climate change, renewable energy, biodiversity, and nature conservation (from its relevance with climate change); GIZ's assistance to Mexico has nearly doubled in the recent years, and almost half of the assistance is in the environment sector. Among the assistance in the environment, about half is dedicated to the "brown issues", and among them, about half is dedicated to waste management issues. - Implements many projects on "green issues", but they generally last a short time (about 3 years; Other projects generally last longer such as for 10 years	
Dominican Republic	IDB	DR-T1067 : Integrated MSWM in the Inter-Municipal Area of DR (*Plan Maestro para Manejo Integral de los Residuos Sólidos en la Mancomunidad de Ayuntamientos del Gran Santo Domingo*)	From 2009 to 2012
	AECID、LA COOPERAZIONE ITALIANA ALLO SVILUPPO、AFD	Financial support to FEDOMU (association of local governments)	Source: Interview with FEDOMU
	GIZ	- Has organized trainings for engineers of MARENA regional offices and FEDOMU with the objective to reinforce environmental management capacities, utilizing the human resources of Department of Environment Management of MARN. - Based on the idea that it is important to build the capacity of the country, instead of dispatching experts directly to local governments, GIZ has organized trainings for the Department of Environment Management of MARN; the Department then invited to Santo Domingo the engineers from local governments and conducted training for them. GIZ prioritizes capacity building and conducts activities such as development of learning materials in cooperation with the government	Source: Interview by JICA Study Team
	AFD	- Mainly providing loans due to increase in income level in the Dominical Republic - Has conducted survey on constructing a sanitary landfill site in Haina City in the Santo Domingo metropolitan area	Source: Interview by JICA Study Team

3 Retrospective Evaluation

The studies and projects regarding waste management conducted by JICA in the Central American and Caribbean Region are shown in the following table. Among these studies, retrospective evaluation was conducted for 4 studies and 3 projects, namely the followings, as there was sufficient information on these studies and projects. Based on the existing survey results, the promoting factors and the obstacles were analyzed.

- the Study on the Improvement of the Solid Waste Management System for the City of Managua;
- the Study on Solid Waste Management in the Urban Area of Tegucigalpa, Central District, Republic of Honduras
- the Study on Solid Waste Management for the City of Mexico in Mexico;
- the Project for Improvement of Solid Waste Management for the Municipality of Panama in the Republic of Panama
- the Development of Waste Management Policy based on 3Rs in Mexico;
- the Project on Integrated Solid Waste Management for Local Governments in El Salvador;
- the Project for Appropriate Waste Management in Santo Domingo National District

Table 3 : Principal JICA Studies regarding Waste Managing in the Central American and Caribbean Region

No	Country	Year terminated	Name of Study	Target Year for Planning
1	Guatemala	1991	The Study on Solid Waste Management in Metropolitan Area of Guatemala City	2000
2	Nicaragua	1994	The Study on the Improvement of the Solid Waste Management System for the City of Managua	2010
3	Nicaragua	1998	The Study on the Improvement of Sanitary Conditions in Major Urban Cities in the Republic of Nicaragua (*El Estudio sobre el Mejoramiento de las Condiciones Sanitarias Urbanasde las Principales Ciudades de la República de Nicaragua*)	2010
4	Honduras	1999	The Study on Solid Waste Management in the Urban Area of Tegucigalpa, Central District, Republic of Honduras (*Estudio sobre Manejo de Residuos Sólidos en el Area Urbana de Tegucigalpa, Distrito Central, en la República de Honduras*)	2010
5	Mexico	1999	The Study on Solid Waste Management for the City of Mexico in Mexico (*El Estudio sobre el Manejo de Residuos Sólidos para la Ciudad de México de los Estados Unidos Mexicanos*)	2010
6	El Salvador	2000	The Study on the Regional Solid Waste Management for the Metropolitan Area of San Salvador in the Republic of El Salvador (*Estudio sobre el Manejo Regional de Residuos Sólidos para El Área Metropolitana de San Salvador en la República de El Salvador*)	2010
7	Panama	2002	The Study on Solid Waste Management Plan for the City of Panama in the Republic of Panama (*Estudio sobre el Plan de Manejo de los Desechos Sólidos para JICA la Municipalidad de Panamá en la República de Panamá*)	2015
8	Mexico	2004	Development Study of Environmental Management in the Caribbean Coast of Quintana Roo (*Estudio de Manejo de Saneamiento Ambiental en la Costa del Estado de Quintana Roo en los Estados Unidos Mexicanos*)	2015
9	Cuba	2006	The Study on Integrated Municipal Solid Waste Management Plan in Havana City	2015
10	Dominican Republic	2007	The Study on Integrated Solid Waste Management Plan in Santo Domingo de Guzman National District (*Estudio del Plan de Manejo Integrado de los Desechos Sólidos en Santo Domingo de Guzmán, Distrito Nacional, República Dominicana*)	2015
11	Mexico	2008	Development of Waste Management Policy based on 3Rs in Mexico (Support to formulate national program on integrated waste management)	–
12	El Salvador	2009	The Project on Integrated Solid Waste Management for Local Governments in El Salvador	–
13	Panama	2010	The Project for Improvement of Solid Waste Management for the Municipality of Panama in the Republic of Panama (*Proyecto de Mejoramiento del Manejo de los Desechos Solidos para la Municipalidad de Panama en la Republica de Panama*)	–
14	Dominican Republic	2012	Project for Appropriate Waste Management in Santo Domingo National District (*Proyecto de Seguimiento al Manejo Adecuado de los Residuos Sólidos en Santo Domingo de Guzmán, Distrito Nacional, República Dominicana*)	–

3.1 The Study on the Improvement of the Solid Waste Management System for the City of Managua

3.1.1 History

The objective of this Study which was conducted in 1994 and 1995 was to formulate the waste management master plan for the City of Managua and to implement prioritized projects selected in this master plan.

The goal of the master plan was to "make Managua City beautiful and clean city towards the 21st Century through developing and realizing participatory, independent and sustainable waste management".

4 prioritized projects in the master plan consisted of a project to improve collection, a project to construct a new final disposal site in Acahualinca, a project to improve the existing vehicle workshop in Los Cocos, and a project to promote the awareness, cooperation, and participation of the citizens.

In addition, before this Study, a grant aid of 403 million JPY was provided to improve equipments for waste collection in Managua City. With this grant, the City became equipped with the necessary equipments and vehicles for the management of municipal solid wastes.

The improvement of the final disposal site Acahualinca was considered an important project among the prioritized projects. However, there was no progress for many years after the Study. In 2007, a project called *El Proyecto de Desarrollo Integral del Barrio Acahualinca* (PDIBA) was finally implemented with the assistance of Spanish Agency for International Development Cooperation (AECID) which realized the improvement of the disposal site, improvement of the living conditions in the neighboring areas, and improvement in waste collection.

With regard to the grant aid provided by Japan, the JICA Nicaragua office conducted a terminal evaluation in 2000. The findings were as follows.

- Lessons learned
  In this project, very little assistance was provided from Nicaragua Government to the Managua City and the fees collected from the citizens were not sufficient. In the future, if there are projects to be implemented at the municipal level, the participation of the governmental organizations and citizens should be promoted from the planning stage so that there would be stronger support and better understanding among the stakeholders.

- Recommendations
  The Managua City should review its organizational structure and revenue sources. In particular, the collection method of waste collection fees and the allocation of financial resources for maintenance of provided equipments should be improved. Furthermore, the City should strengthen its partnership with the national government, implement environmental education for the citizens concerning solid wastes, and create regulations on solid waste management.

3.1.2 Promoting Factors and Obstacles

- Obstacle: The results of the Study led to high expectations that grant aid would be provided for the improvement of final disposal sites. However, it was never realized.
- Promoting factor: Although many donors proposed different ideas regarding the final disposal site such as introducing inter-municipal management, it was decided that the current final disposal site Acahualinca would be improved ant utilized.

3.2 The Study on Solid Waste Management in the Urban Area of Tegucigalpa, Central District, Republic of Honduras

3.2.1 History

This Study concluded as follows.

- Many of the issues regarding waste management in the Urban Area of Tegucigalpa are caused by the organizational or institutional structure and inefficient financial management system. Meanwhile, there are very few problems with the technical aspect. Currently, in order to implement any effort to improve the technical system, it is important to establish a proper organizational structure. Therefore, the top priority is to improve the organizational and institutional system in the area.

In the interview with the staffs of the Ministry of Natural Resources and Environment, they have made comments on this Study as follows.

- The achievements obtained through the development of the master plans and implementation of pilot projects through the JICA Study in the Urban Area of Tegucigalpa by JICA in 1999 are not fully utilized due to the political situation (i.e. changes in the policy priorities of the Honduran Government)

3.2.2 Promoting Factors and Obstacles

- Promoting factor: The development of the master plan and the implementation of the pilot projects were realized without major problems in the Study in 1999. The master plans were developed in cooperation with JICA and the officials of the Urban Area of Tegucigalpa and the final report of the Study was accepted by the Honduran parties without any problems.
- Obstacle: The staffs of the Ministry of Natural Resources and Environment have commented that the achievements of this Study are not fully utilized due to the political situations (i.e. changes in policy priorities of the policy makers).

3.3 The Study on Solid Waste Management for the City of Mexico in Mexico

3.3.1 History

- The Study which was conducted from July 1998 to May 1999 aimed to achieve the following objectives.
  - Formulate a SWM master plan for the target year 2010.
  - Carry out the feasibility study of the priority project(s).
  - Pursue technology transfer regarding SWM to the counterpart personnel.

    Note: In the years 1998 and 1999, in the development surveys, there was no perspective of capacity development but rather technology transfer.

- As the remaining life time of the existing disposal site was unclear and there were concerns that its end of life is approaching, feasibility study concerning the followings were implemented.
  - the vertical expansion of existing final disposal site (Bordo Poniente IV);
  - the construction of a new final disposal site (Bordo Poniente V); and
  - the creation of a composting plant for the processing of organic wastes (sorted at source)
- From December 2000 to December 2002, a long-term JICA expert was dispatched to support the implementation of this project. As a result, this promoted the prolongation of

the existing disposal site Bordo Poniente IV through its vertical expansion and implementation of the composting project.

- With regard to construction of the new disposal site Bordo Poniente V, the feasibility for this project was not realized due to political conflicts among the stakeholders from 2000 right after the Study up until today in 2012. While the Federal Government supports the political party PAN, the Mexico City supports the political party PRD, and the Mexico State where the disposal site is planned to be located supports the political party PRI.

- Although some of the implementation process changed from the initial plans, most of the contents of the master plan which had 2010 as its target year were realized except for the construction of the new disposal site. The contents of 2 out of 3 feasibility studies were realized.

3.3.2 Promoting Factors and Obstacles

- During the Study, it was demonstrated that a feasibility study could be conducted towards the vertical expansion of the final disposal site by utilizing Japanese technologies. This as a result led to the prolongation of the life time of the disposal site, although the level of expansion was different from the plans. The Mexico City was able to improve its waste management by utilizing the achievements realized in cooperation with JICA.

- The dispatch of the JICA long-term expert right after the Study promoted the realization of the content of 2 out of 3 feasibility studies.

- The political conflicts continued among the Federal Government, the Mexico City, and the Mexico State. As a result, although the construction of a new disposal site which was proposed in the Study was technically a feasible option, it could not be realized.

3.4 The Project for Improvement of Solid Waste Management for the Municipality of Panama in the Republic of Panama

3.4.1 History

The Municipality of Panama considered that, in order to realize the contents of the master plan which was formulated under the JICA Study in 2002, it is essential that methods to solve the current challenges faced be understood. This is why the city requested to the Japanese Government for its assistance through the Panama National Government. In January 2007, the Project for Improvement of Solid Waste Management for the Municipality of Panama in the Republic of Panama was initiated, the project duration being three years.

In September 2009, the terminal evaluation was conducted for this study. In the evaluation, it was concluded that “Although the relevance of this project is considered to be high, the effectiveness and efficiency of this project is considered to be low. It was evaluated that the objectives of the project were only “partially met”.

In May 2009, when this terminal evaluation was conducted, the election for the president of the country and the Panama City mayor was held. Thus, at the point of the terminal evaluation, the city was under a period of drastic change.

In addition, an organization called DIMAUD which served as the Cleansing Directorate of the city in September 2009 was dismantled in the following year and formed into a national organization called AAUD (Autoridad de Aseo Urbano y Domicilio). The responsibility of this organization has greatly changed since then.

3.4.2 Promoting Factors and Obstacles

- Promoting factor: Before the year 2009, the mayor was elected for 2 terms (i.e. 8 years) with its pledge to realize a clean city through improving waste management in the city. Thus, waste management was greatly promoted in Panama City as this was an important element to realize the pledge made by the mayor. As a result, the mayor succeeded in making the city clean and also greatly contributed to keeping it clean.
- Obstacle: In the latter half of the mayor's second term, the mayor started to prepare to become the candidate for the next presidential elections. As a result, the officials responsible for waste management and many other stakeholders had to support the mayor with his election campaign. In the end, the mayor lost in the presidential elections, and the Cleansing Directorate of the city was dismantled. As a consequence, many of the knowledge and experience which were accumulated in the organization through technical cooperation projects and other efforts were lost.

3.5 The Development of Waste Management Policy based on 3Rs in Mexico

Among the 7 studies and projects that are subject to the retrospective evaluation in this report, only this case is a case where policy formulation support was provided to the central government.

3.5.1 History

- Basic Law for Prevention and Integral Waste Management (*Base para Legislar la Prevención y Gestión Integral de Residuos)* was enacted in October 2003 as basic principles for implementing integral waste management that aims to promote waste generation reduction, recovery, reuse, and recycle of resources, and cooperation and sharing responsibilities among various stakeholders such as federal government, local government, civil society, industries. The law obligated THE MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES (SEMARNAT) to formulate and implement a national program for integral waste management (hereinafter National Program). In this respect, THE MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES (SEMARNAT) published the Basic Diagnosis for Integral Waste Management. Meanwhile, since Mexico did not have a long history in implementing 3R (reduce, reuse, and recycle) and experiences on 3R were very limited, it faced difficulties in formulating an effective and realistic national program on 3R.

- Under these circumstances, the Government of Mexico requested Japan for technical cooperation for the Project for the Development of Waste Management Policy based on 3Rs to the Government of Japan. In response, JICA organized the first Japanese Preparatory Study Team in November 2006 and the second Japanese Preparatory Study Team in February 2007 and the tentative project framework and measures to be taken by each side for the Project were confirmed.

- The national policy formulation was supported mainly through dispatch of multiple short-term JICA experts from June 2007 to November 2008.

3.5.2 Promoting Factors and Obstacles

- This was a technical cooperation project with the objective to support the development of 3R policies. Under this project, distinguished Japanese experts on 3R including Mr. Hideto Yoshida (Director General of Waste Management and Recycling Department, Ministry of the Environment) and Mr. Masaru Tanaka (former president of Japan Society of Waste Management) visited Mexico as short-term experts to give seminars or presentations. It is considered that this had a great influence to raise awareness of the relevant parties in Mexico.

- As the new Mexican administration which was established in December 2006 had limited to time to develop the national policy, there was high commitment from the Mexican parties. As a result, accomplishments were made after 1.5 years, which is a very short project period for a JICA technical cooperation project.
- Either because the size of the project budget was small or because the project duration was short, there was no PDM (project design matrix) or PO (plan of operation) formulated. This is believed to have promoted the efficient implementation of the project. For instance, experts could be dispatched flexibly without having to stick with the initial PO.
- In addition, as this was a project to support the central government with regard to policy formulation, there were no equipments provided. When there is equipment provision under a project, the project duration generally becomes longer as there would be additional components in the project such as technical trainings on how to use the equipments or pilot projects utilizing the equipments. It is considered that the fact that there was no equipment provision in the project contributed to shorten the project duration and to enable additional dispatch of experts as necessary.
- While there was no equipment provision, flexible measures such as financing for events such as done by GIZ could not be realized. Thus, the short-term experts mainly supported the drafting of the national policy.

3.6 The Project on Integrated Solid Waste Management for Local Governments in El Salvador (PROMADES)

3.6.1 History

In November 2011, SICA-CCAD decided to formulate "the Program to Support Local Governments for the Regional Waste Management in the Central American Region" and requested Japan for its assistance. Later, each country in the Central American region requested individually for implementation of technical projects in their country as a component of the above program. Among them, El Salvador requested Japan to implement "Project on Integrated Solid Waste Management for Small Municipalities in the Republic of El Salvador"

The Global Environment Department of JICA decided that the individual project requested by El Salvador could be considered for implementation. Meanwhile, regarding the program proposed by SICA-CCAD, it decided that it would consider its adoption after seeing the progress or results of the project in El Salvador.

Before project implementation, two preliminary surveys were conducted and consultations on project implementation were held. As a result of these works, the followings were realized.

- Basic components of the project such as the program objective, the project objective, project duration (36 months), project implementation organization, and draft project design matrix (PDM) were agreed upon.
- Purpose of the project was formulated which is to strengthen the capacities of the central government so that they can apply to other cities after the project termination the integrated solid waste management system (ISWM) which would be developed in ASINORLU as a model.
- It was decided that the establishment of the ISWM model in ASINORLU itself would not be the project objective. It was designed to be a pilot project in order to realize the capacity development of the government officials. The officials of the central government would cooperate with ASINORLU in establishing the model. The Japanese experts would not directly give advice to the ASINORLU members but rather to the

officials of the central government.

- The followings were confirmed as inputs from the Japanese side.
  - Dispatch of experts: long-term and short-term
  - Acceptance of trainees: from 2 to 3 each fiscal year
  - Provision of equipments: equipments for operation of disposal site (e.g. bulldozer, loader, dump truck, sprinkler truck, truck scale or weigh bridge), equipments for the pilot project on collection, transport, and inter-mediate treatment (e.g. collection containers, hand carts), educational materials for environmental education and awareness raising (e.g. videos, projectors), and 4-wheel drive vehicles.
  - Burden of local costs: costs for construction works of sanitary landfill site, implementation of other pilot projects, and organization of seminars and workshops in the Central American region
- The Salvadoran side supported the cost necessary for closing of the existing open dumping disposal site (the grant assistance from DAC program of IDB was utilized).

3.6.2 Promoting Factors and Obstacles

a. Careful Project Formulation

The formulation period for this project was especially long compared to other projects; 2 preliminary studies and consultations for implementation were conducted between the project finding and project implementation. Furthermore, although the project period was initially scheduled to be 3 years, it was prolonged to 3.5 years after the first preliminary study.

The fact that a long time was invested for the project formulation as a result brought the commitments from the El Salvador side and promoted the implementation of the project.

Meanwhile, the fact that it took a long time for the project formulation and the fact that JICA is less speedy and flexible compared to other donors sometimes exhausted the authorities of El Salvador or decreased their motivation.

b. Construction of Visible Infrastructures (Sanitary Landfill Site and Leachate Treatment Facility)

The construction of the final disposal site (i.e. construction of a Fukuoka-method sanitary landfill site and leachate treatment facility) with the support of the Japanese expert contributed to realize technical transfer and to appeal the benefits of the project to the relevant authorities in El Salvador. Furthermore, as it improved the final disposal site by changing it from an open dumping site to a sanitary landfill site, it contributed to formulate the consensus of the local residents regarding the project.

c. Need to Comply with Laws with Penalties (Legislative Decree 237)

Municipalities were obliged to submit to the Ministry of Environment and Natural Resources the implementation plans necessary for closure or improvement of inappropriate disposal sites as there were penalties for incompliance. This as a result functioned as the “stick” of the “carrot and stick” and became the promoting factor.

d. Available Financial Source for the El Salvador Side (DAC Program of IDB)

Municipalities which submitted implementation plans for the closure or improvement of inappropriate disposal sites had the opportunity to receive financial aid, which functioned as the

"carrot" of the "carrot and stick".

3.7 The Project for Appropriate Waste Management in Santo Domingo National District, Dominical Republic

3.7.1 History

In July 2005, JICA conducted the Study on Integrated Solid Waste Management Plan in Santo Domingo de Guzman National District (the Study). In the Study, in order to strengthen the capacity of the municipal government (ADN), an Integrated Solid Waste Management Plan for Santo Domingo (Master Plan; M/P) was developed aiming at achieving the following four goals; namely, i) provision of collection service to maintain healthy living environment (100% waste collection); ii) establishment of an environmentally sound disposal site, iii) promotion of waste minimization through recycling and reducing (15% reduction rate), and; iv) ensuring fiscal soundness (limiting waste management-related cost to 30-40% of the general account budget) by 2015.

Meanwhile, despite the recommendations in the M/P, issues regarding waste minimization, public awareness raising concerning waste discharge practices, and maintenance of collection and transportation vehicles were not fully solved due to lack of knowledge, skill or experiences of the ADN staff.

The Project has been implemented since July 2009 for 36 months to strengthen ADN's capacity on SWM.

3.7.2 Promoting Factors and Obstacles

- The fact that the members of the Study on Integrated Solid Waste Management Plan in Santo Domingo de Guzman National District including the chief member among the counterpart authorities participated in this technical cooperation project was a great promoting factor for the success of the project. Mr. Jose Miguel, the chief member among the counterpart authorities, provided smooth and timely support for the cooperation with the expert team, as he had already experience in the Study and had trust in JICA.

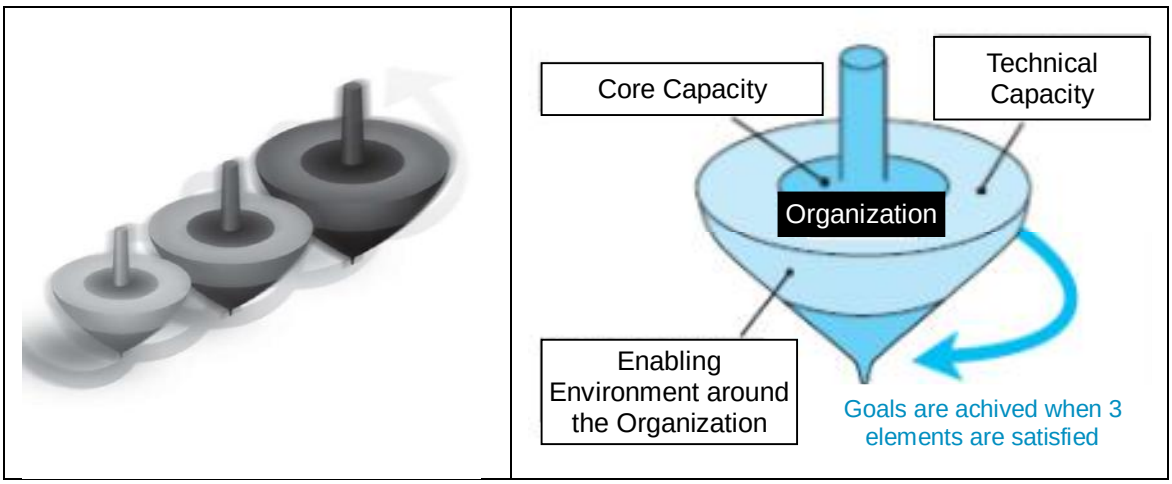
- In May 2010, which was 10 month after initiation of the project, city mayoral elections were held. This became an obstacle for the project, as the Dominical Republic side could not express concrete commitments for the implementation of the activities. However, after the elections, the fact that the term for the mayor became 6 years, which is exceptionally long, became a promoting factor for the project as this enabled the relevant parties to have a long-term vision for the future.

- Among the different pilot projects, the pilot project to treat green wastes with the crusher provided by JICA was effective in showing to the public the visible impact of the project and in bringing out the initiatives of the Dominican side.

3.8 Conclusions of the Retrospective Evaluation

The Capacity Assessment Handbook (JICA 2008) explains capacity (the capability to handle issues) through the conceptual diagram on the below. Technology, particular knowledge, and tacit knowledge on the part of the organization is referred to as "technical capacity," and the will, attitude, leadership, and management capabilities to activate technical capacity are referred to as "core capacity," and serve as core elements for capacity. The systems, societies, and so on which underpin such capacities are referred to as the "enabling environment" that encompasses the organization. Capacity only comes about once these three elements have been integrated. It is thought that capacity is expanded in a stepwise fashion by repeating a cycle of status analysis –

strategy planning – implementation – evaluation.



When overviewing the promoting factors and the obstacles of the above 7 studies and projects, the key elements can be categorized into three elements, namely "enabling environment", "core capacity", and "technical capacity".

3.8.1 Enabling Environment

In implementing the Project on Integrated Solid Waste Management for Local Governments in El Salvador (PROMADES), the promoting factors (the "carrot and the stick") were the Presidential Decree 237 with penalties and the DAC program of IDB which provided financial assistance for the implementation of the Presidential Decree. The fact that the JICA project was implemented after the enactment of the Presidential Decree and when financial assistance was provided by IDB/DAC worked as the enabling environment which promoted the implementation of the project.

Regarding the Development of Waste Management Policy based on 3Rs in Mexico, as it was stipulated by the law that the national program for integral waste management must be developed and implemented, this worked as the "stick" as the Mexican authorities were obliged to develop this program. In addition, as the budget for the implementation of this program was clearly written in Chapter 11 of this national program, this made the fund procurement for the relevant projects legitimate.

In many cases, the issue that becomes an obstacle for the activities is elections. In the months before the elections, the relevant authorities have difficulties in making decisions and thus the activities often become delayed. If the policy makers change after the elections, there is the risk that the relevant authorities involved in the project would also change and that the project activities would have to start over. Thus, if possible, projects should be designed taking into consideration the timing of the elections when formulating or adopting a new project.

Furthermore, it is important that appropriate time is committed for the project formulation. During this period, it is important that the JICA field offices and Project Formulation Advisors of JICA bring out the commitments of the recipient country and support the development of core capacities such as leadership and management skills. Such efforts are considered to lead to the successful management of the projects after initiation.

3.8.2 Core Capacity

In the case of Project for Appropriate Waste Management in Santo Domingo National District in the Dominican Republic, important promoting factor was the leadership and management skills

of Mr. Jose Miguel who was the chief among counterpart authorities. It is without doubt that the fact that Mr. Miguel had the capacity to persuade the policy makers was a great promoting factor for the project.

In the Project on Integrated Solid Waste Management for Local Governments in El Salvador (PROMADES), opinions of the counterpart authorities were respected from the project formulation period and the fact that the project formulation period was long led to the development of the core capacities of the counterpart authorities and thus contributed to the success of the project.

3.8.3 Technical Capacity

In the Project on Integrated Solid Waste Management for Local Governments in El Salvador (PROMADES), the promoting factors were the construction of the final disposal site supported by the Japanese experts (construction of a Fukuoka-method landfill and leachate treatment facilities) and the provision of equipments for the management of the disposal site including bulldozers, excavators, and dump trucks. In the Project for Appropriate Waste Management in Santo Domingo National District in the Dominican Republic, the same can be said for the provision and utilization of the crusher for the green wastes.

For developing countries and also emerging countries like Mexico, it is often difficult to apply technologies or equipments that they are not familiar with in the waste management sector. When technologies or equipments are applied without sufficient knowledge, many risks arise such as the risk that the equipments become quickly damaged and discarded

On the other hand, although it is the donor's responsibility to introduce appropriate technologies to the developing countries, if the main objective of cooperation is to highly technical and involves activities such as proposal or demonstration of specialized technologies, schemes such as loans or public-private partnerships may be more suitable as scheme for cooperation.

However, if the main objective of cooperation is overall capacity development, it is believed that technical projects that are founded on the three elements of "enabling environment", "core capacities", and "technical capacities" would be more suitable as scheme for cooperation.

3.9 Lessons Learned

Among the 3 elements, namely "enabling environment", "core capacity", and "technical capacity", there is higher chance that the projects would succeed when there is high "core capacity" in the recipient country and higher chance that the project would fail if it is lacking.

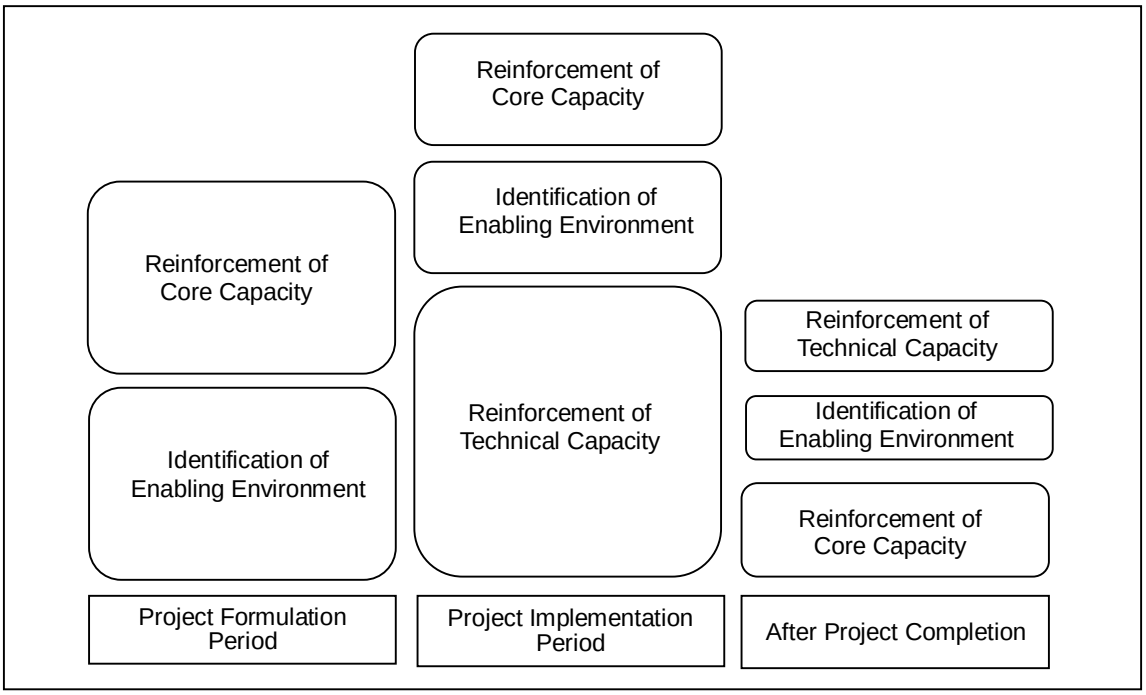


Figure 6: Concept of Capacity Development in Different Stages

3.9.1 Project Formulation Period

In the project formulation period, the most important element to consider is the "enabling environment". It is important to identify whether the implementation of the project is necessary in complying with the laws (whether there is the "stick") and whether there are resources available to implement the project or policies (whether there is the "carrot"). When considering the implementation of a project which supports formulation of a policy, identification of such information is most important.

In addition, something that can and should be done during the project formulation period is to develop the "core capacity" of the counterpart authorities. For the success of the project, it is most important that the commitments of the recipient country are brought out at the stage of project formulation.

On the other hand, development of "technical capacity" cannot be done at the project formulation period.

3.9.2 Project Implementation Period

During the project implementation period, development of "technical capacity" is most important in achieving the project objectives and in developing the capacity of the counterpart authorities. Technical capacity development is conducted especially effectively when Japanese experts assist in formulation of master plans or feasibility studies or when visible improvements are demonstrated through pilot projects utilizing equipments provided by JICA.

3.9.3 After Project Completion

After project completion, little can be done for development of "technical capacity" or "enabling environment". At this stage, it is expected that the counterpart authorities would continue the project activities on their own initiative utilizing their "core capacity".

However, it should be noted that in some cases, the dispatch of experts after the project

completion lead to achievement of the project objectives or strongly promote the continuation of the activities.

3.9.4 "Spatial Expansion" of the Impacts of Cooperation

Up to present, the case of PROMADES-ASINORLU in El Salvador has led to spatial expansion of cooperation activities. The Project for Appropriate Waste Management in Santo Domingo National District, Dominical Republic, which completed in 2012, is also starting to lead to spatial expansion, as the local governmental officials who take part in the project have organized workshops for officials of other local governments.

This could be due to the fact that the spatial expansion of the impact was aimed for from the project formulation stage and it was reflected in the project design. On the other hand, under most of the other studies and projects listed in Table 3, activities were conducted to formulate master plans or to implement feasibility studies on the priority projects for the capital cities of each country with the objective to realize technical transfer to the governmental officials. Thus, the activities conducted were unique to the circumstances in the capital cities of each country. As a result, the impact of cooperation became more significant but at the same time more spatially limited.

3.9.5 "Duration" of the Impacts of Cooperation (Sustainability of the Impact of Capacity Building)

As external factor, the "enabling environment", or the environment where the "stick and the carrot" continue to be in place, is an important factor for the long duration of the cooperation impact. Meanwhile, something that JICA could do to prolong the duration of the impacts is to continue to support the development of core capacities and technical capacities in order to help sustain the developed capacity level of the government officials of the recipient country. For instance, the following activities conducted by JICA office in El Salvador and in the Dominican Republic are believed to have helped in sustaining the impacts of the cooperation activities.

- Planning in advance for follow-up activities and their implementation after termination of the project (e.g. dispatch of short-term experts)
- Invitation of the relevant officials of the recipient country to Japan for JICA trainings in order to not lose the continuity of the cooperation impacts

4 Analysis of Issues

4.1 Current Conditions in the Target Countries of the Field Survey

4.1.1 Central Government

a. Result of Capacity Assessment

Based on the result of capacity assessment of the countries where the field surveys were conducted, the common issues seen with regard to central governements are summarized in the table below.

Table 4: Conditions of Central Government in the Countries Target of Field Survey

Item	Condition
Basic information	All countries have sufficient basic information regarding waste management in order
Laws	Only El Salvador has enacted laws on waste management, and other countries are currently preparing to enact such laws. In the laws of El Salvador, there are no rules on “hazardous wastes” and thus the issue should be addressed in the future.
Policies	Although the extent is different among countries, all counties have policies regarding waste management in place.
Administration	In all countries, the central ministries and agencies provide supervision, and the local governments implement the actual work of waste management.
Organization	Although the system is different among countries, organizations in charge of waste management are established in all countries
Private participation	Although the level is different among countries, partial private participation can be found in many countries.
Finance	All countries have difficulties in securing financial resources.
EIA	All countries have systems in place, and construction of waste related facilities must go through EIA procedures.
Hazardous waste management	There are no laws enacted that enables actual management of such wastes.
Environmental pollution caused by wastes	There are issues such as the deterioration of landscapes and illegal dumping of wastes in the rivers. In addition, the hazardous wastes are not properly managed.
Education and trainings	Personnel have been trained through support from JICA and GIZ. In El Salvador, there is the urgent need to train sanitary landfill engineers.
Personnel and organizational structure	Although the situation is different among counties, the departments or organizations in charge of waste management are established in all countries.
Equipments and facilities	Not applicable as central government is not in charge of the actual waste management operations.

From the observations above, the followings were concluded.

- While all countries need enactment of the laws regarding waste management, El Salvafor has already enacted laws on management of municipal solid waste. The next step for El Salvador is to enact laws on management of hazardous wastes.
- While the private sector takes part in waste management in all countries, the public sector is not properly controlling the private participation in most of the cases.
- In all countries, hazardous waste management is not properly implemented.
- In Latin American countries including the target countries of field survey, it is common practice to throw wastes in rivers, and this is causing environmental pollution.
- As El Salvador is aiming to improve sanitary landfills, there is the urgent need to train sanitary landfill engineers. In the near future, it is likely that such needs would grow in the

other countries in the Central America and Caribbean Region as the percentage of sanitary landfills grows in this region.

b. PCM Workshop

PCM workshops were organized with the objective to identify the core problem in waste management with the officials of central government, and the results of these workshops are as shown in the previous sections. In all countries where the workshops were organized, there were few cards below the core problem which show the cause of the core problem and there were more cards above the core problem which show the consequence of the core problem.

Table 5: The Core Problem and its Cause Identified in the PCM Workshop

Country	Core Problem	Cause
Honduras	Waste management is not properly implemented	- Low public awareness on environmental issues - Lack of waste management engineers - Lack of adequate collection service - Lack of sanitary landfills
Guatemala	The relevant ministries and agencies are not properly functioning	- Low social pressure - Lack of institutions regarding waste management
El Salvador	Waste management is lowly prioritized among policy issues	- Lack of public understanding on waste management - Low prioritization by the national government - Lack of understanding among politicians
Dominican Republic	There is lack of laws and regulations regarding waste management	- Lack of policies and political will among national and local governments

From the results of the workshops, it was found that although the participants recognized the issues that have come to the surface, the cause for those issues were not clearly understood other than in Honduras. The workshop participants in the other counties identified only general problems as the cause of the core problem.

This may be due to the fact that the participants of the workshop in Honduras consisted of 2 central government officials and 7 local government officials. As the local government officials implement the actual waste management works on the field, they may have been able to identify more concrete issues behind the core problem.

The central ministries and agencies in charge of waste management should better understand and analyze the actual situation of waste management and should further analyze the detailed cause of the core problem. Furthermore, based on the results of the problem analysis, the objective analysis should also be conducted so that the future goal would become clarified. Then, the appropriate approach to solve the problem should be selected among different approaches. After the selection of approach and clarifying the concrete actions, the actions can be implemented as a project on capacity building on waste management targeted to the central ministries and agencies.

4.1.2 Local Governments

All local governments visited in the field survey held issues unique to that area. Meanwhile, it can be said that in all countries visited, street sweeping was conducted at relatively high level and thus the cities “look” clean. However, in these countries, the laws and regulations on waste management are not insufficient or do not exist, and they often suffer from lack of financial resources for waste management.

4.2 Analysis of Issues in the Target Countries of the Field Survey

The main issues and necessary actions to be taken in the target countries of the field survey in this study are summarized in the following table.

Table 6: Unit Cost for Waste Management Activities in Latin American Countries

Country	Main Issues	Necessary Actions
Honduras	The sanitary landfill coverage rate is 11.3%.	- Promote construction of sanitary landfill sites
	The Waste Management Unit has just been established, and both the number and the capacity of the staffs are lacking	- Increase personnel - Build capacity building of the organization - Provide technical support
	The current waste management cost is USD 28.97/ton, which is about half of the cost that is believed to be appropriate which range from USD 50 to 60.	- Increase waste management costs - Secure financial sources
	Public awareness regarding waste management is low.	- Raise public awareness - Make efforts to change the mentality of the government staffs
	In Ocotepeque, an organization which may not have adequate technical capacity is planning to be in charge of construction of a sanitary landfill.	- Provide technical support by experts
Guatemala	The sanitary landfill coverage rate is 15.4%.	- Promote construction of sanitary landfill sites
	The law on integrated waste management is not yet approved by the national congress, the relevant ministries and agencies are not properly functioning, and appropriate waste management cannot be implemented due to the current legislation which is insufficient	- Make efforts to promote approval of the law by the national congress - Reinforce the function of the relevant ministries and agencies - Tighten the regulations
	The policy priority regarding waste management is low compared to that regarding infrastructures. Meanwhile, the lack of proper waste management is causing environmental pollution in rivers and streams.	- Disseminate information on the current situation - Encourage the relevant parties to prioritize higher waste management issues
	There are challenges with regard to participation in trainings by CENICA (there are challenges with technical cooperation through dispatch of experts from third-country).	- Consultations and actions among stakeholders to solve the issues
	In Guatemala City, waste collection is entirely consigned to the private sector and the local government does not provide any management.	- Implement proper management of the collection activities
El Salvador	The sanitary landfill coverage rate is 78.2%.	- Promote construction of sanitary landfills - Establish maintenance system
	Financial resources are needed as the construction of sanitary landfill sites is being promoted nationwide based on the ASINORLU experience.	- Finance through schemes such as loans
	The cost for operation and management of sanitary landfills is great burden for the local governments.	- Establish a system for management and operation of disposal sites
	MIDES which is the company that is operating sanitary landfill sites in the metropolitan and other areas have few problems from the technical aspect. However, the contract fee with MIDES is becoming a great burden for the local governments.	- Stop the current monopolistic situation (i.e. monopoly by MIDES)
	Laws and institutions must be established regarding management of hazardous wastes including E-wastes.	- Develop a sound legal system
Mexico	The sanitary landfill coverage rate is 65.6%.	- Promote construction of sanitary landfill sites - Establish maintenance system
	There are remaining issues regarding south-south cooperation by CENIA.	- Revise methods of implementation; - Support each countries regarding administrative procedures

Country	Main Issues	Necessary Actions
	There are issues with Guatemala regarding south-south cooperation by CENICA.	- Consult with the stakeholders and take actions to solve the issues
	Businesses regarding waste and recycling should be developed to accompany the industrial development.	- Search for possible business opportunities
	The possibility of public-private partnership (PPP) regarding waste management facilities should be explored.	- Search for possible business opportunities
Dominican Republic	The sanitary landfill coverage rate is 33.7%.	- Promote construction of sanitary landfill sites
	Laws on waste management should be enacted at the national level.	- Make efforts to realize early enactment of the bill currently submitted to the national congress
	The capacity of the local government should be developed regarding waste management.	- Increase personnel - Build capacity of the organization
	Another final disposal site must be constructed for the metropolitan area.	- Decide on how to proceed with the issue - Finance the necessary costs

4.3 Cost

4.3.1 Unit Cost of Waste Management

The unit cost for waste management activities in Latin American countries (based on the results of survey conducted by IDB in 2000) are shown in the following table.

Table 7: Unit Cost for Waste Management Activities in Latin American Countries

Country	GDP 2010 (USD/Capita)	Collection Service Coverage (%)	Sanitary Landfill Coverage	Unit Cost of Collection and Transport (USD/ton)	Unit Final Disposal Cost (USD/Ton)	Overall Unit Cost (USD/ton)	Overall Unit Cost/ GDP 2010	Collection and Transport Unit Cost/ GDP 2010	Final Disposal Unit Cost/ GDP 2010
Colombia	6,238	98.9%	81.8%	34.12	23.31	57.43	0.921%	0.547%	0.374%
Chile	12,640	97.8%	81.5%	27.97	11.43	39.40	0.312%	0.221%	0.090%
El Salvador	3,460	78.8%	78.2%	30.42	21.02	51.44	1.487%	0.879%	0.608%
Costa Rica	7,774	90.4%	67.5%	22.65	18.81	41.46	0.533%	0.291%	0.242%
Mexico	9,133	93.2%	65.6%	26.39	10.56	36.95	0.405%	0.289%	0.116%
Argentina	9,124	99.8%	64.7%	69.11	17.63	86.74	0.951%	0.757%	0.193%
Brazil	10,993	96.0%	55.0%	42.46	31.48	73.94	0.673%	0.386%	0.286%
Bolivia	1,979	83.3%	44.7%	15.27	7.89	23.16	1.170%	0.772%	0.399%
Peru	5,292	84.0%	43.5%	15.02	5.98	21.00	0.397%	0.284%	0.113%
Panama	7,614	84.9%	41.7%	-	-	-	-	-	-
Paraguay	2,840	57.0%	36.4%	6.59	5.88	12.47	0.439%	0.232%	0.207%
Dominican Republic	5,195	97.0%	33.7%	-	-	-	-	-	-
Ecuador	4,008	84.2%	30.2%	30.05	5.61	35.66	0.890%	0.750%	0.140%
Guatemala	2,873	77.7%	15.4%	10.84	0.00	10.84	0.377%	0.377%	0.000%
Honduras	2,019	64.6%	11.3%	20.81	8.16	28.97	1.435%	1.031%	0.404%
Uruguay	11,742	98.0%	3.8%	47.85	9.19	57.04	0.486%	0.408%	0.078%
Belize	4,064	85.2%	-	-	-	-	-	-	-
Guyana	2,994	-	-	-	-	-	-	-	-
Jamaica	5,133	73.9%	-	-	-	-	-	-	-
Nicaragua	1,139	92.3%	-	-	-	-	-	-	-
Venezuela, RB	13,658	100.0%	-	-	-	-	-	-	-

(1) current international $ 2010 WB Data Base

Other than (1): REGIONAL EVALUATION ON URBAN SOLID WASTE MANAGEMENT IN LATIN AMERICA AND THE CARIBBEAN - 2010 REPORT, IDB, AIDIS, PAHO 2010

In the above table, it is shown that the unit cost for collection, transport, and disposal range from USD 12/ton to 87/ton. In Columbia, Chili, and El Salvador which are countries with the highest sanitary landfill coverage, the unit cost for final disposal is USD 11.43/ton in Chili and around USD 20/ton in Columbia and in El Salvador.

One of the reasons why the unit cost in Chili is low is because the required leachate treatment system is simple due to climate conditions (i.e. the amount of evaporation exceeds the amount of rainfall). Another reason is that there are efforts to improve the efficiency such as integrating the disposal sites. Thus, it is believed that the minimum unit cost for realizing sanitary landfill and maintaining a high collection rate would be in the range from USD 50/ton to USD 60/ton.

With regard to El Salvador, although the GDP level is the lowest among the three countries that have the highest sanitary landfill coverage, the sanitary landfill coverage is 80% which is not far from the two other countries.

As previously explained, in El Salvador, there are enacted laws to construct sanitary landfills nationwide and continuous management had been realized up until today despite its low GDP. In addition, the ratio of Final Disposal Unit Cost to GDP is the highest among all countries listed in this table.

4.3.2 Total Cost of Waste Management

The costs in Table 5 are direct costs, which is only a part of the total cost for waste management.

For instance, in El Salvador, the annual budget of the Directorate of Solid Waste Sustainable Management in San Salvador City was USD 12,997,252.57 and the amount of collected waste was 127,586 ton in 2011 according to its annual report[14]. When this budget is divided by the amount of collected wastes, the waste management cost becomes USD 101.87 per 1 ton of collected waste, which is about double the total cost for collection, transport, and disposal. The breakdown of USD 101.87 is estimated to be USD 50 for collection, transport, and disposal and the rest for street cleaning and management.

4.3.3 Sustainability of Waste Management from the Financial Perspective

In many cases, management of municipal solid waste is the responsibility of the local governments and the financial source for waste management is generally the general revenue or the collected fees for waste management.

The average amount invoiced for waste management in the Latin American countries range from USD 4.23 to 3.32/household/month or USD 50.76 to 39.84/household/year), although it is different depending on the method of billing.

Table 8: Monthly Amounts Invoiced by Population Size in Latin American and Caribbean Countries

Monthly Amounts Invoiced by Population Size in LAC (US/month)												
Country	Micro		Small		Medium		Large		Mega		Overall	
	FRB	DRB	FRB	DRB	FRB	DRB	FRB	DRB	FRB	DRB	FRB	DRB
Argentina	4.95	-	5.95	5.44	13.34	4.34	-	..	..	5.45	*	
Belize	2.5	-	-	-	-	-	-	-	..	..	*	*
Bolivia	1.14	-	0.62	-	2	1.39	-	2.48	..	..	1.56	2.04
Brazil	-	-	-	0.77	-	2.56	-	5.04	-	-	*	3.36
Chile	-	-	10.06	-	6	-	-	-	..	..	8.65	*
Colombia	2.99	-	3.23	3.23	5.45	-	5.82	-	7.9	-	5.74	*
Costa Rica	3.14	-	4.04	-	3.02	-	4.13	-	..	..	3.45	*
Dom. Rep	-	1.48	0.81	1	-	3.61	-	5	..	..	*	3.57
Ecuador	1.75	-	2.26	-	6.96	2.8	-	-	..	..	5.97	*
El Salvador	1.5	-	1.53	-	3.84	-	7.66	-	..	..	3.34	*
Guatemala	-	-	3.8	3.57	2.69	3.52	4.12	-	..	..	3.46	3.55
Guyana	-	-	-	-	-	-	-	-	..	..	-	-
Honduras	1.39	3.24	1.86	3.03	0.78	3.98	3	7.68	..	..	1.97	3.91
Jamaica	-	-	-	-	-	-	-	-	..	..	-	-
Mexico	-	-	-	-	-	-	-	-	-	-	-	-
Nicaragua	-	-	1.24	2.6	4.24	4.56	4	10	..	..	2.72	4.86
Panama	2.3	-	2	3.75	4.6	3.6	7.5	-	..	..	4.88	3.64
Paraguay	2.3	-	3.45	-	3.98	2.1	-	2.3	..	..	3.44	2.14
Peru	2.1	-	1.75	2.04	2.83	1.94	1.2	1.54	-	-	2.14	1.78
Uruguay	-	-	-	-	-	-	-	-	..	..	-	-
Venezuela	-	-	1.16	2.03	-	3.75	1.41	6.94	..	..	1.34	4.52
LAC	2.7	2.47	3.33	1.59	4.6	4.36	3.79	4.93	*	-	4.23	3.32

FRB: Fixed Residential Billing; DRB: Differentiated Residential Billing

- Information not available .. No population of this size * Not enough data to calculate the aggregated variable at country level

Micro: ≤15.000 inhabitants; Small: 15.001 - 50.000 inhabitants ; Medium: 50.001 - 300.000 inhabitants;

Large: 300.001 - 5.000.000 inhabitants ; Mega > 5.000.000 inhabitants

Source: Regional Evaluation on Urban Solid Waste Management in LAC - 2010 Report , IDB

Under the assumptions that the number of people per household is 5 and that amount of waste discharged is 0.9 kg/person/day, the amount of annual waste discharged would be 0.32 ton/person/year and 1.64 ton/bill/year, which imply that the annual amount charged would be from

[14] Memoria de Labores2011-2012 Dirección Municipal para la Gestión Sustentable de Desechos Sólidos

USD 30.95 to 24.29/ton/year. On the other hand, the total cost for waste management in El Salvador is approximately USD 100/ton. In the case of Japan, the total cost for waste management is JPY 42,000/ton (equivalent to USD 25/ton) according to the latest statistics[15].

As the fees for waste treatment is often determined based on the financial capacity of the residents, increasing the fee is not an easy task. Therefore, if the collected fees are not sufficient to pay for all the costs, the rest must be paid by the other sources such as the general revenue of the local governments or other public financial sources.

In order to allocate such financial sources for waste management, it is important to make efforts to reduce the costs for waste management operations and to convince the leader of the organization which has the authority over that financial source that waste management is an important issue worth investing in.

The financial source of waste management activities is generally the tax revenue or waste disposal fees and how much the country can burden the costs for waste management is different among countries. Under the assumption that GDP per capita reflects the economic situation of the country, the relationship between waste management indicators (i.e. multiplication of collection service coverage rate by sanitary landfill coverage rate as shown in Table 5) and GDP was analyzed and the results are shown in Table 5.

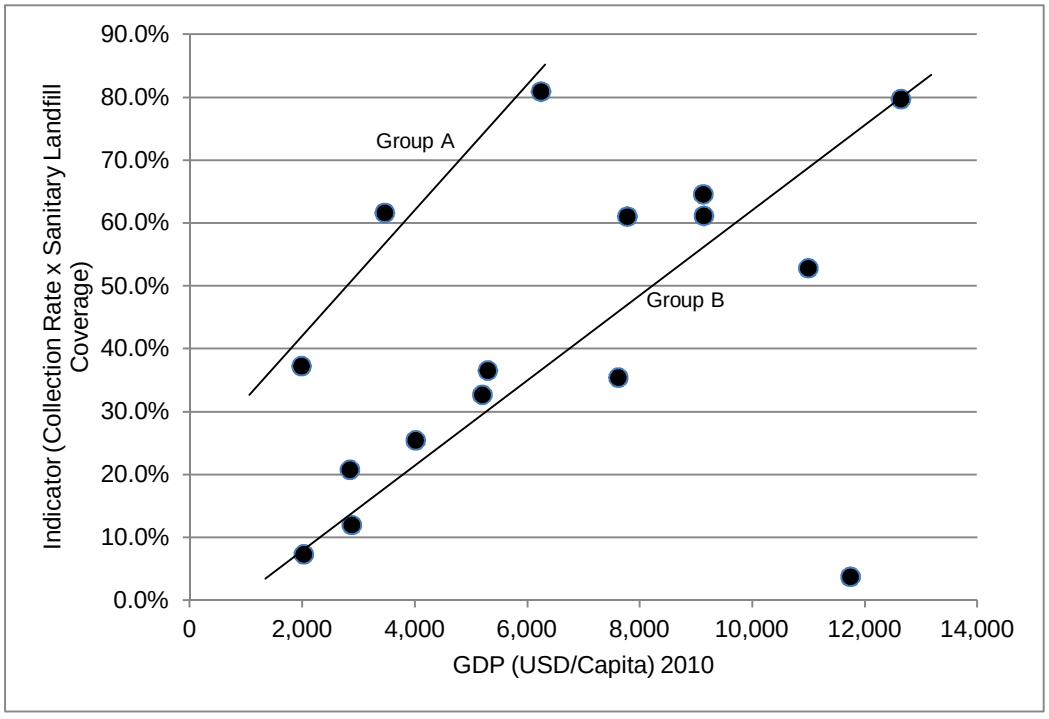


Figure 7: The Relationship between GDP and Waste Management Indicators

The countries of Group A which are plotted in the upper left hand side are countries with high waste management indicators relative to their GDP levels, namely Columbia, El Salvador, and Bolivia. This implies that if GDP level is above a certain level, relatively high standard waste management can be implemented depending on the waste management policies in place. In other words, if there are sound policies and the strong will to implement them, financial sustainability for waste management can be achieved despite the insufficient financial capacity.

[15]According to "Waste Managemnt in Japan in the Fiscal Year 2011" by the Waste Management and Recycling Department, Minister's Secretariat, Ministry of the Environment of Japan, the total amount of waste treated was 43,634,000 ton/year and total expenditure for waste management was 1,825,588,000,000 ton/year

Table 9: The Relationship between GDP and Waste Management Indicators

	GDP 2010 (USD/Capita)	(a) Collection Rate (%)	(b) Sanitary Landfill Coverage (%)	Indicator (a)x(b)
Colombia	6,238	98.9%	81.8%	80.9%
Chile	12,640	97.8%	81.5%	79.7%
El Salvador	3,460	78.8%	78.2%	61.6%
Costa Rica	7,774	90.4%	67.5%	61.0%
Mexico	9,133	93.2%	65.6%	61.1%
Argentina	9,124	99.8%	64.7%	64.6%
Brazil	10,993	96.0%	55.0%	52.8%
Bolivia	1,979	83.3%	44.7%	37.2%
Peru	5,292	84.0%	43.5%	36.5%
Panama	7,614	84.9%	41.7%	35.4%
Paraguay	2,840	57.0%	36.4%	20.7%
Dominican Republic	5,195	97.0%	33.7%	32.7%
Ecuador	4,008	84.2%	30.2%	25.4%
Guatemala	2,873	77.7%	15.4%	12.0%
Honduras	2,019	64.6%	11.3%	7.3%
Uruguay	11,742	98.0%	3.8%	3.7%

4.3.4 Issues in the Central American and Caribbean Region

4.3.5 Analysis of Issues

The existing studies with regard to the countries in the Central American and Caribbean Region are shown in the table below.

Table 10 : Existing Relevant Studies on Central American and Caribbean Region Countries

Country	Countries Target of Field Survey in this Study	Report , IDB (a)	JICA El Salvador Office Reporto (b)	JICA/JOCV St. Lucia Office Report (c)
Antigua and Barbuda				X
Bahamas				
Barbados				
Belize		X	X	
Costa Rica		X	X	
Cuba				
Dominica				
Dominican Republic	X	X	X	
El Salvador	X	X	X	
Grenada				X
Guatemala	X	X	X	
Guyana		X		
Haiti				
Honduras	X		X	
Jamaica				X
Mexico	X	X		
Nicaragua		X	X	
Panama		X	X	
St. Kitts and Nevis				X
St. Lucia				X
St. Vincent and the Grenadines				
Suriname				
Trinidad and Tobago				X

(a) Regional Evaluation on Urban Solid Waste Management in LAC - 2010 Report , IDB
(b) INVESTIGATION ON THE CURRENT SOLID WASTE MANAGEMENT IN THE REGION AND SICA MEMBER COUNTRIES (JICA El Salvador Office)
(c) Data Collection on Solid Waste Management in the Caribbean (JICA/JOCV St. Lucia Office)

Utilizing the results from the studies shown in the above table, the issues with regard to waste management in the Central American and Caribbean countries are summarized in the following table.

Table 11 : Synthesis of Issues in the Central American and Caribbean Countries

Country	Population	GDP per capita (USD/capita)	Waste generated (kg/person/day)	Waste disposed (ton/day)	Collection rate (%)	Sanitary landfill coverage (%)	Unit cost for collection, transport and disposal (USD/ton)	Responsible ministries/ agencies	Relevant laws	Issues
Antigua and Barbuda	88,710	13,006	1.75(c)	330 (c)		100(c)	12.45(c)	National Solid Waste Management Authority(c)	National Solid Waste Management Act, 1995 (c)	(c) - The Minister has great authority over those in charge of waste management - The trainings for those in charge of waste management are not appropriate - Waste management is not a prioritized policy issue of the government
Bahamas	342,877	22,665		723(d)		100 (d)		Environmental Services Department (d)		(d) - There are multiple landfills in the country; in some of them, covering by soil is not appropriate - Hazardous wastes and domestic wastes are not separated for disposal - Collection is conducted jointly by the Environmental Services Department and private companies - Environmental education is mainly conducted by the NGOs
Barbados	273,331	15,035		1,000(e)		100(e)		(e) EPD. Sanitation Service Authority		(e) Currently there are no comprehensive law on waste management, and waste management is implemented based on the laws below: ・Health Services Act(Cap.44)-1969 ・Health Services(Nuisances)Regulations,1969 ・Health Services(Disposal Of Offensive Matter) Regulations,1969
Belize	344,700	4,064	-(a)	119 (b)	85.2 (a)	0 (b)	-	Ministry of the Environment (b)	The Solid Waste Management Authority Act Chapter 224 (b)	(b) - There are no sanitary landfills. Wastes are disposed in open dumping sites or burned in open burnings - Natural resources that could be utilized for eco-tourism are being lost due to inappropriate landfill disposal.
Costa Rica	4,658,887	7,774	0.88 (a)	4,500(b)	90.4 (a)	67.5(a)	41.46 (a)	Ministry of Health	General Health Law, Environmental Law, Municipal Code, Regulation on Garbage Management, Regulation on Sanitary Landfills(b)	- The waste disposal fees cannot cover the disposal costs - There are 39 final disposal sites total (11 are illegal disposal sites and 7 are sanitary landfill sites) - Although law on waste management has been enacted into law by majority vote, local governments have difficulty in its implementation due to lack of financial and human resources. Some local governments within the San Jose metropolitan area are welcoming foreign companies to propose to participate in new waste management operations (Source: JETRO news, July 2011) - Efforts for environmental protection in the urban areas (e.g. water pollution control, waste treatment) have been lacking. Improvement in national and local institutions and facilities, implementation system, and public awareness are key challenges.
Cuba	11,257,979	-	0.7 (f)	1,100 (f) (Havana)	-	-	-		Law 81(f)	There are not sufficient comprehensive waste management measures due to the followings: - Lack of efforts to reduce domestic waste - Lack of collection and transport planning, lack of capacity of vehicle maintenance and repair workshops - Llack of technical capacity in designing and operating final disposal sites - Lack of basic capacity for planning and management in the planning sector which is responsible for the above issues
Dominica	67,757	6,964			-	-	-		Solid Waste Management Act.(g)	Current situation have not been identified.
Dominican Republic	9,927,320	5,195	1.1 (a)	7,000	97.0%	33.7%		Ministry of Environment and Natural Resources	*Refer to Section 2.5*	*Refer to Section 2.5*
El Salvador	6,192,993	3,460	0.89 (a)	3,400	78.8%	78.2%	51.44(a)	Ministry of Environment and Natural Resources	*Refer to Section 2.3*	*Refer to Section 2.3*
Grenada	104,487	7,500	0.92 (c)	146 (c)	95.0 (c)	-	-	(c) Grenada Solid Waste Management Authority (GSWMA)	(c) Grenada Solid Waste Management Authority Act, 1995 Waste Management Act, 2001	(c) - Laws that are more detailed are needed - The subsidy from government to GSWMA is not appropriate - The facilities of the final disposal site are becoming worn out due to its age - There are deficiencies in the comprehensive waste reduction plans - There are districts where wastes are difficult to collect
Guatemala	14,388,929	2,873	0.61(a)	5,734 (h)	77.7%	15.4%	10.84(a)	Ministry of Environment and	*Refer to Section 2.2*	*Refer to Section 2.2*

Country	Population	GDP per capita (USD/capita)	Waste generated (kg/person/day)	Waste disposed (ton/day)	Collection rate (%)	Sanitary landfill coverage (%)	Unit cost for collection, transport and disposal (USD/ton)	Responsible ministries/ agencies	Relevant laws	Issues
								Natural Resources		
Guyana	754,493	2,994	313(i)	0226～1.786(i)			23.8 (i)	MOLGRD; Ministry of Local Government and Regional Development	Environmental Protection Act. 11, 1996	(i) - The laws on waste management are not appropriate - Collection vehicles are lacking and collection system is not appropriate - Fee collection system is not appropriate - Accounting system for waste management is not appropriate
Haiti	9,993,247	664	0.6 (urban area)	-	20 (urban area)	-	-	-	-	-
Honduras	7,600,524	2,019	0.61(a)	2,792	64.6(a)	11.3(a)	28.97(a)	Department of Natural Resources and Environment	*Refer to Section 2.1*	*Refer to Section 2.1*
Jamaica	2,702,300	5,133	-	2,500 (c)	73.9(a)	0(c)	-	Ministry of Local Government and Environment (c)	National Solid Waste Management Act, (Act 27 of 2001 (Jamaica) (c)	(c) - Laws on waste management are complex - Revision of the National Solid Waste Management Act has not been implemented - There are no laws on management of hazardous wastes and specially-controlled wastes
Mexico	113,423,047	9,133	0.94(a)	-	93.2(a)	65.6(a)	36.95(a)	THE MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES (SEMARNAT)	*Refer to Section 2.4*	*Refer to Section 2.4*
Nicaragua	5,788,163	1,139	0.73(a)	-	92.3(a)	-	-	Ministry of the Environment and Natural Resources (b)	General Environmental Law and Natural Resources. Decree 9-96 (b)	-
Panama	3,516,820	7,614	1.22(a)	2,671 (b)	84.9(a)	41.7(a)	-	Authority of Urban and Household Cleaning and National Environmental Authority (b)	General Environmental Law, Law No. 41 July 1, 1998 (c)	-
St.Kitts and Nevis	52,402	12,847	.26 (Kitts), 1.83 (Nevis) (c)	118.8 (c)	-	-	54..7 (Kitts) 57.8(Nevis) (c)	National Solid Waste Management Corporation (c)	Solid Waste Management Act, 2009(c)	- There are sanitary landfills but no leachate treatment systems - There are issues with finance of waste management operation - The collection workers are aging - The workers in charge of waste management are not trained
St. Lucia	174,000	6,890	1.44(c)	220 (c)	-	-	30 (c)	Solid Waste Management Authority (c)	Solid Waste Management Act. (c)	- There are many agencies responsible for waste management and there is not sufficient coordination among them - There is no legal system to solve the different interests and thus waste management cannot be standardized - The equipments for landfill are not being renewed and thus appropriate landfill cannot be implemented - There is illegal dumping - Environmental education should be conducted for waste reduction.
Saint Vincent and the Grenadines	109,333	6,172	-	-	-	-	-	Solid Waste Management Unit of Central Water & Sewerage Authority under the Ministry of Health (composed of departments for waste collection, management of disposal sites, reduction of wastes and environmental education and	- Solid Waste Management Law, No.31, 2000 - Law on Management of Wastes from Water Crafts, 2002 - Regulation on Solid Waste Management, No.11, 2005 - Integrated Solid Waste Management Strategy	-

Country	Population	GDP per capita (USD/capita)	Waste generated (kg/person/day)	Waste disposed (ton/day)	Collection rate (%)	Sanitary landfill coverage (%)	Unit cost for collection, transport and disposal (USD/ton)	Responsible ministries/ agencies	Relevant laws	Issues
								established in 1999)		
Suriname	524,636	8,292	-	-	-	-	-	Ministry of Public Works Ministry of Regional Development	Ministry of Public Works submitted the Law on Integrated Waste Management which was approved in December 2003	-
Trinidad and Tobago	1,341,465	15,614	1.5 (c)	1,818(c)	-	-		Regional Corporation under Ministry of Local Government collects and disposes wastes	- No policies or laws specifically for waste management - Wastes are dealt with based on Litter Act (1973) and Public Sanitation Act (1950) - Ministry of Housing and the Environment is responsible for developing and implementing waste management plans based on Environmental Management Act Standards on management of domestic wastes (NA-RS-001-03)	- There are no policies or laws specifically for waste management. - There are duplications of responsibilities among the agencies in charge of waste management - There are no weighing facilities in the final disposal sites - There is no educational program on wastes - There are districts where wastes are not collected.

Population, GDP : http://databank.worldbank.org/ddp/editReport?REQUEST_SOURCE=search&CNO=2&country=URY&series=&period=, 2010

(a) Regional Evaluation on Urban Solid Waste Management in LAC – 2010 Report , IDB

(b) INVESTIGATION ON THE CURRENT SOLID WASTE MANAGEMENT IN THE REGION AND SICA MEMBER COUNTRIES (JICA El Salvador Office)

(c) Data Collection on Solid Waste Management in the Caribbean (JICA/JOCV St. Lucia Office)

(d) http://www.iadb.org/exr/doc98/pro/esir-bh0008.htm, http://www.bahamas.gov.bs/

€ http://www.epd.gov.bb/category.cfm?category=5

(f) http://www.globalsecurity.org/military/library/report/2004/32253pf.htm, www.sidsnet.org/docshare/other/20031105162315_Extended_abstract_Sectoral_solid_Waste_Evolution_in_Cuba.doc

(g) http://www.dswmc.com/

(h) SITUACION DEL MANEJO DE DESECHOS SÓLIDOS EN LA REPUBLICA DE GUATEMALA JICA Guatemala Office

(i) Solid Waste Sector Analysis Government of the Cooperative Republic Guyana , PAHO/WHO 2004

(j) ANÁLISIS SECTORIAL DE RESIDUOS SÓLIDOS HONDURAS,OPS 2010

The issues that the countries face range from issues at the upstream such as those regarding laws, public finance, policies, and operation of works to issues at the downstream such as those regarding awareness of dischargers, education and trainings of cleaning workers, and operation of collection, treatment, and disposal works. These issues regarding waste management are generally shared among the different countries in the South American and Caribbean Region.

In order to understand the situation in the countries that were *not* target of the field survey, the relationship among GDP, waste generation per capita, collection rate, and sanitary landfill coverage was analyzed. The result is shown in the following figure.

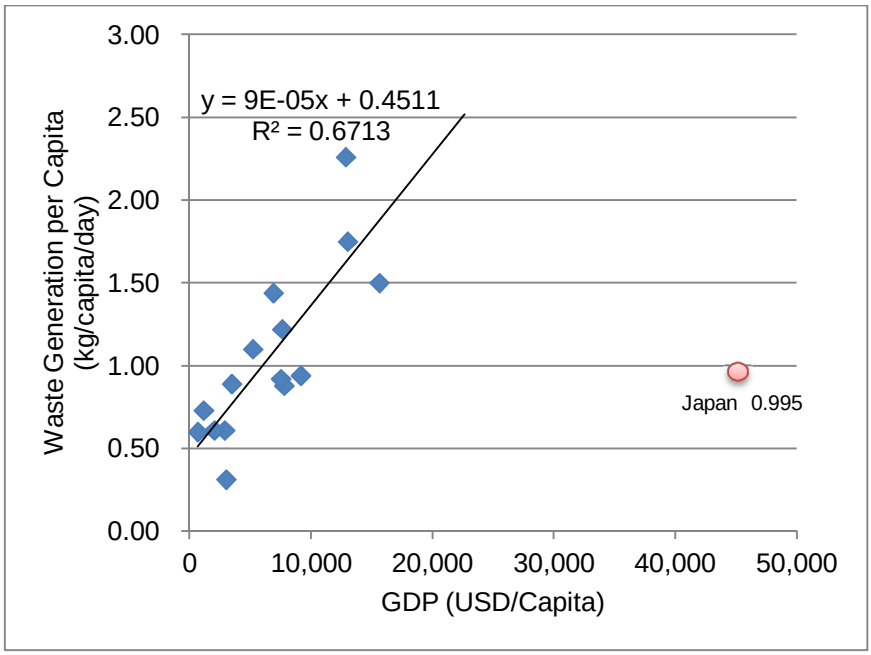


Figure 8: The Relationship between GDP and Waste Generation per Capita

From this figure, it can be said that the countries with GDP above USD 5,000/capita have the tendency to generate waste 1 kg/capita/day or more. It is necessary to understand the reason behind this phenomenon and to make efforts to reduce the amount of waste generated.

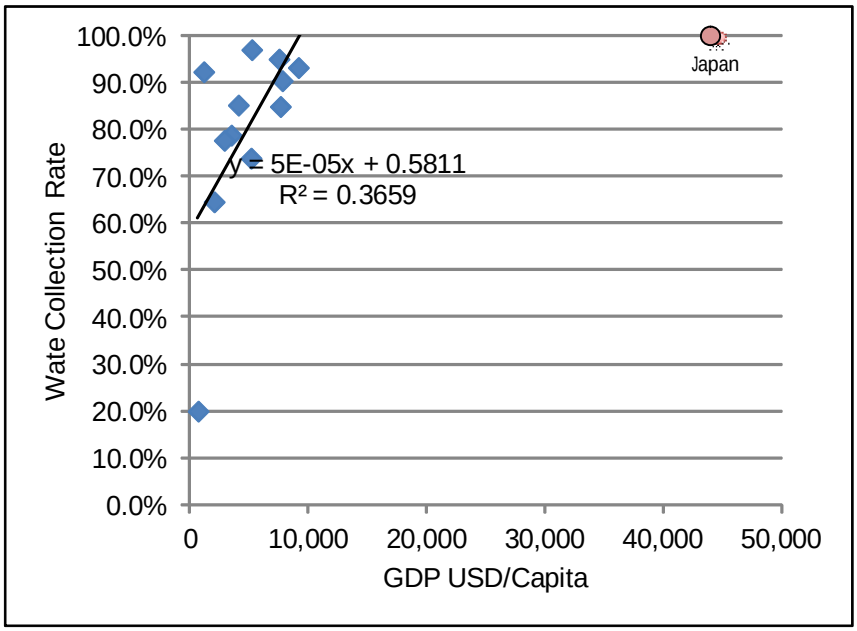


Figure 9: The Relationship between GDP and Waste Collection Rate

Regarding the relationship between GDP and waste collection rate, it can be said that in countries with GDP less that USD 5,000/capita, the waste collection rate tends to be lower than 80%.

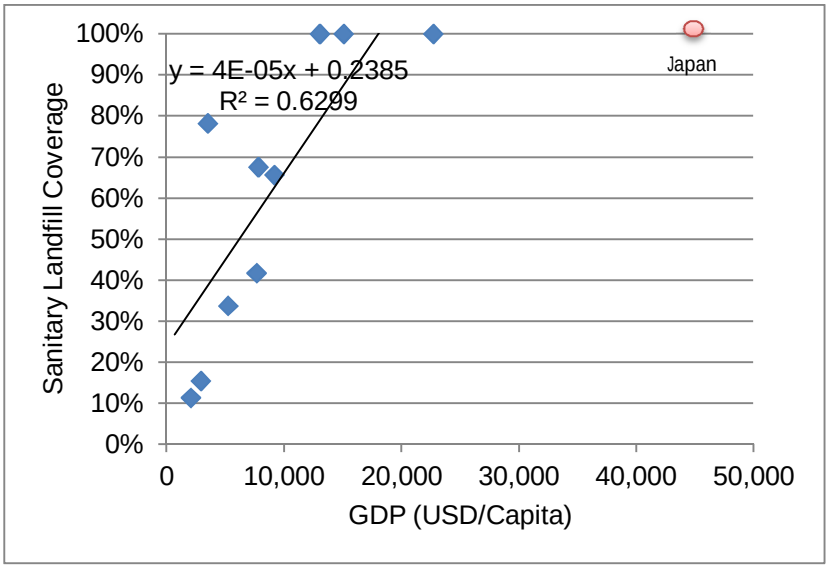


Figure 10: The Relationship between GDP and Sanitary Landfill Coverage

From studying the relationship between GDP and waste collection rate, it can be said that in countries with GDP less that USD 5,000/capita, the waste collection rate tends to be lower than 80%.

Regarding the relationship between GDP and sanitary landfill coverage, the two are proportional among countries with GDP lower than USD 10,000/capita with the exception of El Salvador. In these countries, the increase in sanitary landfill coverage is likely to become the important challenge in waste management.

From the analysis above, the followings can be said in general.

- In countries with GDP above USD 5,000/capita, current waste generation per capita

should be investigated and efforts should be made to decrease the waste generation per capita as necessary.

- In countries with GDP of USD 5000/capita or lower, efforts should be made to improve the waste collection rate
- In countries with GDP of USD 10,000 or lower, efforts should be made to improve the sanitary landfill coverage.

In the figure below, the countries were categorized by the different stages of waste management (as described in Section 1.2 History of Waste Management) and the challenges that they face based on the findings listed above.

Country	Population	GDP per Capita (USD/Capita)	Efforts to Reduce Waste Generation	Efforts to Improve Collection Rate	Efforts to Improve Sanitary Landfill Coverage	Stage of Waste Management
Haiti	9,993,247	664		X	X	1st Stage
Nicaragua	5,788,163	1,139		X	X	1st Stage
Honduras	7,600,524	2,019		X	X	1st Stage
Guatemala	14,388,929	2,873		X	X	1st Stage
Guyana	754,493	2,994		X	X	1st Stage
El Salvador	6,192,993	3,460		X	X	2nd Stage
Belize	344,700	4,064		X	X	1st Stage
Jamaica	2,702,300	5,133	X		X	2nd Stage
Dominican Republic	9,927,320	5,195	X		X	2nd Stage
St. Vincent and the Grenadines	109,333	6,172	X		X	2nd Stage
St. Lucia	174,000	6,890	X		X	2nd Stage
Dominica	67,757	6,964	X		X	2nd Stage
Grenada	104,487	7,500	X		X	2nd Stage
Panama	3,516,820	7,614	X		X	2nd Stage
Costa Rica	4,658,887	7,774	X		X	2nd Stage
Suriname	524,636	8,292	X		X	2nd Stage
Mexico	113,423,047	9,133	X		X	2nd Stage
St. Kitts and Nevis	52,402	12,847	X			3rd Stage
Antigua and Barbuda	88,710	13,006	X			3rd Stage
Barbados	273,331	15,035	X			3rd Stage
Trinidad and Tobago	1,341,465	15,614	X			3rd Stage
Bahamas	342,877	22,665	X			3rd Stage
Cuba	11,257,979	Not identified	Not identified	Not identified	Not identified	Not identified

5 The Future Direction

5.1 Possibilities of Structured Partnership within the Central American and Caribbean Region

5.1.1 Current Situation

The following information was identified as the result of this Study.

- The south-south cooperation by CENICA in Mexico is greatly contributing to the capacity development of those in charge of waste management in the Central American and Caribbean Region. Meanwhile, as explained in Section 2.7 Mexico, the existence of gaps between the training content and the needs of the beneficiary countries and issues in selection and procedures regarding recruitment of the trainees were found.

- In Mexico, there are potentials that the industry related to wastes and recycling would further develop and that public-private partnership (PPP) would be implemented with regard to waste management facilities.

- The Project on Integrated Solid Waste Management for Local Governments in El Salvador (PROMADES) has great impact not only for the country but also for the neighboring countries.

- In El Salvador, a governmental official (an engineer) who used to work for the Cleansing Department of the San Salvador Municipality participated as one of the members of the Study on Integrated Solid Waste Management Plan in Santo Domingo de Guzman National District. This official also participated in the Project for Appropriate Waste Management in Santo Domingo National District, Dominical Republic and has now become one of the top waste management engineers in El Salvador.

- The Project for Appropriate Waste Management in Santo Domingo National District, Dominical Republic has contributed to the capacity development of the relevant authorities of Santo Domingo, and these authorities are currently disseminating the project achievements within the country.

- In the countries where field surveys were conducted under this Study, the officials who had developed their capacities under JICA studies, technical cooperation projects, or trainings in Japan and other countries have become leaders in waste management in their countries. Furthermore, activities such as those by JICA volunteers have become great assets for those countries.

  -Meanwhile, in the Project for Improvement of Solid Waste Management for the Municipality of Panama in the Republic of Panama, It was evaluated at the project termination stage that the objectives of the project were only “partially met”. Furthermore, the partner agency for the project was dismantled after the project termination and a different organization was established to be in charge of waste management.

With regard to other donors, it should be noted that the activities by GIZ have made significant achievements through locally-based activities in both individual projects and programs

Among the five countries where field surveys were conducted in this Study, structured south-south cooperation is already implemented in Mexico through CENICA.

The Project on Integrated Solid Waste Management for Local Governments in El Salvador

(PROMADES) have attracted attention from the neighboring countries, but the activities being implemented to disseminate the achievements of the project are limited and not continuous.

With regard to the Project for Appropriate Waste Management in Santo Domingo National District, Dominical Republic, although the achievements of the project are being shared within the country, they have not been continuous dissemination to the neighboring countries. Only short-term activities, such as inviting the project members to neighboring countries to give lectures on waste management, have been conducted.

5.1.2 Towards Strategic Cooperation

a. Issues in Implementation and Promotion of National-Level Waste Management Policies and Planning

The great challenges in waste management in developing and newly industrialized countries are the increase in waste collection rate, the thorough implementation of street sweeping, and construction and proper operation of sanitary final disposal sites. In addition, there are emerging issues such as promotion of recycling and proper management of E-wastes. In all countries where the field survey was conducted, the streets were generally well cleaned. The laws, policies, waste collection rate, and sanitary landfill coverage is shown in the table below.

Table 12: Laws, Policies, and Challenges in the Countries Target of Field Survey

Country	GDP 2010 (USD/capita)	Waste collection rate (%)	Sanitary Landfill Coverage	HDI (2010)	Laws	Policies	Challenges and Other Issues
Mexico	9,133	93.20%	65.60%	0.767	Municipal solid waste management has improved all over the country based on the National Program for Prevention and Integral Management of Waste (*Programa Nacional para la Prevención y Gestión Integral de los Residuos*) formulated with the support from JICA. Laws on waste management have already been enacted.	Sanitary landfills increased drastically from 88 to 235 due to concentrated investment in waste management facilities in the past 4 years.	In some cases, even if sanitary landfills are constructed, they are not well managed. This is because the level of capacity is greatly different among the local governments which are entities that are in charge of the actual waste management works . JICA's cooperation has been effective in improving the waste management sector at the national level. However, there are still remaining actions to be taken such as concrete measures for the management of E-wastes or the end-of life vehicles (ELV) which JICA has supported until this year.
Dominican Republic	5,195	97.00%	33.70%	0.686	National laws on waste management are currently being drafted.	Climate change and waste management are priority issues.	From reasons such as the lack of waste management laws, the waste management unit in the Ministry of Environment and Natural Resources which is responsible for waste management in the central government does not have sufficient management capacity.
El Salvador	3,460	78.80%	78.20%	0.672	Although laws and regulations on waste management are in place, there is no definition of "hazardous waste". Issues such as treatment methods and ways of supervision should be clarified through the revision of the Environment Act.	Both the national policy and the national strategy are clear. After change in power in 2009, the issue of waste management has been prioritized. Through the cooperation between the Ministry of Environment and Natural Resources and the Ministry of Health, the results of PROMADES have been reflected in the national strategy for the years 2000 to 2015.	The Ministry of Environment promotes the construction and operation of sanitary landfills in many other areas in the nation based on the PROMADES experience. However, it is likely that it will take more time to realize this due to financial limitation. Although constructing and operating sanitary landfill requires substantial costs, many municipalities do not have the financial capacity to finance them. The legal framework and action plans regarding "hazardous wastes including E-wastes" should be developed

Country	GDP 2010 (USD/capita)	Waste collection rate (%)	Sanitary Landfill Coverage	HDI (2010)	Laws	Policies	Challenges and Other Issues
							and implemented.
Honduras	2,019	64.60%	11.30%	0.623	The legal framework on waste management is in the process of being established.	The Draft National Plan 2012-2014 defines proper waste management and 3R.	Although the Ministry of Natural Resources and Environment and the Ministry of Health are both responsible for waste management at the national level, the role of each ministry is not clearly defined. The waste management unit in the central government has been established only recently and thus lacking in number of personnel and capacity.
Guatemala	2,873	77.70%	15.40%	0.573	The legal framework on waste management is in the process of being established.	There is a national program (plan), but it is currently only a plan and not yet at the stage of being implemented.	Municipalities place a lower priority on solid waste management and place their higher priorities on potable water, sewage, street lights, parks, public schools, road pavement etc. The capacity of the staffs in both central government and the Guatemala City is not considered to be high.

In Mexico and El Salvador where clear national laws on waste management and national plans are in place and are being implemented, the sanitary landfill coverage was high and the level of municipal solid waste management is high.

In the Dominical Republic, national laws on waste management are not yet in place and the sanitary landfill coverage is low. Although Santo Domingo special district, the capital city, has improved in collection, transport and recycling of wastes through cooperation with JICA, the method of final disposal is still controlled dumping. In addition, in Honduras and Guatemala, the national laws are not yet in place and the sanitary landfill coverage is low.

In many countries, street cleaning and waste collection are being implemented relatively at a high level even if there are no national-level laws or plans, as these are activities which influence the physical appearance of the cities and thus the impression of the tourists. Meanwhile, it can be said that the activities regarding final disposal are generally not properly implemented without national laws or plans in place, as these activities are not generally seen by the public.

Therefore, countries should not only enact laws on waste management but also formulate national-level plans on waste management in order to implement those laws and plans.

The main issues regarding implementation and promotion of national level policies and plans on waste management are as follows.

- Enactment of laws on waste management
- Establishment of systems to implement the laws
- Establishment of organizations and institutions that would be responsible in implementation of the policies

In addition to the above, as the main actor in waste management is often the local government, the central ministries and agencies should not only formulate laws and plans but also the followings in order to promote the implementation of the laws and plans.

- Technical support to the local governments
- Financial suppprt
- Provision of continuous support through monitoring of achievements
- Application of penalties on local governments that do not comply with the laws and plans

Promoting factors with regard to spread of sanitary landfills in El Salvador
(as explained in the previous sections)

- Construction of visible infrastructure (sanitary landfill disposal site, leachate treatment facilities)
  Construction of infrastructure at the disposal site (Fukuoka-method sanitary landfills and leachate treatment facilities) by the Japanese expert led to visible technical transfer and showed the merits of the project to the Salvadoran project members in addition to ministries and agencies. Furthermore, it also contributed to gaining the consensus of the local residents as it successfully changed an open-dumping site into a sanitary landfill disposal site.

- Compliance of law with penalties (Legislative Decree 237)
  It is stipulated that the local governments must submit implementation plans with regard to closing or improvement of final disposal sites and that penalties would be applied if the local governments do not comply. This functioned as the “stick” in the “carrot and the stick” and became the promoting factor of the project.

- Existence of a loan program that could be utilized by the Salvadoran parties (DAC Program of IDB)
  The governments that submitted implementation plans necessary for closure or improvement of improper final disposal sites were given financial resources to implement those actions. This functioned as the “carrot” in the “carrot and the stick”.

JICA has provided support to local governments through providing support to the capital cities of each country independently and have made certain achievements. However, in some cases, the technical capacity built by the JICA support becomes lost after the support by Japan ends.

The reason for this problem is often due to financial issues or change in personnel.

A typical case is the Rafey Final Disposal Site[16] in the Dominican Republic. Although the public corporation on waste services (*Corporación de Aseo de Santiago*) was able to avoid the direct change in personnel as it was an autonomous entity, the confusion that was caused in the municipal governments after the change in political power caused the capacity that was built through the cooperation to be lost.

As explained in the box to the right, it is essential to establish a feasible system in which proper supervision of the local governments would be provided by the central ministries and agencies.

Case of Rafey Final Disposal Site in Santiago, Dominican Republic

In 2006, the staffs of the public corporation on waste services participated in the JICA training in Japan, and as a result of the training, the "Plan on Revitalizing Rafey Disposal Site" was formulated.

Based on this plan, JICA dispatched the "Study Team on Follow-up on the Integrated Waste Management Seminar" in August 2007 which was led by Professor Yasuji Matsufuji of Fukuoka University who was experienced in improving disposal sites. Since then, the team was dispatched 5 times within 2.5 years and transferred technologies from design and construction of disposal sites to the greening of the site after the closure. The cooperation was implemented smoothly until the year 2010.

However, in 2010, the mayor changed and the entire municipal governments stopped properly functioning as there were some issues in the managing department. The financial resources for the operation and management of the final disposal site became insufficient, and as a result, the disposal site could no longer be properly operated.

The former JICA trainees who were assigned to the Rafey disposal site made their best efforts during the 2 years after the change in mayor, but some of them left the organization.

This problem was not caused by the project but rather the change in the system of the municipal government. However, the personnel in charge of disposal site in the public corporation have commented that the knowledge gained through JICA's cooperation still remains in the organization.

The public corporation on waste services believes that the Ministry of Environment and Natural Resources should provide to the local governments the proper supervision and pressure so that proper waste management would be implemented.

b. Future Direction

In Japan, the laws regarding waste management stipulate the responsibilities of the national government, the prefectures, the municipalities, and the dischargers. The national government decides the measures and obligations for the prefecture or municipal level to implement so that the responsibilities stipulated by the law can be complied with. With regard to large-scale investments for works such as construction of facilities, measures to provide the financial resources such as provision of subsidies or issuance of bonds are implemented. With regard to monitoring, the municipalities have the responsibility to make reports, and surveillance and inspections are conducted to ensure that the standards are being met. If the standards are not being met, countermeasures such as issuing recommendation/order for improvement or bringing the business to shut-down are implemented. Furthermore, if it is difficult for a company to immediately meet the standards from economic or technical reasons, the company can set time-bound goals so that the environmental standards would be met in the long-term.

In order to support countries that have insufficient national laws or systems on waste management or those that have such laws or systems that are not functioning, it is important to support the establishment of custom-made systems for each country that is adapted to the local social situation and customs and reflect the Japanese experience as necessary.

Among the countries target of field survey, Mexico and El Salvador were the only countries that had national-level systems in place that were actually being implemented Therefore, considering the systematic partnership in the region, it is essential that the experience in these countries are

[16] http://www.jica.go.jp/topics/2010/20100528_02.html

efficiently utilized. However, when a Mexican expert was dispatched to Guatemala, there was a misunderstanding regarding the interpretation of Guatemalan laws by the Mexican expert. After the incident, the trainings by CENICA are not fully utilized by the Guatemalan government. Therefore, in order to utilize the experience of different countries, it is important that third-party (e.g. Japanese experts) who have good knowledge of the situation in each country and have the capability to make non-biased decisions provide coordination. Furthermore, it is important that the ownership of the beneficiary countries are fostered so that they would be capable of making concrete cooperation requests (e.g. requests on training menus) to the donor countries.

In this Study, it was identified that national and local governments are making efforts even if financial resources or capacities were lacking. In some cases, the problem of lack of capacities may be solved through trainings or on-the-job trainings (OJT) by experts or senior JICA volunteers.

With regard to lack of financial resources, it is important that efforts are made to increase the budget, that the ultimate goal is set, and that the plans are formulated and implemented so that the activities would be gradually implemented with the available budget.

Although the GDP of El Salvador in 2010 was only USD 3,460/capita, the sanitary landfill coverage was 78.2% which is a level of a country with GDP of around USD 6,000/capita. These figures and the situation of waste management in El Salvador will serve as an important benchmark.

c. Method of Implementation

As noted previously, the assistance by JICA is making great achievements in each country, and the capacity of the human resources in each country is being developed. It would be most effective to utilize these resources in order to further improve the waste management capacity in the Central American and Caribbean Region.

As an example of regional cooperation in the waste management sector implemented by JICA, there is the Project for Promotion of Regional Initiative on Solid Waste Management in the Pacific Region. Under this project, a project office was established in Samoa to provide the overall control of the project. The target region was divided into five regions and one Japanese expert is being dispatched for each region.

Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in the Pacific Region

The requests for 11 technical cooperation projects were compiled into one regional project. Based on the regional waste management strategies and national waste management plans, activities started in February 2011 with the objective to establish appropriate waste management systems in each country, to share the knowledge and experience within the Pacific island countries and to establish a system where the waste management in the Pacific Region will continuously improve.

In order to expand the cooperation activities in the region, it is essential to do the followings: clarify the objectives of cooperation, identify a core country, formulate the cooperation program, prepare necessary inputs (human and financial resources), and reinforce the relevant organizations and institutions.

With regard to the cooperation activities, considering south-south cooperation as an important axis, consulting work regarding the practical aspect of waste management is considered to be appropriate, as CENICA is already implementing trainings and duplication with their activities should be avoided.

For the consulting work, it is necessary that the consultant who conduct the work possess not only the capacities developed through the cooperation with JICA but also the appropriate knowledge and experience required for a professional consultant. Thus, it is considered that utilizing only the human resources which have developed capacities through the JICA

cooperation would be difficult. For this reason, it is considered important that Japanese experts participate in the program and provide the necessary support.

Geographically, the Central American and the Caribbean Region can be categorized into two regions, namely the continental area which connects the North American continent and the South American continent and the Caribbean islands area. Thus, considering the similarities among the countries in the same region, it is considered appropriate to identify different core countries for the continental area and the Caribbean island area.

5.2 Future Assistance Policies and Cooperation Activities

5.2.1 Impact and Efficiency of Cooperation

The result of comparative analysis of the impact and efficiency of cooperation through south-south cooperation and dispatch of Japanese experts is shown in the following table.

Table 13: Comparative Analysis of Tripartite (South-South) Cooperation and Dispatch of Japanese Experts

	Tripartite (South-South) Cooperation	Dispatch of Japanese Experts
Social and cultural background	It is considered that sharing the problems among the countries in the same region is beneficial as many countries in the same region share similar problems and the same language and cultural background.	Efforts must be made by the experts to understand the local beliefs or culture.
Knowledge	The level of local authorities is generally lower than that of Japanese experts.	The level of Japanese experts is generally higher than that of local authorities
Capacity to analyze problems	The level of local authorities is generally lower than that of Japanese experts.	The level of Japanese experts is generally moderate to high.
Capacity to propose solutions	The level of local authorities is generally lower than that of Japanese experts.	The level of Japanese experts is generally moderate to high.
Impact	It cannot be compared as it differs depending on cooperation objectives.	It cannot be compared as it differs depending on cooperation objectives.
Efficiency	From the financial perspective, the fact that relevant parties are geographically close is an advantage. However, whether this approach is more efficient should be examined for each case taking into consideration the cooperation objectives.	From the financial perspective, there is the disadvantage as Japan is far from the Central American and Caribbean Region. However, as Japanese experts are capable of dealing with diverse issues, whether this approach is more efficient should be examined for each case.

CENICA has experience in implementing south-south cooperation through trainings and has high reputations. However, for instance, implementing technical cooperation projects, which have been initiated by the Japanese experts in the past, only by CENICA is considered to be still difficult at this point. Therefore, in order to implement efficient cooperation, it is believed that creating the best mix of the local resources and the Japanese experts would be ideal at this point.

5.2.2 Future Assistance Polices and Cooperation Activities

Under the assumption that the creation of the best mix of the local resources and the Japanese experts is the best approach to implement regional assistance, it can be said that implementation of regional waste management assistance with such a mix would be effective. The concept is illustrated in the following figure.

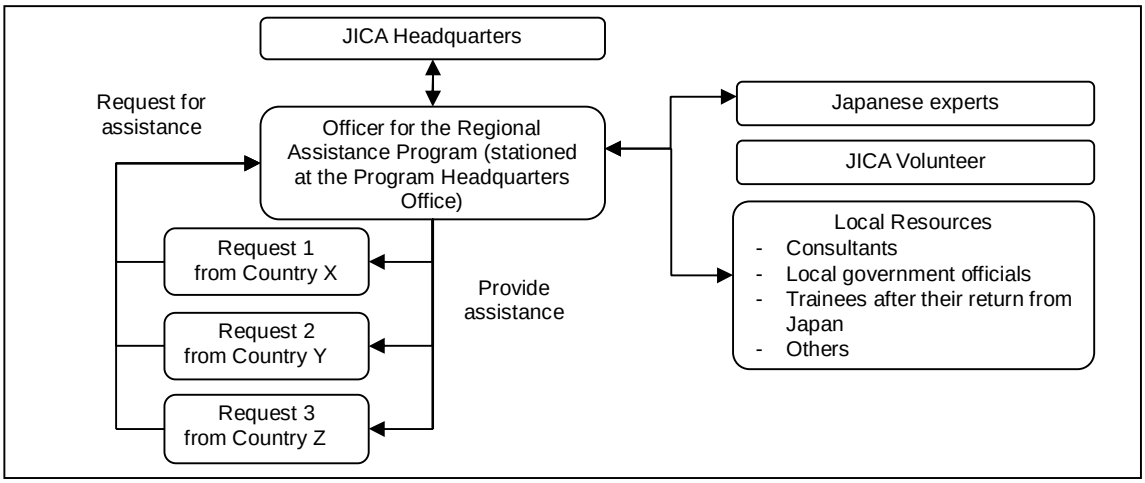


Figure 11: Concept of the Regional Assistance Program

The officers for the regional assistance should be stationed at the JICA office of the "core country" as explained previously and support the activities in the countries which they are responsible for. The type of assistance may vary from third-country trainings to dispatch of experts or implementation of projects. As the type of assistance would be different for each case, the officer for the regional assistance should determine the cooperation activities through consultation with the beneficiary government, the Japanese experts, and the local resources and implement them with the consent of the beneficiary country.

Another type of approach that may be possible is to invite the governmental officials of the neighboring countries to the "core" countries where JICA is implementing projects. There, the project team members of the core country and the governmental officials from the neighboring countries can participate in a joint on-the-job training (OJT).

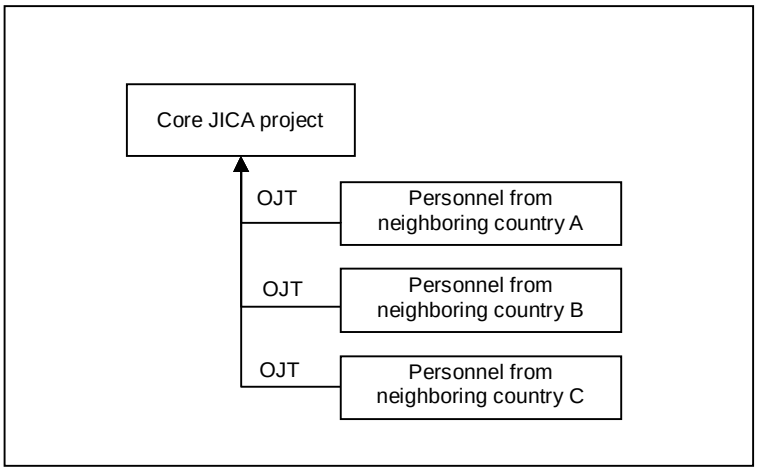


Figure 12: Example of Regional Assistance through Core Projects

5.2.3 Challenges in Promoting Regional Partnerships

As explained in the previous sections, the human resources and organizations which have developed capacities through JICA cooperation have become great assets. In order to utilize them efficiently, it is important that the plans to utilize these assets are proposed to the partner organizations (generally the national or local government that JICA has supported before) and that challenges in implementing the plan are identified. If regional assistance programs as previously explained are to be implemented, challenges such as the followings may be identified.

- Design of the system to implement the regional assistance program

- Scope of the regional assistance program
- Method of sharing the costs
- Method to recruit necessary personnel
- Administrative procedures within the organization

5.2.4 Challenges in Promoting Partnerships with Other Donors

When collaborating with other donors, it is most important that adjustments are made among the interests of different donors. Although actions to be taken are different depending on cases, the followings are generally important.

- Sharing of relevant information among donors
- Coordination of different interests
- Division of responsibilities
- Adjustment for the procurement of financial and human resources

Generally, the donors of each country prioritize the interest of their own country. For instance, in El Salvador, MIDES, the company that holds a large share in the operation of final disposal sites in the country, is a company that has been established jointly by the Canadian private company and the Association of Mayors in the San Salvador Metropolitan Area based on the results of the study conducted by CIDA (Canadian International Development Agency). As 90% of the stock is owned by the private company, it is practically the private company that owns MIDES and is making profit. On the other hand, the local governments pay high waste disposal fees and face difficulties in financing the fees. Therefore, when considering collaboration with other donors, careful considerations should be taken in addition to clarification of objectives and the method of cooperation.

In the case of ASINORLU technical project, while JICA provided certain inputs, El Salvador provided the costs for closing the current open dumping site which was financed through the DAC grant program of IDB. This type of cooperation among donors where technical assistance is provided by JICA and financial resources is provided by international development banks such as IDB is considered to be highly beneficial.

In the case of Mancomunidad Gran Santo Domingo (Inter-municipal Association of the Santo Domingo special district) of the Dominican Republic, the survey to find the appropriate site for the new disposal site which is financed by the Japanese Trust Fund for Consultancy Service (JCF) of IDB which started in 2011 is close to its final stage. The central government and Mancomunidad Gran Santo Domingo wish to construct the new disposal site through foreign assistance and national budget. This objective of the survey is to select an appropriate site and to formulate the basic concept of waste management. In the coming years, pre-feasibility study (Pre-F/S), feasibility study (F/S), basic design (BD), and detailed design (DD) would be implemented followed by the construction works. There are possibilities that JICA provide the technical assistance and the financial resources would be provided though international development banks such as IDB.

In the Central American and Caribbean Region, IDB is an important provider of financial resources for development activities. If partnership between JICA and IDB can be realized where JICA provide technical support and IDB provide financial support, it would be highly beneficial for both JICA and the beneficiary countries.

6 Other Issues

6.1 Possibilities to Utilize Japanese Technologies

6.1.1 Semi-Aerobic Landfill

The semi-aerobic landfill, which is also called the Fukuoka-method landfill, is a type of landfill that enables the early stabilization of the wastes. On the other hand, anaerobic landfill is a type of landfill where the landfills are made to be anaerobic so that methane gas can be collected as an energy source. This method has economic benefits as well as benefits from the climate change perspective as it decreases the green house gas emission which leads to acquisition of carbon credits which can be sold. Meanwhile, the anaerobic method has disadvantages from the perspective that it can lead to ignition and fires at the disposal site. For this reason, it is important that the method of landfill is carefully selected based on the situation of each landfill site.

6.1.2 3R

3R and recycle-based society are concepts proposed by Japan which are recognized in many countries as they are concepts easy to understand. However, in all countries worldwide, the system of recycling is already in place and there are many stakeholders involved in this system.

Especially in the developing countries, this sector involves the people in the informal sector such as the poor including the waste pickers. The introduction of 3R activities without the sufficient consideration to such people may destroy their livelihoods.

Therefore, it is essential to coordinate with such stakeholders before introducing 3R activities. Although it is difficult to contact such stakeholders or to identify their activities as they are informal, introduction of 3R activities without sufficient consultation with such stakeholders may destroy the livelihoods of the poor and lead to riots.

In addition, introduction of 3R activities would force the middlemen that buy the recyclables and the companies that buy the recyclables from those middlemen to change their way of business. Therefore, they may resist to the governmental management of recyclables. Such companies may use their political power to prevent the introduction of 3R activities. For these reasons, although the situation is different among countries, the introduction and implementation of 3R activities often proves to be difficult. To prevent such difficulties, 3R activities should be promoted in ways that are suitable to the situation in each country or cities. It is considered that promotion of 3R should be conducted under the initiative of Japanese experts who are experienced in introduction of 3R activities in Japan or in the developing countries in collaboration with local staffs who have good knowledge of the local situation.

> Economic development and recycling activities are closely related. In Japan, the rapid economic development led to the situation where recyclables were being discarded and treated as wastes, which led to the initiation of 3R activities.
>
> As there is limited available land in the country, there is a limit to the number of final disposal sites that can be constructed in Japan. Therefore, the system of 3R was introduced with the objective to decrease the generation of wastes and to efficiently utilize the materials so that the pressure on the final disposal sites would decrease through the establishment of a recycle-based society. After consultation with many stakeholders, the 3R system gradually developed. Many laws were revised and newly enacted in order to realize this new system, and the system was established over 10 years of time.

6.1.3 Waste Incineration

In order to incinerate wastes, construction of facilities, advanced techniques and skills for operation and maintenance of facilities, in addition to a social system that can support such a system are essential. Social system here includes not only the human resources that would be necessary for the operation and maintenance of the incineration facilities but also the economic level which would enable the appropriate maintenance system including the procurement of

mechanical spare parts, stable electric supply, or the financial capacity to burden the operation costs.

For this reason, when considering the introduction of waste incinerators, the preconditions under which the incinerators are required to be built and operated must be carefully considered before determining their introduction.

An example of municipal solid waste incineration in the Central American and Caribbean Regions is the stoker-fired incinerators with the treatment capacity of 100 tons per day (two units of incinerators with the daily capacity of 50 tons), which was introduced as the pilot facilities at San Juan de Aragon in Mexico City during 1990-1992. However, the project ended with failure of their continuous operation due to not well fitted design to the composition of waste to be incinerated as well as their high cost of operation. Since then, there has been no operation of waste incinerators in Mexico City so far.

Recently, another municipal solid waste incinerator was introduced with the assistance by Korea at Costa del Sol in Guatemala, but again failed to continue its operation due to technical and financial problems.

The first country in Asia after Japan to introduce municipal solid waste incinerators was Singapore around 1988, when its per capita GDP was USD 9,034. Due to its limited availability of land for final disposal waste, volume reduction of waste is critical to the country, which accelerated installation of waste incinerators with the growing economy.

In the same period, the Republic of Korea also installed its first stoker-fired incinerator in Seoul. In this case, auxiliary fuels were required to properly incinerate the waste because of its lower calorific value. China and Taiwan also started to introduce incinerators in the same period.

In the year 2000, the SAPROF (Special Assistance for Project Formulation) Study was conducted with the finance of JBIC (Japan Bank for International Cooperation) for introduction of municipal solid waste incineration in the Bangkok Metropolitan Region of Thailand, but there is still no installation of incinerators for municipal solid waste.

Some of the key factors of motivating a country to introduce municipal waste incinerators are the critical lack of land for final disposal of waste and sufficient economic capacity to finance construction and operation of incinerators, as typically shown in the case of Singapore, where the per capita GDP at the time of introducing waste incinerators in 1988 was USD 9,034. In the case of Japan, where the similar incinerators were introduced in 1970s, its per capita GDP in 1970 was USD 9,448, which is nearly same as the level of GDP in Mexico now.

According to the interviews to the Urban Service Department of the Mexico City Government, the previously utilized final disposal landfill within the city has already been closed while the municipal waste generated in the city is currently transported to other disposal landfills located outside the city. Although the current final disposal cost (tipping fee) of municipal solid waste ranges between 140 and 150 peso per ton (USD 12/ton) while the cost of incineration is as high as USD 50 per ton at its lowest in the international market, there would be a feasible option of introducing municipal solid waste incinerators if taking into account the near future difficulty in procurement of the land for final disposal and current economic level of the country.

6.2 Private Participation of Waste Management Activities

Waste management in the Latin American countries, including the target countries of field survey in this Study, is often realized based on cooperation with the private sector.

Meanwhile, cleansing operations are often under the responsibility of the local government. Options other than direct management by the local government are as follows.

- Contracting operation of specific services such as waste collection to the private sector
- Concession of partial rights regarding waste management to the private sector

In both cases, the local government must contract with the private sector. The provisions of the contract should be carefully examined so that private operation would be more advantageous to the local government than direct management. After signing the contract, the local government should monitor and control the private operator so that the provisions of the contract would be complied with.

The advantage in private operation is that local governments do not have to burden the cost for purchase of equipments. This kind of expenditure often becomes great burden for the finance of local governments.

For instance, when contracting waste collection work, the local government should decide the requirements such as the collection equipments, collection route, collection frequency, and collection amount. Meanwhile, the private operator should procure equipments or recruit personnel necessary for the work. The local government in return will make the necessary payment to the private company. The required investment would reach its peak periodically at the time of replacement of equipment and/or facilities if the work is directly operated by the local government while under private operation the local government can pay a fixed fee to the private operator which would be more manageable for the public finance.

When implementing such private operation, it is most important that the local government monitor, supervise, and control the private company so that they comply with the provisions in the contract. If the private operator is not complying with the provisions, the local government must require its fulfillment. Meanwhile, the private operator should verify the conformity of actual conditions with the contract stipulation and to request for amendment if the conditions are not being complied with by the local government so that they can keep the cost within the contract amount to make a profit.

This basically applies also when a concession contract is made. When concession contracts are made, the local governments determine the basic requirements and outputs necessary for the operation. Meanwhile, the private operator designs the work necessary for complying with the basic requirements and necessary outputs and receives the necessary payment. Again, it is important that the local government supervise and control the private operator and require its improvement if there are any problems so that the provisions in the contract are complied with. Needless to say, it is necessary that the provisions are carefully examined so that there are no provisions that are disadvantageous to one of the parties. This type of examination is conducted also in Japan for monitoring of long-term contracts on comprehensive maintenance and management of public facilities or for provision of public services under the private financing initiatives (hereinafter “PFI”).

In order to provide support in this field, cooperation among experts experienced in this field (i.e. PFI or long-term comprehensive contracts), governmental officials of the beneficiary country, and persons who have good knowledge of local laws and institutions would be necessary. An example of this type of cooperation is the support for the concession contract made for the final disposal site in the Project for Improvement of Solid Waste Management for the City of Panama in the Republic of Panama (*Proyecto de Mejoramiento del Manejo de los Desechos Solidos para la Municipalidad de Panama en la Republica de Panama*) which was implemented in Panama from 2006 to 2010.

In Latin America, concession contracts for public works are quite common, and legal systems for concession contracts are generally well established and do not have to be improved. As the national government does not directly sign the concession contracts on waste management, the support to be provided for the central ministries and agencies would be to identify methods to utilize the current legal systems so that private concession can be implemented efficiently and fairly and to implement those methods.

6.3 Utilization of Existing Survey Results and Achievements of Technical Projects by JICA

The achievements of studies and technical cooperation projects by JICA implemented in the Central American and Caribbean Region since 2000 which may be utilized in other countries are listed in the table below. Among them, the textbooks on waste management for other local governments which were prepared under the Project for Appropriate Waste Management in Santo Domingo National District in the Dominical Republic can be utilized in other countries, as they were prepared to be utilized in other areas.

Although it was not with regard to waste management, the manual for design of domestic wastewater treatment facilities which was prepared under The Study of Management on Sanitation Environment in the Coast of Quintana Roo State in the United Mexican States can also be easily utilized in other regions as the target region of the manual spread to the coastal region of the Yucatan Peninsula.

With regard to environmental education videos, although some of them include names or situations specific to each country, they can often be utilized in many Spanish-speaking countries as many of them are composed of children or animated characters and the language used is Spanish.

Target country	Termination year	Name	Environmental education video	Textbooks for environmental education (including for public awareness raising)	Technical manual and others
El Salvador	2000	The Study on the Regional Solid Waste Management for the Metropolitan Area of San Salvador in the Republic of El Salvador (*Estudio sobre el Manejo Regional de Residuos Sólidos para El Área Metropolitana de San Salvador en la República de El Salvador*)	X	X	None
Panama	2002	The Study on Solid Waste Management Plan for the City of Panama in the Republic of Panama (*Estudio sobre el Plan de Manejo de los Desechos Sólidos para JICA la Municipalidad de Panamá en la República de Panamá*)	X	X	Guidance for closing final disposal sites
Mexico	2004	The Study of Management on Sanitation Environment in the Coast of Quintana Roo State in the United Mexican States (*Estudio de Manejo de Saneamiento Ambiental en la Costa del Estado de Quintana Roo en los Estados Unidos Mexicanos*)	X	X	Manual for designing domestic wastewater treatment facilities
Cuba	2006	The Study on Integrated Management Plan of Municipal Solid Waste in Havana City	Not identified	Not identified	Not identified
Dominican Republic	2007	The Study on Integrated Solid Waste Management Plan in Santo Domingo de Guzman National District (*Estudio del Plan de Manejo Integrado de los Desechos Sólidos en Santo Domingo de Guzmán, Distrito Nacional, República Dominicana*)	None	X	None
Mexico	2008	Development of Waste Management Policy based on 3Rs in Mexico (Support to formulate national program on integrated waste management)	None	None	None
El Salvador	2009	The project on Integrated Solid Waste Management for Municipalities in El Salvador	Not identified	Not identified	Not identified
Panama	2010	The Project for Improvement of Solid Waste Management for the Municipality of Panama in the Republic of Panama (*Proyecto de Mejoramiento del Manejo de los Desechos Solidos para la Municipalidad de Panama en la Republica de Panama*)	None	X	Manual on management of concession contracts
Dominican Republic	2012	Project for Appropriate Waste Management in Santo Domingo National District (*Proyecto de Seguimiento al Manejo Adecuado de los Residuos Sólidos en Santo Domingo de Guzmán, Distrito Nacional, República Dominicana*)	None	X	Textbook on waste management for other local governments

Annex

1. Minutes from Meetings in the Field Survey
2. Capacity Assessment Sheet
3. Outline of Current Situation of Waste Management in Target Countries

Annex 1

Minutes from Meetings in the Field Survey

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1 Honduras

1.1 Survey Schedule

Date		Schedule	Outline
10/Aug./2012	Fri.	Narita to Dallas	Moving day
11/Aug./2012	Sat,	Dallas to Tegucigalpa/Honduras	Moving day
12/Aug./2012	Sun.	Tegucigalpa/Honduras	Team meeting
13/Aug./2012	Mon.	Tegucigalpa/Honduras	SERNA, JICA office, AMHON
14/Aug./2012	Tue.	Tegucigalpa/Honduras	OPS/ONU, Comayagua landfill site
15/Aug./2012	Wed.	Tegucigalpa to Ocotepeque/Honduras	Moving day
16/Aug./2012	Thu.	Ocotepeque/Honduras	Mancomunidad Ocotepeque
17/Aug./2012	Fri.	Ocotepeque to Tegucigalpa /Honduras	Moving day, Report to JICA office
18/Aug./2012	Sat.	Honduras to Guatemala	Moving day

1.2 Results of the Survey

1.2.1 SERNA (Secretaría de Recursos Naturales y Ambiente)

Date	14/ Aug./2012 (Mon.) 9:00 to 10:00
Place	SERNA Address: Por el Estadio Nacional a 100 Metros de las Canchas Birichiche
Participant	＜Honduran side＞ Issac Chavez Técnico Asociación de Municipios de Honduras (AMHON) Marvin Martínez Coordinador Departamento de Residuos Sólidos, SERNA Kessel Rosales Director de Gestión Ambiental, Secretaría de Recursos Naturales y Ambiente Percy Dion Técnico, Unidad de Cooperación Externa, SERNA ＜Japanese side＞ Mr. Kato, Mr. Ogawa, Ms. Shimazaki (interpreter)
Outline	(1) Explanation of the survey to Honduran side (2) Explanation of a present situation from Honduran side
Collected data	(1) Acuerdo Creacion Depto. Residuos Solidos.pdf (2) ACUERDO DEL REGLAMENTO PARA EL MANEJO INTEGRAL DE RESIDUOS SOLIDOS.pdf (3) ANALISIS_SECTORIAL_COMPILADO_NOV2009.pdf (4) Estrategia Honduras final.pdf (5) Evaluación Nacional Hoduras.pdf (6) Inventario Sitios DF.doc (7) Manual para la Gestion Integral de Residuos Solidos.pdf (8) Ultimo Borrador Politica 27-7-12.doc

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Present situation of Solid Waste Management in Honduras

- Minister of the SERNA visited ASINORLU sanitary landfill site in El Salvador. After that the minister recognized importance of the solid waste management and regulation of

solid waste management approved by the Congress in 2011.

- Furthermore, January 2011 department of the solid waste management is established in SERNA.
- Solid waste discharges amount in the country is around 1,200ton/day. The solid waste contained several sort of wastes such as domestic waste, industrial waste, institutional waste and medical waste (all together mixed).
- There 298 municipalities found in the country of which 60 municipalities handled waste collection service.
- The governing agencies of solid waste management are SERENA and ministry of health, sharing role of both agencies is not clear at present.
- Execution body of the solid waste management is municipality. However, their capacity of solid waste management is poor, due to the lack of experiences and knowledge.
- SERANA sets up joint committee for solid waste management. The committee is composed by ministries concerned, municipalities and private companies.

Meeting with SERANA

- Current problem regarding solid waste management is lack of operation and maintenance capacity for sanitary landfill (i.e. sanitary landfill system completed by donation is appropriate, however in operation and maintenance stages there is no support by donor, therefore it is very difficult to continuing appropriate operation and maintenance due to the Honduran side has not enough operation and maintenance capacity.). Therefore capacity development for operation and maintenance of sanitary landfill is an important issue on the solid waste management in the Honduras.
- Private sector participation on solid waste management is only waste collection field, final disposal in charge of municipalities.

b. Other Donor

- OPS/OMS(PAHO/WHO)
- Formulation of solid waste management master plan in Ocotepeque area targeted three municipalities.
- UN HABITAT and NGO from Costa Rica
- Preparing 3R national strategic plan.(part of capacity development project in the central America region)
- DANIDA
- Installation of plastic recovery facility and composting facility. Establishment of operation organization for the facilities by feminine cooperative.

c. JICA Assistance

- Results of the JICA development study (Estudio sobre Manejo de Residuos Sólidos en el Area Urbana de Tegucigalpa, Distrito Central, en la República de Honduras)in 1999 is not enough utilized, due to the political issues (changed investment policy of priority infrastructure development)
- Two persons participated CENICA solid waste management training program in 2011 and 2012 (Mr. Kessel :2011, Mr.Marvin:2012). Especially Mr. Marvin formulated action plan in the CENICA training contributes to development of national solid waste management law and regulations.

d. Ocotepeque

- Present landfill method is open dumping.
- Two municipalities associations are formulated strategic land use plan of the agricultural area, the plan is including solid waste management plan. Based on the plan these municipal associations decide construct co-use sanitary landfill.
- Construction cost of co-use sanitary landfill site donated by SICA
- Support of SICA is only for construction, it does not include operation and maintenance part. However it is necessary technical cooperation of operation and maintenance such as ASINORLU in El Salvador.
- Therefore, it would like to ask possibility of technical cooperation by JICA such as ASINORLU including measures of assisting waste picker .
- It is the visit to ASINORLU project that triggers the sanitary landfill development in Honduras.

1.2.2 AMHON (Asociación de Municipios de Honduras)

Date	14/ Aug./2012 (Mon.) 14:30 to 15:30
Place	AMHON Address: Col. La Reforma, Casa #2783, Tegucigalpa
Participant	＜Honduran side＞ Issac Chavez　Técnico en desarrollo municipal, Asociación de Municipios de Honduras (AMHON) Marvin Martínez　Coordinador, Departamento de Residuos Sólidos, SERNA Luis Castillo　Jefe Desarrollo Económico Social y Ambiente, AMHON Teresa Martínez　Técnico en Gestión Ambiental, SERNA / DGA Danilo Castillo　Director Ejecutivo, AMHON ＜Japanese side＞ Mr. Kato, Mr. Ogawa, Ms. Shimazaki (interpreter)
Outline	(1) Explanation of the survey to Honduran side (2) Explanation of a present situation from Honduran side
Collected data	(1) Compendio de Competencias Municipales en Materia de Ambiente (Print, DVD) (2) LA VISIÓN MUNICIPAL EN LOS PLANES DE DESARROLLO (Print, DVD)

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Outline of AMHON

- AMHON is the federation of 298 municipalities in Honduras. Main function of AMHON is coordination between 298 municipalities. Environmental issues are in charge of Social Economic Division. Also AMHON has Policy Division the division is in charge of supporting legislative activities.
- 298 municipalities are classified into 4 categories (A,B,C,D) depending on the economic development level.

b. Present Solid Waste Management in Municipalities

- AMHON organized solid waste management training in 2010 receiving support from Stewart university and Honduras domestic university. Purpose of the training is capacity development of solid waste management to in charge person in municipalities. Participants of the training were 25 to 30 persons.
- AMHON received support from many donors. However, support was only sporadic

support in many cases.

- In environmental field, water supply and sewage area are major subject in the institutional system in Honduras. The importance of solid waste management field is unrecognized.
- There are certain levels of regulations for final disposal site. However, those are not enough for overall solid waste management. SERNA and AMHON intent to establish new or additional regulations for improvement of present situation.
- SERNA and AMHON wish to consider the dispatch of long term expert for organization and institution from JICA.
- There are some municipalities, which achieve appropriate solid waste management (Puerto Cortes, Comayagua and Santa Rosa). These municipalities have common feature which are comparatively large population and appropriate waste fee collection based on good economic performance.
- Puerto Coretes landfill has not leachate treatment system and disposal cost is USD4 per ton.
- There are concession contract of solid waste collection work in Tegucigalpa and San Pedro, however, the work is not appropriate.
- AMHON wishes to establish an appropriate solid waste management system for each municipality taking into account capacity of the municipality. AMHON recognizes the solid waste management system in El Salvador is appropriate. Therefore, AMHON wishes introduce that system.

c. Ocotepeque

- Ocotepeque is consisted in category C and D municipality.
- Final disposal method is open dumping.
- Ocotepeque intended not only construction of sanitary landfill but also improvement collection system.
- Population covered by the Ocotepeque sanitary landfill project (7 municipalities co-use landfill site) is around 50,000persons.

1.2.3 OPS/ONU

Date	14/August/2012 10:15 to 11:15
Place	Organización Panamericana de la Salud Address: Ave. Republica de Panamá, Col. Palmira, Apdo, Postal 728
Participants	<Honduran side> Patarícia Segurado Asesora SDG, OPS/OMS Migel Hontoya Consullor, OPS/OMS Marvin Martínez Coordinador, Departamento de Residuos Sólidos, SERNA Percy Dion Técnico, Unidad de Cooperación Externa, SERNA <Japanese side> Kato, Ogawa, Shimazaki
Outline	(1) Explanation of the survey to Honduran side (2) OPS's Roles for waste management in Honduras (3) Current situation on Ocotepeque
Collected data	(1) Web link of Directory plan (it will be informed by mail)

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. OPS's roles for waste management in Honduras

- Waste management is one of the most important issues and we have been trying to solve this issue for 50 years. We surveyed current situations at regional level in 2001 and also

implemented sector analysis with IDB and AIDIS in 2002 and 2010.

- We developed standard tools for waste management master plan formulations, which is a guideline in Central America called "directory plan" opened to the public by website. This includes the method for checking institutions and regulations and the results shown on maps. We implemented this survey at 54 local governments including Ocotepeque and formulated plans according to the results.
- We are going to formulate institutions on waste management collaborated with the waste management section newly established in SERNA
- In Paraguay, OPS promoted 3Rs on hospital wastes at hospitals, but waste segregation and collection in hospitals were not enough. We want to share these knowledge and experiences among Central America.

b. Current situation at Ocotepeque

- We want to learn the knowledge and experiences of JICA's project in El Salvador and also share the knowledge and experiences by implementing the project planed in Ocotepeque among 3 neighboring countries.
- Ocotepeque has 16 units and 7units belong to Guisayote or Manvasen. These are located at Valle de Sensenti. These 7 units have the plan to construct a landfill site.
- Although each local governments wanted to construct their own landfill sites, they gave up because the central government has a policy of regional waste management system.
- IICA supports for the construction cost (it is revealed later that IICA is incorrect and SICA is correct). IICA has relationships with OEA and IICA supports mainly agriculture sector, thus, IICA donates the cost as a rural developments for agricultural area.
- The site has been obtained. The construction cost is about 4,500,000 Lps, which does not include the cost for operation and maintenance.

Meeting with OPS/PMU

1.2.4 Comayagua Municipality Landfill Site

Date	14/August/2012 13:30 to 14:30
Place	Comayagua Municipality Landfill Site
Participants	<Honduran side> Marvin Martínez Coordinador, Departamento de Residuos Sólidos, SERNA Landfill site operators <Japanese side> Kato, Ogawa, Shimazaki
Outline	Understanding Sanitary Landfill in Honduras

- This landfill site construction project support by DANIDA (Denmark)
- DANIDA supports human resources and fund.
- DANIDA dispatched project manager from Demark and they hired a Salvadoran solid waste consultant.
- The consultant participated JICA San Salvador solid waste management development study and ASINORLU technical project. The consultant gets much knowledge from JICA study and project.
- Landfill facilities consisted weighting bridge, administration building, landfill facility, medical waste disposal site and leachate treatment facility.
- Beginning operation was 25th February 2012. Daily disposal amount is 45 t0 70 ton.
- Comayagua Municipality and DANIDA made the effort to encourage new recycling business to waste pickers who work in old open dumping site illegally. As a results of the effort, waste pickers established recycling company and they disappear from landfill working face.
- Waste from medical institution is still not received, because it does not finish discharging manner education to discharger.
- Operation and maintenance condition is very good.

Entrance of Landfill Site


Weighing Bridge


Landfill Working Face

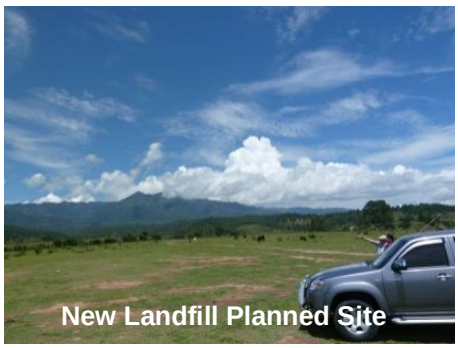
1.2.5 Ocotepeque

a. Site observation of the landfill

Date	9:30 ~ 11:30 16th August 2012
Place	Meeting Room at Municipality of San Marcos, Ocotepeque
Participants	< Honduran side> José Antonio Valle — Director Ejecutivo, Hermandad de Honduras Melecio Larrama — Coordinador Gestión, Hermandad de Honduras Mario Herrera — Alcalde, Municipalidad SVF Kessel Rosales — Director de Gestión Ambiental, Secretaría de Recursos Naturales y Ambiente Marvin Martínez — Coordinador Depto. Residuos Sólidos, SERNA Doris Lideny López — Coordinadora de UTI, MANVASEN Lenin Villeda Galvajal — Coordinador Unidad Técnica UTI Intermunicipal, Mancomunidad G Salvador Rodezno — Presidente Junta Directiva, Hermandad de Honduras Wilman Benjamin Mejía — Regidor, Municipalidad José Aleman — Corresponsal, Diario La Tribuna Carlos Salbador Aguilar — Alcalde La Labor, Municipalidad Gerber Santos — Alcalde Municipalidad <Japanese side> Kato, Ogawa, Shimazaki
Purpose	Understand situation of an existing landfill site and a new planned site for a sanitary landfill.

- The existing landfill is open dumping.
- The waste management plan was developed as a part of the rural development project of the ECADERT program supported by SICA. The waste management plan includes the Valle de Sensenti landfill.
- According to the plan, the new landfill is going to treat produced waste from 7 municipalities.
- The direct beneficiaries are about 24,000 people, and the indirect beneficiaries are about 50,000 people.
- The project period is 12 years. The area of the site is 20 manzanas (about 14.2 ha).
- The construction is implemented by HERMANDAD (NGO) mainly.
- After the construction, the HERMANDAD is going to be a core organization and establish the municipal company with participating municipalities in order to operate the landfill. The companies' main income is the fee of receiving wastes.
- Waste collection is going to be implemented by each municipaly respectively.
- The site was acquired and the constructions of an access road, a control office, electricity and water supply were completed.


Present Open Dumping Site

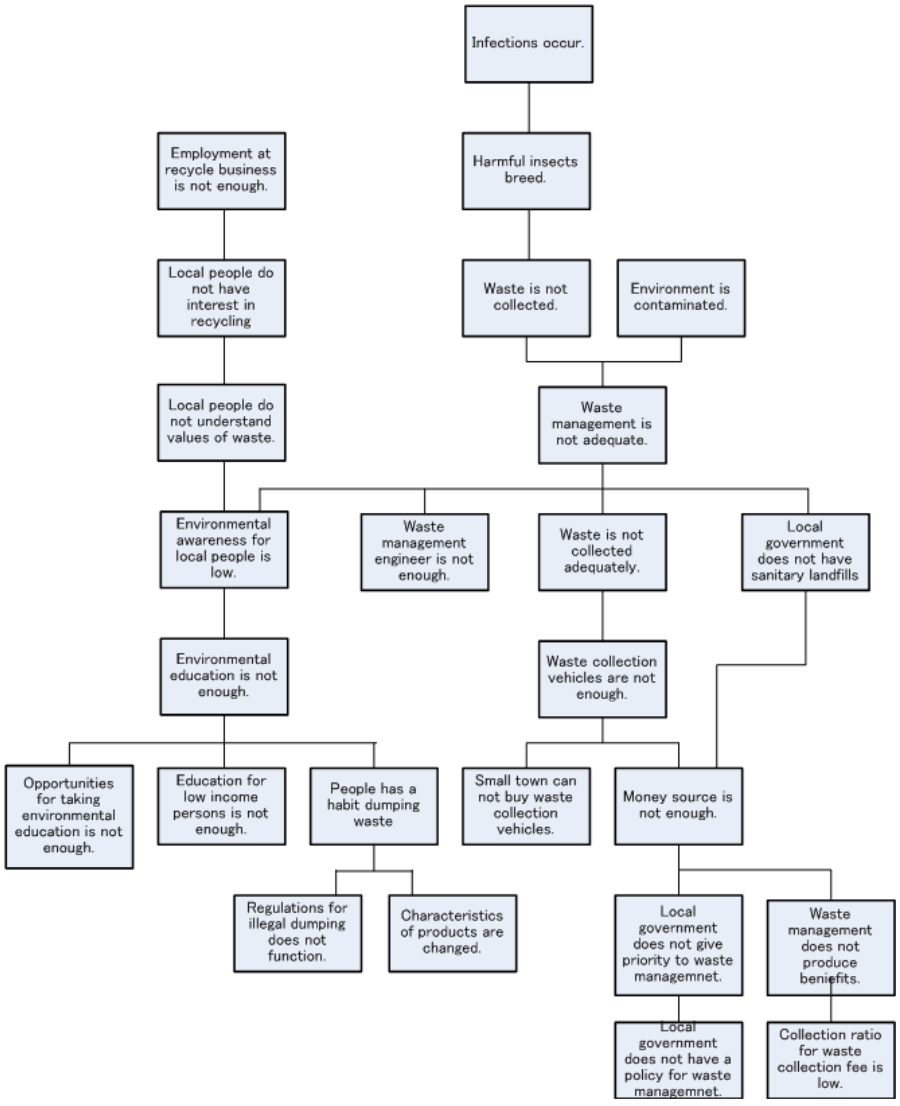

New Landfill Planned Site

- The construction cost of the landfill is 224,000 USD and SICA is going to donate the cost supposing the financial support from Spain. The agreement is going to be made between the NGO and SICA within this week.
- The local contribution for the construction is about 132,000USD and 5 municipalities share the contributions equally. One municipality contributes 300,000 LP. The total contribution from 5 municipalities is 1,500,000 LP equivalent to 132,000USD.

b. PCM workshop

Date	14:00～16:00 16th August 2012
Place	Hermandad de Honduras
Participants	<Honduran side> Doris Lideny López — Coordinadora de UTI, MANVASEN Lenin Villeda Galvajal — Coordinador Unidad Técnica UTI Intermunicipal, Mancomunidad G José Ines Gómez — Coordinador Unidad Municipal Ambiental (UMA), Mancomunidad Sensenti Eber A. Herrera — Coordinador Proyecto Energía, Hermandad de Honduras Marvin Martínez — Coordinador Depto. Residuos Sólidos, SERNA Kessel Rosales — Director de Gestión Ambiental, Secretaría de Recursos Naturales y Ambiente Fardy Antonio — Coordinador UMA, Municipalidad Lucerna Javier Espinoza — Coordinador UMA, Municipalidad San Marcos Edwin Sosa — Coordinador UMA, Municipalidad San Francisco, Valle <Japanese side> Kato, Ogawa, Shimazaki
Purpose	Problem analysis for waste management at Ocotepeque

<Problem tree>



PCM Workshop

＜Summary of the problem analysis and its consideration>

We identified "Waste management is not adequate" as a core problem and started making the problem tree. However, main discussion was about the lack of environmental educations to the people and the number of cards about municipalities' responsibility was quite limited.

As the result of the problem analysis, it is observed the sense of commitment to waste management is very weak in a public sector.

1.2.6 Summary of study in Honduras

a. SERNA

Environment (SERNA or Secretaria de Recursos Naturales y Ambiente in Spanish) in February 2012. Currently, there are two staffs responsible for waste management, and both have participated in the 3R training at the National Environmental Research and Training Center (CENICA in Spanish); one in 2011 and the other in 2012. The action plans that they have developed in those trainings have been useful in preparation for waste management laws and regulations. Currently, there are not many staffs in charge of waste management, but considering that the Minister of Natural Resources and Environment is considering waste management as a priority issue, it is likely that the number of staffs will grow in the near future. The staffs in charge of waste management are aware that they are still lacking in capacity, and they are hoping that JICA can support the capacity building of the waste management administration.

A staff of SERNA has commented that although JICA has supported development of master plans for Tegucigalpa City and implementation of pilot projects regarding waste management, their achievements have not been sufficiently utilized due to changes in the political situation (i.e. changes in priorities of the policy makers).

b. AMHON

Association of Municipalities in Honduras (AMHON or Asocciación de Municipios de Honduros in Spanish) is an association of municipalities which play a central role in waste management. However, the members are aware that they are lack capacity to actually implement waste management (e.g. They are not aware of how much sanitary landfill disposal fee would normally cost), and they hope that JICA would support them for the capacity building.

c. Comayagua City

Comayagua City is a city located to the North East of Tegucigalpa which is the capital city. The final disposal site located in this city is a sanitary landfill where there is leachate treatment facilities constructed with the cooperation of Danish International Development Agency (DANIDA).

For the construction of the facilities, DANIDA provided the financial and human resources. With regard to human resources, staffs to supervise the whole project were dispatched from Denmark. With regard to technical aspects, a consultant from El Salvador was hired. This consultant had good knowledge of waste management which had been acquired through participating in JICA Study on Regional Solid Waste Management for San Salvador Metropolitan Area and ASINORLU (an inter-municipal association) technical project. The site consists of weighing facilities, administration building, disposal site for municipal solid wastes, disposal site for medical wastes, and leachate treatment facilities. The facilities were very well maintained.

d. Ocotepeque Disposal Site

- Some parts of this disposal site such as the administration building are already finished, and the construction fee for the actual final disposal site is going to be financed by Spain through SICA (Central American Integration System) and five local municipalities (the municipal councils have already approved of the finance). Thus, the construction of this disposal site is very likely to be realized.
- Establishment of a regional disposal site managed by seven municipalities is a first trial in Honduras. If this trial proves to be successful, then this example could be applied to other similar regions within Honduras or be applied to other similar regions in other countries with the cooperation of the neighboring El Salvador and Guatemala.
- However, the implementing organization of this project (a NGO which is coordinating the seven municipalities and is promoting this project) does not have experience in construction or management of a disposal site. Thus, this organization wishes that JICA provide it technical cooperation as it has provided for ASINORLU in El Salvador.

e. PCM Workshop

In Ocotepeque Department, Project Cycle Management (PCM) workshop was organized with staffs of municipalities which are members of Mancomunidad in order to analyze the existing problems. The results of the problem analysis in the workshop are shown in Figure 2.

2 Guatemala

2.1 Survey Schedule

Date		Schedule	Outline	Location
18/Aug./2012	Sat.	Honduras to Guatemala	Travel	Guatemala City
19/Aug./2012	Sun.	Guatemala	Team meeting, Classify Data	Guatemala City
20/Aug./2012	Mon.	Guatemala	JICA Guatemala Office, CONADES/MARN	Guatemala City
21/Aug./2012	Tue.	Guatemala	Municipality of Guatemala, OPS/OMS	Guatemala City
22/Aug./2012	Wed.	Guatemala	INFOM	Guatemala City
23/Aug./2012	Thu.	Guatemala	PCM workshop	Guatemala City
24/Aug./2012	Fri.	Guatemala	JICA Guatemala Office	Guatemala City
25/Aug./2012	Sat.	Guatemala to El Salvador	Travel	San Salvador

2.2 Results of the Survey

2.2.1 JICA Guatemala Office

Date	20/August/ 2012　11:00 to 12:00
Place	JICA office Address: 18 Calle, 5-56, Zona 10
Participant	＜JICA ＞ Mr. Sasaki : Representative of JICA office Mr. Hori　: Environmental Management Program Coordinator of JICA office ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey to JICA office (2) Comment and suggestion from JICA office
Information obtained	(1) A report on solid waste management in Guatemala by a local consultant hired by JICA Guatemala office

Japanese mission explained the purpose and the outline of this survey using the summary of Inception report.

a. Comment and Suggestion from JICA office

- Receiving requests for JICA cooperation on solid waste management from municipalities, the JICA Guatemala office considers the needs for cooperation on solid waste management is high.
- In general in Guatemala, donor cooperation for the central government faces problems in implementation and has a limited output. It is outstanding that the Ministry of Environment and Natural Resources does not make clear or quick response nor make decisions on advancement of cooperation projects.
- On the occasion of a donors meeting with the Ministry of Environment and Natural Resources on solid waste management issues, commitment or attitude by the Ministry was not appreciable (e.g., the Ministry's participant soon left the meeting after making his/her presentation speech and did not participate the following sessions.)
- Other donors than JICA in general seem to implement projects directly with local governments.
- A principal role of the Ministry of Environment and Natural Resources is to consolidate the legal frame. Their activities on the issue seem latent and dispersed.
- JICA's communication to MARN is processed and categorized as the Minister's matter and it requires consent by the Minister before starting meeting or discussions.
- As for the South-South cooperation with CENICA Mexico, a dispute was raised on

interpretation of Guatemala's environmental legislation between Mexican expert and the Ministry's director or manager. Although this incidence is not exclusive reason, but the South-South cooperation with CENICA Mexico has not brought about good results in general.

- The JICA Guatemala office conducted a study on present situation of solid waste management in the country through hiring a local consultant. The report is available for the mission.
- Sanitary landfill and 3R themes are what the Japan shows its strength in technologies and administrative management with series of experiences. With this regard, JICA Guatemala office expects a certain orientation for possibilities of finding cooperation needs for the waste management matters.
- It might be considered possible that a regional project on solid waste management involving the three countries of El Salvador, Honduras and Guatemala could be implemented, however, since areas near the boundaries of countries have serious security problems, it requires security considerations in dispatching Japanese experts there.

2.2.2 Ministry of Environment and Natural Resources (MARN), National Commission of Solid Waste (CONADES)

Date	20/August/ 2012　14:00 to 16:00
Place	MARN/CONADES Address: 20 Calle 28-50, Zona 10
Participant	＜Guatemalan side＞ Mr. Edgar Marroquien G.　Asesor de Cooperación Ministerio de Ambiente y Recursos Naturales Mr. Gustavo Suarez　Director, DGPEA - MARN Ms. Sandra López　Asesora, CONADES Mr. Jaime Carranza　Director, CONADES ＜Japanese side＞ JICA office :Mr. Hori Study team :Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of survey purposes (2) Discussion of the survey item (3) Others
Information obtained	(1) LEY PARA LA GESTIÓN Y MANEJO INTEGRAL DE LOS RESIDUOS Y DESECHOS (2) POLITICA NACIONAL PARA EL MANEJO INTEGRAL DE LOS RESIDUOS Y DESECHOS SÓLIDOS (3) Comisión Nacional Para el Manejo de los Desechos Sólidos(ppt) (4) MARCO LEGAL GUATEMALA (5) Copia de PRESENTACION CONADES 111 2005

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Basic information of Guatemala

- Population is about 15 million and 670 thousands (as of 31 July 2012). It consists of 59% not poor, 35% poor, and the rest 6% extreme poor. Urban population counts for 55% and the rural 45%. (It needs to confirm with the national statistics data.)
- According to the geographical division by the National Institute of Seismology, Volcanography and Meteorology and Hydrology, it consists of: Central plateau; South coast; Oriental zone; and North Caribbean.
- Information for three years is available.

b. Present situation of solid waste management and Legislation

- Law for Integral Waste Management (Ley para la Gestión y Manejo Integral de los Residuos y Desechos) is still under examination by the national congress.
- In 2005, the National Policy of Environment was formulated and the waste management is categorized as a prioritized issue.
- It is stipulated that the central government has the competency on regulation and the municipal government is responsible for operation, with regard to the waste management.
- Although the government has changed in January 2012, the national policy on waste management does not change. There is the national program on waste management.
- Ministries, institutions etc. of the national government related with waste management counts for about 10 entities, such as Ministries of Health, Agriculture, Energy and Mining, etc. Related information is to be offered.
- 334 municipalities in the country are responsible for domestic waste management operation, but they face financial problems to implement the adequate waste management.
- There were several international cooperation projects on waste management through INFOM (National Institute of Municipal Promotion).
- With regard to legislation on waste management, at present there are some single and simple legislations but it lacks a comprehensive one. However, a bill of law for integral waste management has been submitted to the congress. (Related information is available. Also other exiting legislation is available from the related web-pages.) There is also a report regarding the legislative matters on waste management.

c. National Program on Solid Waste Management

- There is a national program (plan) of solid waste management, however, today is on its planning stage and its implementation has not started. CONADES (Comisión Nacional para el Manejo de los Desechos Sólidos) is responsible for providing concrete plans and programs.

d. Technical system for solid waste management

- Entity responsible for solid waste management (i.e., municipality) should select an appropriate technology for it.
- It shows a high percentage of organic waste in Guatemala's waste composition in general. It is considered necessary to examine for introducing schemes of such as sanitary landfill, composting, and 3Rs.
- There are some municipalities that introduce incineration facilities.
- Reduction, in terms of 3Rs, will become more necessary.


Meeting at MARN

- Several composting facilities are in operation in Guatemala. Source separation of organic waste is preconditions for that, however, citizen's discharge manner makes hindrance for it to date. It is an upcoming task.
- In San Antonio municipality in Sacatepequez Department had a successful project cooperated by an NGO called the CARE international. The compost project of Guatemala city is also producing favorable results.
- Projects that do not function well usually contain the financial problems. Many of them are suspended or abandoned when they face a shortage of financial resources after the international cooperation is concluded.
- The project in Almolonga municipality was suspended when the mayor was changed. In case of San Juan Ostuncalco municipality, source separation did not work well and all the wastes were brought into the final disposal site, and consequently the site became full soon.

e. Corporate Social Responsibility (CSR) and Public Private Partnership

- The Municipal Code stipulates clauses on concessions. Main concession activities in the solid waste management are domestic waste collection in Guatemala.
- Concession period is 25years. Percentage of waste collection activities by explicit concession contract are low in Guatemala compared with other Latin-American countries. On the other hand, there are many informal collectors in Guatemala.
- Collectors are not legalized bodies. Individual or family groups are formed to conduct informal waste collection services. MARN hopes to promote concessions with private firms.
- It is MARN's role to provide information for promoting public-private-partnership. MARN hopes to start to provide information on certification system as such are needed by the private sector.

f. Private Sectors

- It is increasing private sectors role in solid waste management, especially in collection services.
- It celebrated an Expo on solid waste management facilities (mainly recycling facilities) in Guatemala. MARN has an intention to promote the same kind of activities.

g. Industrial Waste Management

- MARN has data on industrial waste management since 2004. The chamber of commerce and industry played principal roles in its survey.
- Industrial wastes are categorized for 16 types of wastes in the survey.
- The definition of industrial wastes is stipulated in the bill of law for integral waste management that is under examination in the national congress. The Mexican law is referred in its draft preparation.

h. Biomass, Biogas, CDM, etc.

- MARN considers promote biomass, biogas CDM projects in line with the related policy formed in 2005. Meanwhile it is necessary to update the related information.
- The above mentioned policy was formulated by participation of the central government, local governments, civil societies, etc.
- The policy involves themes of CDM and 4 projects related with CDM are in progress in Guatemala.

i. Consolidation of Large-scale Solid Waste Management Infrastructure

- While municipalities take role of deciding what technology to adopt for their solid waste management, MARN has an opinion of promoting compost and recycling, rather than incineration.
- In financing the solid waste management infrastructure, there is an option of providing a loan from INFOM.
- MARN has an opinion of requesting about 10% of the budget of the national development commission in respective departments for the environment related infrastructure development.
- There is an option of obtaining finances from the INFOM fund.

j. Public Awareness on Solid Waste Management

- With regard to waste education such as source separation and separate discharge, it is included in the module that MARN and the Ministry of Education work together.
- NGOs also provide environmental education on solid waste management.
- MARN has the department in charge of environmental education and it offers sometimes the waste management education to citizen.

k. Rotation of personnel

- When the government changes either the national or local, personnel are rotated (i.e., fired and newly appointed) in most cases. Depending upon the employment scheme, some personnel in certain categories are not subject to the rotation at the government alteration.
- Personnel rotation takes place in offices of Mancomunidad when local government

changes take place.

- Personnel change is principally at management levels. Technician personnel have a lesser influences of government changes.
- NGOs do not face problems of personnel rotation at the time of government change, but the government change makes influences on NGOs' project progress and characteristics depending on the organizational form and capacity of NGOs.

l. South-South Cooperation

- Guatemala side hopes to receive south-south cooperation training on technical aspects of solid waste management. They hope to have training courses, for example, not about the legal categorization or definition of hazardous wastes, but about how to establish and operate concrete programs of hazardous waste vigilance and management.
- GIRESOL (Gestión Integral de Residuos Sólidos) program has objective to provide knowledge to formulate solid waste management promoters widely for municipally employees. Its technical contents are not so profound.
- CENICA cooperation provides certain profound and practical knowledge in certain fields, but the fields are limited in their specialties.

2.2.3 Municipality of Guatemala City

Date	20/August/2012　10:00～11:30
Place	City hall of Guatemala city Address: 21 Calle 6-77 Zona 1, Palacio Municipal
Participant	＜Guatemalan side＞ Mr. Julio Campos Gerente de Proyectos, Municipalidad de Guatemala Ms. Sylda Lone Subdirectora,Gerente de Proyecto, Municipalidad de Guatemala Ms. Irma Rodas Coordinadora de Cooperación, Municipalidad de Guatemala ＜Japanese side＞ JICA office :Mr. Hori Study team :Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of purposes of the survey (2) Discussion of the present situation of solid waste management in Guatemala city (3) Others
Information obtained	(1) Programa de Modernización del Manejo de Desechos Sólidos en la Ciudad de Guatemala

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. General information

- After the JICA development study in 1991 to date, although it is made a gradual improvement in solid waste management in Guatemala city, problems with solid waste are still outstanding in the city. It counts for such as problems of waste discharge or disposal manner by citizen, a single technical approach cannot offer the solution for them.
- There were about 700 illegal waste dumping sites 8 years ago, and they are now reduced to about 300 sites.
- General information about the city is available from the annual report of the city.
- The Department of Project Coordination was established in 2007.
- Municipal employees of the Guatemala city are about 9,000 people. Employees related with solid waste management are: 178 persons for the management of marketplace waste and illegal dumping; 34 persons in charge of the final disposal site; and 4 persons in administrative section.

- The annual budget of the city government is 1, 251 million quetzals and the budget for the final disposal site is 25 million quetzals.

b. Collection


Collection vehicles

- Waste collection services are all covered by the concessioners that have the concession contract valid until 2013 or 2014.
- The concessioners own the collection vehicles and provide collection services to citizen and charge and collect tariff of the service.
- The city government receives the fixed concession tariff of 330 quetzals/ vehicle/year from concessioners.
- Most concessioners are micro- companies of family business. Concessioners are member of either one of the two (2) associations of solid waste collection services.
- Service provision areas or collection routes of respective concessioners are decided by the associations. The tariff of the respective collection services is determined by the associations, no competition situation is created.
- The two associations count for 525 collection trucks to cover the all the area of the Guatemala city.
- The fee of the service is directly collected from service users (houses, commercials, businesses, etc.) by the concessioners.
- The tariff of the respective collection services is determined by concessioners. High income residential areas have higher tariff rates and low income area has lower tariff rates. It is in the range of 5 to 7 US dollar per month per household.
- Any complaints for collection services are given directly to concessioners by residents. As the service is the family business, close communication is held between the service user and the provider.
- The city government once tried to provide training for concessioners, associations refused the city's proposal because they said they have more experiences in many years than the city government.
- Concessioners issue receipt of the waste collection service to users.
- The concession contract renewal is the decision matter of the top management of the city government.
- Some municipalities provide direct operation of the collection service.

c. Treatment and Final Disposal

- The municipality manages final disposal operation, but is not in charge of collection operation. With regard to collection, the municipality issues concession permits.
- The disposal site is a private land and the land rent contract was renewed in 2005 after concluding the first land use contract for 50 years from 1955.
- The waste disposal site for Guatemala city is located at the Zone 3, and the AMSA's (Autoridad para el Manejo Sustentable de la Cuenca y del Lago de Amatitlán) disposal site is located in Villa Nueva.
- The Zone 3 disposal site receives about 3,000 ton/day. It consists of about 1,500 ton/day by Guatemala city and the rest about 1,500 ton/day by 9 neighboring municipalities.
- It is not known by the Guatemala municipal personnel the details of waste disposal situation at AMSA's Villa Nueva site.
- Waste collection concessioners do not pay the final disposal tipping fee.
- The municipality looks for a reliable contractor for the appropriate disposal operation works that should have financial soundness and technical reliability.

- The municipality hopes to have a longer service life of the exiting site since the localization of a new site might be difficult.
- It is informed that there are about 1,200 waste pickers in the Zone 3 site.
- Waste composition counts for about 69% of organic waste, 14% of recyclable materials such as plastics and PET bottles, and 17% non recyclable inorganic waste.
- It is reported that the average waste calorific value is 1,172Kcal/kg in the study conducted by a Spanish consultant contracted by IDB.

- The municipality hopes to employ an appropriate technology suited for the situation of the Guatemala city, but not the highly sophisticated technology such as incineration, gasification.
- Costa Sol municipality procured an incineration facility for its solid waste management, however, facing financial and technical problems, they abandoned the incineration system.
- The municipality has an interest on electricity generation by waste incineration. A Canadian company called Carbontreck(?) once offered a project to the municipality but the negotiation did not concluded successfully. Another company now prepares to offer a project of 16MW electricity generation by waste incineration.
- If any CDM project takes place at the Zone 3 site, its benefit goes to the land owner. That was confirmed when the land rent contract was renewed in 2005.
- Electricity price in Guatemala is about 0.22USD/KWh. In view of the relatively high price of electricity in Guatemala, it might be possible to consider a project of an electricity generation from waste incineration.

d. Sweeping works

- There is an organization called “LimpiVerde” that works for road sweeping and green area maintenance. Total employees are 850 persons and it consists of about 820 sweepers and about 30 administrative persons.

2.2.4 OPS/OMS

Date	20/August/2012 14:30～16:00
Place	OPS (Organización Panamericana de la Salud) Address: Edificio Etisa, Plazuela España 7a. Avenida 12-23, Zona 9
Participant	＜Guatemalan side＞ Mr. Guillermo Hegel　Consultor en Desarrollo Territorial de Salud, OPS/OMS Ms. Ana Sofia Fabián　S/A OPS/OMS ＜Japanese side＞ JICA office :Mr. Hori Study team :Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of purposes of the survey (2) Discussion on present situation of waste management in Guatemala (3) Others
Information obtained	(1) Estrategia: municipios saludabeles

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Solid Waste management in Guatemala

- Solid waste management projects formerly extended in Guatemala lack effectiveness and are dispersed in general. It mainly is due to the absence of common goals among those former projects. CONADES is in general in short of capacities in technical aspects and supervision tasks.
- A bill of law for integral waste management has been submitted to the congress. In order to substantially implement this law in the near future, organizational consolidation is required in Guatemala.
- It is indispensable to hold donors' meetings, involving NGOs as well, to reach a consensus among them for formulating a strategic plan in solid waste management sector in Guatemala.


Meeting at OPS

- A conference on solid waste management was held last year by the UN-HABITAT in Guatemala. About 200 waste management experts participated the conference. The strategic plan for solid waste management in Guatemala was proposed in the conference and its finalization is waited. The final draft should be in hands of the MARN and the UN-HABITAT Guatemala. The final report of the conference is not published yet.
- Improvement of solids waste management has been taking place in Guatemala, however, it has not emerged yet the result that should reasonably be expected in view of investment made so far. In particular;
  - Legislative framework is deficient and therefore they are not made clear roles of respective institutions in solid waste management and/or operations;
  - Regulatory institutions do not have practical regulating functions in implementing their activities;
  - No specific public investments are made focusing the solid waste management; and
  - Due to the absence of national strategies of solid waste management, municipalities lack tools and standards to follow in formulating their plans on municipal solid waste management.
- Guatemalan citizen lacks generally the conscience of paying not only the fee of waste management services but even the fee of potable water. In order to solve these problems, environmental education only is insufficient. And therefore, in order to change citizen's conscience, improvement results should be demonstrated by implementing appropriate solid waste management operations.
- In order to minimize the negative impacts of personnel rotation at the time of government changes, legislation improvement and process standardization is necessary.
- As decentralization policy gradually proceeds in Guatemala, personnel rotation is comparatively decreasing these days, especially the technical personnel has less rotation and continues to work in municipalities compared to the former situations.
- Creation of public investment funds for solid waste management is awaited.
- Several former international cooperation projects, after cooperation ends, could not have continuity in operation due to high operation costs of the projects.
- There were several projects with incineration facilities, however, their operation were not continued.
- The project of Naranjo river regime solid waste management, which is about 3 million US dollar Spanish cooperation, counted for: sanitary landfill; composting; source separation; and so on. Maybe the projects covered too many components, and consequently any component has appropriate operation at the end. Once the municipality starts to doubt why should high operation cost be spent in solid waste management, the project loses its continuity.
- The landfill operation by AMSA, although it is not perfect, is considered as a good example in Guatemala.
- As for waste collection, present concession system might be considered acceptable as a

short term solution in view of the situation. However, it also shows the aspect that, since either the central or local government is not able to cope with the problems sufficiently, the task is consequently left for the private initiatives.

- Concession collection is dominant in large and principal cities, direct collection operation is seen in small local cities.

2.2.5 INFOM (Instituto de Fomento Municipal)

Date	22/August/2012　10:00～11:00
Place	INFOM Address: 8 Calle 1-66 Zona 9
Participant	＜Guatemalan side＞ Alfredo Szarata　Director Plantas, INFOM Roberto Casasola E. Asesor Cooperación Internacional, INFOM Manuel QuiñoneZ　Coordinador Unidad Estudios Técnicos, INFOM ＜Japanese side＞ JICA office :Mr. Hori Study team :Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of purposes of the survey (2) Discussion on present situation of waste management in Guatemala
Information obtained	(1) Memoria de labores 2010 INFOM/ Autoridades 2010

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Solid Waste management in Guatemala

INFOM headquarters

- Waste collection in Guatemala city is operated by concessions. As for final disposal, sanitary landfill operation used to be maintained, however, once the site was over filled, sanitary landfill operation could not be continued.
- Another example of landfill management is what AMSA operates. In many small municipalities, open dumping is a common practice of their final disposal.
- The municipality of San Marcos has a project (plan) of source separation and composting. The municipality of Panajachel also has a similar project of constructing a composting plant.
- Conscience on solid waste management in very low in general in this country. Once we raised a discussion on necessity and importance of solid waste management to a mayor, the mayor expressed his opinion saying that “my municipality has a waste management problem because there is no river to dump waste in the territory of my municipality”. It evidently shows that no sufficient knowledge of waste management is given to many local authorities and it is commonly misunderstood that waste should be dumped in the river.
- It is very possible that many municipalities put a higher priority on waste water management than on solid waste management. In 2006, the law for waste water management was enacted and it stipulates that sewerage should be provided and municipal waste water should be treated before its discharge into a public water body before 2015. Municipalities are now strengthening their sewerage construction and sewage treatment efforts. Improvement is mainly extended in sewer provision at present and waste water

treatment counts for only about 2 to 3% of waste water discharge amount.

- INFOM's principal mission is to provide technical assistance and financial support for municipalities. In response to the request from a municipality, INFOM starts to prepare assistance and support to the municipality. INFOM has the training department and provides training for municipal personnel in various aspects.
- As for the Panajachel municipality project, Autoridad del Lago de Atitlán (AMSCLAE) secured and provided the financial resources for the investment and operation of the project. The municipality of San Juan also had a similar project.
- It is commonly considered that most municipalities place higher priority in the order of: potable water, waste water (sewer), road lightening, park, public school, road pavement, etc. Solid waste management is generally placed as a lower priority task.
- Two years ago, the Law for Integral Waste Management (Ley para la Gestión y Manejo Integral de los Residuos y Desechos) was submitted to the national congress, and the diet approval and enactment is being awaited. It should like to be expected its approval in this year.
- The daft law states respective institutions' responsibilities such as: medical waste by the Ministry of Health; industrial waste by the Ministry of Energy and Mining, etc.


Meeting at INFOM

- Once the Law for Integral Waste Management is approved and enacted in the near future, municipalities will have more interests in the solid waste management in order to fulfill their responsibilities. INFOM should then support them with regard to technical and financial assistance. However, INFOM today do not have a solid support system for answering future municipal demands on solid waste management.
- ANAM (Asociación Nacional de Municipalidades de la República de Guatemala) is the association of municipalities and does not have the structure to offer technical or financial support to municipalities. Meanwhile INFOM is the national institute that has the mission and financial sources given by the central government to provide technical and financial assistance to municipalities.
- CONADES (Comisión Nacional para el Manejo de los Desechos Sólidos) can not provide direct support for municipalities since it is structured as a national commission.
- With regard to the sewage management projects that INFOM is involved, once the land for a sewage treatment plant is secured, the project makes a comparatively good progress.
- INFOM hopes to receive technical cooperation from JICA regarding solid waste management, especially about appropriate technologies of final disposal management. INFOM considers that JICA technical cooperation in El Salvador is a good example in this field. INFOM considers that Guatemala does not have strong needs to request JICA's technical cooperation on waste collection aspects.
- With regard to the south-south cooperation, INFOM has no idea whether Guatemala can receive such assistance from El Salvador, but hopes to receive a technical cooperation by JICA directly.
- INFOM principally hopes to receive financial assistance by international cooperation in order to support municipal projects. The idea is that INFOM administrates financial resources granted by international cooperation and then appropriately provides financial assistance to municipalities in solid waste management projects.
- INFOM considers that, as well as from a viewpoint of public health issues, sewage treatment projects have a priority than a solid waste management project in general. But on the other hand, in Guatemala toilet papers used in toilet are discharged as domestic waste and disposed of at final disposal sites, and such papers are scattered in disposal sites to create another public health problem.

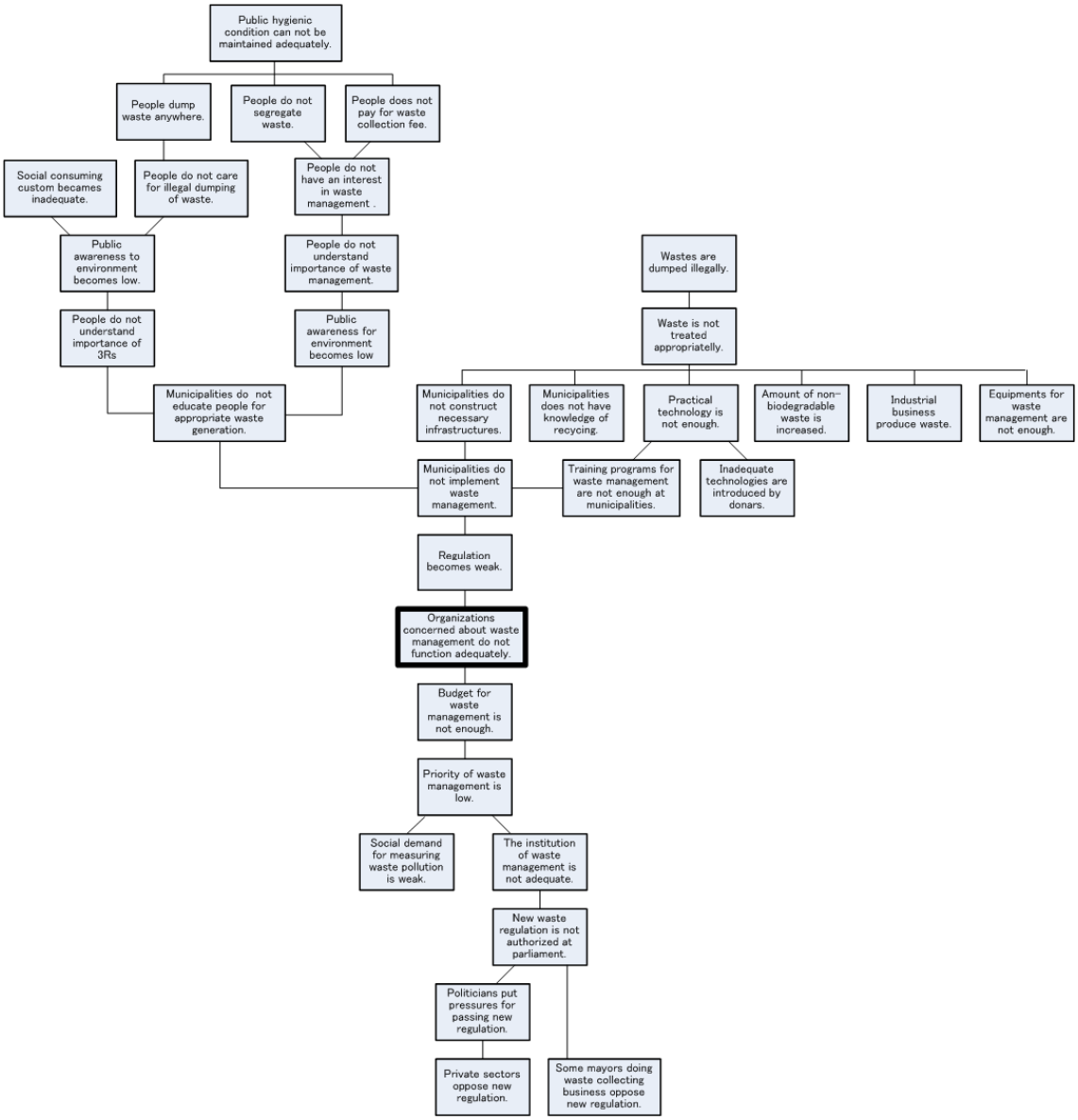
2.2.6 Project Cycle Management (PCM) Workshop

Date	23/August/2012　09:00～15:30
Place	Hotel Clarion Suites Address: 14 Calle 3-08, Zona 10
Participant	＜Guatemalan side＞ Jermy Pérez　Capacitadora CONADES Sandra López　Asesora (Internacional, Fiannciera, Económica), CONADES Melissa Alvarez　Arquitecta (Área técnica), Asesora (infraestructura), CONADES Daniel Interiano　Asistente (Legal), CONADES Otto Sandoval　Asesor (Ambiental) CONADES Jaime Carranza　Director Ejecutivo CONADES Alejandra Soto　Asistente (Administrativo), CONADES Arnaldo Gramajo　Asesor (Políticas), DGPEA - MARN Jennifer Zamora　Asesor (Desechos Peligrosos), Unidad de Productos Químicos Alejandro Estrada　Unidad Planificación, DGPEA - MARN César Barrientos　Asesor - Consultor, ECONSULT- AMSA ＜Japanese side＞ JICA office :Mr. Hori Study team :Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1)　Problems analysis in solid waste management

＜List of Stakeholders concerned with waste management＞

Waste Generators	CONADES	Government Organizations	Non-governmental Organizations
Hospitals	Ministry of Environment	INGUAT	Waste Incinerators Company
People	INFOM	Ministry of Foreign Affairs	Port Association
Industries, Commercial sectors	ANAM	Ministry of Agriculture	Associations for environmental engineers
	CACIF	Ministry of Energy and Mines	Waste pickers association
	SEGEPLAN	Ministry of Finance	Waste segregation companies
	Industrial association	Ministry of Education	Waste collectors
	Merchants association	REDFIA	Waste recyclers
		AMSA	Waste recyclers association
		Municipalities	Recycle companies
		Ministry of Development	international Organizations
		Ministry of Economy	
		Ministry of Labor	
		Congress of the Republic	
		Ministry of Health	

＜Problems analysis tree＞



2.2.7 Summary of study in Guatemala

All institutions visited mentioned that because the Law for Integral Waste Management (Ley para la Gestión y Manejo Integral de los Residuos y Desechos) is not yet approved by the national congress, in the present situation of the absence of that law, it is difficult to implement appropriate solid waste management in Guatemala.

The capital Guatemala city generates about 1,500 ton/day of municipal wastes and the collection service is provided by concessioners. Concessioners take roles of its service charges collection as well as attending complaints by citizen. The municipality of Guatemala is in charge of final disposal management, road sweeping and market waste management. While the municipal employees count for about 9,000 persons, municipal personnel in charge of the solid waste management including direct operation counts for only 216 operational persons and 4 administrative persons. The number seems to be very insufficient to provide an appropriate solid waste management for 2 million citizens by the municipality.

According to the interview to INFOM, municipalities place a lower priority on solid waste management, being their higher priorities on potable water, sewage, road lightening, park, public

school, road pavement etc. INFOM stated that this is due to the absence of the firm legislative framework of solid waste management.

The PCM workshop on 23 August produced a chart of problems analysis, that also concluded that because the regulatory enforcement competence is weak in the present legal system on solid waste management, municipalities are generally in short of implementing appropriate solid waste management and illegal dumping and public health problems are consequently invited.

In summarizing comments of participants in the PCM workshop, the initial scheme proposed with creation of CONADES was to grant more competencies of regulating the waste management for CONADES as a national institute, however today the CONADES is formulated as a commission entity. In this relation, it might be reasonable that the central problem raised in the PCM workshop became "organizations concerned with waste management do not functioning s adequately".

By all means, it is fully awaited that the Law for Integral Waste Management (Ley para la Gestión y Manejo Integral de los Residuos y Desechos) becomes approved in the national congress and enacted, in order to extend improvement activities in solving the solid waste management. However, it is also anticipated that the approval and enactment of the law might be delayed than expected, if interventions for the law examination take place with an influence from some stakeholders' interest.

3 El Salvador

3.1 Survey Schedule

Date		Schedule	Outline	Location
25/Aug./2012	Sat.	Guatemala to El Salvador	Travel	San Salvador
26/Aug./2012	Sun.	El Salvador	Team meeting, Classify Data	San Salvador
27/Aug./2012	Mon.	El Salvador	JICA office, ISDEM head office, BCRC-CAM, CCAD/SICA	San Salvador
28/Aug./2012	Tue.	El Salvador	ISDEM Eastern region office ASINORLU Landfill site	San Salvador
29/Aug./2012	Wed.	El Salvador	Solid waste sustainable management direction of the municipality of San Salvador, COAMSS、MARN	San Salvador
30/Aug./2012	Thu.	El Salvador	PCM workshop	San Salvador
31/Aug./2012	Fri.	El Salvador	JICA office, MAREN	San Salvador
1/Sept./2012	Sat.	El Salvador to Mexico	Travel	Mexico City

3.2 Results of the Survey

3.2.1 JICA El Salvador Office

Date	27/Aug./2012 (Mon.)　09:30 to10:30
Place	JICA El Savador office Address: TORRE FUTURA 8º nivel 803, Calle El Mirador y 87 Av. Norte, Col. Escalon
Participant	＜JICA office ＞ Mr. Tachihara (Representative of the JICA office)、Ms. Sindo (Adviser for Project Formulation), Mr. Luis Miguel VÁSQUEZ ＜SICA＞ Mr. Kamishima (Adviser for Regional Cooperation) ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(3) Explanation of outline of the survey to JICA office (4) Comment and suggestion from JICA office
Information obtained	(2) JICA El Salvador Solid Waste Management Documents 2012 (3) Information of Regional Seminar on 6-8 June 2012 (10. Country report presentation) (4) Information of Regional Seminar on 6-8 June 2012 (comments) (5) Information of Regional Seminar on 6-8 June 2012 (interview notes)

Japanese mission explained the purpose and the outline of this survey using the summary of Inception report.

a. Comments by JICA El Salvador office

- Although not appears in the statistics, open dumping sites are seen in distant local areas. Some newspaper articles report that such open dumps endanger the potable water resources.
- It seems that, in analyzing remaining service life of landfills in the country, waste reduction actions should be necessary.
- Each country in Central America is comparatively small, so that there will be a limitation to deploy waste management cooperation projects individually. A viewpoint of regional approach must be necessary.
- It could be an option that Salvadoran expert be dispatched as the JICA third country expert for example to Ocotepeque project in Honduras.
- In last July, ASINORLU requested JICA support for newly constructing the third cell of

the landfill. They also requested technical advice or discussion regarding methane gas monitoring.

- MARN seems to consider that, as the ASINORLU works appropriately, MARN's investment support should be prioritized to other landfills than ASINORLU. Meanwhile it requests ASINORLU to provide training for other municipal technicians.
- ASINORLU now receives Italian cooperation in aspects of municipal administrative reinforcement.
- As for e-waste, MARN starts to make an inventory of dismantling companies. Another movement is to repair PCs and to donate them to schools. Mr. Miguel Araujo in the Basel convention office in CCAD is a former minister of MARN.

3.2.2 ISDEM (Salvadoran Institute of Municipal Development)

Date	27/August/2012 (Mon.) 11:00～12:00
Place	Salvadoran Institute of Municipal Development (ISDEM) Address: 4ta Calle Poniente entre 41 y 43 Av. Sur Col. Flor Blanca salón del Concejo Directivo
Participant	＜ISDEM＞ Ms. Rosa Elena Pérez de Villeda, Ms. Heide Chacón ＜JICA＞ Ms. Shindo ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey (2) Background and outline of PROMADES
Information obtained	None

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. PROMADES

ISDEM headquarters

- Before PROMADES, we did not have experiences nor knowledge on solid waste management, but through this project we obtained capacities on various aspects of solid waste management such as baseline survey, sanitary landfill methods, financial aspects, organizational aspects etc.
- One of most important factors in implementing the project was the commitment of mayors in it. Depending upon the situation mayors may change their view, therefore, time to time it is necessary to confirm any consensus or discussions among them in writing. For example, the Santa Rosa de Lima mayor changed his opinion against their former consensus and claimed to return back the landfill site land to the municipality and made a tribunal dispute. As a new mayor was elected in this election, the dispute is solved. While, it is requested by a new mayor that the delayed payment should be exonerated.
- After the enactment of the law that obligates the waste disposal at only authorized landfills, ASINORLU landfill has started to accept waste from 27 municipalities. The tipping fee was established that the Santa Rosa de Lima US$ 17/ton, other ASINORLU members US$ 23/ton, and municipalities other than ASINORLU US$ 26/ton.
- It is now necessary to have an investment for newly constructing the third cell.

- Environmental education regarding waste reduction is also being implemented not only st schools but also for adults. Environmental education regarding waste for adults is rather complicated for example about time and location of such events. There is an action in the school cafeteria to stop using disposable dishes and start using plastic ones. This is one result of awareness raising activities.
- As for the closure of small open dumping sites (Poloros, Bolivar, Lislique), a grant portion of DAC (Descontaminacion de Areas Criticas) funds was utilized.
- In order to secure the sustainability and continuity of this kind of project, consensus of related parties should be made as a written document and that should be signed, appropriate technologies should be introduced, capacity of personnel (especially practical knowledge) should be raised, participating municipalities should secure their respective commitments on institutional and financial matters.
- For the sustainability and continuity of this kind of project, it is indispensable to secure the financial stability of the project. Meanwhile some municipalities have difficulties in collection of cleansing service fees. One representative problem is that Santa Rosa municipality delayed the tipping fee payment, and consequently the landfill operation management faced a problem. To solve the situation temporarily FODES resources are to be used for an intervention.


Discussion at ISDEM

- The Salvadoran experts of the ISDEM Eastern office remain the same 7 persons.
- MARN has an intention of diffusing the PROMADES results to other municipal association s in the country, however, ISDEM itself cannot deploy related activities. It is necessary to allocate sufficient budget for the diffusion of PROMADES results. As for diffusion works to date, training and technical support (e.g., landfill operation works) were provided to the municipal association in Chalatenango (a regional landfill of 5 municipalities). After that, occasion to occasion, ISDEM eastern office and ASINORLU have been providing advices in responding their inquiries.
- Information of tariff in ASINORLU will be provided by email from Ms. Rosa Elena. Trends of percentage of waste management budget in the total municipal budget, before and after the Decree 237 enactment will be confirmed and later reported to the study team by Ms. Rosa Elena.

3.2.3 Regional Center of Basel Convention (CRBC)

Date	27/August/2012 (Mon.)14:30～16:00
Place	CRBC office in the SICA building Address: Edificio SICA, Boulevard Cancilleria, Distrit El Espino, Antiguo Cuscatlan, La Libertad. El Savador, C.A.
Participant	＜CRBC office＞ Mr. Miguel Araujo ＜SICA＞ Mr. Kamishima ＜JICA El Salvador office＞ Ms. Shindo, Mr. Luis Miguel Vasquez ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey (2) Outline of CRCB
Information obtained	(1) PACE DVD (material distributed at the COP10 Cartagena meeting)

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. CRCB comments

- This office mainly deals with the following 5 topics: E-wastes related matters, Basel Convention related activities, matters on PC rebuilt from discarded PC, PACE related matters, and training issues.
- DVD distributed at Cartagena meeting is given to the study team.
- DVD consists of one with respective information and another is a promotional video.
- As for E-waste collection in El Salvador, private companies principally collect PC and cellular phones.
- As for PC collected, they are utilized to build up repaired PC and to donated at educational institutions.
- The PACE meeting was held in San Salvador in May 2012. Governmental institutions and private firms from various countries were participated. It includes international private firms that work on E-waste, such as SIEMENS Recycle Solution.
- CRCB hopes to build in Central America a new model that E-waste collection and utilization become more value added.
- The steps should be to develop a cluster in Central America that has high technologies of E-waste treatment, and to consolidate the related infrastructure. All those facilities of E-waste treatment should obtain certification of international accreditation institutions.
- In so doing, value addition can be made in producing products that utilize E-waste resources.
- CRBC hopes to concretize this model in collaboration with the National Council of Science and Technology in El Salvador.
- The industrial activities related with this model will bring about merits of technology development and sea ports revitalization.
- Lead extraction from TV cathode tubes is another task that CRBC should consider to tackle with.
- CRBC submitted to EU a proposal for formulation of E-waste strategies. The proposed plan includes medium term strategies, such as mechanism of E-waste administration in Central America.
- CRBC hopes that it develops the industries that recover lead from discarded car batteries utilizing energy renovation, and to pursuit zero emission by adopting appropriate technologies.
- CRBC also hopes to promote hazardous waste treatment including POPs (persistent organic pollutants) and PCB treatment utilizing cement kiln or plasma technologies.
- CRBC in cooperation with UNDP formulated the task force for Central America E-waste management.

3.2.4 Central American Commission of Environment and Development (CCAD) / Central American Integration System (SICA)

Date	27/August/2012 (Mon.) 16:00～17:00
Place	The Central American Commission of Environmental and Development CCAD/SICA Address: Edificio SICA, nivel 3, Final Bulevar Cancillería, Distrito El Espino, Ciudad Merliot, Antiguo Cuscatlán La Libertad.
Participant	＜CCAD/SICA＞ Mr. Raúl Artiga Ms. Roxana Hernández Villadacies Mr. Kamishima ＜JICA＞ Ms. Shindo, Mr. Luis Miguel Vasquez ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey (2) Outline of solid waste management in SICA
Information obtained	(1) Instrumentos Técnicos sobre Residous Sólidos (CD)

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Outline of solid waste management in SICA


Discussions at CCAD/SICA

- To make a common frame in Central America, SICA offers the facilitation of regional activities.
- In diffusing PROMADES results in other countries, as the cultural and social backgrounds are similar, it is considered possible that Salvadoran PROMADES experts travel to other countries to provide advices and technical guidance. In such cases, SICA is able to provide coordination among related institutions.
- As for solid waste management related activities in SICA, a training course regarding trans-boundary of hazardous waste was held in Mexico, and it was coordinated participants from SICA member countries for the course.
- Regarding the trans-boundary of hazardous waste issues, there is no unified agreement or actions in the Region. CCAD has a rule different from the Basel Convention.
- Regarding the CAFTA framework related with solid waste management, there are no penalty clauses regarding environmental protection requirements. It considers that the capacity development of environmental protection should be accelerated before regulation and sanction are enforced.
- In order to minimize negative impacts by personnel rotation, training should be widely provided for many institutions and related personnel.
- In case of personnel rotation takes place in SICA related projects, SICA makes active stances to explain the background etc. Personnel rotation takes place more in managerial positions and less in technical staff.
- Meanwhile, it is another measure that a technical committee at the regional level should be created and operated to keep know-how there in the regional technical committee.

- SICA, in confirming needs of organizational reinforcement; policy formulation; and action planning, hopes to support the member countries in due course.
- Regarding the environmental policy implementation capacities, SICA considers an approach that respective member countries' needs are to be compiled as a data base and respective dialogue should be carried out then.
- Present principal task in solid waste management issues in member countries is the appropriate closure of disposal sites.
- The MARN minister stated that good practices in Central America should be referred for the Salvadoran improvement and good practices in El Salvador should be transferred to member countries in order to provide support actively.
- As shown in the CD, SICA promoted the project to make indicators. However, it all depends on each country's decision whether or not it is adopted.

3.2.5 ISDEM Eastern Region Office

Date	28/August/ 2012 (Tue.) 11:00 to 12:30
Place	ISDEM Eastern Region Office Address: Oficinas de region oriental, San Miguel
Participant	＜El Slavador side＞ Mr. Andrés Cristóbal Cruz Ms. Patricia Vásquez de Benitez Ms. Ana Miriam Salgado Ms. Humberto Quandique Mr. Julio Roberto Ramírez ＜Study team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of survey purposes (2) ASUNORLU project
Information obtained	None

Japanese side explained the purpose and the outline of this survey.

a. ASUNORLU Final Disposal Project

- ISDEM eastern region office and staff acquired capability of sanitary landfill development, by execution of the ASUNORLU final disposal project.
- ISDEM eastern region office and staff get many capabilities for sanitary landfill development, such as basic study method, sanitary landfill method, finance and institutional system though execution of the project.
- ISDEM is elaborating lateral spread of the project experiences on many opportunities such as a seminar and workshop. However, sometimes go wrong by political issue.
- It is necessary multiple direction (political, technical and public administration) approaches for new sanitary landfill development.
- It is important to agreement between consist of municipalities for sanitary landfill development in Mancomuidad.
- Obtain consensus with local residents is very important for execution of the project. In addition, in case of ASUNORLU, period of getting consensus with waste picker was limited. It is necessary more time for getting consensus with waste picker.
- They have enough capability for sanitary landfill development and operation. However, the bottleneck is a financial matter.
- Many visitors came from home and abroad (Mexico, Dominican Republic, Venezuela and member of CCAD countries).
- It is necessary gain full understanding of the mayor for the executing next ASUNORLU project.

b. Assistance to other Sanitary Landfill Projects

- They wish to spread around nationwide of the experience, they understand; it is they

mission.

- MARN planned new sanitary landfill site development projects in the nationwide. In that case, experiences of ASUNORLU should transfer to relevant Mancomunidad pass through ISDEM.
- Regarding support to a foreign country, if the request from JICA El Salvador office, it is easy to take on.

3.2.6 ASUNORLU Sanitary Landfill Site

Date	28/August/ 2012 (Tue.) 12:30 to 14:30
Place	ASUNORLU Landfill site
Participant	＜ASUNORLU＞ Mr. Hugo Guerrero, Mr. Enrique Turcios ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey (2) Comment and suggestion from ASUNORLU ofiice
Information obtained	(1) Brochure of ASUNORLU (2) RELLENO SANITARIO DE ASINORLU INFORME ANNUAL DE MANTNIMIENTO Y OPERACIONES DEL SITIO

Japanese side explained the purpose and the outline of this survey.

a. ASUNORLU Sanitary Landfill Site

- The landfill site consisted two sites (Phase I and Phase II). Phase I is old site. Phase II is new sit which developed by JICA support. Basically Phase I is closed site, however use in rain season, because access to Phase II site sometime become difficult in rain season (MARN permitted this operation manner).
- Utilizing a period is approximately March to September, depended on a rain condition, other than this period, basically using the phase II site.
- Present waste disposal amount is approximately 30 ton/day. Waste dischargers are ASUNORLU member municipalities (nine municipalities), neighboring municipalities of ASUNORLU member (nine municipalities), common waste from some private sector, industrial waste and custom not passed matters.
- There is an expansion plan for using to a regional landfill site in the country southern area, by KFW loan assistance.
- Annual visitors are approximately 15 groups. Average persons per group are 30 persons. Visitor, including from Comayagua


Phase II Landfill Site


Phase I Landfill Site

municipality in Honduras (Comayagua municipality developed sanitary landfill supported by Danish government).

- Also, in charge person of ASUNORLU was visited for technical support to Chinandega municipality in Nicaragua assistance by Spanish government.
- ASUNORLU asks to ISDEM, transferring of ownership of the landfill equipments which are Japanese government donated to ISDEM. ISDEM leases to ASUNORLU free of charge.
- Original plan of the utilizing the accumulated fund of tipping fee is renewal of the landfill equipments, however ASINORLU considering use to land acquisition for expansion of landfill site..
- If KFW loan assistance decided, they indented to use part of the loan money for the renewing the landfill equipments.
- MARN has a resource for sanitary landfill construction, however, this resource only available to new sanitary landfill project.
- Therefore, they request to Spanish government for expansion of the ASUNORLU landfill site. They wish to request to JICA for support to expansion of the site, before the request they make the effort to prepare the own budget.
- JICA supported plastic bottle separate collection activity is going on in ASINORLU.
- ASINORLU requested to JICA for dispatch silver volunteer, however answer not get yet.
- They carried out environmental monitoring in every year, results of the monitoring report to MARN. Additionally, They carried out landfill gas monitoring for prevent fire and gas explosive accident (latest results of gas monitoring: CH_4:40%, O_2:3%).
- Now in rain season, therefore, some part has erosion in the landfill area. However, project grows steadily.

3.2.7 San Salvador municipality

Date	29/August/2012 (Wed.) 9:00～10:00
Place	The solid waste sustainable management direction of the minicipality of San Salvador Address: Final Calle Concepción, #188, La Gartia, A la par de Texaco La Garita, Limite Cidad Delgado y San Salvador
Participant	＜San Salvador municipality＞ Mr. Alexander Suriano, Director of the solid waste sustainable management direction of the municipality of San Salvador ＜JICA＞ Ms. Shindo ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey (2) Outline of solid waste management in San Salvador municipality
Information obtained	(1) Memoria de Labores 2011-2012

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Solid waste management in San Salvador municipality

- The directorate of solid waste sustainable management is decentralized from the municipal organization in 2008. The chief of the directive council is the mayor and two members are from citizen. Employees are 1,400 in total that counts for 450 collection crews including drivers; 350 road sweepers; and 250 sanitation workers (waste and sludge removal from sewerage pits, etc.). Details can be seen in the Annual report.
- As for Japanese donation in1996, 15 collection vehicles are still working in this municipality and one mobile workshop as well. The weighbridge donated is utilized in the Nejapa landfill. COAMSS/OPAMSS should know the present situation of other donation

vehicles in 1996.

- Certain portion of waste collection works are covered by private companies through contracts. Private collection started from 1999. Waste collection in areas where access is difficult due to narrow roads is covered by micro companies. Large generators waste such from institutional and commercial entities are covered by private collection services.
- About 6 million US$ is annually paid to MIDES for the final disposal tipping fee and for the transport services from Aragon transfer station to Nejapa site.
- The annual expenditure of the directorate is about 14 million US$, which counts for about 9 million for personnel expenditure such as wages, about 1 million for the fuel costs, about 1 million US$ for repair and maintenance works. Details can be seen in the Annual report.
- It is the principal tasks for the directorate that are environmental education and renewal of collection vehicles. A gondola (large vessel container) on a trailer is modified for a mobile class of environmental education.
- This government places more efforts and resources on solid waste management. Sweeping works in the central historical zone are provided in tree shifts.
- Waste service tariff collection is done through the joint billing with the electricity. Some citizen only pays the electricity bill and separately refuses to pay the waste service charges. However in general, majority of citizen pays both at once.
- The directorate is now able to cope with disaster waste management in case it happens.


Brochure "Colonia Limpia"

- Cleansing and waste collection services for marketplaces are now under direct operation with fee charges. Annual income of the service is about US$ 20,000-.
- A pilot project of 2-categories (organic and no-organic) source separation is in progress. The 2-categories wastes are separately gathered in the specially arranged vehicle. The vehicle dumps the organic wastes at the Aragon transfer station for transporting to the Nejapa disposal site, and organic fractions are given to the segregators at the Aragon station for recycling. The directorate hopes to implement composting activities for treating organic waste. However, due to land limitation, no area is available for a compost project in San Salvador municipality. About 80 tons of organic wastes are generated daily at marketplaces in San Salvador.
- There are some containers in the city for separate discharge and collection, in cooperation with Coca Cola Industry as its CSR (Corporate Social Responsibility) activities. As for the "Colonia Limpia" project implemented by the labor union, about 10 private companies cooperate in producing environmental education materials such as pamphlets and separate waste collection bags.
- No one in the directorate has taken the JICA training course. The director Mr. Suriano himself wishes to take a JICA training course but 1.5 months absence from his duty is very difficult.
- When the decentralization of the directorate was made, the labor union showed offensive actions in worry about the privatization of the cleansing services. Series of talks were made and the union showed the understanding of the matter. Welfare of employees are improved through provision of work uniforms, clinics etc. Provision of work uniforms with refracting tapes reduced the work accidents.
- The MIDES contract stipulates that all the waste collected should be disposed of at the landfill site. Waste reduction activities such as composting will result in the final disposal amount reduction and MIDES's income reduction, therefore active reduction promotion by the municipality will invite the contractual dispute of the above clause stipulated. San Marcos municipality once disposed of its waste in another disposal site and MIDES raised tribunal dispute and the case was judged by the local court that the municipality breached the contract and consequently penalty was paid from the municipality to MIDES entity. 3R activities now deployed by the San Salvador municipality is declared as an educational

promotion in order to avoid being claimed by the MIDES entity.

- Today's tipping fee that the municipality pays to MIDES is US$22-. If waste reduction by composting is realized at the cost of or below US$22, this should be financially feasible for the municipality in theory.
- The MIDES contract will ends in about 5 years. When the contract was made about 15 years ago, municipalities were innocent about the contractual traps stipulated. In renewing the contract in about 5 years later, contract clauses should most carefully be examined. It seems that there are no collective strategies yet for the future relationship with MIDES by COAMSS. It should be the most important issue of the solid waste management in the San Salvador metropolitan area.
- The directorate considers that a new international cooperation should be provided through COAMSS. Important topics in solid waste management should be: renewal of equipment (especially collection vehicles); public education; and technical improvement of sanitary landfills.
- Private collection companies are commonly micro enterprises. The municipality hopes them to formulate association to strengthen their capacity and to become a partner in municipal waste management.

3.2.8 COAMSS

Date	29/August/2012 (Wed.) 10:30 ~ 11:30
Place	Solid Waste Unit, COAMSS Address: Edificio OPAMSS, Diagonal San Carlos, 25 Calle poniente y 15 avenida norte, Col. Layco
Participant	<COAMSS> Mr. José B. Pérez Ibarra Coordinador, OPAMESS, Unidad de Residuos Sólidos <JICA> Ms. Shindo <Study Team> Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of the purpose of the study (Study team) (2) Activities of COAMSS on waste management
Information obtained	(1) information concerning about waste management

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Activities of COAMSS on waste management

- COAMSS has waste management data obtained from May 1999 to June 2012 for 11 municipalities out of 14 relating municipalities. Regarding other 3 municipalities, COAMSS could not get data because MIDES did not cooperate for submitting data.
- It is observed seasonal fluctuations of weight of collected waste. In rainy season, its weight is heavy, and in dry season, it is opposite. It is assumed that moisture content is changed in waste. Specific weight of waste is about 160kg/m^3.
- Waste Collection amount at urban areas such as San Salvador is now decreasing due to decrease of population. There is difference between actual population and predicted one used at formulating the master plan, which might not be considered the


Discussions at COAMSS

difference between the day time and the night time population.

- Because of rising unemployment rate, informal sector expands, and then recyclable waste collection is increased at sources of waste generation. In addition, operators of waste collection vehicles segregate and collect recyclable wastes during operation. Therefore transferred waste amount to the final disposal site is decrease. However we need more detail survey why the amount is decreased.
- Waste collection amount is increased at other municipalities.
- At San Marcos municipality, the transferred amount to the final disposal was decreased in 2005 temporary because they brought the wastes to the open dumping site located at south. This was the breach of the contract with MIDES and MIDES filed a suit against the municipality. As the result, the municipality lost the case and they had to pay 1 million USD.
- Fee for treating waste paid to MIDES is fluctuation connected with consumer price index. Now the fee is increasing (refer obtained information for fluctuations of the fee).

b. Existing situation of MIDESs' activities

- COAMSS made a contact with MIDES at 1997 and start transferring waste from 1999. The end of the contract is in 2019.
- The municipalities consider that they want to construct their own landfill that can be used for long term, MIDES, on the other hand, considers the operation method that can be obtained profit in short term. MIDES might acquire lands surrounding the existing landfill.
- The contract with MIDES reviewed conditions in 2002 and municipalities could operate composting and activities of environmental education.
- The municipalities paid 99 million USD from March 1999 to March 2012.
- MIDES collects biogas by the CDM scheme.
- At the landfills operated by MIDES, condition of the access road is not good enough to pass vehicles in rainy season.
- MIDESs' operation method has many issues, but it is a sanitary landfill, thus COAMSS considers they have a capacity to operate adequately.

c. Other informaiton

- Due to down-sizing of the Unit of COAMSS, there are 2 engineers for waste management.
- The project supporting waste pickers for starting a business (RESOC) is implemented by EU.
- According to the survey by COAMSS, the MIDESs' landfill is going to be full in 2021.
- The new landfill candidate sites were selected by analyzing land use data and some sites were proposed in 2007, however, COAMSS has no specific policy after 2021.
- In order to evaluate waste condition at national level, COAMSS implemented the studies in 2002 and 2005. Waste generation in Sun Salvador was 2kg/day/person, and one in Sun Martin is 2.2.kg/day/person. National average is 0.64kg/day/person. There are 12 sanitary landfills including AHINORLU and MIDES. COAMS also implemented satisfaction level surveys according to the manual made by the JICA's development study. The result is shown in the report obtained.

3.2.9 Ministry of Environment and Natural Resources

Date	29/August/2012 (Wed.) 14:00 ~15:00
Place	Unit of Solid and dangerous waste, Ministry of Environment and Natural Resources Address: Edificio MARN No2, nivel2, Kilómetro 5 1/2 Carretera a Santa Tecia, Calle y Colonica Las Mercedes
Participant	<MARN> Ms. Manlia Romero Directora Gobernanza, MARN Mr. René Ramón Gross Jefe Cooperación Internacional, MARN <JICA> Mr. Luis Miguel VÁSQUEZ <Study Team> Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of the purpose of the study (Study team) (2) Activities of MARN on waste management
Information obtained	(1) Environmental Laws

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Activities of MARN on waste management

- Since the government was changed in 2009, MAEN has been tackling waste issues. MARN corroborated with the ministry of health to formulate national environmental policy from 2010 to 2015, which include the output of PROMADES.
- The national policy includes constructions of infrastructures. MARN considers to get loans from DAC, IDB and KFW for the implementations.
- The president met with German prime minister and requested to get a loan from KFW to prevent environmental issues, and then MARN got a loan from KFW. Some of this finance is going to be used for the phase III of ASHINORLU.


Discussions at MARN

- Output of PROMSDES can be utilized not only technical model but also management model, which is operated by united municipalities.
- In El Salvador, there are 2 engineers who can design sanitary landfills. This factor might be limitation for spreading sanitary landfills, thus, MARN is requesting SICA to implement training courses for sanitary landfills through Mr. Kamishima.
- The governments in Guatemala, Nicaragua and Honduras want to introduce the PROMADES model, thus engineers in these courtiers should be included.
- Engineers for AHINORLU learned appropriate operation methods and these skills are described in the manual. These engineers operate landfills in accordance with the manuals after the end of JICAs' support. These factors lead the success outputs.
- Trainings is also required for improving other landfills, thus staffs of PROMADES go to other landfills to train staffs through ISDEM.
- KFW evaluated that ASHINORLU is one of the good practices. This is described in their report.
- Regarding MIDES, they might be assist protesters surrounding the new candidate site to

keep their monopoly.

- There is fair trade commission, but it does not function adequately. The fee is now 24.5 USD/ton, but they may have a plan to increase up to 45 USD/ton. Although MIDES is a private company, they should be aware that they are doing public business. On the other hand, municipalities should have more negotiation skills based on their experiences.
- Staffs for waste management in MARN are 10 people. MARN is now recruiting the chief. Environmental education unit has been moved other sector.
- MARN needs supports dangerous waste management such as e-waste, tires, lights, metals, batteries etc from JICA.
- MARN has no definition of dangerous waste. It is one of the issues. On the other hand, there are some recycling factories dealing with these wastes. We have to review the environmental laws and establish treatment and monitoring methods of these wastes. In addition, we should implement these monitoring methods according to the reviewed law. This will be one of the issues.

3.2.10 GIZ

Date	30/August/2012 (Thu.) 9:30～10:30
Place	GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) Address: Bulevar Orden de Malta, Edificio GIZ, Urbanización Santa Elena, Antiguo Cuscatlán, La Libertad.
Participant	＜GIZ＞ Ms. Mercedes Herrera ＜Study Team＞ Mr. Yamamoto
Outline	(1) Explanation of outline of the survey (2) Outline of GIZ, solid waste management related activities in El Salvador and Central America
Information obtained	(1) Brochure (GIZ El Salvador)

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. GIZ activities in solid waste management

- Ms. Mercedez Herrera is a JICA trainee and worked for the MARN until 2008 and was the principal counterpart of the PROMADES-ASINORLU project. She is working for GIZ since 2008.
- GIZ El Salvador office now does not provide any specific activities related with solid waste management. Environmental projects in Central America that GIZ El Salvador is working in coordination with CCAD are principally for the following topics:
  - Territorial code consolidation (Ordenamiento territorial);
  - Climate change (Cambio Climatico);
  - Renewable energy (Energia Renovable);
  - Forest and water (Bosque y Agua)
- No specific activities are now extended in El Salvador regarding GIRESOL network. GIRESOL network activities are more extended in Guatemala and Dominican Republic.
- GIRESOL network was formulated in 2009 in SEMARNAT Mexico with support by GTZ (that time). It is a network to train and formulate solid waste management promoters. In its initial operation stage GTZ (that time) principally provided the financial support, but in these days DANIDA is principally supporting the activities.
- Many JICA trainees in Central America who took solid waste management courses in Japan are now at important managerial position in respective countries and also are supporting the GIRESOL network. Mr. Marvin Martinez in Honduras and Mr. Jaime Carranza in CONADES Guatemala are JICA trainees. Mr. Carlos Melendez, Salvadoran JICA trainee, now works for formulating the national policy of solid waste management in

Honduras.

- It is commonly acknowledged by many waste management related institutions and persons in this country that JICA's PROMADES-ASINORLU project offered excellent results for El Salvador. In referring the PROMADES, GIZ supported the inter-municipal waste management in San Juan Nonualco in La Paz department.
- It is informed that the private corporate of cement industry Holcim starts to support for formulating guidelines of recycling and/or treatment of hazardous waste.

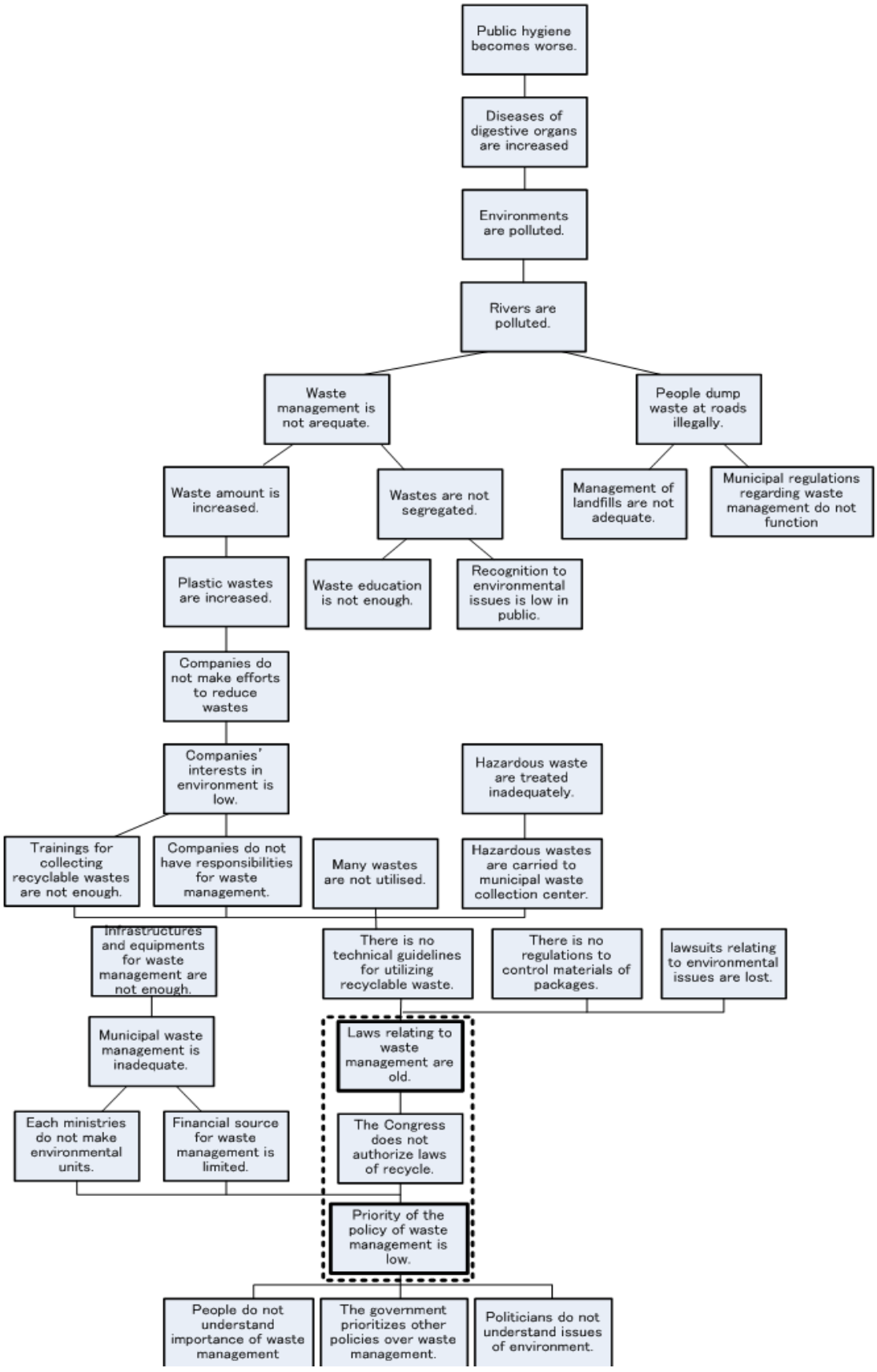
3.2.11 PCM Workshop

Date	09:00～15:00, 30th August 2012 (additional session: 13:30~14:30 31st August)
Place	JICA El Savador office Address: TORRE FUTURA 8º nivel 803, Calle El Mirador y 87 Av. Norte, Col. Escalon
Participant	<MARN> Manlia Romero Directora Gobernanza, MARN (31st only) Itulo Andrés Flamenco Córdova Ministerio Medio Ambiente y Recursos Naturales Milagro de Castro MARN-Unidad de Desehos Sólidos Guadalupe Menendez MARN Alma Barahona MARN-CIDOC <JICA> Shindo <Study Team> Kato, Yamamoto, Ogawa, Shimazaki
Outline	Problem analysis of waste management

<List of Stakeholders>

Central Government	Local Government	Social Sectors	Private Sectors	Sectors working with solid waste	Academic Sectors	international Cooperation
Ministry of Environment and Natural Resources	Municipalities	Citizen	Industrial Association	Sanitary landfills company	Universities	JICA
Ministry of Health	Associations of Municipal Governments	Community Development Associations	National Association of Private Enterprise	Waste recyclers ferrous metal (iron, aluminum, copper, etc.)	Schools	KFW
Ministry of Economy		Local Communities	Chamber of commerce	Waste recyclers (e-waste)		AECID
Ministry of treasury		Associations in a municipality	Unions of small business enterprises (PYMES)	Waste recyclers (paper and plastics)		GEF
Social Investment Fund for Local Development		NGO		Waste collection center		SICA
Legislative Assembly		Church		Processing company of recycled materials		GIZ
Ministry of Foreign Affairs		Boy/Girl Scout		Exporters of processed recycled materials		
Ministry of Education		Youth Groups				
ISDEM		Environmental Wardens				
Union of Municipalities (COMURES)						
Technical Secretariat of the Presidency						
Congress						
Presidential Commission for the management of solid wastes						

<Problem Tree>



3.2.12 Summary of study in El Salvador

The Sanitary landfill in ASINORLU project, 3 years after the JICA cooperation completed, is being fairly well managed by the self-help efforts by the Salvadoran members. Strong positive impacts are being given by PROMADES not only to El Salvador but also to the Central America regarding waste management improvement.

ISDEM headquarters and eastern office consider that it is one of most important mission for them to diffuse nationwide the knowledge and know-how obtained through PROMADES-ASINORLU project implementation.

Therefore, it should be very useful and effective to continue support for the diffusion of ASINORLU experiences to other areas of El Salvador and neighboring countries.

COAMSS evaluates that MIDES Nejapa landfill is technically advanced and appropriate but its tipping fee is very costly and problematic. The monopolistic situation of landfill services by MIDES entity brings about high waste disposal cost burden for municipal financial management in many municipalities in the country.

Meanwhile, taking the ASINORLU results as an important reference, MARN actively supports to implement sanitary landfill projects in many areas in the nation. However it still seems to take time to reach a target level of sanitary landfill localization and operation due to financial support limitation.

It is by all means necessary to look for certain concrete measures to regulate waste disposal fees to an appropriate level. Many municipalities today face problematic situations in securing the appropriate solid waste management mainly due to that waste disposal at sanitary landfill requires substantial costs.

Legal framework on E-waste is not consolidated. Although E-waste calls attention as one of trend issues today, the important task should be the legal frame consolidation for not only E-waste but rather for the administrative management of all hazardous waste. The legal frame expected should invite action plans and their implementation with regard to hazardous waste management.

PCM workshop concluded the central problem being “low priority on waste management policy”. It seems that this is because no evident environmental or health damages are caused.

4 Mexico

4.1 Survey Schedule

Date		Schedule	Outline	Location
1/Sept./2012	Sat.	El Salvador to Mexico	Travel	Mexico city
2/Sept./2012	Sun.	Mexico	Team meeting, Classify Data	Mexico city
3/Sept./2012	Mon.	Mexico	CENICA、SEMARNAT	Mexico city
4/Sept./2012	Tue.	Mexico	GIRESOL Program Office/GIZ.	Mexico city
5/Sept./2012	Wed.	Mexico	JICA office, DGSU Director General de Servicios Urbanos	Mexico city
6/Sept./2012	Thu.	Mexico	Report making	Mexico city
7/Sept./2012	Fri.	Mexico	DGFAUT/SEMARNAT AMEXCID/Mexican Foreign Ministry(Mexican Agency for International Development, Cooperation)	Mexico city
8/Sept./2012	Sat.	Mexico to Dominican Republic	Travel	Santo Domingo

4.2 Results of the Survey

4.2.1 Centro Nacional de Investigación y Capacitación Ambiental (CENICA)

Date	03/September/2012 (Mon.) 10:00 to13:00
Place	Office for Research into Waste and Contaminated Sites, Centro Nacional de Investigación y Capacitación Ambiental (CENICA), INE Address: Edificio W, UAM-Iztapalapa, Col. Vicentina, Delegación Iztapalapa. C.P. 09340
Participant	＜CENICA＞ Ms. Fabiola Ramírez — Directora de Investigación de Residuos y Sitios Contaminados, INE-CENICA Mr. Guillermo Encarnación — Subdirector de Investigación sobre el manejo integral de residuos, INE-CENICA Ms. Alejandra Medina Arevalo — Jefe Departamento Investigación Aplicada de Residuos, INE-CENICA Ms. Alejandra Joy Campos — Jefa de departamento de tecnologías aplicadas al manejo de residuos, INE-CENICA Ms. Ana Paulina Avila Forcada — Jefa de Departamento de Proyectos Regionales , INE-CENICA Mr. Rolando Mendoza Ursulo — Colaborador externo, INE-CENICA Ms. Martha Díaz Terón — Personal de apoyo, INE-CENICA ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey (2) Background and outline of CENICA
Information obtained	(1) Programa_Curso_2012-2014_gea (2) Propuesta del estudio CursoCENICA (3) Propuesta_Curso_Regional (4) Resumen Ejecutivo Manejo Integral de Dese (5) Tabla_evaluación_criterios_GIRS[1]

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. CENICA activities

- The National Institute of Ecology (Instituto Nacional de Ecologia: INE) will be decentralized and reformed as National Institute of Ecology and Climate Change (Instituto Nacional de Ecologia y Cambio Climatio: INECC). It is agreed that all present personnel of INE become INECC personnel. It is expected that activities on solid waste issues become more strengthened and the frame for international cooperation should be consolidated. INECC becomes a decentralized institute.

b. Outline of SEMARNAT's GIRESOL

- It was started in 2005 and 1st to 7th Giresol generation were formulated to date. Average participants are about 40 people per generation.
- Training course for a Giresol generation formulation consists of 3 modules:
  - 1st module is 28 lectures in one week. It is 8 hours/day for 5days.
  - 2nd module, held about one month after the 1st module, consists of: training in communication; public speaking and group management; action plan presentation; and technical visits.
  - 3rd module, held about one month after the 2nd module, consists of: action plan update; exchange of experiences; and awarding of recognitions.
- Initial stages of Giresol, generation formulation were principally targeted for municipal technicians in Mexico. In latter stages, Giresol activities are expanded in other neighboring countries such as Guatemala, Dominican Republic.
- Attentions need to be paid to the issue that Mexican model cannot be simply diffused to other countries. Background and intrinsic conditions of respective countries should be carefully examined.

c. CENICA 3R training course

- The 1st phase of 3R international training course in CENICA consisted for 3 years (2009 to 2011 Japanese fiscal year) and the 3rd course was held in February 2012. The 2nd phase of the 3R training courses is under planning for 3 years of 2012 to 2014 Japanese fiscal year.
- The 3R training courses are offered for 14 foreign participants and 8 Mexican participants. As for Mexican participants, CENICA covers the travel and daily allowances. As for foreign participants, JICA covers the costs of air-tickets, accommodation and daily allowances.
- As for CENICA's international cooperation, as well as Giresol problems, attentions need to be paid to the issue that Mexican good practices cannot be simply diffused to other countries.
- In CENICA 3R international training course, participants are required to elaborate respective action plans, action plans without local condition survey generally have problems in their practicability of implementation.
- Selection of participants needs to be examined. So far, majority of participants were technical staff of medium to lower positions in their organization. It is necessary that managerial personnel that deal with policy formulation regarding 3Rs should participate in the course.
- Meanwhile, in view of personnel rotation risk of government changes, 3R course participants should not be from the top policy management because such personnel is surely replaced at the time of government change. Participants should be those who can continue to work in the same organization even when the government changes takes place.
- In order to have more application for the course, support of respective JICA offices in the region is necessary. It is required that related institutions have an agreement for south-south cooperation.
- The problem of less applicants than expected might consist of:
  - Few responses are made even CENICA distributes course information to related offices of international cooperation in respective governments.
  - In order to have more applicants, CENICA needs to directly communicate respective institution s or personnel that deal with 3R issues in respective countries.
  - It seems that offices of international cooperation in respective countries do not make active communication to 3R related government institutions.

- The official application should be made through the Mexican embassy in respective countries. It is expected that JICA staff in respective countries to support more from course information distribution to application, because JICA staff in respective country have a good contact with ministerial personnel who are should be the candidate for the course participants.

- Invited countries for the 3R course are those in Central American and Caribbean countries. As an exceptional case, one Ecuadorian was invited as an observer of the course, in view of background that Mexico has a good relation in the theme.
- In planning the 2nd phase of the 3R course, questionnaire was made looking for the specific needs of the course. Responses were made from El Salvador, Guatemala, Nicaragua, Honduras, and the Dominican Republic. In view of comments made, main topic for the 2nd phase 3R course will be such as: basic concepts of 3R; reduction of special management wastes; life cycle assessment; solid waste management by private sector; zero emission.

d. Issues with Guatemalan experts that participate in CENICA training

- It was found that the south-south cooperation through Mexico's CENICA is greatly contributing to the capacity development of those who are in charge of waste management in the Central America and the Caribbean Region. Meanwhile, there were issues with regard to tailoring the training content to the needs or the level of the Guatemalan participants, the selection of the trainees, and the application procedures.
- Personnel in charge of the both countries made discussions twice in order to solve the pending problems, however, no solution is found.
- It is understood that Guatemalan side do not comply with the required commitments agreed, and their procedures are very slow. In addition to that, personnel in charge of Guatemalan side frequently changed. This might be due to political problems in the Guatemalan side. No key to solution is seen.
- In spite of the situation, it is invited that Guatemalan participate the 2nd phase 3R course.

4.2.2 SEMARNAT Courtesy visit

Date	3/September/2012 (Mon.) 14:30～15:30
Place	SEMARNAT Address: Blvd. Adolfo Ruiz Conrtines 4209, 5° Piso ala "B"Col. Jardínes en la Montaña, Del. Tlalpan
Participant	＜SEMARNAT＞ Mr. César R. Chavez Director General, SEMARNAT, DAFAUT Mr. Sergio Gasca Alvarez Director de Area, SEMARNAT, DAFAUT ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey (2) Background and outline of SEMARNAT
Information obtained	None

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. GIRESOL

- It might have positive impacts to present good practices in solid waste management in Mexico to other countries, but it will have problems to simply introduce such practices into other countries.
- For example, Mexico has series of legislation for solid waste aspects. However, it has another aspect that this complicated legislative framework in Mexico hinders to take some project actions.
- Meanwhile, maybe Central American countries have deficiencies in legislative framework. But on the contrary, project actions are further easy than in Mexico for a certain

improvement of solid waste management.
- Participants for Giresol courses should be not only technical staff but also personnel who deal with policy matters in their duties.

b. Others

- International cooperation should target and focus on policy level.
- There are many cases that private sector plays an important role in solid waste management. Regarding south-south cooperation, private sector should be more involved in the training course.
- Facilities visits and discussion with facility technicians are more important and effective than lectures only.
- It is expected to formulate a Mexico model of integral waste management in studying good practices in Mexico. However, it is doubted that Mexico can offer international cooperation in solid waste management sector to such an extent that Japan offers.
- It is necessary for Mexico to review that in what specific area in the solid waste management Mexico is able to offer international cooperation through analyzing strength and weakness of Mexico's solid waste management.
- It is a pleasure to continue discussions on this Friday again.

4.2.3 GIZ

Date	10:00 ~ 11:30 4th September 2012
Place	GIZ Address: Av.San Jerónimo No.438, 3° Piso Col. Jardines del Pedregal 01900
Participants	<GIZ> Pablo Heredia Asesor Programa, Gestión ambiental Urbana e Industrial, GIZ Daniela Méndez Asesora Programa, Gestión Ambiental Urbana e Industrial, GIZ <JICA> Judith Garcia <Consultant Team> Kato, Yamamoto Ogawa, Shimazaki加藤
Topics	(1) Explanation of survey purposes (2) GIZ's Activities
Information obtained	(1) Girasol Network (Local efforts, global impacts) (2)

Japanese mission explained the purpose and the outline of this survey using the summary of Inception report.

a. GIRESOL

- In 2003 Giresol was formulated. Its purpose is to educate staffs in the central government and local governments about waste management. At the first stage, this program was implemented in Mexico, and then from 2006, it started implementing outside of the country which was Guatemala. Until today, the program was implemented in Republic of Dominica, Ecuador and El Salvador. The trainee completed the course is called "Environmental promoter"
- The waste management unit was established in SEMARNAT, thus some roles of GIZ and SEMARNAT were overlapped on waste management.
- Since February 2008, CENICA has become a coordinating committee for Giresol.
- At this moment, Giresol is not to expand the network but to strengthen the capacity within the network.
- GIZ and SEMARNAT support financially and CENICA contributes for sending lecturers.
- AMMAC was a member of the coordinating committee, but it was left due to the political reason in 2010.
- The trainees completed the course should implement the action plan made at the course. In order to implement, promoters may establish a group and try finding supports. The

supports may choose promoters / groups depending on which political party they support. This is one of the problems. GIZ is also one of the supporters and try choosing promoters / groups which SEMARNAT supports.

- GIRESOL network expanded to Republic of Dominica. Promoters in Republic of Dominica asked JICA to implement their action plans. This is one of the good practices.
- In order to minimize influence of personnel changes, GIZ implements training every year for increasing numbers of promoters. In order to create promoters efficiently, firstly, promoters are increased in urban areas, and then they expand to local and small governments. This is one of the ways for making networking structure. On the other hand, GIZ strengthened networks among local governments by implementing urban environmental projects In addition, personnel of engineers and technicians in regional waste disposal associations are not susceptible to political change.
- El Salvador had some difficulties to cooperate. For example, logistics and contents of the course were issues to cooperate. GIRESOL has guidelines and models and El Salvador should decide these are accepted or not. However El Salvador did not understand the condition.

b. Other activites

- GIZ implements a financial management improvement project in Colima state.
- GIZ implements a e-waste and PET recycle project from gender point of view.
- GIZ also implements a project concerning lifecycle and support making policy paper named "sustainable production and consumption"
- GIZ has been supporting for formulating the national waste management plan since 2007. GIZ supported for formulating waste management plans to some states and local governments including making their regulations and defining their roles. And also GIZ supports formulating plans of disaster waste management.
- GIZ's cooperation gives high priorities to the sectors of renewable energy, bio diversity, and nature conservation. The cooperation budget to Mexico doubled in the past few years. It is used for an environmental sector mainly, of which almost half is for brown issues and of which almost half is for waste management.
- Project periods for green issue are short generally even thought there are many project. It completed in 3 years. Other project period is about 10 years.
- It is necessary for donors to get efficient results. We have to exchange opinions each other.

4.2.4 JICA Mexico Office

Date	10:30 ~ 11:15 5th September 2012
Place	JICA Address: Ejército Nacional No.894 Piso 16B Col.Palmas Polanco C.P. 11560
participants	<JICA> KAMIJYO Naoki Directir General Judith Garcia Local Staff <Consultant Team> Kato, Yamamot Ogawa, Shimazaki
Topics	(1) Explanation of the survey results (2) Discussions about the results
Data obtained	

Consultant Team explained the outline of this survey and its results.

a. Discussions about the results

- Mexico Office gives high priority to sectors of industry and South-South Cooperation. Waste management projects are located in South-South Cooperation.
- Purpose of supports on industrial sector is for assisting Mexican industrial development. Nowadays Japanese companies of car industry expand to Mexico and human development

at this sector supports their business. The Office seeks the way that the both side of Japan and Mexico has benefits from a point of view of cooperation between the public and private sectors. Is it possible to locate waste management projects in the sector of industrial development to be satisfied both the public and private sector.

- (Consultant Team) Development of recycling industries is one of the ideas. For example, A company in Mexico owned by DOWA industry develops copper mining and the company starts e-waste recycle business. And ELV has relevance for car industry. If imports of used cars are implemented adequately by formulating and applying regulations, it may support development of car industries.

- Regarding South-South cooperation, we have an issue with Guatemala. The issue started from the period of former government.
  - (Consultant Team) In the government of Guatemala, roles of waste management are not defined, thus correspondence is not good. In addition, topics about waste management is controlled by the minister, thus it is difficult for the JICA office in Guatemala to discuss the issue. On the other hand, in Honduras, action plans made at the training course implemented by CENICA supports for formulating the law of waste management, thus it can be said that south-south cooperation makes achievements.
- Mexico is not the country for ODA loan, thus it is difficult to find new projects.
  - (consultant Team) The landfill of Mexico city was full now. Wastes generated in the city transferred to landfills located at outside of the city. It might be necessary for introduce incineration plants. We may consider the project under the scheme of PPP in order to grasp needs of Mexican side.

4.2.5 SEMARNAT

Date	7/September/2012 (Friday) 10:00～11:30
Place	SEMARNAT Address: Blvd. Adolfo Ruiz Conrtines 4209, 5° Piso ala "B"Col. Jardínes en la Montaña, Del. Tlalpan
Participant	＜SEMARNAT＞ Sergio Gasca Alvarez Director de Area, SEMARNET, DAFAUT César R. Chavez Director General, SEMARNET, DAFAUT Ivana Fernández S. Directora de Cooperación Bilateral, UCAI - SEMARNAT ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey (2) Solid Waste Management in Mexico
Information obtained	None

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Solid waste management in Mexico

- National Program for Prevention and Integral Management of Waste (Programa Nacional para la Prevención y Gestión Integral de los Residuos: PNPGIR) was formulated with JICA cooperation and PNPGIR is working as the base for promoting solid waste management improvement projects all over the country.
- PNPGIR enabled the total national investment of 9 billion and 500 million pesos for: collection service improvement; construction and operation of sanitary landfills; transfer stations construction; and reduction of wastes.
- In these four years, based on PNPGIR framework, investment for solid waste management infrastructure has been strongly implemented and the number of sanitary landfill was increased from 88 to 235. Meanwhile, further efforts should be provided for municipal

capacity development in operation of landfill management because some municipalities face difficulties in landfill operation management after having appropriate sanitary landfills.

- Collection vehicles and heavy machinery renovation will further be promoted for municipal solid waste management. SEMARNAT is also promoting construction of separation plants and recycling plants. Norms and manuals for paper recycling and treatment of e-waste and discarded pneumatics (tires).
- Solid waste management in Mexico is steadily improving but technical capacities in solid waste management widely vary depending on operation entities, especially in operational aspects. Some people even involved in landfill management do not understand the necessity and functions of impermeable liners. Capacity development of operational personnel in solid waste management is an important task for Mexico and in this aspect it is not ready for Mexico to provide international cooperation for other countries.
- Questionnaire survey is conducted for all municipalities in the country to understand the present situation. All the date including the survey results are made open to public and the middle of October 2012 with GIS database information. The GIS database information covers not only the waste management infrastructure but also information of private sector activities and study reports conducted to date. SEMARNAT hopes that it becomes a useful portal site for all people concerned with solid waste management in Mexico.
- All international cooperation provided to date for Mexico made respective results. Approach or modality is different by donors and probably there was not a sufficient coordination by Mexican side for them. It is considered that SEMARNAT should expedite more in this aspect in the future.
- A white book on solid waste management including results and lessons learned is under preparation to be published at the termination of the present government.
- A positive evaluation should be given to the point that the policy priority on solid waste management has been raised in the course of PNPGIR formulation. Consequently budget allocation and execution was further facilitated on solid waste management sectors. Before the PNPGIR the BANOBRAS loans were limited for sanitary landfill construction and collection vehicles acquisition, however, it is being allowed that the grants and loans be utilized for such projects of composting and recycling. And it is also allowed that private bank financing be utilized under the scheme of public-private partnership.
- In order to raise or keep the political priority in solid waste management, it is necessary to insist not only the viewpoints of public health improvement and environmental protection but also the aspects that employment creation and economical development are promoted by dissemination and expansion of recycling industries.
- SEMARNAT considers that the solid waste management should not be viewed only from its negative aspects but should also be view from its positive impacts related with industrial economical activities therein. In other words, solid waste management has aspects of a social infrastructure such that compost and recycling plant construction and operation and they work as economical activities in the society.
- It is necessary that adequate financial arrangement supports should be provided for private companies and municipalities involved in waste management operations. All necessary processes are made open to public in documents so that appropriate control be enforced with transparency in related financing procedures.
- In the period of present SEMARNAT, not only municipalities but also private sectors show interests in solid waste management. As one of private sector participation in the solid waste management, it is inaugurated in January 2011 a PET bottles recycling plant with capacity of 30,000ton/year.
- It is desired that Japanese experiences in disaster waste management should give lessons for certain municipalities that face the same sort of problems.
- In planning large scale infrastructures of solid waste management, for example a plan of introducing new technology of RDF (Refuse derived fuels) facility, complicated Mexican legislation system hinders it because the definition of RDF is not given in the legislation.
- One of limitation of Giresol network is that, although the network is formulated, personnel rotation due to government change affects its continuity. Meanwhile, the training contents given by the Giresol do not sufficiently cover all the necessary requirements for

formulating qualified experts in solid waste management.

- JICA's cooperation is being brought about certain evident results in municipal waste management improvement. However, SEMARNAT hopes to receive JICA cooperation continuously for the new tasks of special management wastes such as e-waste, and for taking actions for the subsequent stages of ELV matters. It is a task that SEMARNAT needs to coordinate with the Secretary of Economic Planning.

4.2.6 AMEXCID/Mexican Foreign Ministry

Date	13:00~ 14:00 7th September 2012
Place	Mexican Agency for International Development, Cooperation (AMEXCID/Mexican Foreign Ministry)
Participants	< AMEXCID > Mr. Efrain del Angel, Deputy Director for Bilateral Programs in Asia and the Pacific, Mrs. Lorena Garcia, Chief Department for Partnership Programme with Japan and Bilateral Cooperation for Asia, Mrs. Evelyn Sanchez, Technical Cooperation Programs Officer <JICA> Judith GARCIA <Consultant Team> Kato, Yamamoto, Ogawa, Shimazaki
Topics	(3) Explanation of survey purposes (4) Situations about Mexican International Cooperation
Information obtained	

Japanese mission explained the purpose and the outline of this survey using the summary of Inception report.

a. Situation of Mexican International Cooperation

- Law regarding international cooperation was formulated last year. It states that policy and strategy have to be formulated for cooperation to courtiers in the middle and south America.
- Environmental sector is given high priority on international cooperation. Especially sustainable unitization and management of soil, water and air are focused.
- CENICA was established by Japan and it has excellent human resources and the capacity of the organization is high. On the other hand, there is a limit on bearing international cooperation.
- Practical supports are required on the waste management sector. Municipalities may have know-how, thus for supporting other courtiers, not only CENICA but also local governments, municipalities and private companies commit for international cooperation.
- It might be difficult for only Mexico to support courtiers in middle and south America. Mexico has similar social and cultural system with these countries, thus expansion of Mexicans' good experiences may produce efficient outputs in these countries. On the other hand, Mexico has difficulties to support procurement of necessary equipments and construction of necessary infrastructures. These might be supported by Japan. This combined cooperation might produce effective outputs.

4.2.7 Summary of study in Mexico

The progress in cooperation between Mexico and Guatemala regarding the promotion of south-south cooperation through CENICA has not yet drastically improved. Although the members of CENICA have intentions to continually accept trainees from Guatemala, the

formalities to realize this take a very long time. Another reason why realizing south-south cooperation through CENCIA is difficult is because it intends to apply Mexican cases to other countries without any modifications.

German International Cooperation (GIZ) is implementing GIRESOL, which is a program with the objective to build capacity of the staffs of local governments regarding waste management. The office of GIZ is located inside the office of the Ministry of Environment and Natural Resources (SEMARNAT in Spanish acronym), and most of GIZ's budget is allocated for environmental issues. GIZ provides long-term commitment, and the duration of each project is at least three years.

In Mexico City, as the final disposal site within the city has closed, the wastes generated in the city are currently being transported to disposal sites in and outside the Mexico State. There are possibilities that incinerators be introduced for the management of wastes generated in Mexico City. However, whereas the current disposal cost at the final disposal site (i.e. tipping fee) is from 140 to 150 peso/ton (approximately USD 12/ton), the tipping fee after introducing a very low-price incinerator would be approximately USD 50/ton. Thus, if incinerators are to be introduced, how to finance this fee would be an important issue. However, considering the economic level of Mexico, it can be said that this is not something impossible.

The National Program for Prevention and Integral Management of Waste *(Programa Nacional para la Prevención y Gestión Integral de los Residuos* or PNPGIR in Spanish) was formulated with cooperation by JICA. Based on PNPGIR, solid waste management improvement is being promoted nationwide. In these four years, based on PNPGIR framework, investment for solid waste management infrastructure has increased drastically, and the number of sanitary landfill has increased from 88 to 235. Meanwhile, further efforts should be provided for capacity development at the municipal level with regard to operation of landfilled. This is because in some municipalities, municipal staffs face difficulties in operating the sanitary landfills after they are constructed.

JICA's cooperation has been effective in achieving improvements in the waste management sector at the national level. However, there are still remaining actions to be taken such as taking concrete measures for the management of E-wastes or the end-of life vehicles (ELV) which JICA has supported until this year.

As Mexico is likely to graduate from being an ODA recipient country, JICA focuses its activities on industrial development promotion and south-south cooperation. As industrial development will lead to increase in volume of wastes, it is important that JICA also assist development of industries related to wastes such as through promoting sound recycling or treatment of hazardous wastes.

SEMARNAT is open to the idea of promoting public-private partnership (PPP) regarding the operation of waste related facilities, and there are possibilities that JICA provide support through its PPP cooperation scheme.

5 Dominican Republic

5.1 Survey Schedule

Date		Schedule	Outline	Location
8/Sept./2012	Sat.	Mexico to Dominican Republic	Travel	Santo Domingo
9/Sept./2012	Sun.	Dominican Republic	Team meeting, Classify Data	Santo Domingo
10/Sept./2012	Mon.	Dominican Republic	Courtesy visit to Minister of MARNENA. Courtesy visit to vice minister of MEPyD. MARNENA. ADN	Santo Domingo
11/Sept./2012	Tue.	Dominican Republic	ASDE, MARN Santiago office, Jima municipality	Santo Domingo
12/Sept./2012	Wed.	Dominican Republic	RENAEPA, FEDOMU, Duquesa site, MGSD, JICA	Santo Domingo
13/Sept./2012	Thu.	Dominican Republic	PCM workshop	Santo Domingo
14/Sept./2012	Fri.	Dominican Republic	MARNENA, JICA	Santo Domingo
15/Sept./2012	Sat.	Dominican Republic to USA	Travel	New York
16/Sept./2012	Sun.	Leave USA	Travel	Airplane
17/Sept./2012	Mon.	Arrive Japan	Travel	-

5.2 Courtesy call

5.2.1 Minister of MARNENA (MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES)

Date	10/September/2012 (Mon.) 9:00 to10:00
Place	Minister's office, MARNENA
Dominican side	Minister, Vice ministers, officers of MARENA.
Japanese side	＜JICA＞ Dominican office : Mr. Ozawa, Mr. Yamaguchi, Mr. Suzuki, Mr. Huascar Headquarters : Mr. Adachi, Mr. Aoki ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki

Mr. Huascar of JICA Dominican Republic office explained the outline of the survey and the Minister's comments are summarized below.

The president of the Dominican Republic considers that solid waste management is one of the important themes of the government policies. Prioritized themes for MARNENA are: river regime management; solid waste management; climate changes; and territory management and it is expected that Japan's cooperation are to be given for those themes.

5.2.2 Vice-minister of MEPyD (Ministry of Economy, Planning and Development)

Date	10/September/2012 (Mon.) 11:00 to12:00
Place	Meeting room, MEPyD
Dominican side	Vice ministers, officers of MEPyD.
Japanese side	＜JICA＞ Dominican office : Mr. Huascar Headquarters : Mr. Adachi, Mr. Aoki ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki

Mr. Huascar of JICA Dominican Republic office explained the outline of the survey and the comments by vice-minister and officers of MEPyD are summarized below.

- Prioritized themes related with the environment in this country are: climate changes; and solid waste management.
- Solid waste management problems are also problems of economy, and therefore it is considered that appropriate solid waste management can bring about activation of regional economies.
- It is determined for this government that appropriate solid waste management is to be promoted in these 4 years.
- It is expected that Japanese cooperation works for formulating a national territorial plan in solid waste management.
- As the Dominican Republic government has the strong intention to improve solid waste management, it is expected the Japanese cooperation in the issued is provided.
- Legislative consolidation with regard to solid waste management is now in progress in the Dominican Republic, contents of the legislative efforts are not made public at this moment.
- It might be considered the methane recovery from wastes and electricity generation in this country since it is projected that 85% of urban waste is organic wastes. In order to do so, improvement of waste open dumping sites should be made more concrete and control and management of methane gas from such sites is necessary.
- Sanitation of 42 open dumping sites was carried out under the coordination of CCN.

5.3 Results of the Survey

5.3.1 JICA Dominican Republic office

Date	10/September/2012 (Mon.) 12:30 to13:20
Place	JICA Dominican office Address:
Participant	＜JICA＞ Dominican office : Mr. Ozawa, Mr. Yamaguchi, Mr. Suzuki, Mr. Huascar Headquarters : Mr. Adachi, Mr. Aoki ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(3) Explanation of Results of the Survey (4) Comments by JICA Dominican office
Information obtained	None

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Rafey in Santiago municipality

- Rafey final disposal site in Santiago was drastically improved by the JICA cooperation and closure of old cells and new cells construction was conducted by Fukuoka method several years ago. It used to work as an appropriate model of final disposal management in Dominican Republic.
- After the mayor election in 2010, the new municipal government was started and budget allocation and disbursement had delay problems. Consequently solid waste management also faced serious operation problems.
- Problematic situation is being continued and waste management does not function appropriately.

- Final disposal management neither has an appropriate operation due to the least budget allocation.
- Under such circumstances, some personnel engaged in Santiago waste management that were JICA trainee left and/or are going to leave their positions. However, JICA office expects that they will work for solid waste management improvement in other municipalities or in other occasions in this country.
- Although the JICA office expected that problematic situations in Santiago after the municipal government change should be resolved in about one year, since the situation is still problematic today, it is not considered at this moment any new specific cooperation for the municipality.

b. Other issues, comments

- It is commonly possible in this country that problems after government change such as the case of Santiago might happen in any municipality.
- It is considered a principal problem that the central government policies are not functionally enrooted in local government administrations.
- In the case of Dominican Republic that the decentralization is not so advanced, it is considered that the central government legal consolidation does not bring about specific improvement in local government actions.
- (Team comments) In Japanese past cases of waste management infrastructure consolidation, the central government policies were concretized in the local infrastructure consolidation with investment support with central subsidies for local government.
- Apart from Santiago case, JICA Dominican office expects to be able to defuse the ADN project results for other parts of the country or for the east Caribbean small countries.
- It is judged that the regional approach in disaster management in Caribbean countries has problems. Meanwhile, a regional approach is employed in JICA cooperation for Pacific islands countries, it is expected that lessons there can be useful for examining the JICA cooperation for the east Caribbean small countries.
- It is understood that forthcoming tasks should be: how to consolidate the central government in waste management and how to deploy the related actions; and how to cope with regional waste management issues.
- JICA now needs to clarify and confirm the better intervention for solid waste management issues of countries with the economic levels of US$3,000 GDP per capita.

5.3.2 MARENA (MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES)

Date	10/September/2012 (Mon.) 14:00 to16:00
Place	Department of Environment Management, MARN
Participant	＜MARENA＞ Francisco Flores Chang — Director del Depto. Protección Ambiental Glenys González — Enc. Depto. de Gestión Cooperación Bilateral, Ministerio de Economía, Planificación y Desarrollo Diokasty Payano E. — Analista Ambiental I Ana Hermández — Analista Ambiental I Manuel Castillo A. — Enc. Gestión Ambiental Municipal Julio Ortiz — Enc.- Residuos Sólidos Delly Méndez — Analista de Gestión Ambiental Beatriz Alcántaro C. — Responsable Gestión Territorial FEDOMU ＜JICA＞ Dominican office : Mr. Huascar Headquarters : Mr. Adachi, Mr. Aoki ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of Results of the Survey (2) Solid waste management in Dominican Republic
Information obtained	Legal information on solid waste management in Dominican Republic. Survey report on solid waste management situation in the country. MARENA annual budget information 2012. MARENA's organization chart.

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Solid waste management in Dominican Republic

- The National Development Strategy aims to make an advancement that Dominican Republic comes out from the category of "developing countries". The National Development Strategy prioritizes the solid waste management issues.
- MARENA prioritizes the issues of climate change and solid waste management. A study was carried out in order to understand the present situation of solid waste management.
- In projects of river regime management, final disposal sites improvement are carried out for an objective of water resource conservation.
- MARENA considers its basic principles are waste utilization through 3R promotion and valorization of wastes.
- Environmental education and training are continued in many waste management projects.
- It is expected that Japan offers assistance for Dominican Republic in solid waste management themes in view of the National Development Strategy.
- A couple of municipalities are implementing "zero-waste" project. It is expected that they keep its continuity.
- As for budget allocation in the new government, it will be result-based budget allocation. Results are monitored and evaluated based on certain parameters and indicators.
- Giresol network program supported by GIZ works for capacity training of solid waste management. It is expected to be expanded.
- As for south-south cooperation for solid waste management, it is provided for Dominican Republic from Mexico and Chile supported by German cooperation. As for agriculture sector, Dominican Republic provides assistance for Haiti supported by Japan.
- MARENA highly appreciates and evaluates the south-south cooperation in the country.
- Solid waste management experts in MARENA are 6 persons in the headquarters and 94 persons in regional offices or municipalities. It is expected to increase such human resources in the country.

5.3.3 ADN (Santo Domingo de Guzman, National District,)

Date	10/September/2012 (Mon.) 16:20～18:00
Place	Environment and Risk Management Secretary, ADN
Participant	＜ADN＞ Environment and Risk management Secretary : Jose Miguel Martinez Director General, DIGAUE : Oscar Guillermo Garcia ＜JICA＞ Dominican office : Mr. Huascar Headquarters : Mr. Adachi, Mr. Aoki ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey (2) Solid waste management in ADN
Information obtained	None

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Solid waste management in National District

- Mr. Jose Miguel Martinez is promoted from DIGAUE director to the Environment and Risk Management Secretary. Mr. Oscar Garcia is promoted to DIGAUE director.
- Under the Environment and Risk Management Secretariat, there are DIGAUE, General Directorate of Environmental Management, Environmental Information Center, Recycling Promotion Center, among others.
- One of the new actions related with waste is organic waste collection from two newly established markets.
- IDB study recommends construction of 7 transfer stations and a new sanitary landfill.
- DIGAUE is implementing 35 actions plan stated in the revised M/P.
- About 45% of the total budget of ADN is allocated for waste management services by DIGAUE.
- A new large weighbridge is going to be installed for weighing large trailers from the transfer. The equipment was already purchased and its installation will be before the end of this year.
- A pilot project of 2-catories separation (organic and others) has started.
- DIGAUE considers sanitary landfill is the best option than incineration option for the Dominican Republic.
- DIGAUE/ADN extends such activities that experiences and knowledge of DIGAUE be diffused to other municipalities.
- DIGAUE/ADN is willing to cooperate for waste management training for CARICOM countries too.
- DIGAUE/ADN considers JICA is always its partner for promoting any improvement of not only waste management but also other environmental issues.

b. Solid waste management in National aspects

- Since the MANERA minister was the health minister before, it is expected that his environmental management policy focus health related problems.
- It is also expected in the waste management sectors that medical waste management will be improved.
- As for the national aspects of solid waste management, transfer station and transport, final disposal, and medical waste management are commonly principal tasks in many urban areas in the country.

c. Strengthening of the Central Government in solid waste management

- In order to implement the National Development Strategies, it is necessary to obtain consensus for implementing related policies. Therefore, assessment for it becomes necessary.
- Solid waste management requires teamwork, and therefore it is necessary to form a task force to tackle the problems for solution.
- We consider that DIGAUE's waste management capacity developed by JICA's assistance is higher than that of the central government.
- It seems that the National Law for Waste Management is under examination at the national commission level.
- It took many years for the enactment of the Environmental Law. As for the National Law for Waste Management, if there is a strong policy commitment and necessary assistance is given, it will be established.

5.3.4 Santo Domingo Este Municipality

Date	11/September/2012 (Tue.) 9:20～10:30
Place	Santo Domingo Este Municipality meeting room
Participant	＜Santo Domingo Este Municipality＞ Manuel Méndez — Supervisor Vladimir Martínez — Enc. Depto. de Operaciones Sistema Autorizado Jesús Santana — Secretario Técnico Luis Hernández — Director de Equipo y Transporte y Limpienza Circunscripción No.3 Rafael Hilario Medina — Director de Limpieza y Aseo (LIMPIA) Rafael Montero — Enc. Gestión Ambiental Juan Antonio Pérez — Director Gestión Ambiental, Ornato y Parques Mildred Charlot — Directora Comunicación Luis Hernández M. — Asistente Director D.E.T ＜MARENA＞ Manuel Castillo A. — Enc. Gestión Ambiental Julio Ortiz — Enc. Residuos Sólidos ＜JICA＞ Dominican office : Mr. Huascar Headquarters : Mr. Adachi, Mr. Aoki ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey (2) Solid waste management in Santo Domingo Este municipality
Information obtained	None

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Discussions

- The Santo Domingo Este municipality has received JICA assistance such as volunteers, 5 collection vehicles, water analysis laboratory, and training in Japan.
- In addition to vehicles donation, we have many JICA ex-trainees and they are implementing actions in their current jobs.
- In addition to that, JICA-ADN project outputs are diffused to this municipality.

- Using 5 collection vehicles donated, waste collection improvement pilot project is being implemented since February 2012.
- In this pilot project, it is made an agreement between the Education ministry and the municipality for school waste collection that the municipality provides the collection services for schools and the ministry pays the service fee.
- In so doing, thanks to JICA assistance, waste problems in schools are solved.
- It is expected that good practices in the school waste collection pilot project are diffused further.
- We would like to request JICA for the dispatch of vehicle maintenance engineer.
- It is necessary for us to improve capacity of vehicle repair. It is also expected that collection vehicle be donated for the renewal of collection units.
- In view of public environmental education, it is planned to start establishing the environmental information center at around January 2013. It is expected to receive a Japanese volunteer for environmental and 3R education.
- It is difficult for the municipality only to diffuse JICA cooperation outputs to other municipalities. It is expected that MARENA takes initiative for the diffusion.
- As for education issues, it is necessary that Education ministry takes the initiative and the Health ministry should also collaborate with it in related aspects. It is necessary the central government initiative on the matter.
- It is highly appreciated the JICA training scheme in Japan. Meanwhile it is difficult to send several people at once to Japan in view of current tasks in hand of the municipality. Therefore, if waste management related training is given in a new educational institution (e.g. waste management school) in this country, it is most appreciated.
- Ex-trainees after returning the municipality implement their action plans at their former position or at the promoted position. JICA training report meetings are held twice a year for an average.
- If the JICA volunteer of vehicle maintenance is dispatched, its activities and outputs are to be shared with other municipalities as well.

5.3.5 MARENA Santiago office

Date	11/September/2012 (Tue.) 13:00～14:00
Place	MARENA Santiago office
Participant	＜MARENA Santiago office＞ Ingrid Fernández — Directora General, CASA Pedro de la Cruz — Director Principal, Ministerio medio Ambiente Santiago Alfonsina Acosta T. — Analista de Gestión Ambiental, Ministerio medio Ambiente Santiago ＜MARENA＞ Delly T. Méndez G. — Depto. Residuos Sólidos, Analista de Gestión Ambiental, Ana Hernández — Depto. Residuos Sólidos, Analista de Gestión Ambiental Diokasty Payano E. — Depto. Residuos Sólidos, Analista de Gestión Ambiental ＜FEDOMU＞ Beatriz Alcántara C — Enc. Gestión Territorial y Ambiental ＜JICA＞ Dominican office : Mr. Huascar Headquarters : Mr. Adachi, Mr. Aoki ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey (2) Solid waste management in Santiago municipality
Information obtained	None

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Discussions

a.1. Rafey disposal site

- Improvement of Rafey site was proceeded having targets and periodical feedback of outputs of the improvement works from 2007 to 2010. During the time, Japanese experts mission was dispatched 7 times. Each visit was about for a week and respective training and site improvement was provided. The counterpart team received a set of capacity development. The senior volunteer experts during 2006 to 2010 were also effective.
- The JICA follow-up scheme employed there was also effective. It comprises of lectures and on-site training on improvement works.
- One of the reasons that newly constructed cells were not uses is that it was intended to prolong the service life of the site by using the cells part by part. However, when the mayor was replaced in the 2010 election, it took a series of problems in administrative section, and budget for waste management was in short, and consequently the appropriate final disposal management was abandoned.
- Although efforts have been continued from 2010 to date, some ex-trainees left their position of waste management in Santiago.
- The administrative management of the municipality deteriorated for example the bank account of the municipality was once suspended due to some problems.
- Reasons of this problem are not on the JICA project but on the new municipal government. Experiences, outputs and human resources strengthened by the JICA cooperation remain in the

municipality and/or counterpart personnel.

- It is necessary that MARENA provide effective inspections for municipal waste management activities. MARENA should require for municipalities to conduct appropriate municipal waste management operations.
- In 2005, Rafey site was the open dumping site with continuous landfill fire. But having the JICA assistance, the site was totally improved as a sanitary landfill without fire. After the mayor replacement in 2010, a fire was caught in the site. It is considered that it was the intentional firing by waste pickers. At the same time of the landfill fire, heavy equipment on site was broken down and rental equipment was used for disposal operation. However, when the budget was not allocated, it became impossible to provide the appropriate operation of the site.
- Security guards were changed about 5 times and it was tried to prevent fire, but it was not successful. This is because that the security guards were not aware that they are the staff that controls the landfill operation.

a.2. Role of MARENA

- One of important role of MARENA is dissemination of environmental information. It is therefore necessary to consolidate the organizational capacity of MARENA and it is also required to formulate scheme that enforces compliance of environmental norms.
- It is need that Provincial offices of MARENA should develop their capacity and for that environmental and management knowledge of personnel should be consolidated. For that, sufficient budget allocation is necessary.
- Capacity development of provincial and municipal personnel are promoted having assistance of FEDOMU. Its results are gradually produced.
- The database of solid waste management in the country is under development and it is examined how to effectively utilize the database.
- It is true that when the mayor is replaced knowledge and know-how accumulated so far are going to be lost in many cases.

5.3.6 JIMA Municipality

Date	11/September/2012 (Tue.)　16:20～17:20
Place	JIMA municipality
Participant	＜Dominican side＞ Mayor of JIMA　Ing. Porfirio Alberto Monegro with nine persons MARENA Delly T. Méndez G., Depto. Residuos Sólidos, Analista de Gestión Ambiental, Ana Hernández, Depto. Residuos Sólidos, Analista de Gestión Ambiental Diokasty Payano E., Depto. Residuos Sólidos, Analista de Gestión Ambiental FEDOMU Beatriz Alcántara C, Enc. Gestión Territorial y Ambienta ＜JICA＞ Dominican office　: Mr. Huascar Headquarters　: Mr. Adachi, Mr. Aoki ＜Study Team＞ Mr. Kato, Mr. Yamamoto, Mr. Ogawa, Ms. Shimazaki
Outline	(1) Explanation of outline of the survey (2) Comments and discussions
Information obtained	None

The mayor of Jima municipality explained that the principal problem of solid waste management in Jima municipality is the final disposal site. Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Discussions

- Jima municipality faces problem of final disposal site. It is intended to implement "zero waste" program with sanitary landfill construction, however, it is not realized due to budget limitation.
- The municipality hopes to receive any advices on solid waste management from JICA, as the municipality will make efforts to allocate the maximum possible budget for the solid waste management. The final disposal management is the most prioritized issue for the municipality.
- It is estimated that 25 to 28 ton/day of wastes are generated. However, about 50% of the generation amount is collected. The municipality faces the financial limitation.
- Present situation of the municipality and its solid waste management are explained in details.
- The municipal personnel made a visit to the "zero waste" project site. The municipality hopes to implement the "zero waste" project and to diffuse its experiences and results to adjacent municipalities.
- The JICA mission explained that ADN project showed the successful results of JICA assistance to a large city in this country. Cooperation regarding solid waste management might be necessary for the national level intervention. It is understood that waste management problems in medium and small municipalities. It is suggested that collaboration among municipalities to improve the waste management might be another approach for the solution.

5.3.7 Eco Red (RENAEPA)

Date	12th September 2012 9:00 ~ 10:00
Place	Eco Red (RENAEPA)
Participant	<Eco Red (RENAEPA)> Roberto Herrera Presidente Maria Alicia Urbaneja Directora Ejectiva <JICA> Dominican Office : Mr. Suzuki Headquarters : Mr. Adachi,Mr. Aoki <Study Tema> Kato, Yamamoto, Ogawa, Shimazai
Outline	(1) Explanation of outline of the survey (2) Comments and discussions
Information obtained	RENAEPA Annual Report 2010-2011

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Discussions

- Name of the organization is changed from RENAEPA to Eco Red two weeks ago. Eco Red is an association of private enterprises for environmental preservation. Mission of Eco Red is environmental friendly development and member companies tackle with activities of environmental conservation.
- Eco Red concludes an agreement with organizations of the central government about "El Ministerio de Medioambiente y Recursos Naturales. La Comisión Nacional de Energía. El Consejo Nacional para el Cambio Climático y Mecanismos de Desarrollo Limpio"
- From last year, Eco Red works with Peruvian NGO "Healthy town planning". One of main activities is "BORSICCA、Ecoideas 2011、CCN Giresol、Proyecto de Ley de Residuos Sólidos、Uso Racional de Fundas Plásticas、Alianza Ciudad Saludable.

- Eco Red has established exchange market for industrial solid waste supported by USAID.
- The poster showing waste segregation made by Ecoideas 2011 has got first prize at the environmental contest supported by USAID.
- Proyecto de Ley de Residuos Sólidos started drafting the law of waste management referring ones in Peru, Mexico and Argentine.
- The committee made by the project consists three sub committees, which is policy, organization and incentives.
- In November 2011, the draft law was explained at the congress and was submitted to the sub commission in Ministry of Environment. Eco Red keeps lobbying and it is expected that the law is going to be approved.
- The law is not sufficient. Eco Red thinks that members of the committee are increased and holding a conference when it is approved. Today, the Revised law will be submitted and we are going to explain on Monday. The revised law includes the context of Rio +20
- The project is progressing now. Eco Red and CCN requires financial support for holding explanatory meetings.
- Activities with NGO "Healthy town planning" are going to expand in Republic of Dominica. Eco Red is going to support waste pickers for independence in Republic of Dominica.
- This activity is going to start with ADN and provate sector before passing the law at the congress.
- Utilizing multi sector loan (less than 100 million USD), street recyclers are going to be organized at the old town. This plan is supported by JMM of ADN ant they are going to explain to the Mayer.
- Tourism cluster at Santo Domingo also requested to Canada to implement the projects to support for waste pickers' independence and to increase understandings about waste segregation by people.
- Although many projects are implemented, integrated approach is required.
- Incentives to private companies will be refunding / redacting tax for installing environmental conservation facilities.
- In Peru, waste was reduced 20% by segregating waste by companies. In order to implement, this country requires environmental education. In addition, giving incentives to waste generators for waste segregation can lead waste and cost reduction.
- Private recyclers are working now. In Santiago, plastics are segregated, pressed and exported. Cooperation between private and public sectors are required in order to implement.
- UDAIS support financially for ECO Red's activities. In addition, member companies also support the activities. Total budget is 500,000 USD and the half was paid by USAID and remaining was contributed by the member companies.
- Sustainable production center by Cleaner Production was selected as a green production center in Ministry of Environment. Eco Red is going to implement a feasibility study supported financially by USAID. The center has already started their activities. They are planning conferences with small business companies.
- Eco Red is trying to get financial support and implement activities as much as possible.
- Question: Generally, Ministry has responsibilities for formulating laws. Are you consigned from the Ministry?
  Answer: MoE realizes our activity. A member of the congress had this drafted law and it was not submitted, then CCN and Eco Red found it and worked together for drafting it referring ones in Mexico, Peru and Argentina. Lowers in our organization checks the draft and MoE explains it at the congress.
- Question: What is the capacity that MoE should have?
- Answer: Capacity development in MoE is required. We have to comply laws and establish relationship between MoE and work together. Showing our output and hoping let them understand. These are important factors.
- However, we have already establish relationship with MoE, they do not work inadequately, thus,

their role will be given to the private sectors.

- Regarding sustainability, we have issues such as an example of Santiago. Higher officials must understand its importance.
- Drafting this law is the first case of corroboration between public and private sectors.

5.3.8 FEDOMU (Dominican Federation of Municipalities and political parties)

Date	10:40~12:00 12th September 2012
Place	FEDOMU (Federación Dominicana de Municipios y partidos políticos)
Participants	<Dominican side > Ana Hernández — Analista de Gestión Ambiental, Depto. Residuos Sólidos, Ministerio medio Ambiente Santiago Diokasty Payano E. — Analista de Gestión Ambiental, Depto. Residuos Sólidos, Ministerio medio Ambiente Santiago Lucila Santana — Enc. Género FEDOMU Vilma Contreras — FEDOMU Anna Selva — Relackiones Internacionales FEDOMU Andrés Amaury Bello — Coordinador Técnico FEDOMU/ASOMUREO Polfirio Ferreira R. — Técnico de Residuo, FEDOMU/Cibao Sur Gustavo Rodríguez — Enc. Planificación, Ayuntamiento Guerra Yanilkis Flores Guzmán — Enc. Formulación Proyectos FEDOMU Madeline Cabrera — Coordinadora ASOMUREVA ＜JICA＞ Dominican Office : Mr. Suzuki Headquaters : Mr. Adachi, Mr. Aoki, ＜Study Team＞ Kato, Yamamot, Ogawa, Shimazaki
Outline	(1) Explanation of outline of the survey (2) Comments and discussions
Information Obtained	

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Discussions

- FEDOMU is the organization presenting municipalities in the Metropolitan area. As of 18th November 2012, 12 years has been passed since FEDOM was established. We do not have any connection with political parties. Our mission is to strengthen capacities of staffs in municipalities, thus we do not deputize municipalities works.
- We have 10 local offices and there are technical staffs. They work together with staffs in municipalities.
- There was a national election this year, but we have no influence. The personnel does not change even though tops of municipality are changed.
- FEDOM is registered as OGOs. This is the difference from Mancomunidad. In order to support technical works in municipalities, we establish local offices. There are staffs for waste management and they formulate plans by participatory method. A Mancomunicad is authorized legally for implementing each administrative works.
- Spanish, Italy and France support activities of FEDOM. We have enough skills for implement projects. We also support planning sections in municipalities and can implement our project by self finance.

- We also work together with Eco Red for drafting the law. We visited the site of waste management in El Salvador. In addition, we are the member of 3Rs network in Santo Domingo. We expect implementing a waste management project in Shibao like one in Asunorlu.
- FEDOM is also support projects implemented by multiple municipalities. We have an environmental section and hope having waste management section.
- For the landfill improvement project, GIZ educate people and FEDOM implements soil cover and adjusting shape of the landfill by municipal financial resources. We improve 32 open dumping site among 237 sites. we also support zero-emission activities.
- FEDOM has both roles, which are advocacy to government and support to sites. Our mission is to protect benefits of municipalities.
- The central government does not trust with local government because of lack of its transparency.
- Municipalities require presentation skills to get financial support. In order to support this, we have to strength this capacity in local offices.

5.3.9 Mancomunidad Gran Santo Domingo

Date	15:00 ~16:30 12th September
Place	Mancomunidad Gran Santo Domingo
Participants	<Dominican Side> Domingo Benitez — Enc. Aseo y Limpieza, Ayuntamiento El Carril Rafael Amado — Enc. Aseo Urbano, Ayuntamiento Haina Eladro Rosario — Enc. Aseo, Ayuntamiento San Antonio de Guerra Miguel Echavarria — Director, Ayuntamiento Santo Domingo Norte Onofre Rojas — Director Ejecutivo, MGSD Oscar Tiarción — Director Aseo Urbvano y Equipos, Ayuntamiento Distrito Nacional Ingrid Luz Espinal — Enc. Comunicación, MGSD Onayras de la Rosa M. — Planificación Estratégica, MGSD Emilio De los Santos — Enc. Aseo, Ayuntamiento Nigua Amada Castro — Vice-alcandesa y Directora Aseo, Ayuntamiento Boca Chica Paula de León — Coordinadora Proyecto RSC, Nippon Koei ltd.. Jaqueline de los Santos — Asistente Directora Ejecutivo, MGSD Luisa María Casado — Encargada Administrativo y Aseo Urbano, ASDO Henry Kine Daniel — Encargado Limpieza y Aseo Urbano, ASDO Ingrid Zabala Vice alcaldesa, Ayuntamiento Pedro Blando <JICA> Dominican Office : Mr. Suzuki Headquatrers : Mr. Adachi, Mr. Aoki <Study team> Kato, Yamamoto, Ogawa, Shimazaki
Outline	(1) Explanation of outline of the survey (2) Comments and discussions
Information obtained	

Japanese side explained the purpose and the outline of this survey using the summary of Inception report.

a. Outline

- The study for new landfill site selection is almost completed by the Japanese consultant fund of

IDB.

- According to the result of the study, we want to start implementing the project by getting financial support from donors or the national government.
- The new president considers that environment is one of the main issues from the point of view of clean towns in order to progress tourism industries.
- Public participation may lead continuously of the projects. We want to implement projects by getting understanding each other with people. At least one sanitary landfill may be constructed during the term of present Mayers.
- We also plan transfer stations for efficient operations. The cost of the new system is estimated but the landfill cost will be 33USD / ton assuming 12% of interest rate.
- The cost will be beard by municipalities. These municipalities also consider the benefit by selling recyclable materials.
- 11 municipalities may agree for the burden.
- Just one staff is in charge for waste management, but we are considering the personnel for new waste management system. The landfill will be operated by mancomunidad and collection will be done by each municipalities.
- We expect that the central government support this project financially, but consider PPP for transfer stations.
- Question: Waste law is devising now. Are there any contradiction between the law and the plan?
  Answer: We realize that the law is just drafted, thus the details are not known.
- Question: If the plan is implemented, waste issues will be solved? What is the most important issue?
  Answer: Waste transfer is one of the issues. If the plan is implemented, the issue will be solved.
- Waste collection fee in municipalities is about half of ones at ADN. It might be difficult to collect fees in municipalities except ADN.
- Public participation is required. There is no regulation to give penalty to people if they do not bring their waste at regularly scheduled time. This is one of the big issues for waste collection.
- It is difficult to educate people for waste management.
- At North municipality, population becomes about twice, but the amount of the budget is same. 98% of people do not pay waste collection fee.
- Question: Do you have any ideas for establishing waste management companies for outsourcing?
  Answer: There are some small companies for waste collection in areas that there are some difficulties for collecting waste, but we do not have such ideas. We will consider it.
- After getting consensus among stakeholders, we want to put forward this plan. The plan is expected to be fixed in 2013.
- We want to implement the plan in 2014 with asking support to related organizations.
- We want to implement environmental education utilizing our budget. We establish environment unit and implement as much as we can. Now we are making action plans and start the plans from March 2013 by finding financial resources from private sectors, donors, etc.

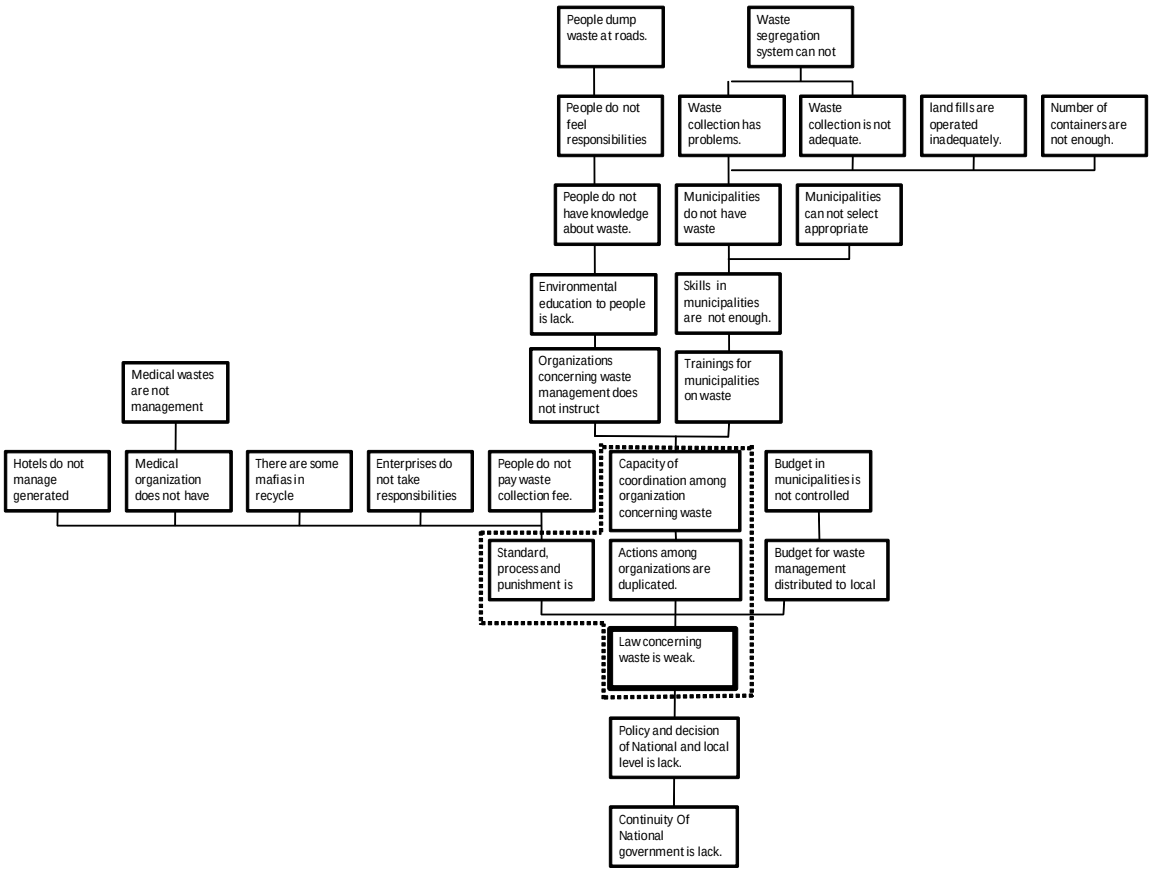
5.3.10 PCM Workshop

Date	09:00 ~ 15:00 13th September 2012
Place	Ministerio de Economía, Planificación y Desarrollo
Participants	<Dominican side> Manuel Castillo A. Enc. Gestión Ambiental Municipal, Ministerio de Medio Ambiente Beatriz Alcántara C. Enc. Gestión Territorial y Ambiental,FEDOMU María de León Analista Ambiental, Ministerio de Medio Ambiente Diokasty Payano E. Analista de Gestión Ambiental, Depto. Residuos Sólidos, Ministerio medio Ambiente Santiago Delly T. Méndez G. Analista de Gestión Ambiental, Depto. Residuos Sólidos, Ministerio medio Ambiente Santiago Julio Ortiz Enc. Residuos Sólidos, Ministerio medio Ambiente Santiago Ana Hernández Analista de Gestión Ambiental, Depto. Residuos Sólidos, Ministerio medio Ambiente Santiago María Urbaneja Directora Ejecutiva, ECORED Glenys Gónzalez Cooperación Internacional, MEPyD <JICA> Dominican Office : Mr. Yamaguchi Headquaters : Mr. Adachi, Mr. Aoki <Study Team> kato, Yamamot, Ogawa, Shimazaki
Outline	(2) Problem analysis on waste management

<Stakeholder analysis>

Congress	municipal council					
Central Government	Local Government	NGO	Industries/ Private sectors	international Organizations	Citizen	Foreigners
Ministry of Environment	Municipalities	Promoters of GIRESOL	ECO RED	JICA	Citizen	Tourists
Ministry of Health	league of municipalities	RED 3Rs	Industrial enterprises	AECID		Residents
Ministry of Education	FEDOMU	Environmental group	Recycle enterprises	USAID		
Ministry of Economy, Planning and Development	MANCOMINIDADES	IDDI		GIZ		
Ministry of Tourism	Municipal committee in political groups	CEDAF	Union of hotels and restaurants	AFD		
Ministry of Industry & Commerce		VIDA AZUL	Hotels	IDB		
National committee for climate change		SUR FUTURO	Hospitals	BM		
INAPA			Schools	PNUD		
INDRHI				APS-OMS		
CAASD				UE		
Ministry of Public Works & Communications				CCAD		
Ministry of Higher Education, Science, & Technology				SICA		
ONE						
Ministry of Public Admin.						

<Tree of problem analysis>



5.3.11 Summary

The National Development Strategy for 2010 to 2030 of Dominican Republic defines sustainable development and environmental protection. It states about the solid waste management. MARENA considers solid waste management as one of prioritized themes as well as river regime management and climate change.

MARENA carried out a study to understand the present situation of solid waste management nationwide. Meanwhile, in projects of river regime management, final disposal sites improvement are carried out for an objective of water resource conservation. MARENA considers its basic principles are waste utilization through 3R promotion and valorization of wastes, and it considers important that environmental education and training are continued in many waste management projects. However it is not seen outstanding results in waste management aspects. Therefore, Dominican side expects that Japanese assistance be given for solid waste management issues in relation to the National Development Strategy.

As a movement of corporate environmental conservation, the network of environmental conscious companies was formulated about two years ago. About 70 companies participate in this network for promoting environmental conservation and sustainable development. It states environmental friendly development and participant companies are promoting environment conservation activities. In practice, participant companies declare that their business activities are carried out in compliance with environmental norms, and in so doing they try to gain confidence from citizens. As the first public –private-partnership project by this corporate association, the bill of law for the national law of solid waste management was submitted to the national congress for discussion.

As for the second largest city Santiago, once the final disposal management was significantly improved by Japanese experts of Fukuoka method. However, after the mayor replacement, municipal management faced a set of problems and consequently it deteriorates the municipal solid waste management, especially the final disposal site management.

IDB study with Japan Fund is being carried out for the master plan of Gran Santo Domingo Mancomunidad that is composed of 11 municipalities, which proposes 7 transfer stations and a new final disposal site.

DIGAUE-ADN continues its intention of diffusing JICA project results not only for other municipalities in the country but also for CARICOM countries. ADN hopes to continue collaboration with JICA in solid waste management issues.

The Santo Domingo Este municipality has received JICA assistance such as volunteers, and is consolidating its environmental management capacities. Although the Santo Domingo Este municipality appreciated the JICA training scheme in Japan, it is difficult to send several people at once to Japan in view of current tasks in hand of the municipality. Therefore, they appreciate that if waste management related training is given in a new educational institution (e.g. waste management school) in this country. It is mentioned that: ex-trainees after returning the municipality implement their action plans at their former position or at the promoted position; JICA training report meetings are held twice a year for an average; and if the JICA volunteer of vehicle maintenance is dispatched its activities and outputs are to be shared with other municipalities as well.

In order to analyze problems related with present solid waste management in the country, PCM workshop was conducted. It concluded principal problems are: (i) norms, procedures and sanctions are not applied; (ii) there are duplicities in competency roles among authorities; (iii) sufficient budget is not allocated for municipalities or for municipal institutions that are in charge of solid waste management operations.

Annex 2

Capacity Assessment

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1 Honduras

1.1 Central government

Survey results on the central government (i.e., SERNA) are summarized in the capacity assessment format below.

Name: (Mr. Kessel Rosales, Director de Gestión Ambiental, Secretaría de Recursos Naturales y Ambiente)
Month/Year (14/08/ 2012)

Basic Information

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Population	Total population, Population density, Estimation of population growth	Are Census data available?		○	National Institute of Statistics (Instituto Nacional de Estadística (INE)) http://www.ine.gob.hn/drupal/node/205 Honduras en Cifras 2009-2011 / Central Bank of Honduras http://www.bch.hn/honduras_en_cifras.php
Land	Area, Land use	Is geographical map available? Is land use map available?		○	National Institute of Statistics (Instituto Nacional de Estadística (INE)) http://www.ine.gob.hn/drupal/node/205
Natural conditions	Variation of temperature, precipitation; Presence/absence of dry and rainy seasons	Is meteorological data available?		○	Servicio Meteorologico Nacional de Honduras http://www.smn.gob.hn/web/
Economy	Economic activities	How much per capita GDP? What is the key industry?		○	Honduras en Cifras 2009-2011 / Central Bank of Honduras http://www.bch.hn/honduras_en_cifras.php
Politics	Political system Administration system	Who is the decision maker?	○		President of the republic, Mr. Lobo Sosa

Central Government

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
National Laws on SWM	Laws and regulations related to SWM Relevant laws on the environment Economic tools such as green consumer rule , etc.	What is the definition of solid waste in your country? Is the responsibility of SWM implementation clearly defined?		○	General Law of Environment (Ley General del Ambiente) Regulation of Integral Solid Waste Management (Reglamento para el Manejo Integral de los Residuos Sólidos)
National policy and plan	Central government policy on SWM	Is there a policy statement on SWM? Are there national plan, strategy and guideline on SWM?		○	Government Plan 2010-2014 (Plan de Gobierno 2010 a 2014) Final Draft of "National Plan for Integral Solid Waste Management with 3Rs focus in Honduras and implementation scheme") (Borrador Final "Política Nacional para la

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
					Gestión Integral de Residuos Solidos con enfoque en 3R en Honduras y los lineamientos para su implementación")
Administration in national level	Administration structure related to SWM in national government; Relationship between national government and local governments	How are the national plan, strategy, and/or policies acted to local government? Is there middle level government such as provincial government?	○	○	Strategy and Intervention for Solid Waste Management, SENERA, Honduras, April 2004 (SERNA, Estrategia de Intervención para la Gestión de los Residuos Sólidos en Honduras/ Honduras, Abril, 2012) The governing agencies of solid waste management are SERENA and ministry of health, sharing role of both agencies is not clear. Execution body of the solid waste management is municipality. However, their capacity of solid waste management is poor, due to the lack of experiences and knowledge.
National organization on SWM	Implementing public organization in national level	Is there national level organization for SWM (e.g. National SWM Centre)?	○		SERNA, AMHON SERANA is set up joint committee for solid waste management. The committee is composed by ministries concerned, municipalities and private companies.
Privatization policy	Policy on privatization in SWM; Presence of waste industry	Is there privatization policy, or direct management system by public organization? Is there nation-wide activity of private waste industry?	○	○	Strategy and Intervention for Solid Waste Management, SENERA, Honduras, April 2004 (SERNA, Estrategia de Intervención para la Gestión de los Residuos Sólidos en Honduras/ Honduras, Abril, 2012) Section 5.2 "Incentives for business opportunities related with solid waste that enable participation of private, cooperation, financing entities." Private sector participate filed on solid waste management is only waste collection field in Honduras. Final disposal is in charge of municipalities.
Financing to SWM implementation organization	Subsidies; Low-interest loans, Special fund; Investment	Is there subsidy from central government to local SWM implementing organization? Is there investment mechanism for SWM from private sector?		○	Strategy and Intervention for Solid Waste Management, SENERA, Honduras, April 2004 (SERNA, Estrategia de Intervención para la Gestión de los Residuos Sólidos en Honduras/ Honduras, Abril, 2012) Section 5.1. Design, amplification, and implementation of financial strategy for Integral solid waste management Section 5.3. Arrangement of financial theme based on solid waste management investment information .
Environmental impact assessment (EIA) system	Information on the application for constructing SWM facilities; EIA and SEA systems	Are procedures for EIA clearly presented to waste-related facilities? How does it work for SWM facilities such as landfill?		○	General Law of Environment (Ley General del Ambiente) Decree No. 104-93, May 27,1993) Art. 78 al 80: EIA is obligatory for solid waste management projects.

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Hazardous wastes and chemicals	Regulation and treatment standards for hazardous waste; Medical infectious waste	Is there a classification of hazardous waste; rules on handling and treating hazardous waste (e.g. Manifest system, PRTR)?		○	General Law of Environment (Ley General del Ambiente) Decree 104-93, Article 66: It favors in general solid waste treatment to avoid environmental pollution and delegate sold waste management to municipalities from generation to final disposal, including themes of reuse and recycle.
Pollution caused by waste	Environmental pollution caused by solid waste	Is there any pollution caused by mismanagement of solid waste or illegal dumping?		○	Interviewed citizens answered it is problematic waste contamination, excessive energy consumption, noise, scenery deterioration is minor. (Análisis Sectorial de Residuos Sólidos Honduras/2010, OPS)
Education and Training	University, college and institute for studying/training solid waste management	How are SWM engineers and technicians produced?	○		AMHON organized solid waste management training in 2010 receiving support from Stewart university and Honduras domestic university. Purpose of the training is capacity development of solid waste management to in charge person in autonomous. The participant of the training was 25 to 30 persons. AMHON received support from many donors. However, support was only sporadic support in many cases.
Donors	Activities by donors in SWM sector	Is there aid activity by any donors in SWM sector? Is there any experience of international aid in SWM sector?	○	○	Solid waste Sector Analysis Honduras, 2010, PAHO (Análisis Sectorial de Residuos Sólidos Honduras /2010, OPS) Manual for Integral Solid Waste Management/ USAID (Manual para la Gestión Integral de Residuos Sólidos /USAID) Initiative for Technical Assistance and Institutional Consolidation in Solid Waste Management in Central America / UN-HABITAT 2012 (Iniciativa de Asistencia Técnica y Fortalecimiento Institucional en la Gestión de los Residuos Sólidos para Centroamérica / ONU-HABITAT 2012) Final Disposal Sites Data Inventory in 38 municipalities in Honduras/ PAHO/WHO 2010 (Inventario Georefenciado de Sitios de Disposición Final En 38 Municipios de Honduras/ OPS/OMS 2010) JICA/CENICA (2011,2012)

1.2 Local governments

Survey results on local governments (Ocotepeque / Mancomunidades Guisayote y Valle de Sensenti) are summarized in the capacity assessment format below.

Ocotepeque / Mancomunidades Guisayote y Valle de Sensenti

Name (José Antonio Valle, Director Ejecutivo, Hermandad de Honduras)
Name of City/Governorate (Ocotepeque, Mancomunidades Guisayote y Valle de Sensenti)
Month/Year (16/08/2012)

Basic Information

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Population	Total population Estimation of population growth			○	National Institute of Statistics (Instituto Nacional de Estadística (INE)) http://www.ine.gob.hn/drupal/node/205 Honduras en Cifras 2009-2011 / Central Bank of Honduras http://www.bch.hn/honduras_en_cifras.php
Land	Area (km2), Land uses			○	National Institute of Statistics (Instituto Nacional de Estadística (INE)) http://www.ine.gob.hn/drupal/node/205
Natural conditions	Variation of temperature, precipitation; Presence/absence of dry and rainy seasons			○	Servicio Meteorologico Nacional de Honduras http://www.smn.gob.hn/web/
Economy	Economic activities	What is the key industry?		○	Agriculture

Administration of Solid Waste Management (SWM)

Category	Information required	Key question	Information acquisition method		Information source
			Interview	source provided	
Administration	Administration system Subdivision (District etc.)		○		Municipalities, Mancomunidades Guisayote y Valle de Sensenti
Service area and populations covered	SWM service area (%) SWM service population (%)		○		Not available
Rule, Regulation	Laws, Ordinances or orders about SWM	Is there any specific law or ordinance about SWM in the city/governorate?		○	General Law of Environment (Ley General del Ambiente) Article 1 and 67. Law of Municipalities (Ley de Municipalidades) Article 13 and 14. Regulation for solid waste management (Reglamento para el manejo de residuos sólidos) (Agreement 378-2001): Article 2 and 3.
SWM Policy	SWM Policy	Is there any policy on SWM?	○		It is required compliance of solid waste management related laws.
Master Plan in city level	SWM Master Plan	Is there any plan for SWM?	○		No
SWM Finance	Budgeting mechanisms; financial management systems; Latest budget	Is there well-defined SWM accounting and financial management system?	○		General budget of municipalities, donors assistance

Category	Information required	Key question	Information acquisition method		Information source
			Interview	source provided	
	allocated				
SWM Accounting	Waste collection fee Income and expenditure for SWM implementation	How the waste collection fee is collected? Is balance sheet for SWM prepared?	○		Details not available
Human Resources	Number of the SWM department(s), Organization chart	How many members are working for SWM? Is the number of staff is appropriate?	○		Several per municipality
Intellectual assets in SWM	SWM survey/research reports, research papers, database Data on volume and quality of waste generated in the city Waste stream in the city	Has SWM survey implemented so far? Is the survey report available?	○		No
Information on SWM Implementation in the City/Governorate					
Waste generation	Amount of total waste generation (ton/month) Average waste composition - Biodegradable (%) - Plastic (%) - Glass (%) - Metal (%) - Paper (%) - Cloth (%) - Others (%)		○		16 ton/day - Biodegradable : 72% - Plastic ,Glass ,Metal, Paper, Cloth: 22% - Others: 6% Waste composition not available
Waste discharge	Method of discharge	Is there source segregation practice?	○		No source segregation
Collection and Transportation Equipment	- Waste containers - Transportation vehicles - Repairing workshop	How many containers/vehicles are there?	○		It depends on respective municipalities. In general collection vehicles are in short.
Waste Collection	Door-to-door collection, Curbside collection, Community container collection, or others?	How solid waste is collected?	○		Community container
Sweeping Cleansing	Is there road sweeping practice? Waste generation from sweeping (ton/month)		○		It is practiced. Sweeping amount date is not available.
Waste transport	Private or public transporter? Transfer	Who is transporting the solid waste? Is there transfer station?	○		Direct operation by public entity. No transfer station.

Category	Information required	Key question	Information acquisition method		Information source
			Interview	source provided	
	station?				
Intermediate Treatment	- Composting - Manual separation - Incineration - Biogas recovery	Which kind of intermediate treatment is available? Who is managing the facilities?	○		No
Recycling	Recycling	Which kind of material is recycling? How much the recycling ration to total waste?	○		Waste piker (final disposal sites)
Final Disposal Site	Open dump? Controlled dump? Sanitary Landfill?	How many dump sites? Remaining capacity? Who is managing?	○		4 open dump sites
Medical Waste	Generation amount (ton/month)	Is there special handling and facility?			Not available
Hazardous Waste	Type and generation amount (ton/month)	Is there special handling and facility?			Not available
Industrial Waste	Type and generation amount (ton/month)	Is there special handling and facility?			Not available
Society and Education					
SWM Social organizations	NGOs, Community based organizations (CBOs), universities; un-organized actors	Is each organization active and/or influential? Who or which organization is recognized as an important stakeholder for SWM?	○		Hermandad de Honduras (NGO).
Waste Pickers	- Street Waste Pickers - Dump Waste Pickers	How many waste pickers are there, approximately?	○		Dump Waste Pickers: several per site
Waste Recycling markets	- Junk buyer shop - Recycling factory - Recycled selling shop	Which kind of items can be sold as recyclable?	○		Intermediary comes to purchase them.
Waste and Environmental education	- School education - Social education - Public awareness campaign		○		Mancomunidades provide education and campaign at schools.
Solid Waste Problem(s)					There is no sanitary landfill. Collection services are not appropriate. Residents are not well aware of environmental issues.

2 Guatemala

2.1 Central government

Survey results on the central government (i.e., MARN, CONADES) are summarized in the capacity assessment format below.

Name (MARN, CONADES),
Month/Year (20/8/2012)

Basic Information

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Population	Total population, Population density, Estimation of population growth	Are Census data available?		○	Guatemala en Cifras, Bank of Guatemala: http://banguat.gob.gt/default.asp National Statistics Institute http://www.ine.gob.gt/np/
Land	Area, Land use	Is geographical map available? Is land use map available?		○	Guatemala en Cifras, Bank of Guatemala: http://banguat.gob.gt/default.asp National Statistics Institute http://www.ine.gob.gt/np/
Natural conditions	Variation of temperature, precipitation; Presence/absence of dry and rainy seasons	Is meteorological data available?		○	INSIVUMEH http://www.insivumeh.gob.gt/meteorologia.html
Economy	Economic activities	How much per capita GDP? What is the key industry?		○	Guatemala en Cifras, Bank of Guatemala: http://banguat.gob.gt/default.asp National Statistics Institute http://www.ine.gob.gt/np/
Politics	Political system Administration system	Who is the decision maker?	○		President of the Republic, Mr. Pérez Molina

Central Government

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
National Laws on SWM	Laws and regulations related to SWM Relevant laws on the environment Economic tools such as green consumer rule , etc.	What is the definition of solid waste in your country? Is the responsibility of SWM implementation clearly defined?	○		Law for Integral Waste Management (Ley para la Gestión y Manejo Integral de los Residuos y Desechos) is still under examination by the national congress. In 2005, the National Policy of Environment was formulated and the waste management is categorized as a prioritized issue. It is stipulated that the central government has the competency on regulation and the municipal government is responsible for operation, with regard to the waste management. Although the government has changed in January 2012, the national policy on waste management does not change. There is the national program on waste management. Ministries, institutions etc. of the national government related with waste management counts for about 10 entities, such as Ministries of Health, Agriculture, Energy and Mining, etc. Related information is to be offered.

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
National policy and plan	Central government policy on SWM	Is there a policy statement on SWM? Are there national plan, strategy and guideline on SWM?	○		National Policy for Integral Solid Waste Management (Politica Nacional para el Manejo Integral de los Residuos y Desechos Sólidos) There is a national program (plan) of solid waste management, however, today is on its planning stage and its implementation has not started. CONADES (Comisión Nacional para el Manejo de los Desechos Sólidos) is responsible for providing concrete plans and programs.
Administration in national level	Administration structure related to SWM in national government; Relationship between national government and local governments	How are the national plan, strategy, and/or policies acted to local government? Is there middle level government such as provincial government?	○		It is stipulated that the central government has the competency on regulation and the municipal government is responsible for operation, with regard to the waste management. The central government plan and strategies are conducted through provincial offices.
National organization on SWM	Implementing public organization in national level	Is there national level organization for SWM (e.g. National SWM Centre)?	○		CONADES
Privatization policy	Policy on privatization in SWM; Presence of waste industry	Is there privatization policy, or direct management system by public organization? Is there nation-wide activity of private waste industry?	○		The Municipal Code stipulates clauses on concessions. Main concession activities in the solid waste management are domestic waste collection in Guatemala. Concession period is 25years. Percentage of waste collection activities by explicit concession contract are low in Guatemala compared with other Latin-American countries. On the other hand, there are many informal collectors in Guatemala. Collectors are not legalized bodies. Individual or family groups are formed to conduct informal waste collection services. MARN hopes to promote concessions with private firms. It is MARN's role to provide information for promoting public-private-partnership. MARN hopes to start to provide information on certification system as such are needed by the private sector.
Financing to SWM implementation organization	Subsidies; Low-interest loans, Special fund; Investment	Is there subsidy from central government to local SWM implementing organization? Is there investment mechanism for SWM from private sector?		○	334 municipalities in the country are responsible for domestic waste management operation, but they face financial problems to implement the adequate waste management. There were several international cooperation projects on waste management through INFOM (National Institute of Municipal Promotion).
Environmental impact assessment (EIA) system	Information on the application for constructing SWM facilities; EIA and SEA systems	Are procedures for EIA clearly presented to waste-related facilities? How does it work for SWM facilities such as landfill?		○	Law for Protection and Conservation of Environment (Ley de Proteccion y Mejoramiento del Medio Ambiente) It stipulates Decree No. 68-86 of National Congress. It requires EIA for final disposal sites.
Hazardous wastes and chemicals	Regulation and treatment standards for hazardous	Is there a classification of hazardous waste; rules on handling and treating hazardous waste (e.g. Manifest system, PRTR)?		○	The bill of Law for Integral Waste Management (Ley para la Gestión y Manejo Integral de los Residuos y Desechos), that is under examination by the national congress, includes clauses for hazardous waste management. As it is drafted

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
	waste; Medical infectious waste				with reference to the Mexican law, it may in practice require application adjustment.
Pollution caused by waste	Environmental pollution caused by solid waste	Is there any pollution caused by mismanagement of solid waste or illegal dumping?	○		Water contamination by waste disposal in rivers (e.g., Lake Amatitlan).
Education and Training	University, college and institute for studying/training solid waste management	How are SWM engineers and technicians produced?	○		GIZ /GIRESOL JICA/CENICA
Donors	Activities by donors in SWM sector	Is there aid activity by any donors in SWM sector? Is there any experience of international aid in SWM sector?	○		GIZ /GIRESOL JICA /CENICA IDB: Solid Waste Management National Plan (Cooperación Técnica No Reembolsable No. ATN/MA-12949-GU. Plan Nacional de Manejo de Residuos Sólidos).

2.2 Local government

Survey results on local government (Guatemala City) are summarized in the capacity assessment format below.

Name (Mr. Julio Campos, Gerente de Proyectos, Ms. Sylda Lone, Subdirectora, Gerencia de Proyecto, Ms. Irma Rodas, Coordinadora de Cooperación, Municipalidad de Guatemala)
Name of City/Governorate (Guatemala City)
Month/Year (21/8/2012)

Basic Information

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Population	Total population Estimation of population growth			○	Guatemala en Cifras, Bank of Guatemala: http://banguat.gob.gt/default.asp National Institute of Statistics (Instituto Nacional de Estadística (INE)) http://www.ine.gob.gt/np/
Land	Area (km2), Land uses			○	Guatemala en Cifras, Bank of Guatemala: http://banguat.gob.gt/default.asp National Institute of Statistics (Instituto Nacional de Estadística (INE)) http://www.ine.gob.gt/np/
Natural conditions	Variation of temperature, precipitation; Presence/absence of dry and rainy seasons			○	INSIVUMEH http://www.insivumeh.gob.gt/meteorologia.html
Economy	Economic activities	What is the key industry?	○		Main industries: agriculture, tourism.

Administration of Solid Waste Management (SWM)

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Administration	Administration system Subdivision (District etc.)		○		Waste collection services are all covered by the concessioners that have the concession contract valid until 2013 or 2014. The concessioners own the collection vehicles and provide collection services to citizen and charge and collect tariff of the service. The city government receives the fixed concession tariff of 330 quetzals/ vehicle/year from concessioners. The municipality manages final disposal operation, but is not in charge of collection operation. With regard to collection, the municipality issues concession permits.
Service area and populations covered	SWM service area (%) SWM service population (%)		○		The collection service is provided by concessioners. Concessioners take roles of its service charges collection as well as attending complaints by citizen. The municipality is not aware of related detail information.
Rule, Regulation	Laws, Ordinances or orders about SWM	Is there any specific law or ordinance about SWM in the city/governorate?	○		Law for Integral Waste Management (Ley para la Gestión y Manejo Integral de los Residuos y Desechos) is still under examination by the national congress. In 2005, the National Policy of Environment was formulated and the waste management is categorized as a prioritized issue. It is stipulated that the central government has the competency on regulation and the municipal government is responsible for operation, with regard to the waste management. It was enacted in 2002 the municipal regulation (Reglamento de Manejo de Desechos Solidos para el Municipio de Guatemala). A project for the regulation review took place in 2007, however it remains the same as it was in 2002.
SWM Policy	SWM Policy	Is there any policy on SWM?	○		The competency is on the national government.
Master Plan in city level	SWM Master Plan	Is there any plan for SWM?	○		It was implemented in 2004 the Program of modernization of the management of solid waste in the city of Guatemala, with IDB assistance.
SWM Finance	Budgeting mechanisms; financial management systems; Latest budget allocated	Is there well-defined SWM accounting and financial management system?	○		The annual budget of the city government is 1, 251 million quetzals and the budget for the final disposal site is 25 million quetzals.
SWM Accounting	Waste collection fee Income and expenditure for SWM implementation	How the waste collection fee is collected? Is balance sheet for SWM prepared?	○		The tariff of the respective collection services is determined by concessioners. High income residential areas have higher tariff rates and low income area has lower tariff rates. It is in the range of 5 to 7 US dollar per month per household. The city government receives the fixed concession tariff of 330 quetzals/ vehicle/year from concessioners.
Human Resources	Number of the SWM department(s), Organization chart	How many members are working for SWM? Is the number of staff is appropriate?	○		Municipal employees of the Guatemala city are about 9,000 people. Employees related with solid waste management are: 178 persons for the management of marketplace waste and illegal dumping; 34 persons in charge of the final disposal site; and 4 persons in administrative section.
Intellectual assets in SWM	SWM survey/research reports, research papers, database Data on volume and quality of	Has SWM survey implemented so far? Is the survey report available?	○		It was implemented in 2004 the Program of modernization of the management of solid waste in the city of Guatemala, with IDB assistance.

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<tr><th rowspan="2">Category</th><th rowspan="2">Information required</th><th rowspan="2">Key question</th><th colspan="2">Information acquisition</th><th rowspan="2">Information source</th></tr>
<tr><th>Interview</th><th>source provided</th></tr>
<tr><td></td><td>waste generated in the city
Waste stream in the city</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">Information on SWM Implementation in the City/Governorate</td></tr>
<tr><td>Waste generation</td><td>Amount of total waste generation (ton/month)
Average waste composition
- Biodegradable (%)
- Plastic (%)
- Glass (%)
- Metal (%)
- Paper (%)
- Cloth (%)
- Others (%)</td><td></td><td></td><td>○</td><td>
<table>
<tr><th>Municipality</th><th>Population (2002)a)</th><th>PPC kg/capita/day b)</th><th>Amount Ton/day</th></tr>
<tr><td>Guatemala</td><td>942,348</td><td>1.072</td><td>1,010.2</td></tr>
<tr><td>Mixco</td><td>403,689</td><td>0.878</td><td>354.4</td></tr>
<tr><td>Villa Nueva</td><td>355,901</td><td>0.723</td><td>257.3</td></tr>
<tr><td>Villa Canales</td><td>103,814</td><td>0.723</td><td>75.1</td></tr>
<tr><td>S.M. Petapa</td><td>101,242</td><td>0.723</td><td>73.2</td></tr>
<tr><td>S.C. Pinula</td><td>63,767</td><td>0.723</td><td>46.1</td></tr>
<tr><td>S.J. Pinula</td><td>47,278</td><td>0.723</td><td>34.2</td></tr>
<tr><td>Chinautla</td><td>95,312</td><td>0.658</td><td>62.7</td></tr>
<tr><td>Fraijanes</td><td>30,701</td><td>0,723</td><td>22.2</td></tr>
<tr><td>TOTAL:</td><td>2´144,052</td><td>0.903</td><td>1,935.4</td></tr>
</table>
a) Census. INE. 2002., b) Proyecciones JICA. 1991. Sourcee*: Estimados por el consultor. 2003.*
<table>
<tr><th>Component</th><th colspan="4">Socio-economical stratum</th><th>Average (%)</th></tr>
<tr><th></th><th>High</th><th>Middle high</th><th>Middle low</th><th>Low</th><th></th></tr>
<tr><td>Materia orgánica</td><td>48.8</td><td>41.8</td><td>54.7</td><td>56.4</td><td>50.4</td></tr>
<tr><td>Cartón y papel</td><td>20.4</td><td>22.0</td><td>17.0</td><td>12.9</td><td>18.1</td></tr>
<tr><td>Escoria, cenizas y lozas</td><td>4.9</td><td>5.8</td><td>6.1</td><td>7.6</td><td>6.1</td></tr>
<tr><td>Plásticos</td><td>12.1</td><td>11.5</td><td>8.6</td><td>8.1</td><td>10.1</td></tr>
<tr><td>Textiles y cueros</td><td>2.3</td><td>5.5</td><td>3.5</td><td>6.0</td><td>4.3</td></tr>
<tr><td>Metales</td><td>2.4</td><td>2.5</td><td>2.1</td><td>1.8</td><td>2.2</td></tr>
<tr><td>Vidrios</td><td>2.5</td><td>1.7</td><td>1.3</td><td>1.0</td><td>1.6</td></tr>
<tr><td>Huesos</td><td>0.5</td><td>0.5</td><td>0.6</td><td>0.4</td><td>0.5</td></tr>
<tr><td>Otros</td><td>6.1</td><td>8.7</td><td>6.1</td><td>5.8</td><td>6.7</td></tr>
<tr><td>SUMA:</td><td></td><td></td><td></td><td></td><td>100%</td></tr>
</table>
Source: CEPIS-OMS. 1998.</td></tr>
<tr><td>Waste discharge</td><td>Method of discharge</td><td>Is there source segregation practice?</td><td>○</td><td></td><td>Mixed discharge</td></tr>
<tr><td>Collection and Transportation Equipment</td><td>- Waste containers
- Transportation vehicles
- Repairing workshop</td><td>How many containers/vehicles are there?</td><td>○</td><td></td><td>525 units (by concessioners)</td></tr>
<tr><td>Waste Collection</td><td>Door-to-door collection, Curbside collection, Community container collection, or others?</td><td>How solid waste is collected?</td><td>○</td><td></td><td>By concessioners</td></tr>
<tr><td>Sweeping Cleansing</td><td>Is there road sweeping practice?
Waste generation from sweeping (ton/month)</td><td></td><td>○</td><td></td><td>There is an organization called “LimpiVerde” that works for road sweeping and green area maintenance. Total employees are 850 persons and it consists of about 820 sweepers and about 30 administrative persons.</td></tr>
<tr><td>Waste transport</td><td>Private or public transporter?
Transfer station?</td><td>Who is transporting the solid waste?
Is there transfer station?</td><td>○</td><td></td><td>No transfer station (not necessary)</td></tr>
<tr><td>Intermediate Treatment</td><td>- Composting
- Manual separation
- Incineration
- Biogas recovery</td><td>Which kind of intermediate treatment is available?
Who is managing the facilities?</td><td>○</td><td></td><td>None</td></tr>
<tr><td>Recycling</td><td>Recycling</td><td>Which kind of material is recycling?</td><td>○</td><td></td><td>Waste picker
Certain recycling activities by citizen</td></tr>
</table>

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
		How much the recycling ration to total waste?			
Final Disposal Site	Open dump? Controlled dump? Sanitary Landfill?	How many dump sites? Remaining capacity? Who is managing?	○		The waste disposal site for Guatemala city is located at the Zone 3, and the AMSA's (Autoridad para el Manejo Sustentable de la Cuenca y del Lago de Amatitlán) disposal site is located in Villa Nueva. The Zone 3 disposal site receives about 3,000 ton/day. It consists of about 1,500 ton/day by Guatemala city and the rest about 1,500 ton/day by 9 neighboring municipalities. It is not known by the Guatemala municipal personnel the details of waste disposal situation at AMSA's Villa Nueva site.
Medical Waste	Generation amount (ton/month)	Is there special handling and facility?	○		Not available
Hazardous Waste	Type and generation amount (ton/month)	Is there special handling and facility?	○		Not available
Industrial Waste	Type and generation amount (ton/month)	Is there special handling and facility?	○		Not available
Society and Education					
SWM Social organizations	NGOs, Community based organizations (CBOs), universities; un-organized actors	Is each organization active and/or influential? Who or which organization is recognized as an important stakeholder for SWM?	○		No information Any complaints for collection services are given directly to concessioners by residents. As the service is the family business, close communication is held between the service user and the provider.
Waste Pickers	- Street Waste Pickers - Dump Waste Pickers	How many waste pickers are there, approximately?	○		About 1,200 Waste Pickers (Zone 3 disposal site)
Waste Recycling markets	- Junk buyer shop - Recycling factory - Recycled selling shop	Which kind of items can be sold as recyclable?	○		There are many intermediary buyers.
Waste and Environmental education	- School education - Social education - Public awareness campaign		○		Details are not available.
Solid Waste Problem(s)			○		The municipality hopes to have a longer service life of the exiting site since the localization of a new site might be difficult.

3 El Salvador

3.1 Central government

Survey results on the central government (i.e., MARN) are summarized in the capacity assessment format below.

Name (Ms. Manlia Romero, Directora Gobernanza, MARN, Mr. René Ramón Gross, Jefe Cooperación Internacional, MARN)
Month/Year (29/08/2012)

Basic Information

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Population	Total population, Population density, Estimation of population growth	Are Census data available?		○	Ministry of Economy (Ministerio de Economía, Dirección General de Estadística y Censos – DIGESTYC, San Salvador, Revisado Mayo de 2010) http://www.digestyc.gob.sv/index.php/servicios/descarga-de-documentos.html
Land	Area, Land use	Is geographical map available? Is land use map available?		○	National Service of Territorial Studies (Servicio Nacional del Estudios Territoriales) http://www.snet.gob.sv/ver/geologia
Natural conditions	Variation of temperature, precipitation; Presence/absence of dry and rainy seasons	Is meteorological data available?		○	National Service of Territorial Studies (Servicio Nacional del Estudios Territoriales) http://www.snet.gob.sv/ver/meteorologia
Economy	Economic activities	How much per capita GDP? What is the key industry?		○	USD3,728.6 per capita Main industries: agriculture, textile
Politics	Political system Administration system	Who is the decision maker?	○		President of the Republic

Central Government

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
National Laws on SWM	Laws and regulations related to SWM Relevant laws on the environment Economic tools such as green consumer rule , etc.	What is the definition of solid waste in your country? Is the responsibility of SWM implementation clearly defined?		○	<table><tr><th>Instrument</th><th>Name, date, additional comments</th></tr><tr><td>Law</td><td>Ley del Medio Ambiente May 2008</td></tr><tr><td>Regulation</td><td>Reglamento de Manejo de Desechos Sólidos Decree 42, year 2000</td></tr><tr><td>Norm</td><td>No official technical norms, there were a proposal in year 2003</td></tr><tr><td>Municipal ordinance</td><td>34 municipalities</td></tr></table>

<table>
<tr><th rowspan="2">Category</th><th rowspan="2">Information required</th><th rowspan="2">Key question</th><th colspan="2">Information acquisition</th><th rowspan="2">Information source</th></tr>
<tr><th>Interview</th><th>source provided</th></tr>
<tr><td>National policy and plan</td><td>Central government policy on SWM</td><td>Is there a policy statement on SWM?
Are there national plan, strategy and guideline on SWM?</td><td></td><td>○</td><td>Since the government was changed in 2009, MAEN has been tackling waste issues. MARN corroborated with the ministry of health to formulate national environmental policy from 2010 to 2015, which include the output of PROMADES.
<table>
<tr><th>National policy</th><th>Plan/Program</th><th>National strategies</th></tr>
<tr><td>Política Nacional de Manejo Integral de Desechos Sólidos year 2001

Nueva Política Nacional de Manejo Integral de Desechos Sólidos 2009-2014, under approval process.</td><td>Programa Nacional para el Manejo Integral de los Desechos Sólidos,
Its components:
(1) Plan Nacional de Mejoramiento del Manejo Integral de los Desechos Sólidos, by the President initiative in may 2010;
(2) Plan Nacional de Recuperación de Desechos Sólidos, under formulation process; and
(3) Plan Nacional de Educación y Sensibilización, under formulation process</td><td>No official strategies</td></tr>
</table></td></tr>
<tr><td>Administration in national level</td><td>Administration structure related to SWM in national government; Relationship between national government and local governments</td><td>How are the national plan, strategy, and/or policies acted to local government?
Is there middle level government such as provincial government?</td><td>○</td><td></td><td>COAMSS, ISDEM,</td></tr>
<tr><td>National organization on SWM</td><td>Implementing public organization in national level</td><td>Is there national level organization for SWM (e.g. National SWM Centre)?</td><td>○</td><td></td><td>MARN
Staffs for waste management in MARN are 10 people. MARN is now recruiting the chief. Environmental education unit has been moved other sector.</td></tr>
<tr><td>Privatization policy</td><td>Policy on privatization in SWM; Presence of waste industry</td><td>Is there privatization policy, or direct management system by public organization?
Is there nation-wide activity of private waste industry?</td><td>○</td><td></td><td>It is necessary to place adequate control on the MIDES entity in view of monopoly situation.</td></tr>
<tr><td>Financing to SWM implementation organization</td><td>Subsidies; Low-interest loans, Special fund; Investment</td><td>Is there subsidy from central government to local SWM implementing organization?
Is there investment mechanism for SWM from private sector?</td><td>○</td><td></td><td>The national policy includes constructions of infrastructures. MARN considers to get loans from DAC, IDB and KFW for the implementations.
The president met with German prime minister and requested to get a loan from KFW to prevent environmental issues, and then MARN got a loan from KFW. Some of this finance is going to be used for the phase III of ASHINORLU.</td></tr>
<tr><td>Environmental impact assessment (EIA) system</td><td>Information on the application for constructing SWM facilities; EIA and SEA</td><td>Are procedures for EIA clearly presented to waste-related facilities? How does it work for SWM facilities such as landfill?</td><td>○</td><td></td><td>EIA is required for localization of the waste final disposal site. (Article 21, Ley de Medio Ambiente.)</td></tr>
</table>

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
	systems				
Hazardous wastes and chemicals	Regulation and treatment standards for hazardous waste; Medical infectious waste	Is there a classification of hazardous waste; rules on handling and treating hazardous waste (e.g. Manifest system, PRTR)?	○		MARN considers principal problems are with hazardous waste management such as e-waste, tires, lights, metals, batteries etc MARN has no definition of dangerous waste. It is one of the issues. On the other hand, there are some recycling factories dealing with these wastes. We have to review the environmental laws and establish treatment and monitoring methods of these wastes. In addition, we should implement these monitoring methods according to the reviewed law. This will be one of the issues.
Pollution caused by waste	Environmental pollution caused by solid waste	Is there any pollution caused by mismanagement of solid waste or illegal dumping?	○		Although no evident environmental or health damages are caused, there is no definition of hazardous waste, and it is not taken an appropriate management on them.
Education and Training	University, college and institute for studying/training solid waste management	How are SWM engineers and technicians produced?	○		In El Salvador, there are only a few engineers who can design sanitary landfills. This factor might be limitation for spreading sanitary landfills, thus, MARN considers that it is necessary to implement training courses for sanitary landfills.
Donors	Activities by donors in SWM sector	Is there aid activity by any donors in SWM sector? Is there any experience of international aid in SWM sector?	○		JICA, KFW, AECID, GEF, SICA, GIZ

3.2 Local government

Survey results on local government (San Salvador) are summarized in the capacity assessment format below.

Name (Mr. Alexander Suriano, Director, solid waste management directorate, municipality of San Salvador)
Name of City/Governorate (San Salvador)
Month/Year (29/8/2012)

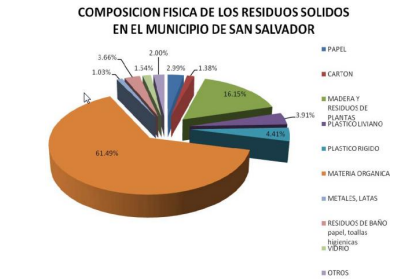
Basic Information

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Population	Total population Estimation of population growth			○	Ministry of Economy (Ministerio de Economía, Dirección General de Estadística y Censos – DIGESTYC, San Salvador, Revisado Mayo de 2010) http://www.digestyc.gob.sv/index.php/servicios/descarga-de-documentos.html
Land	Area (km2), Land uses			○	National Service of Territorial Studies (Servicio Nacional del Estudios Territoriales) http://www.snet.gob.sv/ver/geologia
Natural conditions	Variation of temperature, precipitation;			○	National Service of Territorial Studies (Servicio Nacional del Estudios Territoriales)

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
	Presence/absence of dry and rainy seasons				http://www.snet.gob.sv/ver/meteorologia
Economy	Economic activities	What is the key industry?	○		USD 3,728.6 per capita Main industries: agriculture, textile

Administration of Solid Waste Management (SWM)

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Administration	Administration system Subdivision (District etc.)		○		The solid waste sustainable management direction of the municipality of San Salvador http://www.desechossolidos.gob.sv/?page_id=20
Service area and populations covered	SWM service area (%) SWM service population (%)		○		Collection service coverage 100% Certain portion of waste collection works are covered by private companies through contracts. Private collection started from 1999. Waste collection in areas where access is difficult due to narrow roads is covered by micro companies. Large generators waste such from institutional and commercial entities are covered by private collection services.
Rule, Regulation	Laws, Ordinances or orders about SWM	Is there any specific law or ordinance about SWM in the city/governorate?	○		<table><tr><th>Instrument</th><th>Name, date, additional comments</th></tr><tr><td>Law</td><td>Ley del Medio Ambiente May 2008</td></tr><tr><td>Regulation</td><td>Reglamento de Manejo de Desechos Sólidos Decree 42, year 2000</td></tr><tr><td>Norm</td><td>No official technical norms, there were a proposal in year 2003</td></tr><tr><td>Municipal ordinance</td><td>34 municipalities</td></tr></table>
SWM Policy	SWM Policy	Is there any policy on SWM?	○		Statute of Municipal Directorate for Sustainable Management of Solid Waste (Estatutos de la Dirección Municipal para la Gestión Sustentable de Desechos Sólidos.)
Master Plan in city level	SWM Master Plan	Is there any plan for SWM?	○		JICA provided M/P for the San Salvador metropolitan area (COAMSS) through the development study.
SWM Finance	Budgeting mechanisms; financial management systems; Latest budget allocated	Is there well-defined SWM accounting and financial management system?	○		The annual expenditure of the directorate is about 14 million US$, which counts for about 9 million for personnel expenditure such as wages, about 1 million for the fuel costs, about 1 million US$ for repair and maintenance works.
SWM Accounting	Waste collection fee Income and expenditure for SWM implementation	How the waste collection fee is collected? Is balance sheet for SWM prepared?	○		Waste service tariff collection is done through the joint billing with the electricity. Some citizen only pays the electricity bill and separately refuses to pay the waste service charges. However in general, majority of citizen pays both at once. Annual Report of Municipal Directorate for Sustainable Management of Solid Waste (Memoria de Labores de Dirección Municipal para la Gestión Sustentable de Desechos Sólidos 2011-2012) http://www.desechossolidos.gob.sv/?page_id=20
Human Resources	Number of the SWM department(s), Organization chart	How many members are working for SWM? Is the number of staff is appropriate?	○		Employees are 1,400 in total that counts for 450 collection crews including drivers; 350 road sweepers; and 250 sanitation workers (waste and sludge removal from sewerage pits, etc.).

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Intellectual assets in SWM	SWM survey/research reports, research papers, database Data on volume and quality of waste generated in the city Waste stream in the city	Has SWM survey implemented so far? Is the survey report available?	○		SWM survey implemented Annual Report of Municipal Directorate for Sustainable Management of Solid Waste (Memoria de Labores de Dirección Municipal para la Gestión Sustentable de Desechos Sólidos 2011-2012)
Information on SWM Implementation in the City/Governorate					
Waste generation	Amount of total waste generation (ton/month) Average waste composition - Biodegradable (%) - Plastic (%) - Glass (%) - Metal (%) - Paper (%) - Cloth (%) - Others (%)		○		Solid Waste Characteristics Survey (Estudio de Caracterización de Residuos Sólidos/ San Salvador, January 2010) 
Waste discharge	Method of discharge	Is there source segregation practice?	○		A pilot project of 2-categories (organic and no-organic) source separation is in progress. The 2-categories wastes are separately gathered in the specially arranged vehicle. The vehicle dumps the organic wastes at the Aragon transfer station for transporting to the Nejapa disposal site, and organic fractions are given to the segregators at the Aragon station for recycling.
Collection and Transportation Equipment	- Waste containers - Transportation vehicles - Repairing workshop	How many containers/vehicles are there?	○		142 units Memoria de Labores de Dirección Municipal para la Gestión Sustentable de Desechos Sólidos 2011-2012 P79
Waste Collection	Door-to-door collection, Curbside collection, Community container collection, or others?	How solid waste is collected?	○		Curbside collection, community container. It has compactor trucks, road sweepers, and mobile workshop, etc. (total 142 units). Vehicle renovation is the principal issue.
Sweeping Cleansing	Is there road sweeping practice? Waste generation from sweeping (ton/month)		○		Manual and mechanical
Waste transport	Private or public transporter? Transfer station?	Who is transporting the solid waste? Is there transfer station?	○		About 6 million US$ is annually paid to MIDES for the final disposal tipping fee and for the transport services from Aragon transfer station to Nejapa site.
Intermediate Treatment	- Composting - Manual separation - Incineration - Biogas	Which kind of intermediate treatment is available? Who is managing the facilities?	○		The municipality hopes to implement composting activities for treating organic waste. However, due to land limitation, no area is available for a compost project in San Salvador municipality. About 80 tons of organic wastes are generated daily at marketplaces in San Salvador.

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
	recovery				
Recycling	Recycling	Which kind of material is recycling? How much the recycling ration to total waste?	○		San Marcos municipality once disposed of its waste in another disposal site and MIDES raised tribunal dispute and the case was judged by the local court that the municipality breached the contract and consequently penalty was paid from the municipality to MIDES entity. 3R activities now deployed by the San Salvador municipality are declared as an educational promotion in order to avoid being claimed by the MIDES entity.
Final Disposal Site	Open dump? Controlled dump? Sanitary Landfill?	How many dump sites? Remaining capacity? Who is managing?	○		Sanitary landfill at Nejapa
Medical Waste	Generation amount (ton/month)	Is there special handling and facility?	○		After the autoclave treatment, sanitary landfill disposal at Nejapa site
Hazardous Waste	Type and generation amount (ton/month)	Is there special handling and facility?	○		No facility. There is no definition of hazardous waste. Meanwhile there are private recycling activities (list of recyclers).
Industrial Waste	Type and generation amount (ton/month)	Is there special handling and facility?			
Society and Education					
SWM Social organizations	NGOs, Community based organizations (CBOs), universities; un-organized actors	Is each organization active and/or influential? Who or which organization is recognized as an important stakeholder for SWM?	○		There are some containers in the city for separate discharge and collection, in cooperation with Coca Cola Industry as its CSR (Corporate Social Responsibility) activities. As for the "Colonia Limpia" project implemented by the labor union, about 10 private companies cooperate in producing environmental education materials such as pamphlets and separate waste collection bags.
Waste Pickers	- Street Waste Pickers - Dump Waste Pickers	How many waste pickers are there, approximately?	○		The project supporting waste pickers for starting a business is implemented, and they recover recyclable from 2-categories (organic and no-organic) source separation.
Waste Recycling markets	- Junk buyer shop - Recycling factory - Recycled selling shop	Which kind of items can be sold as recyclable?	○		There are intermediary buyers at various areas in the city.
Waste and Environmental education	- School education - Social education - Public awareness campaign		○		It is the principal tasks for the directorate that are environmental education and renewal of collection vehicles. A gondola (large vessel container) on a trailer is modified for a mobile class of environmental education. The San Salvador municipality places more efforts and resources on solid waste management. Sweeping works in the central historical zone are provided in tree shifts.
Solid Waste Problem(s)					MIDES problem The MIDES contract stipulates that all the waste collected should be disposed of at the landfill site. Waste reduction activities such as composting will result in the final disposal amount reduction and MIDES's income reduction, therefore active reduction promotion by the municipality will invite the contractual dispute of the above clause stipulated. San Marcos municipality once disposed of its waste

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
					in another disposal site and MIDES raised tribunal dispute and the case was judged by the local court that the municipality breached the contract and consequently penalty was paid from the municipality to MIDES entity.

4 Dominican Republic

4.1 Central government

Survey results on the central government (i.e., MARENA) are summarized in the capacity assessment format below.

Name (Mr. Francisco Flores Chang, Director del Departamento de Protección Ambiental, MARENA)
Month/Year (10/09/2012)

Basic Information

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Population	Total population, Population density, Estimation of population growth	Are Census data available?		○	National Office of Statistics (Oficina Nacional de Estadística (ONE)) http://www.one.gob.do/index.php
Land	Area, Land use	Is geographical map available? Is land use map available?		○	National Office of Statistics (Oficina Nacional de Estadística (ONE)) http://www.one.gob.do/index.php
Natural conditions	Variation of temperature, precipitation; Presence/absence of dry and rainy seasons	Is meteorological data available?		○	National Office of Meteorology (Oficina Nacional de Meteorología.) http://www.onamet.gov.do/
Economy	Economic activities	How much per capita GDP? What is the key industry?		○	Central Bank of Dominican Republic (Banco Central de la Republica Dominicana) http://www.bancentral.gov.do/
Politics	Political system Administration system	Who is the decision maker?	○		President of the Republic

Central Government

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
National Laws on SWM	Laws and regulations related to SWM Relevant laws on the environment Economic tools such as	What is the definition of solid waste in your country? Is the responsibility of SWM implementation clearly defined?		○	It is under preparation the General Law for Solid Waste (Ley General de Residuos Sólidos) There are Law176-07 (Ley176-07), Law 64-00 (Ley64-00) and the norm (Norma para la Gestión Ambiental de Residuos Sólidos No Peligrosos) for regulating the issue.

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
	green consumer rule , etc.				
National policy and plan	Central government policy on SWM	Is there a policy statement on SWM? Are there national plan, strategy and guideline on SWM?		○	The National Development Strategy aims to make an advancement that Dominican Republic comes out from the category of "developing countries". The National Development Strategy prioritizes the solid waste management issues. MARENA prioritizes the issues of climate change and solid waste management. A study was carried out in order to understand the present situation of solid waste management.
Administration in national level	Administration structure related to SWM in national government; Relationship between national government and local governments	How are the national plan, strategy, and/or policies acted to local government? Is there middle level government such as provincial government?	○		MAREAN has the competency in the national level. Competency in local level is given to municipalities.
National organization on SWM	Implementing public organization in national level	Is there national level organization for SWM (e.g. National SWM Centre)?	○		It is principally MARENA at national level. While the municipal federation (FEDOMU) as a NGO also handles solid waste management projects, functional role demarcation is necessary.
Privatization policy	Policy on privatization in SWM; Presence of waste industry	Is there privatization policy, or direct management system by public organization? Is there nation-wide activity of private waste industry?	○		ADN carries out collection and final disposal activities through concession. While some other municipalities carry them out either through concession or by direct operation, or mixture of them.
Financing to SWM implementation organization	Subsidies; Low-interest loans, Special fund; Investment	Is there subsidy from central government to local SWM implementing organization? Is there investment mechanism for SWM from private sector?	○		Budget for municipal solid waste management is basically from the service tariff income and municipal general budget. Large investment waste management project requires a public credits from the national government.
Environmental impact assessment (EIA) system	Information on the application for constructing SWM facilities; EIA and SEA systems	Are procedures for EIA clearly presented to waste-related facilities? How does it work for SWM facilities such as landfill?	○		It is stipulated in the Article 41 of the law (Ley General sobre Medio Ambiente y Recursos Naturales (law 64-00)).
Hazardous wastes and chemicals	Regulation and treatment standards for hazardous waste; Medical infectious waste	Is there a classification of hazardous waste; rules on handling and treating hazardous waste (e.g. Manifest system, PRTR)?	○		There is no law for hazardous waste management.
Pollution caused by waste	Environmental pollution caused by solid waste	Is there any pollution caused by mismanagement of solid waste or illegal dumping?	○		Waste disposal in rivers

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Education and Training	University, college and institute for studying/training solid waste management	How are SWM engineers and technicians produced?	○		GIZ/GIRESOL, JICA/CENICA, and JICA training courses in Japan
Donors	Activities by donors in SWM sector	Is there aid activity by any donors in SWM sector? Is there any experience of international aid in SWM sector?	○		JICA, AECID, USAID, GIZ, AFD, IDB, BM, PNUD, APS-OMS, UE, CCAD, SICA

4.2 Local governments

Survey results on local governments (Ayuntamiento de Distrito Nacional) are summarized in the capacity assessment format below.

Name (Mr. Jose Miguel Martinez, Environment and Risk Management Secretary, ADN)
Name of City/Governorate (Ayuntamiento de Distrito Nacional)
Month/Year (10/09/2012)

Basic Information

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Population	Total population Estimation of population growth			○	National Office of Statistics (Oficina Nacional de Estadística (ONE)) http://www.one.gob.do/index.php
Land	Area (km2), Land uses			○	National Office of Statistics (Oficina Nacional de Estadística (ONE)) http://www.one.gob.do/index.php
Natural conditions	Variation of temperature, precipitation; Presence/absence of dry and rainy seasons			○	National Office of Meteorology (Oficina Nacional de Meteorología.) http://www.onamet.gov.do/
Economy	Economic activities	What is the key industry?	○		Central Bank of Dominican Republic (Banco Central de la Republica Dominicana) http://www.bancentral.gov.do/

Administration of Solid Waste Management (SWM)

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Administration	Administration system Subdivision (District etc.)		○		Environment and Risk Management Secretary (Secretario de Gestion Ambiental y Riesgo / Dirección General Aseo Urbano y Equipos) http://www.aseourbano.adn.gob.do/
Service area	SWM service		○		It is estimated approximately 100%. Exact

<table>
<tr><th rowspan="2">Category</th><th rowspan="2">Information required</th><th rowspan="2">Key question</th><th colspan="2">Information acquisition</th><th rowspan="2">Information source</th></tr>
<tr><th>Interview</th><th>source provided</th></tr>
<tr><td>and populations covered</td><td>area (%)
SWM service population (%)</td><td></td><td></td><td></td><td>population at difficult access areas is not known.</td></tr>
<tr><td>Rule, Regulation</td><td>Laws, Ordinances or orders about SWM</td><td>Is there any specific law or ordinance about SWM in the city/governorate?</td><td>○</td><td></td><td>Regulation on Non-hazardous Waste Management (Provided by the JICA development study)</td></tr>
<tr><td>SWM Policy</td><td>SWM Policy</td><td>Is there any policy on SWM?</td><td>○</td><td></td><td>It is targeted to establish sustainable solid waste services in the ADN strategy plan for 2005 – 2015 with:
1. maintaining sound environment
2. managing waste in an environmentally appropriate manner
3. reducing waste amount for minimizing environmental loads</td></tr>
<tr><td>Master Plan in city level</td><td>SWM Master Plan</td><td>Is there any plan for SWM?</td><td>○</td><td></td><td>Master Plan provided by the JICA study. Revision of M/P is conducted by the JICA technical cooperation project.</td></tr>
<tr><td>SWM Finance</td><td>Budgeting mechanisms; financial management systems;
Latest budget allocated</td><td>Is there well-defined SWM accounting and financial management system?</td><td>○</td><td></td><td>Budget for municipal solid waste management is basically from the service tariff income and municipal general budget. Large investment waste management project requires a public credits from the national government.</td></tr>
<tr><td>SWM Accounting</td><td>Waste collection fee
Income and expenditure for SWM implementation</td><td>How the waste collection fee is collected?
Is balance sheet for SWM prepared?</td><td>○</td><td></td><td>Tariff collection is contracted for a private company.
45% of the total municipal budget is spent for the waste services. 30% of the cleansing services expenditure is covered by the tariff collected.</td></tr>
<tr><td>Human Resources</td><td>Number of the SWM department(s), Organization chart</td><td>How many members are working for SWM?
Is the number of staff is appropriate?</td><td>○</td><td></td><td>About 30 persons in the administrative section.</td></tr>
<tr><td>Intellectual assets in SWM</td><td>SWM survey/research reports, research papers, database
Data on volume and quality of waste generated in the city
Waste stream in the city</td><td>Has SWM survey implemented so far?
Is the survey report available?</td><td>○</td><td></td><td>It is reported in the quarterly report of the Recycling Promotion Center of ADN. ADN manages the database system of collection and disposal, and the database of directly operated collection vehicles.</td></tr>
<tr><td colspan="6">Information on SWM Implementation in the City/Governorate</td></tr>
<tr><td>Waste generation</td><td>Amount of total waste generation (ton/month)
Average waste composition
- Biodegradable (%)
- Plastic (%)
- Glass (%)
- Metal (%)
- Paper (%)
- Cloth (%)
- Others (%)</td><td></td><td></td><td>○</td><td>2,000 ton/day
Waste composition investigated through JICA study
% (Wet Base)
<table><tr><th>Category</th><th>Low Income</th><th>Middle Income</th><th>High Income</th></tr><tr><td>Kitchen Waste</td><td>51.2</td><td>53.5</td><td>45.7</td></tr><tr><td>Paper</td><td>11.7</td><td>16.9</td><td>22.4</td></tr><tr><td>Textile</td><td>3.0</td><td>3.7</td><td>5.4</td></tr><tr><td>Grass/Wood/Bamboo</td><td>10.5</td><td>5.9</td><td>1.3</td></tr><tr><td>Plastic</td><td>17.9</td><td>8.4</td><td>10.6</td></tr><tr><td>Rubber/Leather</td><td>1.4</td><td>0.0</td><td>0.0</td></tr><tr><td>Metal</td><td>1.9</td><td>1.7</td><td>3.1</td></tr><tr><td>Bottle/Glass</td><td>2.4</td><td>8.0</td><td>8.3</td></tr><tr><td>Soil/Stone/Ceramics</td><td>0.0</td><td>1.9</td><td>3.2</td></tr><tr><td>Others</td><td>0.0</td><td>0.0</td><td>0.0</td></tr><tr><td>Total</td><td>100</td><td>100</td><td>100</td></tr></table></td></tr>
<tr><td>Waste discharge</td><td>Method of discharge</td><td>Is there source segregation practice?</td><td>○</td><td></td><td>No source segregation</td></tr>
</table>

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
Collection and Transportation Equipment	- Waste containers - Transportation vehicles - Repairing workshop	How many containers/vehicles are there?	○		41 units of the directly operated collection. Majority of the services is covered by the private contractors.
Waste Collection	Door-to-door collection, Curbside collection, Community container collection, or others?	How solid waste is collected?	○		Curbside collection, and community container
Sweeping Cleansing	Is there road sweeping practice? Waste generation from sweeping (ton/month)		○		Manual and mechanical
Waste transport	Private or public transporter? Transfer station?	Who is transporting the solid waste? Is there transfer station?	○		There is one transfer station.
Intermediate Treatment	- Composting - Manual separation - Incineration - Biogas recovery	Which kind of intermediate treatment is available? Who is managing the facilities?	○		None
Recycling	Recycling	Which kind of material is recycling? How much the recycling ration to total waste?	○		Plastic, aluminum, paper, glass The Recycling Promotion Center of ADN makes efforts to compile the recycling data.
Final Disposal Site	Open dump? Controlled dump? Sanitary Landfill?	How many dump sites? Remaining capacity? Who is managing?	○		Controlled Dumping
Medical Waste	Generation amount (ton/month)	Is there special handling and facility?	○		Source separation of medical wastes and general wastes is promoted by the JICA assistance.
Hazardous Waste	Type and generation amount (ton/month)	Is there special handling and facility?	○		There is no special handling.
Industrial Waste	Type and generation amount (ton/month)	Is there special handling and facility?	○		There is no special handling.
Society and Education					
SWM Social organizations	NGOs, Community based organizations (CBOs), universities; un-organized actors	Is each organization active and/or influential? Who or which organization is recognized as an important stakeholder for SWM?	○		CBOs participate collection works at difficult access areas. Network of recycling activities is promoted.
Waste Pickers	- Street Waste Pickers - Dump Waste	How many waste pickers are there, approximately?	○		Waste pickers recover recyclables at streets and at final disposal site. There are about 400 waste pickers in Duquesa site.

Category	Information required	Key question	Information acquisition		Information source
			Interview	source provided	
	Pickers				
Waste Recycling markets	- Junk buyer shop - Recycling factory - Recycled selling shop	Which kind of items can be sold as recyclable?	○		There are many intermediary buyers both in the city and near the disposal site. The Recycling Promotion Center of ADN makes efforts to compile the recycling data.
Waste and Environmental education	- School education - Social education - Public awareness campaign		○		ADN provides environmental education and public awareness raising activities in selected communities and schools. There are many public awareness campaigns related with CSR.
Solid Waste Problem(s)					Construction of a new final disposal site

Annex 3

Outline of Solid Waste Management in Target Countries

Outline of Current Situation of Solid Waste Management in Target Countries

Country	Population (in millions)	Population of major cities	Urban population rate (2010)	GDP (in million USD)	GDP per capita (USD)	GNI per capita (USD)	Current Situation of Waste Management			Past assistance by Japan	Activiies by other donors	References
							General Situation	Responsible ministries/ agencies	Policies, laws, regulations, standards			
Antigua and Barbuda	0.09	- Saint John's (capital) 27,000 (2009)		1,154	13,006	-	- Waste generation ratio : 1.75Kg/ capita/ day (high ratio due to economic development and tourists) - Collection of industrial wastes: By private sector - Collection of domestic waste: 40% by National Solid Waste Management Authority; 60% by private sector - Waste collection rate: 95-100% (collected 2 times a week) - There are sanitary landfills with leachate treatment facilities in Barbuda and Cooks - Medical wastes: landfilled	- National Solid Waste Management Authority (established based on National Solid Waste Management Authority Act)	- National Solid Waste Management Authority Act (enacted in 1995, amended in 0 2005) - No policy regarding solid waste management - 3R is already being implemented (collection of recyclables at recycle center, composting and feeding to livestock the food wastes, environmental education)	-	-	- Country Report from Training on Sustainable Waste Management in the Caribbean Island Countries (A) at JICA Okinawa International Center in FY 2011
Republic of El Salvador	6.2	- San Salvador (capital) 1.534 million (2009)	64%	21,428	3,460	1,428	- Waste generation amount : 3,400ton/day (0.68Kg/capita/day) - Waste collection rate: 75% - Rate of local governments with waste management plans: 100% in cities with population of over 300,000; 41.3% nationwide - Disposal sites: 15 (among them, 5 can accept more than 20ton/day; creation of new disposal sites and expansion of current sites to capacity of 50ton/day is planned) - Open dump sites closed by 2007 - Local governments make annual plans but do not have mid or long-term waste management plans	- Ministry of Environment and Natural Resources	- Solid Waste Management Policy 2009-2014 (under approval procedure as of 2011) - Solid waste integrated management program (under development as of 2011) - Environment Act 233, 1998 stipulates development of Integrated Waste Management Program - Special Regulation on the Integrated Solid Waste Management 42, 2000	- Preliminary study for the study on regional solid waste management for San Salvador metropolitan area in the Republic of El Salvador (1999-2000) -Technical corporation project: Project for Integrated Solid Waste Management for Municipalities in the Republic of El Salvador (2005-2009) - 5 volunteers for the follow-up of the above projects (2011)	- IDB: Integrated Management of Solid Waste Generated in the San Andrés Valley 2007	- Regional evaluation on urban solid waste management in Latin America and Caribbean 2010 (Pan-American Health Organization) - Investigation on the current solid waste management in the region and SICA member countries (JICA 2011) - Country Report from Training on Waste Treatment Technologies and 3R for Central and South America at JICA Sapporo International Center in FY 2011 - Country report from Training on Waste Management to promote Recycle-based Society for South and Central Americas at JICA Chubu Center in FY2011 - Country-specific annual review of volunteer programs for FY 2010
Republic of Guyana	0.8	- Georgetown (capital) 132,000 (2009)	29%	2,259	2,994	-	-	MOLGRD; Ministry of Local Government and Regional Development	Environmental Protection Act. 11, 1996	-	- IDB: Georgetown Solid Waste Management 2006	-

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							General Situation	Responsible ministries/ agencies	Policies, laws, regulations, standards			
Republic of Cuba	11.3	- Havana (capital) 2.14 million (2009)	75%	-	-	4,839	- Lack of efforts to reduce domestic waste, lack of collection and transport planning, lack of capacity of vehicle maintenance and repair workshops, lack of technical capacity in designing and operating final disposal sites, - Lack of comprehensive waste management measures due to lack of basic capacity for planning and management in the planning sector which is responsible for the above issues	Ministry of Economy and Planning Ministry of Science Technology and Environment	Law 81	- Study on Integrated Management Plan of Municipal Solid Waste in Havana City (2004-2006) - Dispatch of short-term JICA expert: Advised improvement of final disposal site operation, planning of emergency closure of disposal site (2006) - Provision of second-hand waste collection vehicles through Grass Root Grant for Recycle (2007) - Dispatch of short-term JICA expert; municipal solid waste management (2007) - Havana Waste Management Capacity Building Project (2009-2014)	- UNIDO: Transfer of EST For Cleaner Management of Municipal Solid Waste (MSW) in Havana City and "Tourist Poles", Pilot Demonstration Project; Conducting pilot project on separate collection (2005-June 2009)	- Country report from Training on Waste Management to promote Recycle-based Society for South and Central Americas at JICA Chubu Center in FY2011
Republic of Guatemala	14.4	- Guatemala City (capital) 1.075 million (2009)	49%	41,341	2,873	13,464	-	- Ministry of Environment and Natural Resources - National Commission for the Management of Solid Waste (CONADES) external body of Ministry of Environment and Natural Resources	- National policy for integrated solid residue management (approved in 2005) - National Plan for Solid Waste Management - Environment Protection and Improvement Act, DL68-86 - Health Code 90-97 define that waste collection and management is the responsibility of local governments	-The Study on solid waste management in metropolitan area of Guatemala city (1991) - Expert as Advisor of Administrative Capacity Formulation for Waste Treatment Management (2009-2012) - Senior volunteer on (waste management) (2010-2012)	- IDB: National Plan for Solid Waste Management in Guatemala 2011 - AECID (Spain): Construction of sanitary landfill (2011), composting facility (2011),and sanitary landfill (2010) - GTI: Support to development of National Waste Management Policy (completed in 2005) - Denmark: Support to waste management authorities through training of environmental promoters and capacity building of local government staffs on environmental management - Program for environmental recuperation of the Lago de Amatitlan basin.	- Investigation on the current solid waste management in the region and SICA member countries (JICA 2011) - Country-specific annual review of volunteer programs for FY 2010 (draft)

Country	Population (in millions)	Population of major cities	Urban population rate (2010)	GDP (in million USD)	GDP per capita (USD)	GNI per capita (USD)	Current Situation of Waste Management			Past assistance by Japan	Activiies by other donors	References
							General Situation	Responsible ministries/ agencies	Policies, laws, regulations, standards			
Grenada	0.10	- Saint George's (capital) 40,000 (2009)	39%	784	7,500	-	- Waste generation ratio: 0.92Kg/capita/day (estimated based on records at the disposal site) - Waste collection rate: 95% - Disposal sites: 2 managed by the national government; 1 has leachate collection pipes - Metal is sorted in the inter-treatment facility	- Grenada Solid Waste Management Authority (agency within Ministry of Health, established in 1996)	- Grenada Solid Waste Management Authority Act, 1995 - Waste Management Act, 2001 - National Waste Management Strategy, 2003	-	-	- Country Report from Training on Sustainable Waste Management in the Caribbean Island Countries (A) at JICA Okinawa International Center in FY 2011
Republic of Costa Rica	4.7	- San Jose (capital) 1.416 million (2009)	64%	36,218	7,774	454,621	- Waste generated: 4,500ton/day (0.86Kg/capita/day) - Waste collection rate: 75% - Waste disposal fee cannot cover treatment costs - Final disposal sites: 39 (among them, 11 are illegal and 7 are sanitary landfills) - Although law on waste management has been enacted into law by majority vote, local governments difficulty in its implementation due to lack of financial and human resourcess. Some local governments within the San Jose metropolitan area are welcoming foreign companies to propose of participate in new waste management operations (Source: JETRO news, July 2011) - Efforts for environmental protection in the urban areas (e.g. water pollution control, waste treatment) have been lacking. Improvement in institutions and facilities of national and local governments, implementation system, and public awareness are key challanges.	- Ministry of Health	- General Law on Solid Waste Management (approved in 2010) - Waste Management Plan (2007-2022) - Integrated Waste Management Law, No.8839, 2010 - General Law of Health, No.5395, 1973 regulates separate collection, recycle, treatment of wastes -Regulation on Waste Management, Decree 19049-S, 1989 regulates collection, storage, transport, and disposal of wastes - Regulation on Electronic Waste Management E-Waste, Decree 35933-S, 2010 - Regulation on sanitary landfills, Decree 27378,1998	-	- UNIDO: Establishment and Operation of a National Cleaner Production Centre	- Investigation on the current solid waste management in the region and SICA member countries (JICA 2011) - Country Report from Training on Waste Treatment Technologies and 3R for Central and South America at JICA Sapporo International Center in FY 2011 - Country Report from Training on Waste Management Technologies and Environmental Education (A) at JICA Kyushu International Center - Country-specific annual review of volunteer programs for FY 2010

Country	Population (in millions)	Population of major cities	Urban population rate (2010)	GDP (in million USD)	GDP per capita (USD)	GNI per capita (USD)	Current Situation of Waste Management			Past assistance by Japan	Activiies by other donors	References
							General Situation	Responsible ministries/ agencies	Policies, laws, regulations, standards			
Jamaica	2.7	- Kingston (capital) 580,000 (2009)	52%	13,872	5,133	-	- Waste generated: 1,890ton/day - 60% of waste collection is by National Solid Waste Management Authority; 30% is by private sector - Disposal sites: 8 (no sanitary landfills); access roads in poor conditions, fire hazards occur in the sites - Waste collection: 1 time/week; in some areas 2 times/week (the planned collection rate: 2 times a week) - Illegal dumping is occurring (dumped in rivers, unoccupied space or bunt) due to low collection rate - Rate of local governments with waste management plans: 0%	- National Solid Waste Management Authority (a department within Ministry of Local Government and Environment)	- National solid waste management act,2001: stipulates establishment of National Solid Waste Management Authority, inspections, waste management standards, and recycle - Medical Waste Management Policy - Integrated Waste. Management Strategy and Action Plan - No system for recycling of materials - Initiating hazardous waste management is being considered	-	-	- Regional evaluation on urban solid waste management in Latin America and Caribbean 2010 (Pan-American Health Organization) - Country Report from Training on Municipal Solid Waste Treatment by Local Governments at JICA Osaka International Center in FY 2011 - Country Report from Training on Sustainable Waste Management in the Caribbean Island Countries (A) at JICA Okinawa International Center in FY 2011
Republic of Suriname	0.5	- Paramaribo (capital) 259,000 (2009)	69%	4,351	8,292	-	-	- Ministry of Public Works - Ministry of Regional Development	-	-	-	NATIONAL ASSESSMENT REPORT BARBADOS PROGRAMME OF ACTION + 10 REVIEW REPUBLIC of SURINAME February 2004
Saint Vincent and the Grenadines	0.1	- Kingstown (capital) 28,000 (2009)	49%	675	6,172	-	- Waste collection: implemented by both government and private sector - Waste collection rate: 1 time/week except in Kingstown (collected everyday) - Bulky wastes are collected 1 time/week - Industrial wastes are collected by private sector - Disposal site: 2 publicly operated sites with leachate collection and gas vent pipes - Facilities for composting organic wastes, production of activated carbon from wood chips, metal collection exist in the final disposal sites	- Solid Waste Management Unit of Central Water & Sewerage Authority; semi-autonomous public sector enterprise under the Ministry of Health and the Environment: Composed of departments for waste collection, management of disposal sites, reduction of wastes and environmental education, established in 1999	- Solid Waste Management Law, No.31, 2000 - Law on Management of Wastes from Water Crafts, 2002 - Regulation on Solid Waste Management, No.11, 2005 - Integrated Solid Waste Management Strategy	-	-	- Country Report from Training on Sustainable Waste Management in the Caribbean Island Countries (A) at JICA Okinawa International Center in FY 2011

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							General Situation	Responsible ministries/ agencies	Policies, laws, regulations, standards			
Saint Christopher and Nevis	0.05	- Basseterre (capital) 13,000 (2009)		673	12,847	-	- Collection of domestic wastes: By Solid Waste Management Authority - Collection of hazardous wastes: By Public Sanitation Department - Concept of 3R already introduced	- Solid Waste Management Authority under Ministry of Health - Solid Waste Management Department under Ministry of Health (Nevis)	- Solid Waste Management Act, 2009 - Regulation on Solid Waste Management in Nevis, No.6, 2002	-	-	- Country Report from Training on Sustainable Waste Management in the Caribbean Island Countries (A) at JICA Okinawa International Center in FY 2011
Saint Lucia	0.17	- Castries (capital) 15,000 (2009)	28%	1,199	6,890	-	-	Solid Waste Management Authority	Solid Waste Management Act	- Expert for legislative preparation regarding solid wastes and regional coordination (3 months in FY 2010)	- USAID: Industrial Survey for Cleaner Production and Eco-Efficiency in the Caribbean	- Country Report from Training on Sustainable Waste Management in the Caribbean Island Countries (A) at JICA Okinawa International Center in FY 2011 - Preliminary Study on Cooperation on Waste Management Sector in the CARICOM countries (February 2009)
Common-wealth of Dominica	0.07	- Roseau (capital) 14,000 (2009)	67%	472	6,964	-	-	-	Solid Waste Management Act	-	-	-

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							General Situation	Responsible ministries/ agencies	Policies, laws, regulations, standards			
Dominican Republic	9.9	- Santo Domingo (capital) 2.138 million (2009)	69%	51,576	5,195	35,884	- Waste generated: 7,000ton/day (1.26kg/day/capita in metropolitan area) - Waste collection: By private sector (about half are private companies); 50% of collected wastes are disposed in privately owned disposal sites - Public awareness on waste amount reduction and disposal rules lacking; technologies, knowledge, and experience are lacking with regard to maintenance of collection and transport vehicles	- Ministry of Environment and Natural Resources and Ministry of Health: Develop laws and regulations - Local governments: implement waste management - Standard on domestic waste management: NA-RS-001-03 - Law 176-07 stipulates that local governments are responsible for waste management - Law120-99 stipulates penal provisions for illegal dumping of wastes - Ministry of Health Law 42 (2001) stipulates legal system under which waste would be managed in cooperation with Ministry of Environment and Natural Resources	- General Environmental Law 64-2000: stipulates that municipal solid waste management is under the responsibility of Ministry of Environment and Natural Resources and Ministry of Health・	- Project for Appropriate Waste Management in Santo Domingo de Guzman, National District (2009-2012) - Study for Integrated Management of Urban Solid Waste in Santo Domingo (2005-2007)	- EU: SABAMAR project (improvement of waste collection in poor neighborhoods (ended in 2006) - IDB: Integrated MSWM in the Inter-Municipal Area of DR 2009	- Investigation on the current solid waste management in the region and SICA member countries (JICA 2011) - Country report from Training on Waste Treatment by Local Governments at JICA Hyogo International Center in FY 2011 - Country Report from Training on Waste Treatment Technologies and 3R for Central and South America at JICA Sapporo International Center in FY 2011 - Country Report from Training on Techniques for Integrated Waste Management at JICA Chugoku International Center in FY 2011 - Country report from Training on Waste Management to promote Recycle-based Society for South and Central Americas at JICA Chubu Center in FY2011
Republic of Trinidad and Tobago	1.3	- Port-of-Spain (capital) 57,000 (2009)	14%	20,945	15,614	-	- Waste generated: 700,000t (surveyed in 2010), 1.5Kg/capita/day - Final disposal site: 5 (3 operated by the Solid Waste Management Company Limited - The Solid Waste Management Company limited is operating 3 major disposal sites in cooperation with Regional Corporation which operate small-scale disposal sites - Private glass company is applying deposits in order to collect beer bottles - Composting is being promoted at regional level under governmental initiative	- Regional Corporation under Ministry of Local Government collects and disposes wastes - Standards on management of domestic wastes (NA-RS-001-03)	- No policies or laws specifically for waste management - Wastes are dealt with based on Litter Act (1973) and Public Sanitation Act (1950) - Ministry of Housing and the Environment is responsible for developing and implementing waste management plans based on Environmental Management Act	-	-	- Investigation on the current solid waste management in the region and SICA member countries (JICA 2011) - Country Report from Training on Sustainable Waste Management in the Caribbean Island Countries (A) at JICA Okinawa International Center in FY 2011

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							General Situation	Responsible ministries/ agencies	Policies, laws, regulations, standards			
Republic of Nicaragua	5.8	- Managua (capital) 934,000 (2009)	57%	6,591	1,139	6,011	- Waste generated: (Managua): 420,000t/year, 1.2Kg/capita/day - Waste collection rate: 82% (23% from reclamation work of illegal dumping site) - 90% of collected wastes is disposed in sanitary or controlled landfills - Rate of local governments with waste management plans: 100% in cities with population of more than 300,000 (1.2% nationwide) - No incineration facilities - Waste is collected by local governments (partially privatized)	- Ministry of Environment and Natural Resources	- National Strategy and Action Plan on Environment and Climate Change - -National Policy on Solid Waste Management in Nicaragua, No.47-2005 - Environment and Natural Resources Law, 9-95 - Environment and Natural Resources Regulation - Regulation on Sanitation, 934 - Regulation on Local Governments, 52-97 - Standards on Management, Treatment, and Final Disposal of Domestic Wastes, NTON 05014-02-2002 - Standards on Sanitary Landfill on Domestic Wastes, NTON 05013-01-2001	-The study on the improvement of the solid waste management system for the City of Managua (1994) - The Study on the Improvement of Urban Sanitation Environment of Principal Cities in the Republic of Nicaragua (Leon, Chinandega, and Granada) (1998)	- IDB :NI-M1030 : Integrated, Sustainable Solid Waste Program in Nicaragua's Southern Au Pr(2012) - UN-HABITAT : Solid Waste Management Technical & Institutional Assistance Initiative for Central America (2011) ・ aecid : El Proyecto de Desarrollo Integral del Barrio Acahualinca (PDIBA)	- Regional evaluation on urban solid waste management in Latin America and Caribbean 2010 (Pan-American Health Organization) - Solid waste management in the world's cities UN-HABITAT - Investigation on the current solid waste management in the region and SICA member countries (JICA 2011) - Country Report from Training on Waste Treatment Technologies and 3R for Central and South America at JICA Sapporo International Center in FY 2011
Republic of Haiti	10.0	- Port-au-Prince (capital) 2.143 million (2010)	52%	6,635	664	1,357	- Waste generated: 0.6Kg/capita/day (in urban area) - Waste collection rate: 20% (in urban area)	-	-	-	- IDB: Support for Environmental and Solid Waste Management in Managua 2007	-

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							General Situation	Responsible ministries/ agencies	Policies, laws, regulations, standards			
Republic of Panama	3.5	- Panama City (capital) 1.346 million (2009)	75%	26,777	7,614	5,563	- Waste generated: 2,671ton/day (2007), 0.65Kg/capita/day (urban area) - 40% of waste in urban area is collected by private sector - Waste disposal: In urban areas, 70% of wastes is disposed in sanitary landfills, 30% illegally disposed - Rate of local governments with waste management plans: 100% in cities with population over 300,000 (43.1% nationwide) - Has been successful in purchasing about 40 collection vehicles and expanding existing final disposal sites through independent funding. However, the capacities of the managers and engineers to address different issues are still lacking	- Urban and Household cleaning authority: develop waste management plans - Environmental National Authority	- Executive Decree No.34 2007 stipulates reduction of wastes - Regulation on National Network of Solid Wastes, Decree No.197 - Local Government Act (N9 106 1973) stipulates that waste management is under the responsibility of local governments - Basic principles regarding nationwide waste management was formulated with cooperation of UNDP and UNICEF (2001)	- Project for Improvement of Solid Waste Management for the Municipality of Panama (2007-2009) - Study on Solid Waste Management Plan for Municipality of Panama (2001- 2003)	- IDB: Survey on current conditions on waste management in 7 cities (Panama, San Miguelito, Arraiján, Chorrera, Capira, San Carlos, Colón)	- Regional evaluation on urban solid waste management in Latin America and Caribbean 2010 (Pan-American Health Organization) - Investigation on the current solid waste management in the region and SICA member countries (JICA 2011) - Country Report from Training on Waste Treatment Technologies and 3R for Central and South America at JICA Sapporo International Center in FY 2011 - Country report from Training on Waste Management to promote Recycle-based Society for South and Central Americas at JICA Chubu Center in FY2011
Common-wealth of the Bahamas	0.3	- Nassau (capital) 248,000 (2009)	84%	7,771	22,665	21,067	-	- National Environmental Authority - Urban and Housing Authority	EIA 規則 2005 - Environmental Impact Assessment Regulations 2005 - Pollution Control and Waste Management Regulations 2000	-	-	- Investigation on the current solid waste management in the region and SICA member countries (JICA 2011)

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							General Situation	Responsible ministries/ agencies	Policies, laws, regulations, standards			
Barbados	0.3	- Bridgetown (capital) 112,000 (2009)	44%	4,110	15,035	-	-	EPD. Sanitation Service Authority	Currently, there is no comprehensive law on waste management. The following laws are utilized for waste management. -Health Services Act (Cap.44)-1969 -Health Services (Nuisances) Regulations,1969 -Health Services (Disposal Of Offensive Matter) Regulations,1969	-	-	-
Belize	0.3	- Belmopan (capital) 20,000 (2009)	52%	1,401	4,064	-	- Waste generated:119ton/day (nationwide) - Rate of local governments with waste management plans: 25% - Waste collection rate in urban areas: 85% (by private sector) - Disposal method: Open-dumping (85%), illegal dumping (15%) - Financing schemes exist for investing in waste treatment - Waste disposal fee is determined by the Public Service Committee	Ministry of Natural Resources and the Environment	- National Plan For Solid Waste Management - Solid Waste Management Act Chapter224	-	- IDB: Solid Waste Management Project 2008	- Investigation on the current solid waste management in the region and SICA member countries (JICA 2011) - Regional evaluation on urban solid waste management in Latin America and Caribbean 2010 (Pan-American Health Organization)
Republic of Honduras	7.6	- Tegucigalpa (capital) 1 million (2009)	52%	15,344	2,019	20,175	- Waste generated:1,200ton/day (0.5Kg/capita/day) - Disposal sites: Open Dumping - Rate of local governments with waste management plans: 100% in cities with population of more than 300,000 (26.7% nationwide)	Ministry of Natural Resources and Environment	- General Environmental Law 104-93 - Regulations for Integrated Management of Solid Waste, Agreement 378-2001	Estudio sobre Manejo de Residuos Sólidos en el Area Urbana de Tegucigalpa, Distrito Central, en la República de Honduras (1999)	-	- Investigation on the current solid waste management in the region and SICA member countries (JICA 2011)

Country	Population (in millions)	Population of major cities	Urban population rate (2010)	GDP (in million USD)	GDP per capita (USD)	GNI per capita (USD)	Current Situation of Waste Management			Past assistance by Japan	Activiies by other donors	References
							General Situation	Responsible ministries/ agencies	Policies, laws, regulations, standards			
United Mexican States	113.4	- Mexico City (capital): 19.319 million - Guadalajara: 4.338 million - Monterrey: 3.838 million - Puebla: 2.278 million - Tijuana: 1.629 million (2009)	78%	1,035,871	9,133	76,872	- Waste generated: 1.52Kg/capita/day - Rate of local governments with waste management plans: 25% in cities with population of more than 500,000 (88% in cities with population from 300,000 to 400,000)	- Minister of Environment and Natural Resources	- General law on waste prevention and integrated management (2003) - Preliminary Analysis for Integrated Waste Management: Basis of formulating national program for integrated waste management	・Project of Development of Waste Management Policy based on 3Rs (2007-2008)	- GIZ: Urban and industrial environmental management 2010 Sustainable waste management in the tourism sector of the Mexican Caribbean (PPP) 2008 Solid Waste and Contaminated Site Management 2005	- Regional evaluation on urban solid waste management in Latin America and Caribbean 2010 (Pan-American Health Organization) - Country report from Training on Waste Management to promote Recycle-based Society for South and Central Americas at JICA Chubu Center in FY2011

Source: Population, GDP, GNI per Capita: World Bank (for FY 2010, http://databank.worldbank.org/ddp/editReport?REQUEST_SOURCE=search&CNO=2&country=URY&series=&period=); Population of major cities, urban population rate: CIA World fact book